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"Impact Of Walking And The OTAGO Exercise Program On Improving Balance Parameters In The Elderly". (Research Methodology).

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Abstract

There will likely be a rise in fall rates as the population ages. This will impact our society and put more strain on healthcare systems by increasing the number of unintentional injuries and injury-related deaths. According to Zijlstra et al. (2007), falls have a significant psychological impact on individuals, frequently leading to diminished confidence, decreased functional activity, deconditioning, and an elevated risk of falls. Estimated costs of fall-related damage to older adults owing to demographic changes in Australia (2003) predict that by 2051, fall-related injuries, which currently account for 5% of the country's overall health budget, would triple and cost the Australian health system about $1,375 million annually. Exercise and other modifications in lifestyle can potentially reduce the risk of many physical falls (Gregg et al., 2000; Sherrington et al., 2011). The current recommendations for physical exercise among older persons, which include elements of aerobic, resistance, and balance training, are not met by many of them. According to Chodzko-Zajko et al. (2009), the American College of Sports Medicine (ASCM) advises older persons to engage in aerobic, muscle-strengthening, and flexibility exercises. People who have mobility issues or are at risk of falling should also engage in certain activities designed to enhance their balance. We determined that the study's subjects would be third-age individuals (over 65) who reside in assisted living facilities located in Tirana's district and city due to the issues that this demographic faces.

Keywords: falls prevention, ageing, nursing home support services, quality of life, older people, walking, OTAGO exercise program, balance, preventive care.

Introduction

Based on official data from the Social Security Administration and the State Social Service, as well as information from the media, it appears that quote Journal Si, July 29, 2022— "Every year, between 150 and 200 requests are made for accommodations in senior citizen homes." There are 350 spots available in total for senior homes across the nation. According to Journal Shqiptarja.com (12.09.2023), "76,413 people over 80 were estimated to reside in Albania by INSTAT in January 2019." "In Albania, there are six state homes for the elderly in Tirana, Kavaja, Gjirokastër, Shkodër, Fier, and Poliçan," the Social Security Administration website states as well". Given that the number of senior citizens housed in state-run nursing homes or institutions is limited to 350, we will use a program to randomly select 48 subjects from among the 350 names. We wish to stress that this study has its own challenges in persuading and heavily involving this demographic category in the experimental research because of health issues, a lack of culture surrounding physical exercise, skepticism regarding their participation in the study, etc. We estimate that 48 people in all will be involved in this study, split into the following groups, with measurements being taken both before and after the experiment for each group:

- Experimental Group with 24 subjects,
- Control Group with 24 subjects.

Subjects in total: 48.

According to Cumming et al. (2000), falls are one of the most prevalent age-related health issues affecting older people. They also frequently result in hospitalization for injuries, a loss of independence, and a lower quality of life. Exercise alone has been shown to help address the physiological deficits that are part of the complex etiology of falls and can reduce the rate of falls by about 30%. Exercises that challenge balance in particular have been shown to be especially effective in this regard (Sherrington et al., 2008; Sherrington et al., 2011b; Gillespie et al., 2012).

a. Walking is an inexpensive, low-impact type of physical activity. It has a vital function in the prevention and treatment of many diseases in addition to enhancing general health and quality of life (Stewart et al., 2017). Since it doesn't call for any specialized knowledge or equipment, walking is a fundamental activity that anyone can perform (Morris & Hardman, 1997). In order to achieve the same health advantages as 30 minutes of moderate-to-intense physical exercise, older people should walk between 7,000 and 10,000 steps per day, according to a review by Tudor-Locke et al. (2011). Another recommendation is that older persons engage in 30 minutes or 3000 steps of

moderate-intensity walking each day (Marshall et al., 2009). Walking improves fall-related psychological issues as well as balancing components (Okubo et al., 2014). Over a 16-month application period, the authors found that walking at a self-selected pace for 30 minutes, 2-3 times per week, decreased the risk of falls in older persons (Okubo et al., 2015).

b. Dancing has the ability to enhance a wide range of physical and cognitive fall risk factors since it is a sophisticated sensorimotor rhythmic exercise that integrates various physical, cognitive, and social elements. Dancing is more of an enjoyable social exercise for a lot of individuals than many basic, monotonous strength and balance routines that are frequently done alone. Research on the remarkable balancing abilities of young professional dancers has led to the suggestion that dancing might be a useful fall prevention technique (Judge, 2003). Ever since, a number of research studies that focused on dance and involved senior citizens have been published (Keogh et al., 2009), providing evidence for the positive effects of dance on gait and balance, two of the biggest risk factors for falls in the elderly (Ganz et al., 2007). According to Verghese (2006) and Jian-Guo et al. (2008), cross-sectional research has demonstrated that older adults who dance exhibit better gait and balance features than age-matched controls.

c. According to Campbell et al. (1997), the OTAGO fitness program is a progressive, well-structured, personally designed workout regimen that may be completed at home. Numerous studies in various nations and contexts have assessed OEP (Benavent-Caballer et al., 2016; Shubert et al., 2016; H. N. Yoo et al., 2013). Men and women over 70 were randomly assigned to experimental and control groups in a prior study on the Otago fitness program. It was found that the OTAGO exercises enhanced balance, increased muscle strength, and decreased the risk of falls (Liu-Ambrose et al., 2008). When it comes to keeping older adults from falling, one of the most well-liked exercise regimens is the OTAGO Exercise Program (OEP). It is typically created as a home workout regimen that includes walking, balance training, and exercises for strengthening muscles (Campbell et al., 2005). In order to prevent falls in older adults, the University of OTAGO in New Zealand created the OTAGO Exercise Program (OEP), a customized resistance and balance exercise program (Campbell & Robertson, 2006; Zalewski, 2015; Society et al., 2001; Patel et al., 2008; Robertson et al., 2002). It includes six warm-up exercises, five exercises for strengthening the muscles in the lower extremities, twelve activities for balancing that get harder and harder with time, and two exercises for recovery (Sherrington et al., 2011b; Robertson, 2001).

d.

Material and methods

The study will be based on preliminary laboratory tests that will determine the experimental groups' and the control group's levels of static and dynamic balance. The study will involve individuals who are 65 years of age or older, receive housing and assistance from public and private nursing homes in Tirana, are able to walk with or without assistance, have experienced at least one fall in the previous 12 months, and have successfully completed both the international standardized questionnaire (eq-5d) and a minimalist mental state test. The premise of the intervention is that:

a. For a duration of 12 weeks, the experimental group will receive treatment using an OTAGO exercise program three times a week and walking with varying volumes, intensities, and respite along with dance elements once a week.
b. The control group will carry on with its own daily schedule and plans, independent of the outcomes of the two experimental groups.

In weeks 1-4, the elderly will walk with experimental group 1 at a moderate intensity, walking 3000 steps per day or 30 minutes per day, three times per week.

- The elderly will walk with experimental group 1 at a moderate intensity for three times a week, or 4500 steps per day, or 45 minutes per day, in weeks 5-8.

- The elderly will practice walking with experimental group 1 in weeks 9–12, increasing the intensity to 6000 steps per day or 60 minutes per day, three times per week.

- Three times a week, participants should attempt to walk for 30 to 60 minutes at their regular pace. If you find the elderly to be fatigued, you can divide the stroll into shorter parts, such as three 10-minute periods. Elderly people with serious health issues should ideally be accompanied for the duration of the hiking program.

- For a period of 12 weeks straight (a total of 13 sessions), experimental group 1 will participate in weekend Latin/waltz dance classes lasting 45 to 60 minutes. Dance is less about physical goals and more about group social therapy and relaxation exercises.

Recommendations for carrying out the OEP:

Show, explain, and keep a careful eye on the person completing the activities to make sure they:

• Start with five minutes of mild stretching and warm-up.

• Every senior's exercise regimen is customized accordingly.

• The senior is content to carry on working out on her own between visits.

Strength training: The initial level is based on the person's ability to use the ankle cuff weight. Before becoming fatigued, complete 8 to 10 quality repetitions. This needs to be evaluated for every leg's muscle group. Individuals who are 80 years of age or older typically begin with 1 to 2 kilograms. Users may use up to 8 kg.

• Take note: Starting carefully and gradually will reduce the likelihood of both muscular discomfort and noncompliance issues. During strength training, we ensure that:

• The individual utilizes reasonably priced ankle cuff weights.

• The replacement of other muscle groups is modest.

• The individual breathes correctly—before a lift, exhale deeply, and then inhale as the elevator descends.

• The exercises are done slowly by the person using the joints' active functional range of motion (two to three seconds for lifting, four to five seconds for lowering). Between sets, the participant takes one to two minutes to rest.

• All strength exercises are performed standing, with the exception of the "front knee strengthening" exercise, which is performed while seated. (This helps enhance balance and strength.).

• The exercises are somewhat intense; the participant shouldn't overexert himself or go beyond their comfort zone.

Exercises for retraining balance:

• Watch the person perform the balance exercise to make sure they can use lower body techniques to recover their equilibrium.

• Not everyone will finish all of the balancing exercises or begin at level one.

People who are unstable could first require a larger support system. When doing balance exercises, make sure the person can:

• look forward;

• understand that it's beneficial to change lower limb balance throughout exercises, such as the recovery step.

There are many benefits associated with the OTAGO fitness program. By following your program, you can enhance your overall fitness, muscle strength, balance, and general well-being. The workouts listed should be done three times a week. You can divide up the exercises. They don't have to wrap up right away. After every round of exercise, inhale deeply three times or more. Upon beginning an exercise regimen, you could experience some stiffness. This is really typical. As a result, you may be using muscles that are not accustomed to the activity. It

is crucial that you, keep up your training. As your body adjusts to the workout, it will become less stiff (J. C. Davis et al., 2010).

Security

Never try grasping onto a chair or other moving object. Use the side of a solid item, like a bench or table, unless instructed differently. If an illness keeps you from continuing with the fitness program, get in touch with your teacher before beginning it again. Please do not hesitate to call your instructor if you have any of the following symptoms during exercise: dizziness, chest pain, or difficulty speaking due to shortness of breath (J. C. Davis et al., 2010).

Daily

You may become more physically fit by increasing your daily activity, as you may not be aware. Here are a few suggestions for things to do during the day: Use the stairs rather than the escalator or elevator. Walk home after getting off the bus one stop early. Take a walk with relatives and guests when they arrive before enjoying a cup of tea. When the weather permits, use the garden. As you fold clothes, get up. These are but a few instances of time- and money-saving techniques (J. C. Davis et al., 2010).

Walking

Walking is a fantastic way to increase your level of general fitness. You should think about taking a walk on the days in between your workouts. Walk for longer periods of time and farther each time. stroll outside and enjoy the pleasant weather (J. C. Davis et al., 2010).

Advice For Those Who Walk.

- Don't forget to dress comfortably.
- Begin with two minutes of stationary walking as part of your warm-up.

As You Move...

- The shoulders are loose, and the arms swing gently.
- Aim upward rather than below.
- With every step, push with your toes behind the heel.
- Conclude with two minutes of stationary jogging.

Take pleasure in your work!

The tests will take place in the Biomechanics Laboratory of Sports University of Tirana.

1. CRT: Chair Rising Test / Test for rising from the chair
2. Romberg Test
3. Semi-tandem stance balance exercise

Discussions & Conclusions

In order to maximize performance gains, the literature review, meta-analysis, and study design seek to identify the quantitative correlations between balance training modalities (i.e., training length, training frequency, and training volume), equilibrium in healthy adults 65 years of age and older, primarily among residents of or guests in assisted living facilities (public or private). To the best of our knowledge, this study and the balance training regimens it uses to improve performance and balance in healthy older persons 65 years of age and older are, as far as we know, the first of their kind to be developed at the PhD level in our nation.

We believe the 12-week training period, three weekly sessions, 36 training sessions total, each lasting 30 to 60 minutes, and a weekly total of 90 to 120 minutes of OTAGO exercise program (without walking time) combined with 12 dance sessions (one every weekend) will be well received by the nursing home community, boosting their confidence that everything in this study is for improving their quality of life, which will culminate in a 30 to 40% improvement in their balance, thereby reducing the number of falls. Falls are one of the most sensitive issues for this relatively vulnerable age group and are often left untreated by peers, family, and policymakers.

In order to increase the effectiveness of practitioners' and therapists' protocols for improving balance, our study will offer new scientific evidence and guidance on load-dosing relationships. It will also emphasize the need for studies that combine balance training with programs that are methodically structured. The anticipated notable enhancement of balance from 30–40% would represent a noteworthy accomplishment for Albanian physical activity in the health field. This, in turn, would improve the elderly population's quality of life while also significantly lowering the national health system's expenses who mostly in the last ten years, has come to view falls and the consequences they produce as an emergency.

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Improving Physical Abilities And The Most Efficient Methods In Adults Over 40 Years Old.

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Abstract

Only a small percentage of adults engage in regular physical activity, which means a decline in quality of life and a very poor result compared to Europe (Osiński, 2013). The purpose of this literature review is to find the most contemporary methods from the most ranked scientific works on the improvement of physical abilities and the most efficient methods in adults over 40 years old. Digital databases such as Scopus, Medline, JStore, Embase, Cochrane Central, PsycInfo, Schoolar, and SPORTDiscus were used in this literature review. Inclusion criteria are: individuals must be healthy and average age at least 40 years old. Many other studies such as (Skelton et al., 1994; Foldvari et al., 2000; Bean et al., 2007) report that physical functions are more related to muscle power than to muscle strength or mass. Strength training has many benefits on physical function in older adults compared to traditional strength training (Tschopp et al., 2011; Da Rosa., 2019). Harmonization or proper use of variables such as exercise selection, breaks, number of sets, number of repetitions, frequency affect the increase in the level of muscular fitness. Strength, muscular endurance, muscular strength and muscular hypertrophy are the characteristics that should be trained (Ratamess et al., 2009). While in an all-inclusive program resistance training improves the cardiovascular system (Fleck. 1988), limits the risk of coronary heart disease (Goldberg. 1989; Hurley & Kokkinos, 1987), helps prevent osteoporosis (Layne & Nelson. 1999), removes the risk of diabetes (Miller et al., 1984), promotes maintaining a healthy weight and losing excess weight (Evans. 1999), reduces the risk of cancer in the spine (Koffler et al., 1992), helps in psychological/mental well-being

(Ewart. 1989) as well as improves dynamic stability and maintenance of functional capacity (Evans. 1999). In conclusion from the study of Balachandran et al. (2022) found that strength training leads to improvements in physical function more than traditional strength training.

Keywords: fitness, aging, power, strength, exercises

Introduction

Only a small percentage of adults engage in regular physical activity, which means a decline in quality of life and a very poor result compared to Europe (Osiński, 2013). The ability to perform activities of daily living (ADL) is vital to living independently. Age-related loss in muscle strength can compromise (Hairi et al., 2010) this ability and lead to disability. For example, the progression of muscle weakness limits the ability to grasp an object which further hinders the ability to open a jar. Experiencing difficulty in ADL and relying on others is not only associated with reduced quality of life (Hellstrom et al., 2004) but also increased likelihood (Gaugler et al., 2007) of long-term nursing (staying at home).

As a result, the population of the third age will dominate, which will be a serious problem for the economy of the state due to poor health. Therefore, maximum efforts are needed to improve the quality of health and life of the third-age population. Szukalski (2011) pointed out that the decrease in income as a result of the aging of the population means the need to increase the professional activity of the elderly. But this need has other disadvantages such as low physical performance as a result of involutional structural changes in the internal organs, the respiratory system, the cardiovascular circulation and the passive and active motoric system (English & Paddon-Jones, 2010).

As a result, there is a need for health promoters, the education system and the media to encourage society about regular health education. When encouraging people to work long hours, it should be accompanied by the right physical condition. This requires a good balance of the scope of professional activity and the absence of people at work. The citizens of the Scandinavian countries and the Netherlands are in the best physical condition (KMPG, 2012) stating that 50-70% of them admit that they perform physical activity at least once a week. This percentage also includes people after the age of 50, noticing lower expenses for the treatment of the elderly. Studies show that the citizens of the Scandinavian countries and the Netherlands are in the best physical condition (KMPG, 2012) stating that 50-70% of them admit that they perform physical activity at least once a week. This percentage also includes people after the age of 50, noticing lower expenses for the treatment of the elderly.

The focus on each training component depends on the tasks each training period has. The realization of the performance has a basis which is physical preparation. The higher the physical preparation, the more effective the technical, tactical and psychological components will be. The insufficient level of PF (physical preparation) reflects in the use of human potential during sports performance, the technique is broken and fatigue appears quickly. In the training components, physical preparation is like a foundation stone on the basis of which the other

components "rise". The time required to create a state of higher adaptation depends on the complexity of the skill and on the athlete's physiological and psychological difficulties. The more difficult and complex the sport, the longer the necessary training period will be to promote neuromuscular adaptation.

Regardless of age, a suitable physical activity will bring about the necessary changes in the body (Wernbom et al., 2007). A suitable physical activity is strength and endurance training. According to forecasts, the number of senior citizens is expected to double by 2050 to approximately 1.5 billion (Werner, 2010). However, there are some intervention programs that help slow down the decline in physical functions. One of these programs is strength training to prevent or delay movement limitations in elderly individuals. According to Chmelo et al., (2015) strength training has been recommended to improve physical functions in elderly individuals. However, it is muscle strength that has emerged as a key factor in physical function. Researcher Reid et al., (2014) prove that it is muscle power that decreases at a faster rate compared to muscle strength during the aging period.

The purpose of this literature review is to find the most contemporary methods from the most ranked scientific works on the improvement of physical abilities and the most efficient methods in adults over 40 years old.

Methods

Digital databases such as Scopus, Medline, JStore, Embase, Cochrane Central, PsycInfo, Schoolar, and SPORTDiscus were used in this literature review. There was a restriction on the year of publications (last 10-15 years). Inclusion criteria are: individuals must be healthy and average age at least 40 years old. The resistance training intervention program included machine-related exercises, body weight exercises, ergometric bicycles, elastic belts, etc.

Results

Researcher Reid et al. (2014) prove that it is muscle power that decreases at a faster rate compared to muscle strength during the aging period. Many other studies such as (Skelton et al., 1994; Foldvari et al., 2000; Bean et al., 2007) report that physical functions are more related to muscle power than to muscle strength or mass. Strength training has many benefits on physical function in older adults compared to traditional strength training (Tschopp et al., 2011; Da Rosa., 2019). These studies include plyometric training with exercises such as (CMJ and depth jump) (Miszko et al., 2003; Ramirez-Campillo et al., 2014). According to Vetrovsky et al. (2019) unlike power training which uses slow controlled eccentricity, plyometric training uses fast eccentricity. Previous studies examining the effects of strength training have used different interventions. As an example, standing strength training exercises were used for the experimental group while seated strength training exercises were used for the control group (Bean et al., 2009). The inclusion of many intervention programs makes it difficult to understand the impact that strength training has on physical function.

Some types of strength training require a special methodology (Stefaniak, 2006; Zając et al., 2010). Before starting a training program you must apply a preparatory cycle to adapt to the subsequent program. This preparatory cycle can last from several weeks to several months and has a health and self-educational value to encourage people to engage in physical activity. Resistance training induces biochemical changes in skeletal muscle and thus improves whole body functions (Wernbom et al., 2007). Resistance training causes an increase in the activity of collagen proteins, which affects the increase in muscle turnover (Burd et al., 2010). The study by Davis et al. (2008) prove that the combination of strength training and aerobic training for 11 weeks improves endurance and strength. The high-intensity training group changed body composition more compared to the low-intensity training group. Many literatures suggest the use of resistance exercises. In conclusion, the study of Davis et al. (2008) proved that the combination of strength training and aerobic training for 11 weeks improves endurance and strength.

In the study of Marques et al. (2011) resistance training produced positive changes in bone density (in women), fat reduction and improved balance. Also the researcher Borer. (2005) confirm changes in the inhibition of osteoporosis after the application of resistance training. Researchers Willis et al. (2012) and Ormsbee et al. (2009) proved that isometric exercise improves resting metabolism.

The aim of the study of Kalwa et al. (2019) is to find a suitable method to inhibit the involutionary processes as well as to improve the physical abilities of people over 40 years old. Also, this work aims to determine the loads and the dose of physical efforts, which must be looked at carefully to avoid injuries and to eliminate the negative effects of resistance training. 178 adults, 92 of whom were women and 86 men aged 40-61, participated in this study. They participated in an 8-month training program. The participants in the study were divided into two groups - group 1 (51-61 years old) and group 2 (40-50 years old). Before applying the strength program, a preparatory training cycle was carried out. The training was carried out 3 times a week. Two exercises were performed for each major body part. 15 minutes of warm-up and 60-80 minutes of strength training as well as 10 minutes of stretching. The final results from this study show that the exercise program provides beneficial effects in the fight against the symptoms of aging. The data showed changes in body composition and physical fitness in both groups but the group where the higher intensity exercise was applied had greater changes. Improved fitness was seen in both women and men. The greatest changes were observed in physical fitness.

The meta-analysis of the study of Balachandran et al. (2022) evaluated the impact of strength training on physical functions in the third age. A small number of findings showed that strength training improved physical function more than traditional strength training. The above study only evaluated meta-analyses or studies related to strength training without using plyometric exercises. Two other studies were not included in this meta-analysis because the experimental group performed standing strength training exercises while the control group used seated strength training exercises (Bean, 2004).

Also, two other studies were not included in the analysis because they performed CMJ (Miszko et al., 2003), and the second study combined circuit training with strength training (Balachandran et al., 2014).

The study by Balachandran et al. (2022) focused only on strength training without the intervention of other types of training. To assess physical functions, most studies used the GUG test and the chair sitting test. These two above mentioned tests are used in a fast rhythm while the I Timed up and go test is used in a regular rhythm. For the GUG test we observed a mean

improvement of 1.85 seconds SD 0.62 while for the chair stand test a greater improvement was observed with 4.3 seconds SD 0.56. Strength training produces an increase in strength in type II muscle fibers independent of age and gender (Claflin et al., 1985, 2011). According to Lexell (1995) the fibers of the second type have a loss during the aging period. As seen the improvement of strength and power is responsible for the limitation of movements (Santanasto et al., 2017). Consequently, the improvement of muscular strength provides a biological basis for the improvement of physical functions. While walking speed, strength and muscle mass are not related. In many studies, the same levels of intensity and volume were used for both groups, so we do not expect to have different results of strength and muscle mass. While studies that showed improvements in walking speed applied walking as an exercise program (Pahor et al., 2014). Adverse effects were minimal in both groups.

Discussion

It should be noted that some forms of physical activity that may be of particular importance to an aging population (eg, balance training) may not fit this standard definition. This activity can be carried out during leisure or working hours, and surveys of older adults (Harada, 2001) should include both paid and unpaid (volunteer) work. Moderate physical activity does not appear to be sufficient in terms of increasing participation in these activities among older adults (Dunn, Anderson, & Jakicic, 1998). In order to effect long-term changes in behavior, it is necessary to identify, examine and begin to provide information on the barriers to physical activity that affect adults so that they do not become obstacles from the transition from a passive to a physically active one (Dishman & Sallis, 1994). Harmonization or proper use of variables such as exercise selection, breaks, number of sets, number of repetitions, frequency affect the increase in the level of muscular fitness. Strength, muscular endurance, muscular strength and muscular hypertrophy are the characteristics that should be trained (Ratamess et al., 2009). While in an all-inclusive program resistance training improves the cardiovascular system (Fleck. 1988), limits the risk of coronary heart disease (Goldberg. 1989; Hurley & Kokkinos, 1987), helps prevent osteoporosis (Layne & Nelson. 1999), removes the risk of diabetes (Miller et al., 1984), promotes maintaining a healthy weight and losing excess weight (Evans. 1999), reduces the risk of cancer in the spine (Koffler et al., 1992), helps in psychological/mental well-being (Ewart. 1989) as well as improves dynamic stability and maintenance of functional capacity (Evans. 1999). In conclusion from the study of Balachandran et al. (2022) found that strength training leads to improvements in physical function more than traditional strength training. The study evaluated only meta-analyses or studies related to strength training without using plyometric exercises. For the GUG test we observed a mean improvement of 1.85 seconds SD 0.62 while for the chair stand test a greater improvement was observed with 4.3 seconds SD 0.56. Strength training produces an increase in strength in type II muscle fibers independent of age and gender (Claflin et al., 1985). According to Lexell (1995) the fibers of the second type have a loss during the aging period. As seen the improvement of strength and power is responsible for the limitation of movements (Santanasto et al., 2017). Consequently, the improvement of muscular strength provides a biological basis for the improvement of physical functions. According to studies (Fried & Guralnik, 1997; Janssen et al., 2002; Bergen et al., 2014) aging is associated with a decrease in physical functions, loss of physical independence as a consequence and a decrease in the quality of life. The study by Katz et al. (1983) emphasize that the extension of life expectancy must necessarily be accompanied by the good preservation of physical functions. According to

forecasts, the number of senior citizens is expected to double by 2050 to approximately 1.5 billion (Werner, 2010). However, there are some intervention programs that help slow down the decline in physical functions. One of these programs is strength training to prevent or delay movement limitations in elderly individuals. According to Chmelo et al. (2015) strength training has been recommended to improve physical functions in elderly individuals. However, it is muscle strength that has emerged as a key factor in physical function.

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The Role And Impact Of Outdoor Walks, Combined With A Special Recreational Exercise Program, In Improving Lower Limb Strength And Motor Balance In 55-65 Year Olds

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Abstract

Sports participation is declining in most countries starting at age 12, with the tendency becoming considerably more noticeable as people get older. The most industrialized nations experience a demographic shift that leads to an older population due to declining birth rates and improvements in healthcare. The objective of this literature review is to analyse the existing data to discover the rates, current trends of sports participation, health problems and ways of preventing and improving it through exercise therapies of a recreational nature in the 55-65 age group in Albania and the world. 54 articles from Google Scholar, 16 articles from Crossref, 22 articles from PubMed, 14 papers from Research Gate, and 11 books (a total of 117 references) that were chosen for preliminary screening were evaluated using a methodical methodology. Upon through examination, 29 articles, or 25% of the total, satisfied the requirements to be regarded as legitimate for the subject at hand. The current condition of lower limb strength and balance in both the experimental and control groups will be determined through preliminary laboratory testing. Two instruments from the Sports University of Tirana biomechanics lab; the Leonardo Platform and the Isokinetic Dynamometer will be employed for the aforementioned measurements. We estimate that the study sample will consist of 60–90 working-age men and women who fall into the 55–65 age range. The systematic literature review and meta-analysis aims to define quantitative relationships of lower limb strength with balance improvement. Due to the accelerated aging process, the middle-aged population experiences a decline in strength, endurance, flexibility, and muscle mass (sarcopenia), which impairs coordination, stability, and balance.

Keywords: outdoor walks, special recreational exercises, lower limb strength, age group 55-65, balance, quality of life.

Introduction

People who lead sedentary (inactive) lifestyles are becoming more prevalent at the moment (Guthold et al., 2008). According to (Dumith et al. 2011), the average prevalence of inactivity among adults over 15 years old is 21.4% across 76 nations in the world. The World Health Organization listed physical inactivity as the fourth leading cause of early death. Like other nations, the Czech Republic is seeing an increase in obesity rates, a decline in physical activity, and an increase in inactivity (Ministry of Health of the Czech Republic, 2014a). In the Czech Republic, health insurance companies had to pay 700 million CZK (or 0.4% of total health care expenses) in 2008 for treatment brought on by inactivity (Marešova, 2014). Reversing the downward trend of physical inactivity is one of the goals of the global organizations headed by the World Health Organization, as is enhancing the health of the people in those nations. To promote a comprehensive approach to the promotion of physical activity, the World Health Organization, in particular, releases a number of studies and documents. These include national plans, strategies, and recommendations that help people modify their lifestyles through physical activity in support of health while also taking into account the environment, customs, and cultural specifics of a country (EU Working Groups "Sport & Health", 2008).

Research on the aging population is becoming more and more prevalent. The aging of the world's population is one of the main causes. The World Health Organization issues a warning, stating that the number of adults aged 60 and older may double by 2025. Elderly people who engage in regular physical activity might benefit not only from improved health but also from improved social and emotional well-being, longer periods of self-sufficiency, and lower health care expenses (Services, 2000). Either biological age or calendar age can be used to define old age. Physiological, mental, and social changes that take place throughout life are associated with biological age. Typically, the age range of 60 to 65 marks the transition from maturity to old age (Organization, 2009). However, 50 years old is the historical event that, according to (Vágnerová & Karlova, 2007), indisputably signaled the commencement of old age. The onset of aging results in perceived changes on the inside as well as the first visible changes on the outside. An older person starts to comprehend possible risks, current limitations in movement, cognition, reaction time, or adaptability to new settings, technologies, and societal changes throughout this period. Furthermore, it is linked to the onset of menopause in women over 50, a time when the follicular system vanishes and the level of estrogen drops below what is necessary for endometrial development. Women consequently experience climacteric syndrome (Pelclová, 2015).

The 50–70 age range is considered a transitional period because during this time, people typically transition from being parents to being grandparents (Vágnerová & Karlova, 2007). They are also especially susceptible to the most significant socially conditioned change from being employed to being retired (Pelclová, 2015b). According to (Dumith et al., 2011b; Guthold et al., 2008b), the prevalence of inactivity and the rise in sedentary lifestyles are becoming major global challenges. According to a global analysis, women are more likely than men to be physically inactive as they age, and they are also more likely to live in industrialized nations (Hallal et al., 2012). According to research, two-thirds of adults in EU nations do not engage in enough physical activity (Sjöström et al., 2006). The World Health Organization notes in its assertions that 6% of the world's population dies from physical inactivity, which greatly raises the risk of unfavorable health conditions (Lee et al., 2012b). According to recent research, which is based on systematic literature review studies, there is a strong correlation between physical activity—which can be defined broadly (e.g., by energy expenditure) or more specifically—and health, depending on its intensity, duration, and frequency (Haskell et al., 2007). Physical activity has been demonstrated to lower the risk of osteoporosis, cardiovascular disease, stroke, high blood pressure, colon cancer, breast cancer, type II diabetes mellitus, and premature death in the adult and senior populations (Haskell et al., 2007 Miles, 2007; Nelson et al., 2007; Physical Activity Guidelines Advisory Committee, 2008; Sims et al., 2010; Warburton et al., 2010).

Active And Passive Aging, Health Problems And The Impact Of Physical Activity In Improving The Quality Of Life.

The World Health Organization released guidelines in 2002 stating that each person should engage in at least 30 minutes of physical activity daily. These suggestions were later expanded in accordance with the US CDC/ACSM guidelines (Haskell et al., 2007). The World Health Organization advised that individuals engage in at least 30 minutes of moderate physical activity five times a week or at least 20 minutes of intense physical exercise, divided into intervals of at least 10 minutes, three times a week. Adults should also make sure to engage in two or three times a week of activities that improve their muscle strength and endurance. Current WHO guidelines (World Health Organization, 2010) state that planned exercise, games, sports, housework, active transportation, leisure or recreational activities, and professional activities should all be included in an adult's and an elderly person's daily, family- and social-oriented physical activity.

Adults who walk are the ones who report exercising the most (Hulteen et al., 2017b). Walking is the almost ideal form of exercise because it requires little in the way of equipment or physical expertise and is socially acceptable to most people in most cultures (Morris & Hardman, 1997b). Walking has become a cornerstone of physical activity promotion for public health and a gateway through which inactive and less active individuals can initiate access to these benefits, given the relationship between physical activity and health and the disproportionate population health benefits derived from encouraging the most inactive persons to increase activity (Lee & Skerrett, 2001b). Adults should engage in at least 150 minutes of moderate-intensity physical exercise each week, according to current standards for physical activity (Gibson-Moore, 2019). As suggested, walking's health advantages vary depending on how intense it is (Shephard, 2001b). The single published meta-analysis of walking speed does not distinguish between indoor and outdoor contexts; hence, speed-based intensity recommendations are mostly based on laboratory studies (Bohannon & Andrews, 2011b). Clinically established gait speed thresholds have been applied as a summary measure of physical frailty (Woo, 2015b), as part of geriatric evaluation (Peel et al., 2012b), and to categorize walking independence (Graham et al., 2010b). Additionally, there are guidelines for walking, which is a natural, easy, and efficient way for people to move and the foundation of most regular forms of exercise (Schuna, 2012). Cadence and intensity have a strong correlation; a threshold value of > 100 steps/min has been determined for definitely defined moderate intensity (Tudor-Locke et al., 2018). In order to meet or surpass public health thresholds for moderate-intensity activity, walking at a chosen (normal) pace should be accompanied by an average speed of 1.31 m/s, a cadence of 116.65 steps/min, and an oxygen consumption of 11.97 mL/kg/min.

(Tudor-Locke & Bassett, 2004) proposed a basic PA classification system for healthy individuals based on the total number of steps taken in a day:

a. sedentary lifestyle (<5,000 steps/day),

b. low active (5000–7499 steps/day),

c. somewhat active (7500–9999 steps/day),

d. active (≥10000 steps/day), and

e. very active (>12500 steps/day).

This system follows the general recommendation of 10,000 steps per day.

The Relationship Between Recreational Physical Activity And The Quality Of Muscles In Men And Women Over The Age Of Fifty.

Exercise, especially resistance training, is the most widely utilized method to increase muscle quality in the elderly (Tracy et al., 1999; Reeves et al., 2004; Cadore et al., 2012; Radaelli et al., 2013). Men and women's muscle quality has been shown to increase by 14–28% after nine to fourteen weeks of resistance exercise (Tracy et al., 1999; Reeves et al., 2004; Cadore et al., 2012; Radaelli et al., 2013). Furthermore, it was noted by Kennis et al. (2013) that a year of vibration therapy or fitness training improved muscle quality by +11 and +7%, respectively. According to Chastin et al. (2011), men's muscle quality was also linked to intervals of high activity and extended rest intervals.

There is currently a lot of interest in research that focuses on the physical activity of older people and looks into the physical correlates and variables that are relevant (Kohl et al., 2012). The population's aging is the primary cause. The World Health Organization issues a warning, stating that the number of adults aged 60 and older may double by 2025. Elderly people who engage in regular physical activity have the potential to improve not just their physical health but also their social and emotional well-being, extend their ability to live independently, and ultimately lower their health care costs.

Regarding the onset of aging, that is, the significant social transition from parent to grandparent, from work to retirement, and the significance of physical activity for the elderly, a longer period must be designed, encompassing the status prior to the change, the change period, and the status following the change. Therefore, we concentrated on people 55 years of age and older while discussing the problem of physical activity among the senior population. To ensure that the results are unaffected by harsh weather, research investigations focusing on physical activity are deliberately carried out in the spring and fall, when the average temperature is 10°C (measured four times in a 24-hour period) (Tucker & Gilliland, 2007).

The fundamental tenet of all international guidelines is the same: physical activity is a requirement for healthy aging.

- Physical activity has various health benefits for older people, including maintaining cognitive and physical function. According to the Department of Health (2011), physical activity has a positive impact on health, and any amount of it is preferable to none at all.
- Seniors should engage in some physical activity regardless of their age, weight, or conditions that may be affecting their health. By all means, older individuals should be active every day (Australian Government, Department of Health, 2014).
- As much physical activity as possible is recommended for the elderly (Ministry of Health, 2013).

- Elderly individuals should engage in physical activity to the degree that their illness and current state of health allow if they are unable to obtain the recommended level of PA due to a medical condition (World Health Organization, 2010).

When it comes to beginning physical exercise, older adults are recommended to follow the guidelines of progressively increasing their level of intensity and quantity until they meet the suggested minimum (Department of Health, Australian Government, 2014; Ministry of Health, 2013).

According to Dishman and Sallis (1994), the great majority of physical activity intervention studies conducted to date have concentrated on populations of younger adults. Our goal is to present a critical analysis of the research on interventions aimed at increasing older individuals' physical activity. We have concentrated our efforts on summarizing the highest quality studies that have targeted individuals aged 55 and over, in compliance with the most recent guidelines from the World Health Organization for promoting physical activity and fitness among the elderly ("Responses to Publication of the WHO Heidelberg Guidelines for Promoting Physical Activity Among Older Persons," 1997) as well as the recommendations made by the organization for other health (Higgs, 1991).

Exercise-Based Strategies For Sarcopenia Prevention And Treatment (Loss Of Muscle Mass And Strength).

In addition to low muscle mass and loss of physical functioning, the conceptual definition of sarcopenia has been operationalized into consensus-based diagnostic criteria (Cruz-Jentoft et al., 2010; A. Cruz-Jentoft et al., 2018; Fielding et al., 2011; Dent et al., 2018; Dam et al., 2014; Studenski et al., 2014). Sarcopenia in the elderly has grave and potentially fatal consequences: it affects mortality, morbidity, disability, and health care expenses (A. Cruz-Jentoft et al., 2018; Dent et al., 2018). The World Health Organization's International Statistical Classification of Diseases and Related Health Problems (Anker et al., 2016) has classified sarcopenia as a disease since 2016, highlighting the necessity of its treatment approaches.

It is currently acknowledged that one of the mainstays for the management and prevention of sarcopenia is physical activity (A. Cruz-Jentoft et al., 2018; Dent et al., 2018; Lauretani et al., 2014). However, in recent decades, there has been a greater focus on research in the fields of geriatrics and gerontology (the science of aging), which has resulted in the development of fundamentally new knowledge and information regarding:

- physical activities in relation to aging processes;
- methods to enhance successful aging; and

- appropriate geriatric practice.

Sarcopenia is a significant public health concern among older people in geriatric research and clinical settings (Beaudart et al., 2014). According to Morley (2008), the prevalence of sarcopenia rises with age, from 5–13% in those 60–70 years old to 11–50% in people 80 years of age and beyond. According to a systematic review of the literature, the prevalence of sarcopenia varies by gender and by setting: in the community, nursing homes, and hospitals, it is 12.9%, 26.3%, and 29.7% for men and 11.2%, 33.7%, and 23.0% for women (Chen Z et al., 2021). A conservative estimate puts the current prevalence of sarcopenia at around 50 million, with a projected 40-year increase to 200 million cases (A. J. Cruz-Jentoft et al., 2010).

The best intervention for sarcopenia is physical exercise; no specific medications have been licensed for the treatment of sarcopenia (Iolascon et al., 2014; Montero-Fernández & Serra-Rexach, 2013; Cruz-Jentoft & Sayer, 2019). Physical activity as the main treatment for sarcopenia is generally recommended by evidence-based clinical practice guidelines (Dent et al., 2018).

The Impact Of Recreational Exercise Programs On Improving Lower Limb Strength And, Consequently, Balance Among 55-65 Years Old.

The neuromuscular and cardiorespiratory systems' age-related physiological changes have a major impact on an individual's capacity to maintain their independence and health well into old age. The ability to do daily chores is especially dependent on the development of muscle power in the lower body (Reid & Fielding, 2012b; Bean et al., 2010; Foldvari et al., 2000). Functional limitation manifests as decreased muscular ability (Hairi et al., 2010). Moreover, a lower degree of cardiorespiratory fitness (VO_2max) is linked to a higher risk of morbidity and mortality (Kodama et al., 2009).

Exercise is a potential strategy to counteract the detrimental effects of aging because strength and endurance training can result in considerable increases in fitness in older individuals (C. Liu & Latham, 2009; Huang et al., 2004). Due to the distinct physiological responses caused by the two exercise modalities, older persons should participate in both strength and endurance training to maximize potential health and fitness advantages (Chodzko-Zajko et al., 2009).

Even so, people must devote a significant amount of time to participating in particular endurance and strength training activities—a critical factor to take into account given that time constraints remain a barrier to exercise in a population where adherence to recommended exercise regimens is still low (Jefferis et al., 2014; Cohen-Mansfield et al., 2003). This is why

prospective exercisers may find interest in training regimens that incorporate the benefits of strength and endurance training into a single session.

To enhance muscular power, agility, jump performance, and quick force production, plyometric exercises were initially employed in sports training (Marković & Newton, 2007; Miller et al., 2006). But older folks can also benefit from plyometrics in the same ways. The goal of high-velocity training, according to Ramírez-Campillo et al. (2016) and Ramírez-Campillo et al. (2018), is to enhance older women's functional performance and health-related quality of life. These improvements in functional performance and health-related quality of life may be attributed to increased rapid force generation, which decreases more quickly than maximal force (Izquierdo et al., 1999).

Its fall may play a significant role in accidents and injuries to the elderly during falls as well as in their loss of independence (Rubenstein, 2006b; Aagaard et al., 2010). Rapid force production is essential in daily life when one must quickly correct balance after a fall (Pijnappels et al., 2005; LaRoche et al., 2010). Moreover, balance is favourably correlated with lower extremity muscle strength and agility, per Muehlbauer et al. (2015).Thus, improved balance is probably linked to stronger legs and increased agility, which may lower the risk of fractures and other fall-related injuries.

Improving Balance Through Strength Training In The Elderly

A steady reduction in total muscle strength is linked to aging. A sluggish lifestyle and an elevated risk of falls are the results of lower limb weakness. Testing if lower limb strengthening activities increase lower limb strength and balance function in older people is one of the study's objectives. Human muscle strength, or a person's ability to generate force, peaks in the second and third decades of life and gradually declines until roughly age 50, at which point it starts to decline at a rate of 1.4% to 2.5% annually, with losses accelerating beyond age 65 (Ej et al., 1997; Macaluso & De Vito, 2003).

Functional constraints in day-to-day living are linked to reduced lower limb strength (Foldvari et al., 2000). Furthermore, muscle weakness has been linked to a higher incidence of hip fractures (Langlois et al., 1998), falls (Fukagawa et al., 1995), and unfavourable physiological alterations such as osteoporosis (Sinaki et al., 1986). In order to improve muscular mass, strength, and eventually independence in daily living tasks, strength training is now highly advised for older persons ("American College of Sports Medicine Position Stand. Exercise and Physical Activity for Older Adults.," 1998b). Various approaches can be taken to strength training based on the physiological, functional, or performance objectives.

Elderly people can gain physiological benefits from strength training, according to several studies (Izquierdo et al., 2001; Häkkinen et al., 2001). The results demonstrate that walking for 20 minutes, doing postural control exercises, including basic Tai Chi movements, and doing a combined exercise three times a week that included knee extension and sitting leg press machine exercises could all improve balance function (Earles et al., 2001). Improved balance, enhanced fatigue resistance of the gluteus mediums muscle, or a higher tolerance to instability are some explanations for increases in balance mass.

Methods

The current condition of lower limb strength and balance in both the experimental and control groups will be determined through preliminary laboratory testing. Two instruments from the Sports University of Tirana biomechanics lab; the Leonardo Platform and the Isokinetic Dynamometer will be employed for the aforementioned measurements. We estimate that the study sample will consist of 60–90 working-age men and women who fall into the 55–65 age range. This is the age range in which these issues first surfaced, and they are typically associated with significant issues related to both physical and mental health. The 12-week exercise intervention program will include scheduled walking (step count, pace, and kind of relief), with the goal of increasing from 5000 to 10,000 steps by the conclusion of the 12th week. There will be three walking sessions per week, for a total of thirty-six sessions, along with unique recreational activities (primarily for strengthening the muscles of the lower limbs and balance). The experimental group will be invited to ascend the mountain over the course of the 12th weekend, with the difficulty and length of the ascent being progressively increased. We think that this stage of our exercise intervention will be seen as group therapy as well as having physical benefits (particularly for balance), since individuals need to socialize and bond with one another during a period when individualism is becoming more and more pronounced.

Discussions

This study's findings will offer fresh, up-to-date information on the advantages of a unique training regimen for enhancing lower limb strength and balance parameters in 55–65-year-olds who are generally in good health but lead sedentary lifestyles. This age group, doctors, health managers in the primary health care system, and policymakers should pay more attention to this age group, as if they do not start through sports and physical activity to prevent major health problems that deepen with passive aging, they will face health situations that may require tomorrow, possibly even surgical intervention by doctors and the private or state hospital system. These insights and the positive results anticipated at the end of this study will be helpful and serve as alarm bells.

Conclusion

The systematic literature review and meta-analysis aims to define quantitative relationships of lower limb strength with balance improvement. WHO defines healthy aging as "the process of developing and maintaining functional ability that enables well-being in older age". Due to the accelerated aging process, the middle-aged population experiences a decline in strength, endurance, flexibility, and muscle mass (sarcopenia), which impairs coordination, stability, and balance. These consequences have an impact on general functional status and, consequently, quality of life. Functional status provides a more global and functional perspective of the health conditions of this age group and, therefore, is increasingly used as an outcome in clinical studies. Functional mobility is the physiological ability of people to move independently and safely in a variety of environments to perform functional activities or tasks and to participate in activities of daily living (ADL) at home, work and in the community. It includes movements such as standing, bending, walking and climbing, which are the building blocks of ADLs, and therefore, these are essential to an individual's independent life and global health status. Our research will show the need for more studies that combine lower limb strength and balance training with specialized programs that have methodically structured recreational content, as well as scientific evidence and recommendations on the relationship between lower limb strength improvement and balance for practitioners and therapists to increase the efficacy of their strength and balance improvement protocols. A major accomplishment for the Albanian science of physical activity for health would be the anticipated significant improvement in lower limb strength and balance from 18 to 28%. This would not only improve the quality of life for the elderly and young but also significantly lower the costs of the national health system, which has borne a heavy burden from health issues and their consequences, primarily in the last 20 years.

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Study On The Influence Of Basic Technical Elements Used In The Modern Game Of Football

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Abstract

A social phenomenon and international superstructure is the game of football that forces all participants, respectively all club teams or national schools to compete on equal terms, regardless of geographical area, political systems, religion, color or race, demonstrating that football is international in its specific content. The origins of football go back over 2000 years. In 2004, FIFA recognized China as the birthplace of football. Around 200 BC the Chinese played a similar sport called cuju, the rules evolved, reaching the sport practiced today.

Introduction

Football is a team sport played between two teams consisting of 11 players each.

They play with the ball, on a rectangular field, covered with grass, with a gate at each end. (Teodorescu L, Predescu et al, 1993)

The goal of the game is to insert the ball into the opponent's goal, that is, to score more goals than him, taking into account the rules of the game. Apart from the goalkeeper, other players cannot use their hands to handle the ball, the winner being the one who scores more goals. (Cârstea Gh.,1993)

The origins of football go back over 2000 years. In 2004, FIFA recognized China as the birthplace of football. Around 200 BC the Chinese played a similar sport called cuju, the rules evolved, reaching the sport practiced today. (Colibaba E.1998)

A social phenomenon and international superstructure is the game of football that forces all participants, respectively all club teams or national schools to compete on equal terms, regardless of geographical area, political systems, religion, color or race, demonstrating that football is international in its specific content. (Demian ,1995)

The organization of the game is a notion that includes principles, rules and measures, which establish the content of the activity done by players and a team in the playing field. Today's football ushers in a new dimension of depth of play that coordinate and sums up the simultaneous interactions of players at all times of the game. (Cărăbaş Ionică ,2012)

Looking at the performance of players on the field, we notice a complicated relational system, which requires the capacity for collective self-management and an understanding of the over organized character of the game.

The problem of organization encompasses the fundamental components that concern the team, namely the group, the couple and the individual. (Nicu A.,1993; Stanculescu V.,1999)

The attack is one of the fundamental moments of the game on whose success depends the victory of the team. The attack is the fundamental moment of the game, in which the team in possession of the ball, by carrying out specific individual and collective actions, tries to achieve the goal of the game, namely scoring goals in the opponent's goal. (Motroc I,1994)

The basic elements through which the organization of the attack is carried out constitute the basis of the attack technique.

In today's football, great importance is attached to the organization of the game in midfield. The central area is called the "team lab".

Preserving the ball in midfield is a major problem:

- losing the ball prematurely is a tactical error of the first magnitude;

- One more pass must always be taken than one less pass (except for the completion phase)

The optimal number of phases for breaking through a defense is between 5 and 8. This ensures that conditions for ball security are created around the ball carrier through support and support. (Ionescu I.V.,1995)

Good ball circulation depends on:

- the position of teammates involving organization;
- the position of opponents, which implies adaptation.

The first factor relates to elementary communication and organization recipes, components of specific general tactics, both dependent on the team's game system.

The team's system of play by occupying the court is the referential framework of ball movement. Some players act directly in the center of the phase and others indirectly.

In a positive (offensive) sense, anticipating the evolution of the game situation and the continuation of the proposed tactical chain, and in a negative (defensive) sense, ensuring permanent defensive balance. Preserving the ball is the safest way to defend, the opponent cannot play, can not score if deprived of the ball. (Ionescu I.V.,1999)

The construction of the game in the middle phase must be characterized by: simplicity, safety, speed of execution and reduction of risky executions. Concern for the fast and rational movement of the ball and players, for increasing the speed of play in general, causing a reduction in takeovers, unnecessary turns, excessive driving and dribbling without tactical purpose.

The synchronization of teammates' actions and intentions, responsibility for the phases carried out in this field area leads to increased team homogeneity. (Ionescu I.V.,2007)

The evolution of the game has led to continuous accumulations and changes in the performance of midfielders. From the old and well-known kick-and-run to the technique of the present, there have been spectacular leaps in the technical, tactical and psycho-physical expression of the player in midfield.

The midfield requires in today's football complete players, who have a rich technical-tactical experience and an impeccable physical condition, who can effectively manifest themselves in the midfield area thus serving the interests of the team. (Nicu A.,1993; Stanculescu V.,1999)

Due to the increasingly complex and fluid nature of the game in the middle area, very important is the technical ability and quick and rational adaptation to concrete game situations. Knowledge and adaptation to playing situations and the ability to combine play a decisive role

in the midfielder's performances. This is primarily a problem of endowment, but also of spatial and temporary perception, spontaneous and efficient analysis.

The midfielder is a complex footballer who makes quick and effective decisions to make the transition to action accessible.

As a result of functional versatility and interaction with teammates, the midfielder can and must tactically orient the game.

The midfielder tends to become an elite player, a sports personality who achieves and capitalizes on the team and in its interest. (Ionescu I.V.,2007)

The midfielder of the future is characterized by:

- quick decisions in uncertain situations;
- firmness of dispossessions;
- effective dubbing;
- anticipatory attitude;
- mobility and speed;
- excellent technique;
- quick folding;
- correct placement;
- quick intercalation on the offensive;
- skills for carrying out individual actions. (Ionescu I.V.,2007)

Methods and materials

For each match, an observation sheet was drawn up, for each player, in terms of technical and tactical achievements, and in these were used the following indicators: takeovers, transmitting / passing the ball; crossings; completions; overtaking by dribbling; recoveries by dispossession/interception; Aerial game.

Comparison of two coordinating midfielders, from different countries, in official games regarding the execution of the following technical-tactical elements: passes, takeovers, crosses, finishes, overtaking by dribbling, rebounds by tackling/interception and hitting the ball with the head;

Observing the efficiency of successful executions of each player;

Observing the erroneous executions of each player;

Differentiation of the two players according to the total number of technical-tactical actions;

Establishing the technical profile of the midfielder regarding the individual and collective coordination of the attack.

Study Subjects

FLORIN TĂNASE

He has been playing as a FCSB player since 2016, as a coordinating midfielder and striker, component of the Romanian national team.

He was born in Gaesti, Romania, on 30.12.1994, is 26 years old, 1.85 m tall.

FRENKIE DE JONG

He has been playing as a player for F.C. BARCELONA since 2019, as a coordinating midfielder and is a member of the Dutch national team.

He was born in Arkel, Netherlands, on 12.05.1997, is 1.80 m tall.

The duration of the study was 4 months between 02.11.2020 - 21.02.2021.

The number of games in which FLORIN TĂNASE was observed was 10 matches in Liga I - Romania, competitive season 2020-2021, namely:

1. Chindia Targoviste 0-2 FCSB (02.11.2020)
2. FCSB 4-1 F.C. Botoșani (07.11.2020)
3. Gaz Metan Medias 2-3 FCSB (23.11.2020)
4. FCSB 3-0 UTA Arad (05.12.2020)
5. Univ. Craiova 0-2 FCSB (18.12.2020)

6. FCSB 3-0 Astra (15.01.2021)

7. Viitorul Constanta 2-2 FCSB (19.01.2021)

The number of games in which FRENKIE DE JONG was observed was 9 matches in La Liga Spain, competitive season 2020-2021 namely:

1. Huesca 0-1 F.C. Barcelona (03.01.2021)

2. Athletic Bilbao 2-3 F.C. Barcelona (06.01.2021)

3. Granada 0-4 F.C. Barcelona (09.01.2021)

4. Elche 0-2 F.C. Barcelona (24.01.2021)

5. F.C. Barcelona 2-1 Athletic Bilbao (31.01.2021)

6. Betis 2-3 F.C. Barcelona (07.02.2021)

7. F.C. Barcelona 5-1 Alaves (13.02.2021)

Observation Sheets

For each match, an observation sheet was drawn up, for each player, in terms of technical and tactical achievements, and in these were used the following indicators:

- Downloads;
- transmitting/passing the ball;
- crossings;
- completions;
- overtaking by dribbling;
- recoveries by dispossession/interception;
- aerial game (hitting the ball with the head).

The calculation formula for finding out the percentage of success is the simple method of three:

Total executions x No. of successful executions

100 X

X= 100 x No. of successful executions

Total executions

X = successful executions expressed as a percentage

33 27 2700 = 81.8x = 81.8%

100 X 33

Results and discussion

The effectiveness of technical and tactical actions is determined by the creative thinking ability of players, the higher level of development of motor qualities, the degree of appropriation, automation, mastery of the executed elements.

Observation Sheet No. 1

Match no. 1 **Chindia Târgovişte 0-2 FCSB**

Romanian Championship, Liga I, game played on 02.11.2020

Observed player: FLORIN TĂNASE

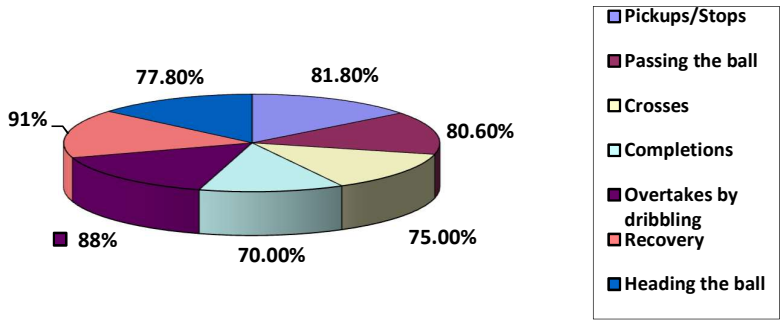
Table 1

Experimental match data from observation sheet 1

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		12	2	15	4	27	6	33	81,8%
Pass	Short	16	3	11	2	27	5	32	80,6%
	Environments	7	1	8	3	15	4	19	
	Elongate	5	3	3	0	8	3	11	
Crossings		2	1	1	0	3	1	4	75%
Completions		3	1	4	2	7	3	10	70%
Overshootings by Drinling		4	1	3	0	7	1	8	87,5%
Recoveries/ Interception		6	1	4	0	10	1	11	91%
Hitting the ball with your head		9	3	5	1	14	4	18	77,8%

Figure 1

Graphical representation of successes expressed in percentages %%-observation sheet1



Observation Sheet No . 2

Match No. 2 FCSB 4-1 F.C. Botoșani

Romanian Championship, Liga I, game played on 07.11.2020

Observed player: FLORIN TĂNASE

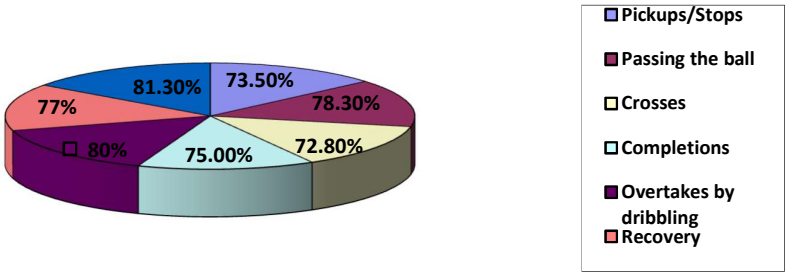
Table 2

Experimental match data from observation sheet 2

Items **Technical**		**No. of executions First Half**		**No. of executions Second Half**		**No. of executions at Final**		**Total Executions**	**Executions Successful expressed in %**
		Successful	**Wrong**	**Successful**	**Wrong**	**Successful**	**Wrong**		
Pickups, stops		**14**	**15**	**22**	**8**	**36**	**23**	**49**	**73,5%**
Pass	**Short**	**11**	**3**	**15**	**4**	**26**	**7**	**33**	**78,3%**
	Environments	**8**	**2**	**6**	**1**	**14**	**3**	**17**	
	Elongate	**3**	**2**	**4**	**1**	**7**	**3**	**10**	
Crossings		**5**	**2**	**3**	**1**	**8**	**3**	**11**	**72,8%**
Completions		**4**	**1**	**2**	**1**	**6**	**2**	**8**	**75%**
Overshootings by Drinling		**3**	**0**	**5**	**2**	**8**	**2**	**10**	**80%**
Recoveries/ Interception		**6**	**2**	**4**	**1**	**10**	**3**	**13**	**76,9%**
Hitting the ball with your head		**8**	**2**	**5**	**1**	**13**	**3**	**16**	**81,3%**

Figure 2

Graphical representation of successes expressed in percentage % - observation sheet



Observation Sheet No. 3

Match No. 3 Gaz Metan Medias 2-3 FCSB

Romanian Championship, Liga I, game played on 23.11.2020

Observed player: FLORIN TĂNASE

Table 3

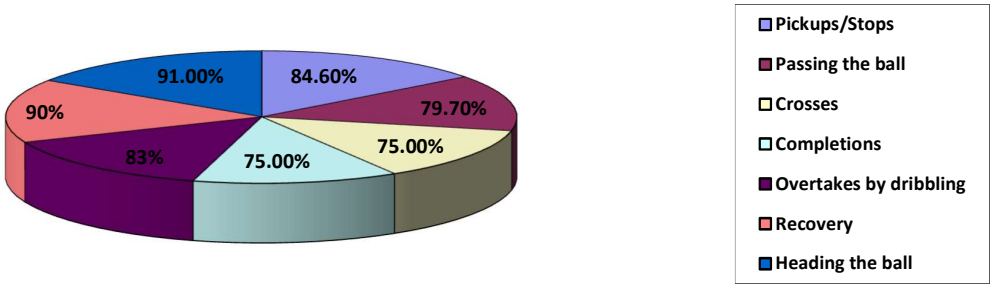
Experimental match data from observation sheet 3

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		13	3	20	3	33	6	39	84,6%
Pass	Short	14	3	10	4	24	7	31	79,7%
	Environments	5	1	8	0	13	1	14	
	Elongate	6	3	4	1	10	4	14	
Crossings		2	0	5	1	7	1	8	75%
Completions		3	0	4	1	7	1	8	75%

Overshootings by Drinling	2	0	3	1	5	1	6	83,4%
Recoveries/ Interception	3	1	6	0	9	1	10	90%
Hitting the ball with your head	7	0	3	1	10	1	11	91%

Figure 3

Graphical representation of successes expressed in percentage %-observation sheet 3



Observation Sheet No . 4

Match No. 4 FCSB 3-0 UTA Arad

Romanian Championship, Liga I, game played on 05.12.2020

Observed player: FLORIN TĂNASE

Table 4

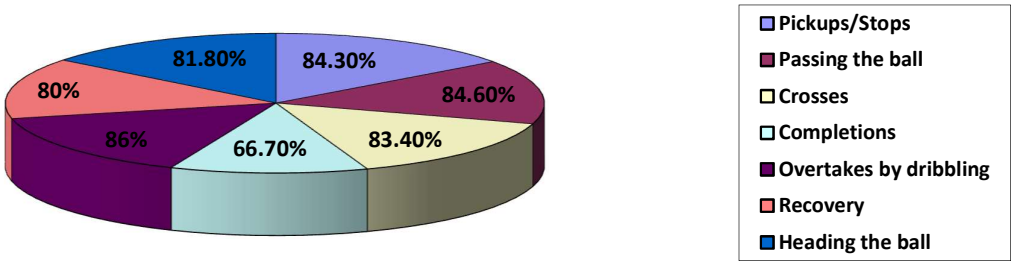
Experimental match data from observation sheet 4

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		15	2	12	3	27	5	32	84,3%
Pass	Short	12	1	9	3	21	4	25	84,6%
	Environments	7	3	6	2	13	5	18	

	Elongate	3	2	4	0	7	2	9	
Crossings		2	0	3	1	5	1	6	83,4%
Completions		1	0	3	2	4	2	6	66,7%
Overshootings by Drinling		4	1	2	0	6	1	7	85,7%
Recoveries/ Interception		5	1	3	1	8	2	10	80%
Hitting the ball with your head		6	0	3	2	9	2	11	81,8%

Figure 4

Graphical representation of successes expressed in percentage % - observation sheet 4



Observation Sheet No . 5

Match No. 5 Univ. Craiova 0-2 FCSB

Romanian Championship, Liga I, game played on 18.12.2020

Observed player: FLORIN TĂNASE

Table 5

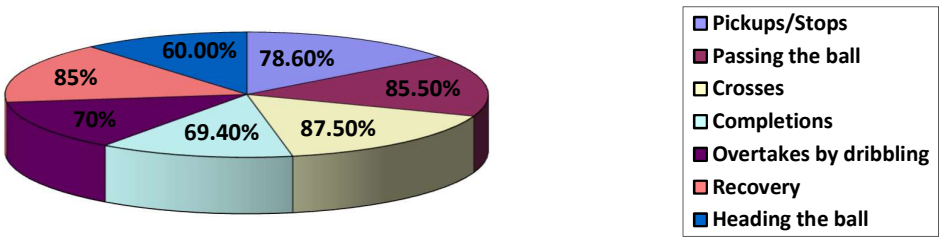
Experimental match data from observation sheet 5

Items Technical	No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
	Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops	18	3	15	6	33	9	42	78,6%

Pass	Short	11	4	13	2	24	6	30	85,5%
	Environments	3	2	4	0	7	2	9	
	Elongate	6	2	5	3	11	5	16	
Crossings		3	0	4	1	7	1	8	87,5%
Completions		4	0	5	4	9	4	13	69,4%
Overshootings by Drinling		4	2	3	1	7	3	10	70%
Recoveries/ Interception		5	0	6	2	11	2	13	84,6%
Hitting the ball with your head		4	3	5	3	9	6	15	60%

Figure 5

Graphical representation of successes expressed in percentage % - observation sheet 5



Observation Sheet No. 6

Match No. 6 FCSB 3-0 Astra

Romanian Championship, Liga I, game played on 15.01.2020

Observed player: FLORIN TĂNASE

Table 6

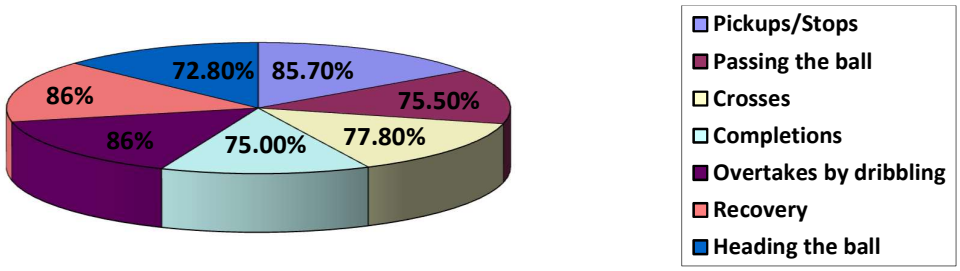
Experimental match data from observation sheet 6

Items Technical	No. of executions First Half	No. of executions Second Half	No. of executions at Final	Total Executions	Executions Successful expressed

		Successful	Wrong	Successful	Wrong	Successful	Wrong		in %
Pickups, stops		11	1	13	3	24	4	28	85,7%
Pass	Short	8	2	14	3	22	5	27	75,5%
	Environments	5	3	2	0	7	3	10	
	Elongate	6	4	8	2	14	6	20	
Crossings		3	2	4	0	7	2	9	77,8%
Completions		3	0	3	2	6	2	8	75%
Overshootings by Drinling		2	0	4	1	6	1	7	85,7%
Recoveries/ Interception		4	1	2	0	6	1	7	85,7%
Hitting the ball with your head		5	2	3	1	8	3	11	72,8%

Figure 6

Graphical representation of successes expressed in percentage %-observation sheet 6



Observation Sheet No . 7

Match No. 7 Viitorul Constanta 2-2 FCSB
Romanian Championship, Liga I, game played on 19.01.2020
Observed player: FLORIN TĂNASE

Table 7

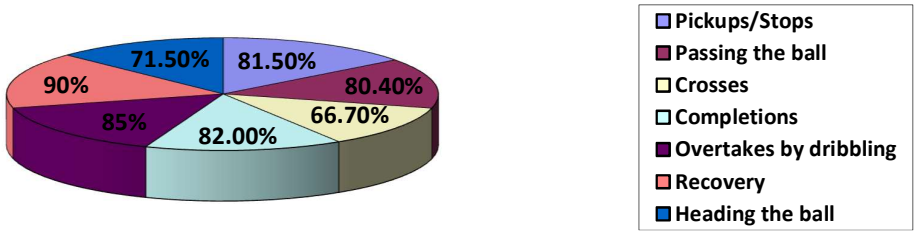
Experimental match data from observation sheet 7

Items	No. of executions	No. of executions	No. of executions	Total	Executions

Technical		First Half		Second Half		at Final		Executions	Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		16	3	15	4	31	7	38	81,5%
Pass	Short	12	1	15	3	28	4	32	80,4%
	Environments	8	5	5	0	13	5	18	
	Elongate	3	2	6	1	9	3	12	
Crossings		4	0	3	2	7	2	9	66,7%
Completions		3	1	4	3	7	4	11	82%
Overshootings by Drinling		5	0	6	2	11	2	13	84,6%
Recoveries/ Interception		6	1	3	0	9	1	10	90%
Hitting the ball with your head		3	2	2	0	5	2	7	71,5%

Figure 7

Graphical representation of successes expressed in percentage % - observation sheet 7



We will compare the two players according to the results obtained from the sheets and graphs made after calculating them.

Observation Sheet No . 8

Match No. 1 Huesca 0-1 F.C. Barcelona
Spanish Championship, La Liga, game played on 03.01.2021
Player observed: FRENKIE DE JONG

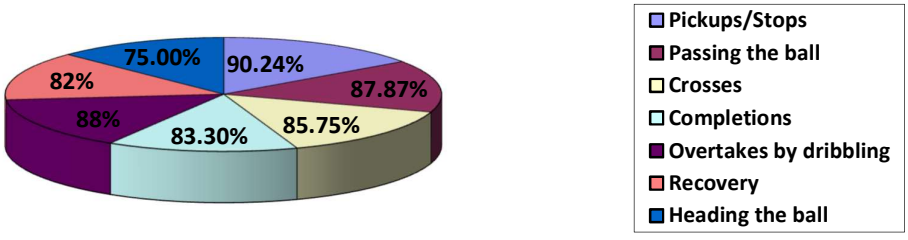
Table 8

Experimental match data from observation sheet 8

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		34	3	41	5	74	8	82	90,24%
Pass	Short	35	5	28	2	63	7	70	87,87%
	Environments	7	1	8	1	15	2	17	
	Elongate	7	3	2	0	9	3	12	
Crossings		4	1	2	0	6	1	7	85,75%
Completions		2	1	3	0	5	1	6	83,3%
Overshootings by Drinling		3	0	4	1	7	1	7	87,5%
Recoveries/ Interception		8	1	6	2	14	17	17	82,3%
Hitting the ball with your head		6	2	3	1	9	12	12	75%

Figure 8

Graphical representation of successes expressed in percentage %-observation sheet 8



Observation Sheet No . 9

Match No. 2 Athletic Bilbao 2-3 F.C. Barcelona

Spanish Championship, La Liga, game played on 06.01.2021
Player observed: FRENKIE DE JONG

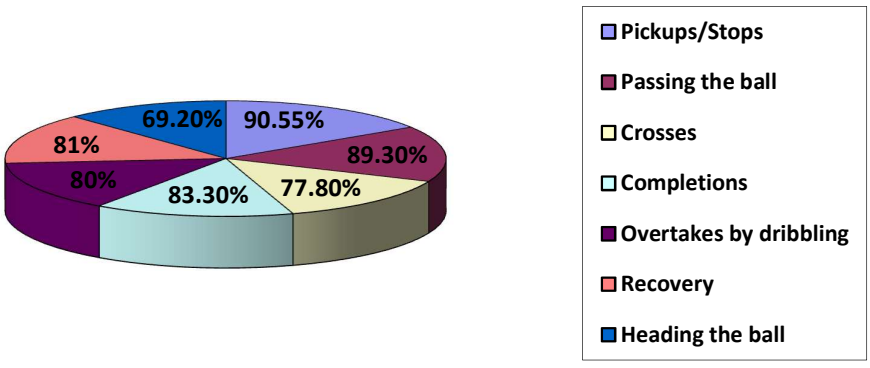
Table 9

Experimental match data from observation sheet 9

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		36	4	31	3	67	7	74	90,55%
Pass	Short	31	4	40	3	71	7	78	89,3%
	Environments	6	1	7	1	13	2	15	
	Elongate	3	0	5	2	8	2	10	
Crossings		3	0	4	2	7	2	9	77,8%
Completions		2	0	3	1	5	1	6	83,3%
Overshootings by Drinling		3	0	5	2	8	2	10	80%
Recoveries/ Interception		8	1	9	3	17	4	21	80,96%
Hitting the ball with your head		5	2	4	2	9	4	13	69,2%

Figure 9

Graphical representation of successes expressed in percentage % - observation sheet 9



Observation Sheet No . 10

Match No. 3 Granada 0-4 F.C. Barcelona
Spanish Championship, La Liga, game played on 09.01.2021
Player observed: FRENKIE DE JONG

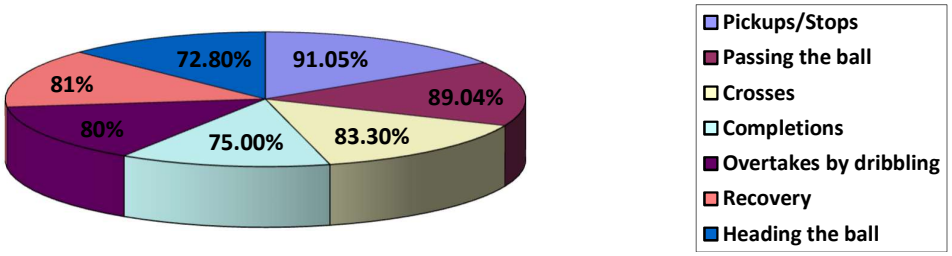
Table 10

Experimental match data from observation sheet 10

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		32	2	29	4	61	6	67	91,05%
Pass	Short	28	6	37	1	65	7	72	89,04%
	Environments	15	2	11	0	26	2	28	
	Elongate	2	0	3	1	5	1	6	
Crossings		3	0	2	1	5	1	6	83,3%
Completions		2	0	1	1	3	1	4	75%
Overshootings by Drinling		6	2	2	0	8	2	10	80%
Recoveries/ Interception		8	1	5	2	13	3	16	81,25%
Hitting the ball with your head		5	2	3	1	8	3	11	72,8%

Figure 10

Graphical representation of successes expressed in percentage %-observation sheet 10



Observation Sheet No . 11

Match No. 4 Elche 0-2 F.C. Barcelona
Spanish Championship, La Liga, game played on 24.01.2021
Player observed: FRENKIE DE JONG

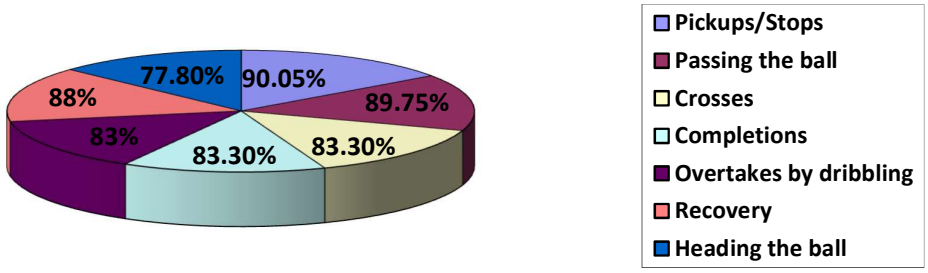
Table 11

Experimental match data from observation sheet 11

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		21	2	27	3	48	5	53	90,05%
Pass	Short	29	3	21	2	50	5	55	89,75%
	Environments	8	1	5	0	13	1	14	
	Elongate	5	1	2	1	7	2	9	
Crossings		2	1	3	0	5	1	6	83,3%
Completions		4	1	1	0	5	1	6	83,3%
Overshootings by Drinling		3	0	2	1	5	1	6	83,3%
Recoveries/ Interception		6	0	8	2	14	2	16	87,5%
Hitting the ball with your head		5	2	2	0	7	2	9	77,8%

Figure 11

Graphical representation of successes expressed in percentage %-observation sheet 11



Observation Sheet No . 12

Match No. 5 F.C. Barcelona 2-1 Athletic Bilbao
Spanish Championship, La Liga, game played on 31.01.2021
Player observed: FRENKIE DE JONG

Table 12

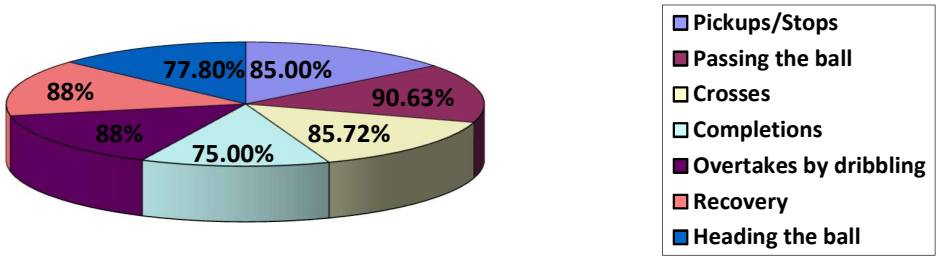
Experimental match data from observation sheet 12

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		26	2	25	7	51	9	60	85%
Pass	Short	31	3	26	1	57	4	61	90,63%
	Environments	9	2	13	1	22	3	25	
	Elongate	3	0	6	2	9	2	11	
Crossings		2	0	4	1	6	1	7	85,72%
Completions		1	0	2	1	3	1	4	75%
Overshootings by Drinling		4	1	3	0	7	1	8	87,5%
Recoveries/		6	0	8	2	14	2	16	87,5%

Interception								
Hitting the ball with your head	3	2	5	3	8	5	13	77,8%

Figure 12

Graphical representation of successes expressed in percentage % - observation sheet 12



Observation Sheet No . 13

Match No. 6 Betis 2-3 F.C. Barcelona
Spanish Championship, La Liga, game played on 07.02.2021
Player observed: FRENKIE DE JONG

Table 13

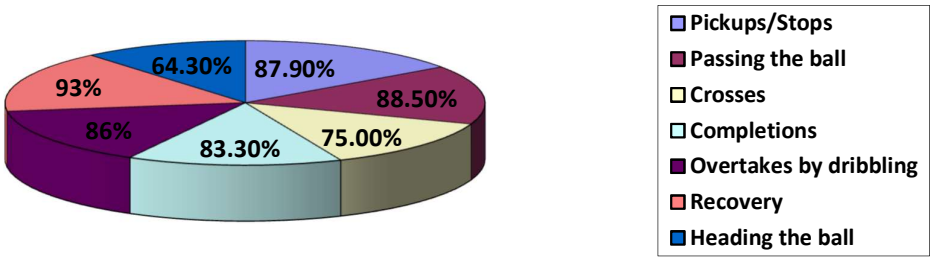
Experimental match data from observation sheet 13

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		23	2	35	6	58	8	66	87,9%
Pass	Short	29	2	25	4	54	6	60	88,5%
	Environments	9	1	8	2	17	3	20	
	Elongate	5	0	9	2	14	2	16	
Crossings		4	1	5	2	9	3	12	75%
Completions		3	0	2	1	5	1	6	83,3%

Overshootings by Drinling	4	0	2	1	6	1	7	85,72%
Recoveries/ Interception	5	0	8	1	13	1	14	92,8%
Hitting the ball with your head	6	3	3	2	9	5	14	64,3%

Figure 13

Graphical representation of successes expressed in percentage % - observation sheet 13



Observation Sheet No . 14

Match No. 7 F.C. Barcelona 5-1 Alaves
Spanish Championship, La Liga, game played on 13.02.2021
Player observed: FRENKIE DE JONG
Table no. 14

Experimental match data from observation sheet 14

Items Technical		No. of executions First Half		No. of executions Second Half		No. of executions at Final		Total Executions	Executions Successful expressed in %
		Successful	Wrong	Successful	Wrong	Successful	Wrong		
Pickups, stops		26	3	29	3	55	6	61	90,16%
Pass	Short	27	2	38	4	65	6	71	90,3%
	Environments	13	2	6	1	18	3	21	
	Elongate	7	1	3	0	10	1	11	
Crossings		3	1	2	1	5	2	7	77,8%

Completions	2	0	4	1	6	1	7	85,72%
Overshootings by Drinling	3	1	4	2	7	3	10	70%
Recoveries/ Interception	6	1	8	2	14	3	17	82,2%
Hitting the ball with your head	5	2	8	3	13	5	18	72,3%

Figure 14

Graphical representation of successes expressed in percentage % - observation sheet 14

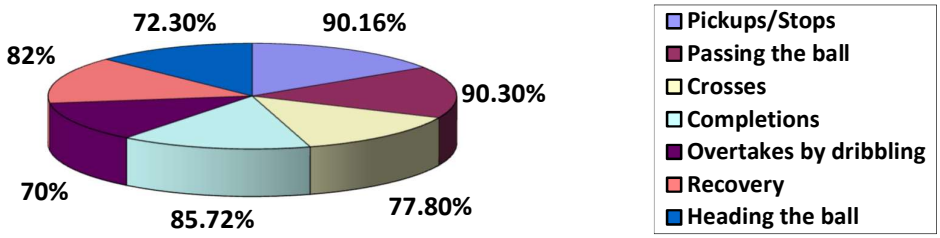
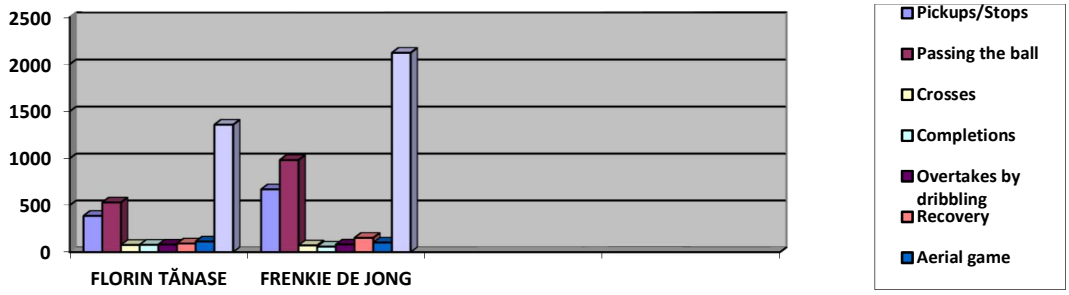


Figure 15

Graphical representation of successes expressed in percentages %--compared to the two players studied



A net superiority in favor of FRENKIE DE JONG, both in terms of technical and tactical achievement in the attack phase and in the specific plan of the defensive phase, through the efficiency of the elements: passes (transmissions), fixed phases (crosses), finishes (shots towards goal), overtaking by dribbling (fenta), recoveries (dispossession / interception);

FRENKIE DE JONG stands out first and foremost as an extraordinary passer and a very good technician in stopping and retrieving the ball;

He threatens the gate several times, with few wrong finishes;

In one-on-one combat he excels by frequently overtaking his opponent, but also by recovering the ball through tackling or interception;

Passing the ball is the essential element of the game in general and of the coordinating midfielder in particular, an element to which FRENKIE DE JONG also showed his superiority and mastery;

Its participation in fixed moments, individual executions or automated combinations with a high degree of danger leads to maximum attack efficiency;

FLORIN TĂNASE stands out as a midfielder of medium level, but inferior to FRENKIE DE JONG in almost all the elements studied, except for one of them, namely:

- aerial play (hitting the ball with the head), determined by a special detent and height difference between the two;

The order of use of indicators in all recorded games is:

- Taking;
- miscellaneous pass;
- fixed phases;
- completions;
- overtaking by dribbling;
- Recoveries;
- Aerial game.

The weight of these indicators is maintained in all 10 matches for each of the two players, which is determined by the general requirements of the game in the middle language, for the construction and attack phase.

Conclusions

The optimal model of the coordinating midfielder is supported again this time, through this work, new data being brought for its construction.

Therefore, coaches and specialists, having these new data, will make a better selection and training of the players who evolve in that position, adapting everything to the conception and game system of their own team, as well as to the particularities and possibilities of the players.

Another conclusion from the research conducted is that: the efficiency of technical and tactical actions is determined by the creative thinking capacity of players, the higher level of development of motor qualities, the degree of appropriation, automation, mastery of the executed elements.

The level of technical training in the Romanian championship in the 10 games worse than the level of preparation in the Spanish championship. In the Spanish championship the speed of play is much higher, which causes a greater number of game actions. Both the sum of frequently used actions and their number confirm the consistency, technical and tactical repertoire of the studied players.

Carefully observing the high degree of efficiency in the executions of technical-tactical elements, we will be able to conclude that the level of physical and tactical training of each studied player is mirrored in the level of the championship he comes from.

The development of football in recent decades increasingly requires serious in-game programming of tactical and design elements. It becomes necessary for the team to act on the basis of strictly motivated actions, which determine the counteraction of adverse offensive tendencies and at the same time, create more possibilities for completion in the attack.

In the new dynamics of football, technical actions are moving towards total tacticalization.

In this sense, the game requires essential executions, which concretely means that the defender dispossesses and passes, the midfielder presses, intercepts, passes and demarches, the striker takes over, passes, penetrates, again takes over and shoots at goal.

The evolution of the game has led to continuous accumulations and changes in the performance of midfielders. From the old and well-known kick-and-run to the technique of the present, there have been spectacular leaps in the technical, tactical and psycho-physical expression of the player in midfield. The midfield requires in today's football complete players, who have a rich technical-tactical experience and an impeccable physical condition, who can effectively manifest themselves in the midfield area, thus serving the interests of the team.

In the future, it is desired to pay more attention to the coordination of the attack by selecting and specializing players capable of playing the role of coordinating midfielder.

We must also have a greater concern for programming in training specific means, capable through repetition to achieve maximum efficiency in both individual and collective expression.

Another proposal is to use the profile of the coordinating midfielder as a model in the training of players who play in this position. At the same time, we can detect certain technical and tactical deficiencies of the players who evolve in this position by reporting them to the model.

Research work will continue to find new data to complete the built model.

In general, it is desired that the means of forming and strengthening the technical and tactical discipline of the footballer in general, but also of the midfielder in particular, are related to a professional education, a perfect pedagogy, a professionalism and the exigency of the general team management framework, as well as the quality and efficiency of the training process.

In the atmosphere of daily training, the availability for integration and homogenization of players and their adherence to the requirements of tactical conception and plans is formed, a stimulating framework for initiative and creation, to serve the team and its performance.

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Development Of Speed Motor Quality Using Complex Motor Actions In Secondary School Students

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Abstract

One of the priority objectives of school physical education, specified in school programs for all education cycles, is the development of motor skills. The topic addressed by us in this paper was born from the need to have the greatest possible efficiency in the teaching of physical education in grades V-VIII, where the instructional-educational process must pursue concrete goals regarding the system of knowledge, skills and motor skills in order to concretize the model of each class in gymnasium physical education and sports.

The study of this topic aims to establish the most effective exercise structures regarding the development of speed motor quality in secondary school students.

Using the means proposed by us, after a well-established program in the physical education lesson for secondary school students, in order to develop the speed motor quality, I believe that it will develop obviously, during the whole school year.

The data resulting from the scientific investigation regarding the development of speed motor quality through the use of movement games at the secondary school level were implemented in school units in the municipality of Arad. They can be used in the instructional-educational process by the specialists in the field and as methodical material by the students of the faculties of physical education and sport in the disciplines "Theory of physical education and sport" and "Practice and methodology of motor activities by age groups" . The research was conducted during the 2022-2023 school year.

Following the application of the experiment, it was found that major differences in student performance were obtained, they had a significant increase between the initial testing and the final testing, which allows us to state that the methodology used in the lessons was adequate. The exercises and games used had a positive influence in obtaining the results of the experiment. Of course, the experiment should be continued and possibly extended to a larger sample of children in order to further improve motor quality, speed in particular, as well as harmonious physical development in general.

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

Introduction

The specialized literature of the field presents numerous points of view in relation to the name of this component of the instructive-educational process (Mihai Epuran, 2002). Thus, we will encounter terms of motor qualities, physical qualities, or motor skills (A. Dragnea, A. Bota, 1999), (Colibaba Evulet Dumitru, 2010).

Motor qualities were also defined as "movement qualities" and were addressed in the context of the analysis of human motor capacity, as one of its basic components (Colibaba, DE., Bota, 2009), (Emilia Florina Grosu, 2009).

The level of motor capacity among children and adolescents was also linked to other important factors, such as health status, activity level, participation in organized physical activities (A. Dragnea, A. Bota).

The motor component has an impact on the physical and social development of children (Adrian Gagea, 2010). In the scientific literature, the motor component is generally a global term used to reflect motor performance, fundamental movement, motor skills, motor capacity and motor coordination to be directed towards the goal (Gh. Cârstea, 2000).

Achieving the objectives of school physical education is only possible if it is followed systematically - hour by hour, lesson by lesson - quarterly, annually and during an entire schooling cycle of the students, the implementation of some purposes of prime importance for motor training and its education as would be (Tudor, Bompa, 2002):

- the development of motor skills characterized in school programs;
- capitalizing on the influence of physical exercise in support of achieving the general objectives of education;
- integration personality the student;
- preparation multilateral A the student.

The objectification of the motor skills development process requires the teacher (Tudor V, 1999):

- to know the level of preparation of the students and from which stages it starts;
- to establish tests and norms specific to each motor quality and to apply them periodically in the practical activity;
- to periodically assess through tests and norms the value of the actuation systems used for the development of motor qualities according to the developed model;

- to keep a practical record of all the data obtained and to use it properly for the critical assessment of the activity carried out, keeping in mind the necessary lessons;
- to develop the final model, by structuring the exercises used to achieve it.

The concept of speed can be presented in two different ways:

- the first way would be quality MOVEMENT or A aCTS drives to be performed quickly;
- the second way refers to the ability of the human body to perform acts and motor actions, in compliance with certain requirements, imposed under certain conditions.

Speed is characterized as the spatio-temporal unit of movements, which is determined by two main factors: tempo and rhythm. Tempo is the density of movement per unit of time (Tudor V., 2013). Speed effort is categorized according to duration, maximal and submaximal intensity, with a very important role in physical education and sports training (A. Dragnea, S. Mate-Teodorescu, 2002).

The hypothesis.

Starting from necessity optimization of the action system in the education lesson physical, in order to increase EFFICIENCY the activity and A effectiveness MEANS used (exercises, games, relays) I formulated following hypothesis:

- using the means proposed by me in this work, after a well-established program in the physical education lesson for secondary school students, in order to develop the motor quality of speed, I believe that it will develop obviously, during the entire school year.

Work methodology.

The actual research was carried out in the town of Arad, at the "Vasile Goldiş" National College. The experiment was applied to 8th grade high school students, in the 2022-2023 school year. The research was carried out between September 15, 2022 and May 15, 2023, staged as follows:

1) 19.09.2022 – initial testing of the 12.5m sprint tests; 25m; 100m.
2) 17.01.2023 - intermediate testing of the 12.5m sprint tests; 25m; 100m.
3) 15.05.2023 - final testing of the 12.5m sprint tests; 25m; 100m.

During the experiment I used the following means to develop the speed of travel:

a) The running step, launched at a moderate tempo. The students performed the repetitions over a distance of 100m (three repetitions). This exercise was used in even weeks.

b) The standing start and the launch from the start, over a distance of 25m each will perform 4-6 repetitions. This exercise was used in odd weeks.

c) The running step launched by speed, each will perform 4-6 repetitions, over a distance of 12.5m. This exercise was used in even weeks.

Research methods use in the development Job

In the elaboration of the paper, I used the following methods:

a) the bibliographic study method;

b) the experimental method;

c) the statistical-mathematical method of data processing (Stefan Tudos, 2000). The indicators that

I used them in this research were: arithmetic mean, amplitude, standard deviation, coefficient of variability;

d) the graphic method.

Results

The results obtained from the experiment are presented in the tables below

Table 1

Performance dynamics experienced in the 12.5m sprint test.

Subjects	Initial testing	Intermediate testing	Final testing
1	3.5	3.45	3.34
2	3.75	3.52	3.46
3	3.5	3.46	3.39
4	3.68	3.5	3.41
5	3.6	3.56	3,4
6	3.8	3.71	3.65
7	4	3.45	3,4
8	3.98	3.78	3.62
9	3.78	3.65	3.49
10	4.43	4.35	4.29
Arithmetic mean	3.80	3.64	3.55
Amplitude	0.93	0.9	0.95
Standard deviation	0.27	0.26	0.27
The coefficient of variability	8.08	7.12	7.51

In the 12.5m speed test, (table no. 1), during the 3 tests (initial, intermediate, final), the results evolved as follows:

- mean had an evolution from 3.802 at the initial testing, to 3.643 at the intermediate testing, and at the final testing 3.545. It resulted in an increase of 0.159 (initial-intermediate), and 0.098 (intermediate-final).
- Amplitude evolved from an average of 0.93 at initial testing, to 0.9 at mid-test, and 0.95 at final testing. It resulted in an increase of 0.3 (initial-intermediate), and a decrease of 0.5 (intermediate-final).
- The standard deviation went from a mean of 0.26 at baseline, to 0.25 at mid-test, and 0.26 at final testing, resulting in a decrease of 0.1 (initial-interim) and an increase of 0, 1 (intermediate-final).
- The coefficient of variability evolved from an average of 8.08 at initial testing, to 7.12 at intermediate testing and 7.5 at final testing, resulting in an increase of 0.96 (initial-intermediate) and a decrease of 0, 38 (intermediate-final).

At the end of the school year (final testing) it is found that the students have achieved higher results compared to the beginning of the school year.

Table 2
Performance dynamics experienced in the 25m sprint.

Subjects	Initial testing	Intermediate testing	Final testing
1	7.2	6.9	6.5
2	7.9	7	6.8
3	7,8	7.6	7.29
4	7.65	7.28	6.92
5	8	7.32	6.99
6	7.5	7.21	7.05
7	8.7	8.43	8.09
8	6.6	6.54	6.21
9	8.5	8,11	7.56
10	6.4	6.29	6.18
Arithmetic mean	7.62	7,268	6.96

Amplitude	2,3	2.14	1.91
Standard deviation	0.70	0.62	0.56
The coefficient of variability	9.20	8.56	8.08

In the 25m speed test, (table no. 2), during the 3 tests (initial, intermediate, final), the results evolved as follows:

- The arithmetic mean evolved from an average of 7.62 at the initial test, to 7.268 at the intermediate test, and 6.96 at the final test, resulting in an increase of 0.352 (initial-intermediate), and 0.308 (intermediate-final) .
- The amplitude evolved from 2.3 at the initial testing, to 2.14 at the intermediate testing and 1.91 at the final testing, resulting in an increase of 0.16 (initial-intermediate), and 0.23 (intermediate-final).
- The standard deviation went from 0.70 at pretest, to 0.62 at midtest, and 0.56 at posttest, resulting in a decrease of 0.08 (pretest-intermediate) and 0.06 (intermediate-final). .
- The coefficient of variability evolved from 9.2 at initial testing, to 8.55 at intermediate testing and 8.08 at final testing, resulting in an increase of 0.65 (initial-intermediate) and 0.47 (intermediate-final) .

At the end of the school year (final testing) it is found that the students have achieved higher results compared to the beginning of the school year.

Table 3

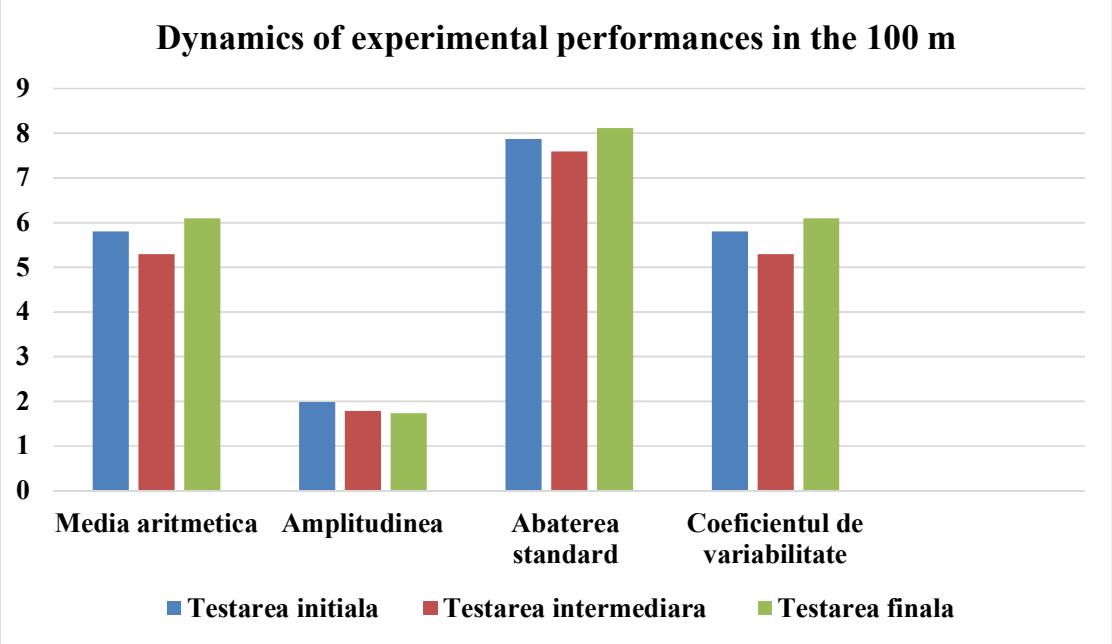
Performance dynamics experienced in the 100m sprint.

Subjects	**Initial testing**	**Intermediate testing**	**Final testing**
1	24.6	22.8	20.6
2	28.2	25.9	23.2
3	23.8	22.5	20.8
4	25	23.6	21

5	24.5	22.4	20.5
6	27.6	26.3	25.6
7	28.3	25.9	22.3
8	24.1	22	20.1
9	23.3	22.4	20.3
10	22.5	21	19.5
Arithmetic mean	25.2	23.5	21.4
Amplitude	5.8	5.3	6.1
Standard deviation	1.98	1.78	1.74
The coefficient of variability	7.87	7.59	8,12

Figure 1

The evolution of statistical indicators in the 100m sprint



In the 100m speed test, (table no. 3 and graph no. 1), during the 3 tests (initial, intermediate, final), the results evolved as follows:

- the arithmetic mean evolved from 5.8 at the initial test, to 5.3 at the intermediate test, and at the final test 5.1 resulting in an increase of 0.5 (initial-intermediate) and 0.2 (intermediate-final) .
- the amplitude evolved from 1.98 at initial testing, to 1.78 at intermediate testing and 1.73 at final testing, resulting in an increase of 0.2 (initial-intermediate), and a decrease of 0.05 (intermediate- the final).
- the standard deviation evolved from 7.87 at initial testing, to 7.59 at mid-test, and 8.12 at final testing, resulting in a decrease of 0.28 (initial-intermediate) and an increase of 1.47 (intermediate- the final).
- the coefficient of variability evolved from 5.8 at initial testing, to 5.3 at intermediate testing and 6.1 at final testing, resulting in an increase of 0.3 (initial-intermediate) and a decrease of 0.8 (intermediate-final).

At the end of the school year (final testing), it is found that students have achieved higher results compared to the beginning of the school year.

Conclusions

After processing the measurement data, the following conclusions can be drawn:

- the means, both those aimed at motor qualities and those aimed at motor skills, must be selected with great competence in order to satisfy the proposed themes and finally achieve the integration of students through physical education in the general set of requirements and implicitly in school performance.
- within the lesson, the ratio between motor qualities and motor skills must be in favor of the qualities, because the higher the qualities are, the faster the motor skills can be acquired.
- the main way for the development of motor skills is the activity within the lessons using the most appropriate exercises, movement games and specific relays adapted to the age.
- Movement games and relay races involve competition and are watched and accepted with particular interest by children who belong to the secondary education cycle.
- following the experiment carried out, the major differences in the results obtained by the students, had a significant increase between the initial testing and the final testing, which allows us to affirm that the methodology used in the lessons was adequate.

With regard to the progress made on all motor capacity tests (speed motor quality), the following situations are noted:

a) in all three speed tests, significant results are obtained, in progress.
b) the sample in which a less significant increase was obtained from the initial to the final testing is the 12.5m;
c) the higher growth rate in the development of speed can be observed between the initial testing and the final testing in the 25m and 100m test respectively;

Through the results obtained in all the tests, the efficiency of most of the drive structures used was validated, but also the possibility that they could be further improved. We can conclude, therefore, that the exercises used had a positive influence in obtaining the results, the tests of 12.5m, 25m, 100m, within the conducted experiment. Of course, the experiment should be continued and possibly extended to a larger sample of children in order to further achieve a harmonious physical development.

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Physical and Motor Characteristics in Basketball to Children and Youth

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Abstract

Basketball is a sport that requires basic and motor characteristics such as strength, speed, endurance and coordination, high-intensity activities such as jumping, dribbling, shooting, blocking and sprinting. It is also a sports discipline that requires aerobic and anaerobic energy processes as well as including intense activities such as jump shooting, blocking shots, movements with rapid changes of direction and high speed. In this discipline, there are many characteristics that affect performance and proper execution of technical and tactical elements according to the positions of the game. The purpose of this paper literature review is to investigate and research the impact of training programs on physical parameters in basketball in age groups. To successfully realize this review paper we studied and analyzed contemporary scientific literature. In this literature review, basic principles of selection in several stages of literature by means keywords are used based on works. Major databases were used through the Jab Ref program such as Cross Ref, DOAJ, Inspire, Web of Science, Scopus, and Sport Discus in the last 10 years. In the literature used, one can clearly see importance of understanding that, higher quality level of sportsman movement culture, higher level of mastery of teaching tasks and higher level of movement skills education.

Keywords: physical parameters, movement, skills, strength, speed, endurance, coordination.

Introduction

Participating in physical activity from an early age helps create a healthy physical structure, while contributing to psychological and social improvement. Having a sports life from childhood is very important for their future in society. If a child is deprived of physical activity, then he will have an inhibited psycho-motor development. For this reason, at this stage, various factors such as a healthy body, socialization, recreational goals play an important role for participation of individuals in sports activities. For many children, their families become stimulus for their participation in physical activity while some other families become a barrier by not knowing importance of physical activities in their lives. Such restrictions create basis for a sedentary life, posing a risk to their health. Therefore, orienting children towards physical activity is very important and a good alternative is basketball, which has anaerobic power in foreground *(Bilim A et al., 2016)*

Development is a complex phenomenon or a type of behavior that integrates many structures and functions related to real life. As a consequence of this integration, earlier stages affect the future stages. The development of a person is a continuous and regular process that comes through life, maturation and learning *(Galan Y et al., 2018).*

Investigating symbols of the environment that surrounds us using emotions, perception and thoughts are part of the developmental process. Psychomotor is science that actions/movements that require coordination of different parts of the body. Controlling execution of these movements and actions helps improve the coordination of different parts of the body. According to researcher psychomotor is composed of combination of cognitive skills, perception and physical skills. Motor development is closely related to mental health and physical abilities *(Harris G et al., 2000).*

Motor development is influenced by physical growth and central nervous system. Understanding psychomotor development helps improve performance and movement skills. These improvements help to increase the self-esteem and emotional stability of people *(Kirichenko V et al., 2015).*

Motor skills such as aerobic endurance, speed and agility are improved in this period. Children's involvement in sports or physical activities should start at an early age. According to *Koval V 2015,* childhood is a period that covers education and play. Childhood is conceived not only as a preparatory period for life but also as a part of life that has its own goals and objectives. Mental retardation in children is divided into two categories according to: 1. Physical and 2. Cultural/familial causes.

Physical causes include chromosomal and genetic disorders as a result of brain damage from congenital infections, malnutrition and drug exposure in prenatal period, while in the post-natal period damage occurs as a result of accidents and diseases. Cultural-familial causes do not come as a result of brain damage but as a result of unstimulating environment and life events. Factors are very important for early brain development. Today's studies are focused on development of motor skills and their improvement. One of the most important sports for development of coordination skills and reaction time speed in children is basketball. Some benefits sport of basketball are: it helps to increase self-confidence, build muscle mass, self-discipline, develop coordination, increase flexibility, dexterity and speed as well as concentration *(Jakovljević S et al., 2017).*

Basketball is a sport that requires basic and motor characteristics such as strength, speed, endurance and coordination, high-intensity activities such as jumping, dribbling, shooting, blocking and sprinting. It is also a sports discipline that requires aerobic and anaerobic energy processes as well as including intense activities such as jump shooting, blocking shots, movements with rapid changes of direction and high speed. In this discipline, there are many characteristics that affect performance and proper execution of technical and tactical elements according to the positions of the game. Depending on playing position of basketball players, physiological and physical demands are different. These study report that offensive and defensive players have higher speed and agility than center players. In this framework, it is necessary that training programs of basketball players are determined according to position of the game *(Vázquez-Guerrero et al., 2019).*

The researcher *Hoffman et al. 1996,* mentioned that 64%-81% of the overall performance is used in lower limb strength, agility, speed and vertical jump. Basketball is a competitive team sport and has its own technical and tactical characteristics, taking into account the limits of athletes. Basketball performance depends on anthropometric characteristics and physical fitness (jumping strength, dexterity with and without the ball, etc.) as well as technical, tactical and psychological characteristics. In recent years, monitoring of sports performances as well as monitoring and evaluation of physical and motor development of young athletes has been considered very important. For this reason, physical and motor tests are also used.

Basketball, like all team sports, requires motor characteristics such as strength, speed, endurance, coordination, as well as technical, tactical, psychological and anthropometric characteristics. For this reason, monitoring physical and motor characteristics of athletes in this age group (12-18 years old) helps to achieve a high performance. Through performance testing and physical testing, coaches monitor athletes' performance objectively. To monitor

performance of athletes, coaches need quantitative data on the development of different ages *(Tessitore A et al., 2006).*

Agility is another important trait in sports performance for three main reasons:

1. Consists of a concrete basis in the neuromuscular system for control of motor skills.

2. Changing directions quickly causes injuries, improving agility reduces the risk of injuries.

3. Improved agility improves performance in both the defensive and offensive phases *(Skurvydas A., 2013).*

Speed is ability of a person to move with a very high level of speed. The most important speed segments are: starting, acceleration and reaction speed. The reaction speed develops from the age of 10-12 years while the start and acceleration develops after puberty because their improvement is related to development of strength. The energy source used in speed is ATP and CP. In children, this source is scarce *(Delextrat A et al., 2009).*

The Role Of Basketball And Games In Physical Education

According to researchers, physical education in school system today does not provide the appropriate level of physical and intellectual capacity required by labor market and necessary for further professional activity. This fact is also reflected by low level of physical fitness, which is a serious problem for society *(Osipov et al., 2018).*

Scientific research to find efficient methods and tools for development of motor qualities and coordination skills for improvement of physical education system is a promising task for coming years. For the development of coordination ability in physical education classes, formation of new methods is required that promote improvement of coordination that a person needs during everyday life and in sports activities *(Bakayev et al., 2018).*

The results of numerous studies conducted in recent decades show that most suitable age for development of coordination skills is the age of 7-12 years due to several psychological and physiological factors. The physical improvement of 12-year-old students of different levels of physical and motor fitness depends on the skills of physical education teacher and their motivation to learn. For development of coordination ability in physical education classes, formation of new methods is required that promote improvement of coordination that a person needs during everyday life and in sports activities. The most used tool for development of physical education for entire population are sports games, which help form foundations of physical education and improve general state of human health. Systematic participation in sports games contributes to general development of students, an obvious positive effect is observed in development of physical skills such as speed, strength endurance, speed, dexterity and coordination of movements. The school program for physical education includes hours of

sports games, mainly football, volleyball and tennis. Basketball also occupies an important place in physical education curriculum for classes 5-9. Despite the use of sports games in school physical education, analysis of research and methodological literature shows the lack of research on the use of basketball as a tool for formation of coordination skills in high school children. *(Kozina et al., 2013).*

The Importance Of General And Specific Coordination Skills In Age Groups In Basketball

In elite basketball, demands at high levels for physical, technical, tactical and psychological skills from players are very necessary. Speed, agility and power are essential components of specific fitness for basketball players. During a basketball game there are reported to be 44-46 jumps, 1000 movements of different directions and 100 sprints. Players must be able to perform specific technical skills sport of basketball such as dribbling, passing, shooting under conditions of physical fatigue and emotional stress. Technical skills are closely related to movement coordination. With passage of age and participation in sports activities, we also improve coordination skills, for example, adolescents who engage in physical activity have better orientation in space, reaction speed, attention and learning of movements than adolescents who do not engage in physical activity *(Drinkwater et al., 2008).*

Skilled players have shown correct execution of technical movements even under conditions of fatigue and emotional stress. General coordination is capacity to perform different motor skills repetitions regardless of sport specialization while specific coordination is continuous repetition of specific sports movements during training sessions. There are only a small number of studies that assess and study specific and general coordination skills, because most studies focus on the assessment of basketball players' capacities in order to identify new talents and investigate the level of differences in these capacities with age *(Fort A et al., 2016)*

Few studies investigate coordination indices in relation to age, and to the author's knowledge no studies have investigated the relationship of specific coordination to fitness variables. This fact is strange because basketball requires different coordination skills such as spatial orientation, movement coordination and movement rhythm, as well as high sport-specific skills. It is a known fact that elite players have a high level of coordination and fitness. It has also been proven that there is a strong relationship between coordination and physical fitness in basketball players of all ages. However, it has been hypothesized that players with a high level of general coordination find it easier to acquire sport-specific skills because general coordination is closely related to the mastery of new movements According to this assumption,

novice players with good general coordination skills will acquire specific skills faster *(Bompa, 1999).*

General coordination plays an important role until acquisition of specific skills of a certain sport, after this moment importance of general coordination declines. This fact supports hypothesis that general coordination changes during development of specific basketball skills. Coaches are aware that skills of a sport must be mastered before puberty begins, e.g. basketball players must practice dribbling before this stage. Moreover, above study confirms that improvement of motor capacities occurs after age of 12-13 years and this improvement comes as a result of sports experience in training sessions *(Köklü Y et al., 2011).*

Effects Of Training On Motor Skills In Young Basketball Players

As in all sports, development of basic motor skills in basketball is an essential part of training sessions. The development of basic motor skills is a prerequisite for success in sports. Moreover, it is a fact that the development of basic motor skills helps facilitate application of technical-tactical exercises. Despite the fact physical ability of basketball players varies according to positions, again change of directions, speed and vertical jump are specific performance criteria of all athletes *(Bishop, & Wright, 2006).*

Basketball is a sports discipline that includes different physical features, psychological capacity of players and 4000-5000 m distance described through movements such as running, jumping and dribbling. To cope with this load, basketball players do not need to have an extraordinary physiological capacity. Superior players perform faster, more agility and with better jumps *(Jakovljević S et al., 2017).*

Purpose Of The Paper

Review is to analyze literature review is to investigate and research the impact of training programs on physical parameters in basketball in age groups.

Methods

In this literature review, basic principles of selection in several stages of literature by means keywords are used based on works. (Moher et al., 2015; Nakagawa S, & Cuthill, 2007). Major databases were used through the Jab Ref program such as Cross Ref, DOAJ, Inspire, Web of Science, Scopus, and Sport Discus in the last 10 years.

Keywords were used in first stage of selection, such as: basketball, training, motor skills. The electronic control resulted in a search of 80 scientific works. Further, in the next stage of selection were added, some additional keywords such as effects, kids, youth, intervention. After the literature search, 47 scientific papers were found which were taken into consideration in this paper.

Conclusions

From this literature review, we drew conclusions about theories that will help us in most efficient design of intervention program that will be carried out in discipline of basketball as follows:

1. In study of sports performance improves during adolescence and young adulthood using appropriate training programs and also helps in a successful career in adulthood.
2. Monitoring physical and motor characteristics of athletes in this age group (12-18 years old) helps to achieve a high performance. Also, monitoring sports performance and monitoring physical and motor development of young athletes is very important for specialization in right position in game. Although there is a large number of scientific researchers who study physical and motor characteristics according to position of game in superior category. The number of studies that compare these characteristics according to playing position in adolescent basketball players is limited (Pion et al., 2018).
3. The influence of parameters such as speed and agility is very important in basketball performance, for this reason players who are not fast enough cannot succeed in modern high-level basketball (Castagna, C. 2009).
4. Players with well-developed speed and agility can execute elements of modern basketball technique and tactics more efficiently (Harley, Doust, & Mills, 2008).
5. Improving motor skills to an appropriate level depends on motivation, opportunities and training sessions. Training is a very good tool for improving personality traits, which helps to create relationships with people and surrounding environment (Ziv, G., & Lidor, R. 2009).
6. Acquiring sports skills requires a long training time and best period of motor skill development is between 8-13 years. (Gencer, Y. G., & Asma, M. B. 2017).

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Tax Policy In The World Of Sport Exemples In Turkey, Uk, Spanish, Italy And Germany

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Abstract

Taxes are the most important source of revenue the state relies on to maintain public services. The basic objective of our tax system is to collect taxes in a fair and balanced manner, within the framework of the principles set out in the Constitution. Taxes on income make up a large proportion of tax revenues. In this context, salary income is taxed under the Income Tax Act and there are special regulations for the salary of athletes for the promotion of sport. Looking at Turkey's tax system, different methods of taxing athlete fees have been applied at different times. Comparisons with other countries show that in Turkey, the income tax rates applied to athlete salaries are relatively low, causing problems in terms of tax fairness. The study examined the legal regulations on the taxation of athlete fees and the implementation processes of these regulations, as well as proposals for the correction of practices that distort tax fairness.

Keywords: Taxation of Athletes, Sports Benefit, Income Tax, Tax Justice, Wage Revenue, Athlete Pay

Gel Classification: H20, H24, H29

Introduction

Salaries earned by athletes are taxed in accordance with constitutional principles. However, some aspects of the taxation of athletes, both in literature and in the public, are said to affect tax justice. In particular, the taxation of domestic athletes' gains with a lower tax rate compared to those abroad supports these views (ERGÜR, O.K., & KÜSTEKCI, A. (2021).

For our tax system, we can divide tax revenues into three main categories: income, expenditure and taxes on wealth, for our tax legislation. Income taxes are divided into two categories: income tax on real persons and institutional tax on legal persons. Based on the records of the Revenue Administration, the distribution of tax revenues in Turkey in 2019 shows that the share of income tax is 25.36% and that of institutional tax is 10.68%, and that the "income tax" ratio has a large share in the total tax income collected (CARIBAS, D. 2020).

In accordance with the Income Tax Act No. 193, payments made to athletes by transfer fee or by name and benefits provided are assessed within the fee, and the fees paid to them by sports clubs and anonymous sports companies are taxed by a fixed rate of withdrawal according to provisional article 72 and not according to the increasing rate of tax according to article 94 of the GVK.

As of 31/12/2023 athletes are paid by sports clubs and anonymous sports companies in the sports under the league procedure, with income tax deductions of 20% for top leagues, 20% for the top six leaguees and 5% for the other league. Payments to athletes in sports that are not subject to the league procedure and payments to national sportsmen in exchange for participation in international competitions are subject to a 5% income tax deduction.

As the level of the leagues decreases to protect the sport and the athlete, the reduction of tax rates is the main source of tax injustice. The main problem here is whether the low tax rates in the context of promoting sport and athletes at the entry-level level have achieved their goal. In other words, it is questionable whether or not this advantage created for athletes as a result of low tax rates and taxation reflects sporting achievements.

The taxation of athletes will be explained by enriching them with examples, taking into account updates in the work and tax legislation. Resources obtained using documentary scanning techniques were used in the study. In this context, the tax legislation will be reviewed, the books and theses that have been written about the taxation of athletes have been reviewed and the conceptual framework will be included in the first part of our study, the second part will describe the identification of the eligibility of the athlete, the subject of the tax, the event

of taxation, the method of taxing, tax rates by periods, the expenses to be reduced during the period and through the declaration, with examples of under what conditions and how to declare the cash pay, equal pay, compensation and other income elements that athlets can receive, the third part will compare the taxing of sportsmen in foreign countries and in our country, and in the final part we will include proposals on the subject.

1.1. Taxation Of Athletes İn Turkey

Taxes are the most basic source of income the State needs to carry out public services. The fair and balanced distribution of taxes in accordance with the fundamental principles laid down in the Constitution is the main objective of the tax system. Income from salaries is taxed under the Income Tax Act, and there are exceptional arrangements for taxing athlete's salaries in order to promote sport. When it comes to the Turkish tax system, different taxation procedures are applied at different periods in relation to the taxation of athlete's salaries. In our country, taxes are levied on the income, expenditure and wealth of the payers. Since there is no specific tax on the expenditure and wealth that athletes will pay, our study will focus on the taxes that they will pay on their income (payments).

While sport plays an important role in creating a healthy individual/community, as a fundamental phenomenon of modern society, sport also interacted with economic and social elements in the 2000s. In this context, the income earned by the employer at the expense of physical labor by the athletes is assessed as wage income according to the GVK (ATEŞ, A., & TOKSOY, T. (2023).

In economic terms, wages are "the compensation for the physical and mental human power used in production" and "the price paid to be able to use food in production". According to another recognition, "remuneration is a condition of a service contract, and the remuneration for work is a money agreed upon or fixed by law. Another different recognition is that "pay is a remuneration for service" or "a reward for work." According to article 55/1 of the Constitution, “the remuneration is the reward for labor. According to article 26 of the Labour Code No. 1475 (former) and article 32 of the (new) Labour Law No. 4857: “Wage is, in general sense, the amount provided to a person by the employer in exchange for a job or by third parties and paid in money.

The high income earned by professional footballers answers the question of which income element should be assessed in tax terms. In many countries, along with the countries surveyed, footballers are defined as workers in the labour law, or are considered to be paid in laws such as the debt law. In tax laws, however, the income earned by professional footballers is regarded as wages and the remuneration income is taxed under the regulations under this heading. The taxation of salary income earned by footballers is based on the basis that the salary is deducted at the source at the time of payment, and the deductions made in the event of a declaration are exempted from the calculated income tax (Güler, A. (2022).

In terms of tax law, the salary is covered in GVK 61. According to this recognition, wages are defined as benefits that are provided by money and months and can be represented by money in exchange for services performed by persons who work for a particular employer, depending on their place of work. Each of the laws in the tax legislation defines the beneficiaries of that law, and the other bases are based on eligibility. Since the athletes are real persons, their income will be taxed under the Income Tax Act No. 193 (GVK) and according to the applicable law, the sportsmen are taxed as full payee or narrow payee.

1.1.1. Fully Qualified Athletes

The full beneficiary is the taxable beneficiary in Turkey for all earnings earned within and outside the country. (GVK m.3). The full eligibility conditions are set out in articles 3 and 4 of the GVK. According to the GVK, the first requirement for an athlete to be fully eligible is that he is established in Turkey. So residence is taken into account. The athlete must either be a resident of Turkey or have been resident in Turkey for more than six months continuously in a calendar year.

The other requirement is for Turkish citizens who are affiliated with sports clubs based in Turkey and reside abroad because of the sports club's business. Under this circumstance, the essence of nationality has been taken into account. These persons will not be re-taxed in Turkey if they have paid taxes abroad on their earnings. For example, if a Turkish athlete lives abroad due to the business of a sports club based in Turkey, he or she will be taxed as a full taxpayer, regardless of the length of time (GVK m.3/2).

Athletes entitled to full remuneration are required to declare all the elements of income they have earned during a calendar year, with the exception of income referred to in article 86 of the GVK, in accordance with article 85 of the same law.

1.1.2. Limited Taxpayer Athletes

Payers who are taxed on their earnings and certificates in Turkey (GVK,m.6). According to article 6 of the GVK, non-resident persons in Turkey are limited. If the athletes do not have a residence in Turkey under the civil law and have not been in the country for more than six months in a calendar year, they will not be deemed to be established in the Republic of Turkey. It is also affiliated with a sports club operating in Turkey, and because of its business, foreign nationals who are abroad are also considered to be a narrow recipient. Narrow-paying athletes are taxed only on the gains and qualifications they earn in Turkey. If the athlete has made a concession on the gains and duties earned, the final taxation according to GVK 86/2, and they do not have to make a declaration.

2. Taxation Of Athletes

The Turkish Tax System has adopted the declaration procedure as a method of taxation. Taxpayers or taxpayers are taxed on the matras they have declared to the Chairman of the Revenue Administration, a subsidiary of the Ministry of Treasury and Finance, and the Treasuries and Finance Ministry is responsible for verifying the accuracy of such statements during the period of due process.

According to the GVK, the methods of taxing athletes are in the form of withdrawal, annual declaration, and a non-compliant method involving both.(GVK m.85-m.86-g.m.72).

As shown in Table 1, there will be a change in the tax rates charged on the income of athletes in our country from 1999 to the present day. In our country, as in the case of taxes, there is also a tax deduction, which is applied to taxpayers as an exception and tax incentive. Historically, in terms of income tax, there are usually special practices for taxing athletes. In particular, since the 1990s, when football began to gain more interest and footballers began to earn higher salaries, the tax amounts collected from footballers' fees have been regulated in favour of footballers, with provisional articles added to the law (Ağaya, 2019).

TABLE 1 Taxation of Athletes	
From 01.01.1999 to 24.04.2003	**Taxation has been carried out in accordance with the general provisions.**
From 24.03.2003 to 30.06.2008	**As of 01.07.2008, it was subject to a 15% reduction in income tax.**
01.07.2008 and beyond	**According to the provisional article of 72, it was subject to income tax cuts at rates that vary depending on the status of the league.**
Source : Çeribaş, 2020: 565	

Under the provisions of provisional article 72 of the GVK, the statement of validity until 31/12/2019 has been amended to 31/12/2023. In addition, the income tax deduction has been increased from 15% to 20% for athletes in the top league. Another regulation is that if the total annual remuneration income of athletes exceeds the amount contained in the written tariff in the fourth language (2022, Rs. 880,000.00) under article 103 of the Act, the income must be in the annual declaration. The income tax calculated under the income declared by the issuance of the annual declaration shall be deducted from the sum of tax amounts deduced on the condition that those responsible for making the withdrawal are paid to the tax office (Çeribaş, 2020: 569).

Table 2 Withholding Rates in Taxation of Athletes

	Sports Branches Subject to League Procedure			Payments Made to Athletes in Sports Branches Not Subject to League Procedures	Payments Made to National Athletes for Participating in International Competitions
	Payments Made to Athletes in the Top League	Payments Made to Athletes in the Top Six Leagues	Payments Made to Athletes in Other Leagues		
01.01.1999-23.04.2003	Rates in GVK Md. 103				
24.04.2003-31.12.2007	15%				
01.01.2008-30.06.2008	15%				
01.07.2008-31.12.2019	15%	10%	5%	5%	5%

01.01.2020-31.12.2023	20%	10%	5%	5%	5%

Source: I have drafted the Income Tax Act No. 193 pursuant to provisional article 72.

It was noted that payments made to e-sports players registered in the e-sport club by the sports club association's economic operations under an exception to the Presidency of the Revenue Administration could not be assessed under article G.72 of the GVK, and therefore articles 61, 63, 94, 103 and 104 of the same Act should be subject to income tax under the provisions (GIB 2019).

2. Election Of European Countries With Turkey

As far as this section is concerned, the taxation of athletes in our country has been examined within the legal framework. In this part of our study, we will compare England, Spain, Italy and Germany, the largest leagues in Europe, for comparison purposes.

The tax that the athlete will pay in our country, assuming he plays in the top league, is single and receives a salary of Rs. 10,000,000 in 2022, will be as follows.

- The winnings of the athlete will be deducted by 20% in accordance with provisional GVK article 72. (Retention amount: 10 million TL* 20 % = 2 million TL)
- The remuneration earned as an athlete exceeds the amount contained in the fourth sentence of the written statement in article 103, so it must be declared by annual declaration in accordance with provisional article 72 of the GVK.

Table-7: Turkey's 2023 Income Tax Rate

Tax Differences	Tax Rates
Up to 32,000 TL	15%
Rs. 4,800 for Rs. 32,000 of Rs. 70,000, more	20%
12.400 for 70,000 TL of 170,000 TL (12.400 TL for 70.000 TL of 250,000 TL in salary income), more	27%
39,400 TL for 170,000 TL of 880,000 TL (61,000 TL for 250,000 TL of 880,000 TL in wage income), excess	35%
287,900 TL for 880,000 TL of more than 880,000 TL (281,500 TL for 880,000 TL of more than 880,000 TL in wage income), more	40%

Source: (PWC, 2023)

When calculated on the basis of the data in the above table in the given annual declaration, the athlete concerned will have to pay 3,929,500,00 TL in taxes in our country.

If the athlete had been resident in the UK, he would have won £444,657.88 in 2022 (£10,000,000 / 22,4892).(The currency exchange rate contained in the Official Gazette dated 31.12.2022 has been taken into account as current.)

Table 8: Britain's 2022 Income Tax Rate		
	Tax Rates	**Revenue 2022 (GBP)**
Start Rate for Savings	0%	0 - 5.000
Basic Rate	20%	0 - 37.700
Higher Rate	40%	37.701 - 150.000
Additional Rate	45%	For 150,000 and more

Source: (PWC, 2022)

If the athlete had made a declaration in England, he would have to pay £185,056,05, or £4,161,762,43.

If the athlete had been resident in Spain, he would have won 501,632,81 euros in 2022 for 10 million TL (19,9349). (The currency exchange rate contained in the Official Gazette dated 31.12.2022 has been taken into account as current.).

Table-9: Spain's 2022 Income Tax Rate	
Revenue (EUR)	**Tax rate**
Up to 12,449	19%
12.450 - 20.199	24%
20.200 - 35.199	30%
35.200 - 59.999	37%
60.000 - 299.999	45%
300,000 and more	47%

Source: (PWC, 2023)

If the athlete had made a declaration in Spain, he would have to pay 220.668.97 euros, or £4,399.013.91.

If the athlete had been resident in Italy, he would have won 501,632,81 euros in 2022 for 10 million TL.

Table-10: Italy's Income Tax Rate for 2022		
Taxable Gain (EUR)		**Tax Rate**
0	15.000	23%

15.001	28.000	25%
28.001	50.000	35%
50.001		43%

Source: (PWC, 2023)

If the athlete had made a declaration in Italy, he would have to pay 208,602,11 euros, or £4,158,462,21.

If the athlete had been resident in Germany, he would have won 501,632,81 euros in 2022 for 10 million TL.

Table 11: Germany's 2022 Income Tax Rate				
Tax Shields for Single Guests (EUR)		**Tax Shields for Married Couples (EUR)**		**Tax Rates**
0	10.347	0	21.264	0%
10.347	61.971	21.264	123.942	14%
61.971	277.825	123.942	555.650	42%
277.825	and more	555.650	and more	45%

Source: (PWC, 2022)

If the athlete had made a declaration in Germany, he would have to pay 226,486,51 euros, or Rs.

Table 12: Results of Taxation of Athlete's Gains in Different Countries	
Countries Compared	Taxes to be paid
Turkey	3.929.500,00 TL
England	4.161.762,43 TL
Spain	4.399.013,91 TL
Italy	4.158.462,21 TL
Germany	4.514.985,86 TL

As can be seen from the above comparison, our country is quite advantageous in tax terms for athletes. Due to the flat rate of discharge in our country during the year, athletes are not subject to an increased rate of tax until the end of the year; they use their own money, pay their taxes early, like other payers, and do not finance the state.

4. The Problems Of Taxing Athletes

GVK G.72 states: “In the event of an annual declaration, tax deductions under this Act shall be deducted from the income tax calculated on the declared income, provided that the tax authorities responsible for making the deduction have paid it to the tax office. “There is a judgment.

The cuts in payments to athletes are due after the cuts, not to the athlete, but to the club, etc., that paid the atlétic. In accordance with article 11 of the Tax Procedure Act, the tax deductor is responsible for the payment of the amount deducted. Paragraph 3 of that article applies temporary liability in the case of purchase/sale of goods and service claims. There is no temporary liability for fees. Thus, the employer's failure to allow the worker to be taxed because of his debt is a violation of the property right contained in article 35 of the Constitution.

According to GVK 121, "taxes deducted under this Act from income including earnings and documents indicated in the Annual Income Tax Declaration shall be deduced from income tax calculated on the declaration. There is a provision, i.e. there is no requirement for payment under GVK 121. The taxation of athletes is subject to the payment of the bail made under G.72 of the GVK. Different practices arise here within the same law and this inequality is contrary to article 2 of the Constitution.

The amount of redemption that was not allowed to be paid to the victim on the grounds that the athletes were not paid at the time of the declaration would then be taxed by the employer and the sportsman would have to deal with the return process.

In addition, the amounts withdrawn by the employer from the athlete's salary are declared by the employee in a summary statement. The summary declaration may include amounts withdrawn from more than one athlete, as well as compensation from different services purchases (freelance earnings, extensive construction repairs over the years, etc.). There is no explanation in our legislation as to what concession the amount paid if the employer pays part of the debt belongs to (Department 2020).

Conclusion

Sport plays a very important role in the establishment of a healthy society. That is why sports activities are being promoted and encouraged in our country. The introduction of a flat rate tax for athletes instead of an increased rate of tax, the exemption of amateurs' salaries from tax under certain conditions, and the exclusion of awards awarded to amateurs for achievements in competitions are some of them. Even if we only make annual declarations because of the income of the athletes, our country is relatively more advantageous in terms of sportsmen than other states.

Countries are reforming their tax legislation and offering various incentives to improve the financial situation of sports clubs and athletes and to make their countries more attractive to professional sportsmen. With this approach, they aim to increase competitiveness in the sports sector and create a tax haven for high-income athletes (Bjärsholm, D., & Backman, J. (2023). In order to increase employment in our country and enable newly-grown youth to participate in the working life, tax advantages are granted to clubs that raise athletes (Basbuga, H, Kitapci, H., Oguz, E. C., & Elkoca, Y. (2022).

Athletes were taxing up to 2019 according to a flat-rate withdrawal procedure, depending on whether they were in the league and national team of the sports club they were affiliated with. The purpose of this initiative was to promote sport, to make our country attractive to athletes. However, over time, the system has been subjected to a number of criticisms because of the institutionalization of sports activities and the development of the sector and the athletes' earnings reaching very high amounts, the increasing taxation of other payers, and the violation of the taxation principles in the Constitution because they pay relatively higher taxes to athlets and the principles of justice and taxation according to financial power. The amendment to the law increased the allowance rates in article 72 of the Interim Income Tax Act for the income of athletes who signed contracts in 2020 and beyond, and imposed the obligation to report annually if the gain exceeds a certain amount, thereby imposing an increasing rate of tax on athlets.

In the sports sector, only athletes in the top leagues of a few sectors, such as football, were earning higher incomes, while others earned more reasonable incomes than the league they played in. It would be unfair for low-income athletes to keep the entire sports sector subject

to an entirely increased rate of tax due to the high consistency of winners. That is why the new application, introduced in 2020, is the most reasonable solution for us.

The requirement that athletes can deduct from their previous salaries during the annual declaration has caused a number of difficulties, such as the violation of the constitutional right of ownership and the levying of payable taxes. Similarly, the payment requirement imposed for the return in VAT withdrawals has been abolished by the Advisory Committee. Repayments from athletes' salaries to the state are the obligation of the employer, and there is no such obligation and authority as to check whether the athlete pays his employer's debt. Furthermore, in the case of partial payments made by the employer, there is no provision that the payment belongs to the athlete's redemption. The provisional article 72 of the GVK should be deleted because the purpose of the introduction is to tax the wages paid by athletes lower and the payment requirement is not compatible with the objective of the article in question.

The legal and economic principle of savings applicable to the taxation of salaries is in conflict with a continuation of the old practice for athletes signing contracts before 2020, contained in provisional article 91. According to us, the tax rate of that time should be applied whenever the salary is obtained.

Under GVK 23/1-6, women's servants are provided with shelter allowance, while men's service allowance is not provided with such allowance. Although the exception was introduced with the aim of adapting women to work, men with children have been ignored. It's not just a woman's duty to take care of children in a family institution. Therefore, legal regulations need to be made for the exploitation of male servicemen and thus dependent working male athletes from the application contained in paragraphs 23/1-6.

Moreover, cryptocurrency has recently started to be used in the sports industry, and it is an important topic for future researchers to look at how to take tax measures (Glebova, E., & Mihal'ová, P. (2023).

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Values Of Physical Preparation In Female Gymnasts

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Abstract

Artistic gymnastic is one of the components of competitive gymnastics and is divided in men's and women's artistic gymnastics. There are four events in the women's artistic gymnastics: vault, uneven bars, balance beam and the floor. Strength training in artistic gymnastic is closely linked to the gymnastic skills, so we can talk about the development of specific strength that is comparable to other sports. Taking into consideration the predetermined role of the muscular preparation in defining the physical training for female gymnasts. In this study, were obtained analysis twenty-one female gymnasts from four sports clubs in different cities of Albania, who are members of national gymnastics competitions. Tests realized in the beginning and final are as follows: SJ (cm), CMJ (cm), TF SJ (ml/s}, T F CMJ (ml/s}, SJBW (cm), CMJ 15 sec. (cm), HP (cm), HPWB (cm). Gymnasts have level average in SJ and CMJ. Low ratio indicates optimal condition strength to gymnasts. Referring tests shows that 16 gymnasts have high value flight times jumps SJ and CMJ. A different tableau is observed to 5 gymnasts, where look lower values of flight times jumps in SJ and CMJ. From the measurements of the tests, it resulted that those gymnasts that were involved in the study had an average level of strength of their lower limbs and a lower level of power of their upper limbs.

Keyword: Artistic Gymnastics, Physical Training, Strength, Performance.

Introduction

Artistic gymnastic is one of the components of competitive gymnastics and is divided in men's and women's artistic gymnastics. There are four events in the women's artistic gymnastics: vault, uneven bars, balance beam and the floor. On the each of apparatus, except on vault, where is performed only one jump, gymnasts do links between the series of gymnastic elements which merge into one routine of 30 to 90 seconds duration. *(Meta A., 2019)*

Strength training in artistic gymnastic is closely linked to the gymnastic skills, so we can talk about the development of specific strength that is comparable to other sports. When we look at children's artistic gymnastic, considering definitions of strength and power, we cannot talk about strength, we can, only, talk about power, especially explosive. *(Jorgoni A., 2007)*

Jumps take an important part of gymnastics daily routines. Gymnasts' ability to transmit their impulse from their feet to their upper bodies following rebounds is crucial, allowing acrobatic skills such somersaulting and twisting. Artistic gymnastics has seen amazing evolution throughout the last five decades *(Kosova et al., 2022).*

Exhibited strength, power, flexibility and spatial awareness via the incredible complicated aerial skills have contributed in shaping a new profile of the modern gymnast *(Jemni, 2018 & Ramirez-Campillo R et al., 2013).*

Vertical jumps are used in a plenty of sports. Their primary goal is usually to reach the greatest possible height *(Feeney et al., 2016).* Gymnasts' jumping ability is often linked to successful performance (especially in floor routines and vault).

Gymnasts have incredible neuromuscular connections and they are also characterized by very high levels of strength, power, flexibility, and muscular endurance, combined with speed and coordination *(Asadi et al., 2017).*

The gymnasts differ from each other in motor abilities which are reflected in the performing quality of gymnastic movements, or accuracy of the techniques, levels of the elements, compositional possibilities of the realization of gymnastic exercises. *(Bogdanis C et al., 2019).*

From the perspective of child development, gymnastics is one of the key sports as any physical exercise on the floor or apparatus that offers a great range of locomotive, stability and body control movements which are highly important for the development of children *(Romero C et al., 2021).*

Measurements And Methods

In this study, were obtained analysis twenty-one female gymnasts from four sports clubs in different cities of Albania, who are members of the national gymnastics competitions. Experimentation and comparison of data from different measurements, occupies an important place in the study, which enable testing of explosive strength and modeling training her.

To measure these important indicators, the Leonardo Mechanography (GRFP) certified apparatus was used, which is a platform connected to the computer that measures the power, jumpiness, balance of the legs in various tests, which are presented in its manual. Specific data for the performed tests were obtained from this apparatus.

To measure important indicator of explosive strength of upper limbs, was used Ergo-jump Bosco System, Made by Globus equipment, which were taken from specific data.

Tests with gymnasts were conducted in the laboratory of the Scientific Research Centre of Sports in UST during the period March 2023 (first measurement), May 2023 (second measurement).

Statistic

Descriptive statistics were performed for the entire group and the homogeneity of the distribution was investigated. Measurement pairs were compared by nonparametric Wilcoxon Test. The relations between variables were examined by Correlation test. The data was analyses with the help of Microsoft Excel, 2010.Significance was set to $p<0.05$ and $p<0.01$ levels. Software was used in all the statistical procedures.

Apparatus used

Lengthmeter; scales; Leonardo Mechanography (GRFP); Ergo-jump Bosco System, Made by Globus. computer.

Calculations

Indicators measure the sportsmen by Bosco P. *(Marina M, Jemni M. 2014).* were:

- Height, weight measurements of study group were taken.

Body Mass Index (BMI) was determined by the following equation: (BMI) = weight / height (cm) ^{2}

All anthropometric measurements were applied according to Anhtropometric Standardization Manuel *(Wang 2000 & Timothy et al., 1988).*

- Was measured height flight in both types of CMJ and SJ jumps and flight time.

- Based on the difference of the two types of jumps CMJ & SJ, muscular elasticity was determined in cm.
- In test 15 seconds jumps, knowing the time average flight, defined the average height of flight.
- Decided to report the average height of flight for 15 seconds with to jump (CMJ).
- The evidence of 15 seconds is measured, the average time of flight and the average time of contact with the ground.
- In three tests thrust with hands in the vertical, was calculated the average.

Environment temperature was 23^0C place was soft.

Methods standard jumps

Standard jump (fig. 1a) starts from the stand at attention with their hands in the middle, sportsman makes leg flexion and quickly jumps up. This jump is called CMJ (Mouvement Jump Counter).

In Figure 1b, is shown jumping out of position with knees bent at 90 ° angle. This jump is called SJ (squat Jump).

Vertical thrust technique

Vertical thrust is one specific exercises necessary thrust his hands in gymnastics. She realized with extended arms, which reached a jump with shift down-up and return again to vertical position.

Figure 1

SJ and CMJ jump .

Methodology development of physical qualities of gymnasts

Gymnasts competing at the highest levels, should be "light" weight. For this reason, coaches are very careful in strength training because it is an important skill motors in artistic gymnastics.

Exercises preparation physical and special place three times a week alternating, a physical preparation day, another special day. They were carried at the end of the preparatory part training.

Exercises physical preparation

Exercises physical preparation were made to ten weeks presented in tables 1 as follows:

Table 1

Plyometric training program (6 weeks) (Slimani et al., 2016)

Week Plyometric training program

number of sets × number of rebounds

Standing vertical hops 2 × 10

Single foot hops 4 × 8

1–2

Counter movement jumps 3 × 5

Multiple two-foot hurdle jumps (hurdle height 0.55 m) 6 × 6

Depth jumps (drop box height 0.20 m) 3 × 6

Lateral two-foot jumps 2 × 10

Two-foot jumps 4 × 8

3–4 Counter movement jumps 3 × 5

Multiple two-foot hurdle jumps (hurdle height 0.65 m) 6 × 6

Depth jumps (drop box height 0.30 m) 3 × 6

Two-foot jumps forward and backward: 2 × 10

Single foot jumps 2 × 8 on each foot

5–6 Counter movement jumps 3 × 5

Multiple two-foot hurdle jumps (hurdle height 0.76 m) 6 × 6

Depth jumps (drop box height 0.40 m) 3 × 6

Exercises special preparation

Special preparation is exceptional value in the acquisition of gymnastic techniques, as exercises selected for this purpose, not only are similar from the standpoint of neuro-muscular strain, but above all, with technique self of performing elements in kind different many gymnastic competitions. *(A.G.F. a. g. 2020)*

Exercises special preparation were for ten weeks: Dosage load calculated by the amount of tools in part basic to training.

Table 2

Methodology of special exercises. (A.G.F., a. g. 2020)

Floor exercises: • Run combined with jumps in diagonal. • Rondat flic row. • Back somersault, flic, back somersault. • Flic, back somersault, flic. • Tempo row. • Front somersault row.	Beem: • Transportation, front and back, lengthwise. • Combination with the more simple elements.
Vault: • Run 20-30m sprint. • Push the feet and hands from different positions.	Parallel bar: • All press to handstand. (stradle. piked. swing) • Handstand up and down. • Uprise with swinging front (back) row. • Swinging over row times.

Exercises special preparation were included at half preparatory training by developing motor qualities to gymnasts at high level until the execution of gymnastic exercises as well.

Results

To obtain exact data on the realization of our goals in the study, conducted anthropometric measurements. Measurements served to calculate body mass index (BMI), which helped us to take important conclusions over actual status of functional indicators, seeing the relationship between body weight and height.

Table 3

Gymnasts anthropometric indicators.

n=21	Min	Max	M ±SD
AGE (years)	16.32	18.24	17.04±3.28
WEIGHT(kg)	35.2	49.8	42.71±7.90
HEIGHT(cm)	141	158	150.13±6.90
BMI (kg/m2)	17.03	20. 16	18.495±2.21

Tests in two standard jumps

Two standard jumps were performed, Squa Jump (SJ) and the Counter Movement Jump (CMJ). In both jumps, gymnasts performed each three proofs of which were registered average results. Results SJ and CMJ were: SJ, IT 38.2cm. sd ±3:24, TF 40.7cm. sd ± 4. 61. Ratio between two jumps CMJ / SJ was: IT 1.131 sd ±0.01,TF 1.143 sd± 0.01 and fast muscle fibers, IT 87% sd ± 11, TF 94% sd± 9.

Testing of jumps in 15 second

Gymnasts were tested, doing as much jumps, hanging within a maximum time of 15 seconds, where was measured: the number of jumps in 15 seconds TI 16 sd ± 2, TF 18 sd ± 3.The average height of these jumps: TI 26.6cm sd ± 6.4, TF 30.1cm sd ± 5.1 and calculation of the ratio between the average height of CMJ / CMJ jumps for 15 seconds: IT 1798 sd ± 0.11, TF 1737 sd ±0.12.

Handstand push testing

Handstand push without and with busily. gymnasts were tested by performed three proofs in both cases. Average results were: HP, IT 3.4cm sd ± 1.2, TF 4.2cm sd ± 1.5 and HPWB, IT 6.9 cm sd ± 2.3, TF 8.1cm sd ±1.8.

Testing of time flight in jumps CMJ and SJ

Flight time, measured in milliseconds, is an additional parameter of neuro-muscular skills of gymnastics. Time flying in SJ was: IT 545 milliseconds sd ± 106, TF 581 milliseconds sd ± 134 and CMJ was: TI 427 milliseconds sd ±57, TF 466 milliseconds sd ± 48.

Testing jump with load to equal body weight

Gymnasts tested also jump SJ load placed on the neck, to equal the body weight. From this test (SJBW), issued the following data: IT 20.6 cm sd ± 4.12, TF 22.9cm sd ± 3.9 and report SJBW / SJ: IT 0354 sd ± 0.15, TF 0377 sd ± 0.24.

Table 4

Supplied data tests described above.

LEGEND	TI s/d	TF s/d	DIF	MEAN	SD
SJ (cm)	38.2 ±3.24	40.7 ±4.61	2.5	39.45	±3.925
CMJ (cm)	45.8 ±6.05	49.4 ±2.93	3.6	47.6	±4.49
T F SJ (ml/s)	545 ±106	581 ±134	36	563	±120
T F CMJ (ml/s)	427 ±57	466 ±48	39	446.5	±52.5
R CMJ / SJ	1.131 ±0.01	1.143 ±0.01	0.012	1.137	±0.01
F M F (%)	87 ±11	94 ±9	5	91.5	±10
SJBW (cm)	20.6 ±4.12	22.9 ±3.9	1.7	23.75	±4.01
R SJBW/ SJ	0.354 ±0.15	0.377 ±0.24	0.023	0.3655	±0.195
N CM.J 15 sec	16 ± 2	18 ± 3	2	17	±2.5
CMJ 15 sek (cm)	26.6 ±6.4	30.1 ±5.1	3.5	28.35	±5.75
R CMJ/ CMJ 15sec	1.798 ±0.11	1.737 ±0.12	-0.061	1.7675	±0.115
HP (cm)	3.4 ±1.2	4.2 ±1.5	0.8	3.8	±1.35
HPWB (cm)	6.9 ±2.3	8.1 ±1.8	1.2	7.5	±2.05

Discussion

The data in table five, we see that gymnasts generally have BMI normal values and underweight. The speed of the explosive force of these is optimal, where seen a good performance in the execution of gymnastic elements. A small part of the gymnasts are overweight. This shows the main deficiencies in intramuscular coordination, lowering of capacity motor and physical. The important for us is to observe if they sportswoman overweight have in favor muscle mass of greater or fat mass BMI based on data of literature given in table 6.

Table 5.

(Wang et al., 2000)

Classification	Female
Normal	16.5-21.99
Overweight	22 -26.99
More overweight	27 high

Links between SJ and CMJ are very strong. This shows that the two tests are similar and valid for determining the strength fast of the lower bias. Table 6 shows that gymnasts have level average in SJ and CMJ. Low ratio indicates optimal condition strength to gymnasts. BMI is in normal situation, are good indicators that represents predominance of speed. Some gymnasts with high elasticity, strength is insufficient, low percentage of fast fibers and no balance of forces, it shows deficiencies in speed.

By comparing these data, we see that the level of our gymnasts CMJ is high indicator. At CMJ, for 15 sec concluded that gymnasts have the average level. This level is not evidenced in the report CMJ / CMJ 15 seconds where the great value of this ratio indicates sustainability anaerobic lesser of gymnasts.

Handstand push without and with busily. gymnasts were tested presented in the lower levels. After final testing results show an increase from exercises methodology used, the situation is still low level.

Referring tests shows that 16 gymnasts have high value flight times jumps SJ and CMJ. This ability to levels relatively high reflect even in poor motor coordination in different floor

exercises and vault. A different tableau is observed to 5 gymnasts, where look lower values of flight times jumps in SJ and CMJ. This indicates a better motor coordination by them.

The data in Table 6 in the jump test load equal to the weight of the body shows that 11 gymnasts have a total strength of relatively small compared to others, but have good balance between strength and speed. The 7 gymnasts, strength predominates, while the 3 gymnasts lack strength.

Report strength / speed comes from the jump SJ to load the body weight and jump SJ, If this report is 0.33, have a balancing situation, larger values indicate the predominance of force, while values lower level insufficient strength. The literature data presented in the table 10 helped us to calculate the level of gymnasts tested SJBW / SJ where their status is 0.3655, balancing.

Table 6

Rapport speed / strength (Petrigna et al., 2019)

Strength	**Speed**	**Boscos indicators**	**Level**
SJ to load the body weight	SJ	Rappot speed / strength	
15 cm	45 cm	15 / 45 = 0.33	**Balanc**
13 cm	45 cm	13 / 45 = 0.28	**Insufficient strength**
18 cm	**45 cm**	**18 / 45 = 0.40**	**Predominance stre.**

Conclusions

Based on content of our study, we arrived at some basic conclusions, which we are listing as follows:

- The results of our study showed that in artistic gymnastics among gymnasts, strength (especially relative) with forms of its manifestation, without underestimating other movement and coordination skills, is one of most important physical skills.
- Physical preparation is the basis for high results. Its preparation and progressive development are evaluated as a special component in the annual training macro cycle, and it is accompanied by complex tests, through which level of training is determined, for achieving satisfactory results in various activities (Bacciotti, S., et al., 2017).
- To our subjects conclude average level of strength in the lower limbs.
- The effects of physical preparation derive from the time and preoccupation devoted to it. Skills of gymnasts obtained in our study were found in this order: 4 were at a good level, other 12 were at an average level and 6 were poor.
- Physical preparation is a necessary component for preparation of quality sportsman in artistic gymnastics. (Sands, W. 2017).

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Descriptive Study On Muscular Strength Testing And Gait Assessments In Patients With Covid-19 In The Hyperacute Ward

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Abstract

The early intervention of physiotherapy applied in the rehabilitative treatment of patients presenting mild and moderate symptoms of the SARS-CoV-2 virus, in hyperacute and acute wards, becomes necessary to enhance the efficiency of multidisciplinary treatment.
The presented study was conducted on a total of 80 subjects divided into an experimental and a control group, over a staged period of 8 months during the years 2021-2022.
Investigations highlighted the fact that the specific involvement of rehabilitative physiotherapy in these types of patients, differential aspects, from the perspective of musculoskeletal functional recovery, being correlated, with the optimization of respiratory functions.
Prompt activity of the physiotherapist through the development of personalized programs according to the pathological state of the subjects resulted in the improvement of basic motor functions as well as coordinative capacities, especially of the locomotor system.

Keywords: Physiotherapeutic assessment, muscular strength, gait testing, COVID-19, intensive care.

Introduction

Globally, the functional side effects of COVID-19 infection has highlighted the necessity of early intensive physiotherapy approach. The main aim to reduce the period of hospitalization, and especially the time spent in intensive care units, where these patients often have prolonged bed immobilization due to respiratory system impairment, which most often limits the maintenance of muscular strength and consequently locomotor functions, sometimes making impossible the optimization and recovery of those severely affected by the virus.

In this context, physiotherapy may be considered a component of the process of accelerating the restoration of homeostasis, thus becoming an essential support of drug treatment, making the the recovery process more efficient. These gentle techniques lead to the effectiveness of physiotherapeutic management in ICU sections, where studies show that changing postures, specific positioning, and the earliest possible elevation of patients from

various lying positions to sitting, then to standing shortens the duration of stay in the hyperacute unit. (after Shamsi S. et. al., 2020, pp.112-115).

Correctly applied and adapted physical exercises complement the treatment scheme by maintaining and progressing muscular strength, which leads to the achievement of the final objectives necessary for returning to daily activities of living (ADL).

The above is mirrored by the following comparative results in initial testing (Ti) and final testing (Tf).

This study aims to highlight the importance of combining physical exercises with respiratory physiotherapy, applied to this type of patients, which can lead to improved lung capacity and health status, emphasizing the importance of muscular assessment and gait testing after a period of bed rest.

Methodology

The study included a total of 127 patients, of which 80 individuals diagnosed with COVID-19, were selected according to the inclusion and exclusion criteria from the experiment, admitted from the hyperacute and acute wards, where I've practiced my physiotherapy activity.

The patients were divided into two equal groups.

The physiotherapeutic protocol for the experimental group included specific exercises for optimizing respiratory function, such as passive and active mobilization, as well as specific techniques for improving muscle strength and gait reeducation.

The other 40 individuals from the control group benefited from a physiotherapeutic protocol made up of basic physical exercises, which included specific exercises of both passive and active mobilization, for improving muscle strength and subsequently walking function.

Selection criteria included: subjects between 55 – 70 years old, with peripheral saturation greater than 80%, without large doses of vasoactive medication, with a high level of consciousness, without hallucinations or delirium, having a high level of cooperation, without neurological diagnosis or result of a trauma, without contraindications to physiotherapy and mobilization, without admission to the intensive care unit for more than 7 days.

The initial and final assessments included measurements of muscle strength and walking tests, to assess the progress of each patient.

Muscle strength assessment was performed using the Oxford scale, applied segmental analysis, divided on the upper and lower limbs.

The walking tests included some very important inclusion criteria, such as the maximum O2 support not to exceed 2L/min., and the saturation (SaO2) not to be below 92%. Those with chronic pulmonary conditions were excluded from testing, as in certain conditions the SaO2 level being lower, even though the minimum necessary level of O2 support most often can be quite high and thus new medical complications can occur, for example hypercapnia. The 30-meter walking test was adapted for patients in the ICU, with low saturation, also presenting other slightly affected parameters. (Tudorache E. et. al., 2019, pp. 473-474).

Results

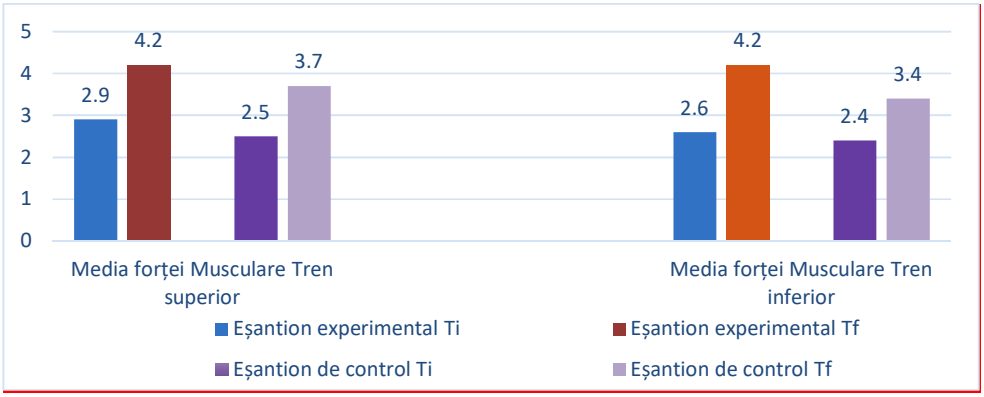
Out of the total of 80 patients, a significant number showed significant improvements both in muscle strength and in walking capacity.

The results arising from the application of the recovery program to the experimental sample reflect an improvement both in muscle strength, progress in walking tests, and respiratory functions, indicating significant functional recovery, compared to the control sample, where only basic physical exercises were applied, highlighting the efficacy of physiotherapy in the context of individuals infected with COVID-19.

We consider that the walking tests are essential in these individuals, however, due to the fluctuating health status through the symptomatic manifestations of the COVID-19 virus, the results were relevant only after covering a distance of 30m, without reference to the time it took to complete the route.

Figure 1

The arithmetic average mean of muscular strength of the upper and lower limbs, in the experimental sample and the control sample



The comparative graphic interpretation highlights the progress between the initial and final tests, regarding the average means of the results of the two groups.

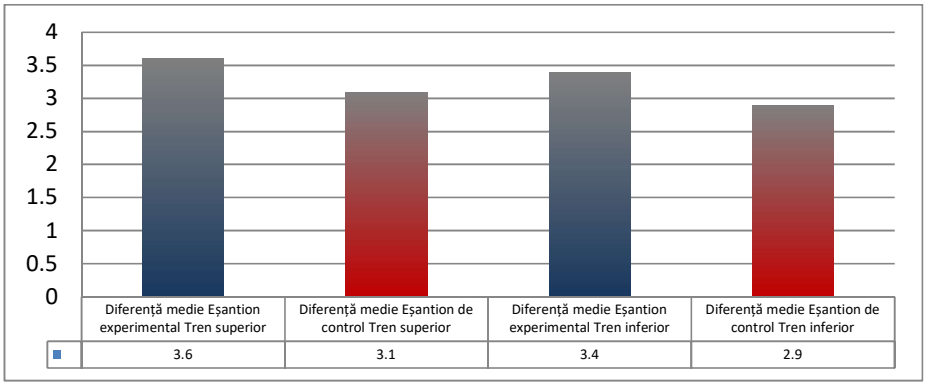
In the experimental group, we note that the average mean of the muscular strength at the level of the upper limbs at the initial testing (Ti) is only 2.9, while at the final testing (Tf) it is 4.2, registering a significant progress of 1.3. At the level of the lower limbs, Ti is only 2.6, while Tf is 4.2, registering a relatively significant progress of 1.6.

Analyzing the comparative graphs of the control group, the average mean show a poor muscular strength at the level of the upper limbs, where Ti is only 2.5, and Tf is 3.7, recording an expected progress of 1.2, taking into consideration the type of treatment applied and the testing period. At the level of the lower limbs, Ti is 2.4, and Tf is 3.4, showing a modest progress of 1.

According to the Oxford scale where the tests are done from 0 to 5, the results presented above can be interpreted as an efficiency of the physiotherapeutic program applied to the experimental group.

Figure 2

The difference in the final arithmetic means between the experimental sample and the control sample regarding the muscular strength of the upper and lower limbs.



In the comparative graph presented above, we mention that the differences in the final averages of muscular strength between the two groups show a value of 0.5 at both tests, for both the upper and lower limbs.

In the walking tests, from the experimental group, 95% of the 40 individuals (38 patients) managed to complete the 30-meter path. In the control group, 34 out of 40 individuals managed to cover the entire distance of the path, thus only 85% of those tested in this group has managed to complete the whole walk.

Discussions

Most clinical settings around the world have faced intermittent waves of hospital admissions of individuals with various manifestations of COVID-19 symptoms, leading to the need of adapted interventions, by medical staff and by physiotherapists, who operate in acute and hyperacute wards. Several studies have demonstrated the need for more specialized therapists in ICU sections, but also the implementation of new intervention programs. (Trojiman A. et. al., 2022, pp. 155-156).

The results presented in this study highlight several essential aspects, such as the importance of physiotherapy in the recovery process of patients with COVID-19, the role of segmental muscle strength assessments, gait testing, and encouraging and motivating those tested to participate in physiotherapy sessions, but also the abilities of physiotherapists to support patients in overcoming their anxiety and depression, caused by respiratory insufficiency, general weakness, and low motivation. Following the above, we can consider that the field of physiotherapy is in continuous evolution and thus arises the need for new work protocols adapted to specific needs, well-structured, demographically divided and by age categories, in order to increase the level of functional independence of the treated patients.

Recommendations

To fulfill the duties of physiotherapists working in acute and hyperacute wards, certain interventions are necessary, which we recommend in order to obtain optimal results, especially when referring to patients with symptoms and aspects similar to those infected with the COVID-19 virus:

1. Continuous assessments and testing during treatment, to identify the specific needs of each patient and to intervene as early as possible to avoid the further deterioration of major functions, by adjusting, as needed, the treatment plan.

2. Development of personalized and individualized treatment schemes, which include methods and specific techniques for the recovery of respiratory functions, applied primarily, but combined with programs for maintaining and increasing muscle strength, both at the segmental level but also at the general strength to achieve the proposed objectives, more precisely the reintegration of the treated individual into daily activity. The conscious recovery process by promoting the autonomy of motor activity, such as the possibility of becoming more independent.

3. Active participation in the multidisciplinary team on the ICU wards, where an essential role is held by the physiotherapist with competencies and abilities to recover both the respiratory system and the musculoskeletal system, being capable of intervention in critical moments, where the health status of the treated subject can deteriorate at any moment, even outside the working schedule, thus the necessity of on-call physiotherapists is important for the prevention of complications related to the area of therapeutic activity deployment. Communication, regarding integration, with the multidisciplinary team through the active participation of the members can enhance the efficiency of holistic recovery of patients from acute and hyperacute wards.

Limits of the research

We mention that this study presents some research limits, among which it is necessary to highlight the relatively small number of individuals selected, according to the mentioned criteria, and the individualization of the physiotherapeutic intervention programs, which led to a variability of result interpretations, due to the fact that we faced differences in symptomatology from one patient to another, suggesting a limitation of progress, influencing the generalization of the results.

We consider that future studies are necessary to strengthen specific intervention programs of physiotherapy in individuals with COVID-19, in order to develop a unique global methodology, in potential future patients with similar physical and respiratory manifestations.

Another limitation may be considered the separation by climate-geographical, demographic: gender and age.

Conclusions

Physiotherapy applied in acute and hyperacute wards is considered an important pillar in the treatment and management of patients with COVID-19, and by approaching new methods and specific techniques, adapted to the needs of the iterated individuals, this study tries to highlight the fact that patients from the experimental group, who also benefited from specific applied physical exercises combined with respiratory exercises, have gained a significant improvement, compared to those in the control group, who benefited only from basic physical exercises. The differences between the two groups, in terms of muscular strength, capacity, but also the quality of their gait, were visible, also reducing the stay in the hyperacute wards for those in the experimental group.

Continuous assessments contribute to accelerating the recovery process, by adjusting and readapting, as necessary, the treatment scheme, improving in some cases even the health status of the patients, reducing the negative impact of the prolonged period of bed immobilization, especially in patients from ICU sections.

Finally, we specify that taking into account the physiotherapeutic potential in the context of a COVID-19 pandemic-like situation, one can resort to a guiding methodology, according to the above-mentioned.

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The Study Of Types Of Speed Through Team Games

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Abstract

Exploring movement during early childhood serves as a primary avenue for understanding the environment, achieved through interacting with objects and engaging with the world around them. Among various physical activities, engaging in games involving movement offers distinct benefits, fostering the concurrent development of motor skills, psychological processes, and aspects of personality.

These activities should be dynamic and captivating for children, fulfilling their inherent need for play and movement. A successful activity allows students to demonstrate their strength, dexterity, and problem-solving abilities. Given its numerous educational benefits, movement-based play is integrated into physical education across all age groups and subjects, highlighting its instructive value.

Keywords: motricity, games, speed, schoolchildren, psychic processes, competences

Introduction

Physical education in primary schools serves as an instructive and educational tool, employing physical activities to enhance students' abilities and physical skills. However, its impact extends beyond the realm of physicality, influencing intellectual, emotional, and moral development as well. As students engage in intellectual pursuits upon entering school, it becomes imperative to strike a balance between academic efforts and the need for movement and leisure.

Achieving this balance requires a well-rounded physical education program, with appropriate content and goals aimed at fostering the holistic development of students' personalities. This entails tailoring the curriculum to suit the local context and traditions while organizing the content in alignment with an educational model that progresses concentrically.

Each motor action encompasses various fundamental motor qualities, albeit with differing emphasis. For instance, dribbling a football while running requires skill, particularly when navigating obstacles, as well as speed due to the motion from running, strength for muscle engagement in movement, and endurance, especially during repeated dribbling in game scenarios. These motor qualities are interconnected, with skill and strength being noted for their broad interrelation with other motor abilities, according to experts (Tatu Al., 2007).

These qualities, also referred to as physical or psycho-motor qualities, are inherent attributes of the human body that develop from birth and continue evolving throughout life. Every individual possesses certain levels of motor qualities at birth, which develop over time until a certain age before gradually declining at varying rates, influenced by various factors (Leucea I.). Motor qualities can be classified into two categories:

- Basic motor qualities: encompassing speed, skill, strength, and endurance.

- Specific motor qualities: those tailored to particular sports or activities, often comprising combinations of the aforementioned qualities.

Speed, as a motor quality, refers to the ability of the human body to execute acts, actions, or motor tasks either with the entire body or specific body parts in a brief timeframe. Its development and expression can be significantly influenced with notable results observed between the ages of 10 and 18, with initiatives for improvement typically commencing around 4 to 5 years old. However, it's essential to acknowledge a less favorable period around 13 to 14 years due to pubertal changes (Tatu Al.).

According to Frey, rapidity is defined as the capacity to generate force or perform motor actions in the shortest possible duration, rooted in the mobilization of neuromuscular processes

and muscle capabilities (Firea E., 1984). Speed is further categorized into acyclic speed, referring to sequences of similar motor actions like running, and acyclic velocity, which pertains to isolated, often repetitive motor actions.

In pursuit of achieving maximum speed, Zaţ Iorski emphasizes the importance of ensuring that the action does not induce fatigue (Leucea I.).

The classification of speed often leads to diversity due to the potential confusion between its definition as a motor skill and its broader implication as a capacity linked to agility and swift movement, particularly evident in disciplines emphasizing accelerations. However, speed encompasses more than just rapid running; it's a fundamental aspect of timely response and reaction in acyclic performance scenarios. Gundalch highlights that speed is evident in cyclic movements, defined as the capability to initiate a powerful acceleration at the onset of motion and sustain it to achieve heightened maximum speed.

In the realm of theory and methodology, these components are integral to conditional skills (Steiner Adalbert, Steiner Ghe., 2004). Regarding running speed, Filin, Zat, and Iorski differentiate between:

- Quick motor reactions
- The capacity to attain maximum motion frequencies
- The capability to attain and uphold maximum speed within a defined space.

Physiologically, rapid movements are distinct from slower ones in that corrections during execution are impractical. Biochemically, limitations arise from ATP availability and its rapid breakdown within short timeframes. These processes are influenced by neuromuscular factors and the activation of enzymes like myozyme-ATP-ase and creatine phosphokinase, notably abundant in white fibers.

While athletes specializing in sprinting, a quintessential expression of speed, tend to have a prevalence of white fibers, pinpointing specific limiting factors in movement remains challenging.

Research indicates that individuals with faster nerve conduction speeds tend to exhibit swifter movement, a trait largely determined by genetic or constitutional factors. Besides, rapid force generation and joint mobility play crucial roles in speed development: the former enables the transition from a resting state, while the latter enhances movement efficiency.

The progression of speed is influenced by the physiological maturation of an individual. Similar to other skills, training stimulus alone may not suffice unless provided during the appropriate age range, typically between 7 and 12 years old.

However, speed is characterized by a relatively low coachability percentage. According to Filin, the potential for improvement does not exceed 20%, while other authors suggest it may be even lower. Analysis of speed development highlights distinct variations in different manifestations, such as reaction speed and maximum movement frequency.

Reaction speed undergoes a unique developmental trajectory, reaching its peak around the age of 20, whereas maximum movement frequency follows a typical progression of coordination skills. The ability to sprint evolves somewhere between conditional and coordination skills. Additionally, as noted by Carbonaro, maximum movement frequency serves as a general predisposing factor.

The significance of speed and its various expressions are influenced by numerous factors, some inherent in the genetic makeup of each individual and less amenable to improvement. Experimental findings suggest that muscles containing a higher proportion of white fibers are associated with greater speed development (Leucea-Ilica L). Key factors conditioning speed include:

- Mobility of cortical nervous processes: Facilitating rapid alternation between excitation and inhibition in motor areas of the cerebral cortex ensures synchronization of muscle contraction and relaxation.

- Speed of nerve impulse transmission: This encompasses the time taken for signal reception, receptor quality (e.g., vision, hearing, sense of balance), impulse transmission to the central nervous system, transmission to motor organs (muscles), and muscle activation.

- Development level of motor qualities: Speed is influenced by strength, with an inverse relationship between motion speed and external resistance. Increased strength facilitates overcoming resistance. (Ifrim M. Iliescu A.,1978)

- Resistance training for speed: Maintaining speed over extended durations necessitates specific endurance.

- Skill-based conditioning of speed: Technique proficiency significantly impacts the execution of motor actions. Enhanced technique leads to smoother movements. Additionally, skill plays a role in the speed of response within complex motor actions requiring anticipation, analysis, and adaptation (Stănescu M., Ciolcă C., Urzeală C., 2004).

Methods and Materials

In our study, we considered the morpho-functional characteristics of young school-aged children, as well as individual and gender-specific traits. The research spanned two semesters, allowing for activities both indoors and outdoors. The materials utilized included mattresses, balls, flags, badges, handkerchiefs, cubes, sticks, pebbles, and other items.

Subjects underwent initial measurements at the end of November 2022, before the commencement of initial tests, and in May 2023, before final tests were conducted. Measurement results were documented in tables and compared against prevailing standards.

Somatoscopic examination involves visually observing the child's body to assess physical development and identify any physical deficiencies. With the child undressed and in shorts, a general assessment of overall appearance was conducted followed by examination of specific regions.

Anthropometric examination entails measuring various aspects of the human body. By determining values such as length, width, thickness, volume, and mass of the body or its segments, individual or class averages can be compared against national norms.

Experimental Setup:

The study was conducted within the framework of the EUROFIT test, specifically Class IV. This observational-ameliorative experiment spanned the entire school year 2022-2023 and included the following phases:

- Initial testing at the beginning of the school year.
- Development of motor content.
- Final tests.

Test Battery:

1. Speed Running (A.Vt.) - 25m:
   - Initiated from a standing start with timed movement.
   - Two attempts were permitted with a 5-6 minute break between runs, recording the best performance.
   - Appropriate sports footwear and a smooth surface were utilized.
   - Results were recorded in seconds and tenths of a second.

2. Touch the Tiles (A.Pl.):

Factors: Speed of execution and coordination of upper limbs.

Test Description: Quickly touch two marked areas alternately with the skilled hand on a board.

3. Shuttle Race (A.N.A.) - 10 x 5m Round Trip:

Factors: Running speed, execution speed, coordination, skill.

Test Description: Full-speed shuttle run.

Regarding variables, they can be either continuous or discrete, denoted as X. Continuous variables span between two measured values with infinite intermediate values. The measurement of continuous variables is influenced by the technique and equipment used.

b) Data processing involves the following steps:

Ordering, grouping, and intuitive (graphic) representation of variables to highlight the distribution of the studied characteristic.

Calculation of typical values, indicators of central trend, and dispersion.

To calculate the arithmetic mean of a dataset ($\bar{x}$), the following formula is used:

$$\bar{x} = \frac{X1+X2+X3+\cdots+Xn}{n}$$

$$\bar{x} = \frac{\sum x}{n}$$

$\bar{x}$ = selection mean

Σ = addition operator (sum)

X = values of variable 1 to n.

The scattering amplitude (W) is determined by the difference between the highest and lowest values in the distribution:

$$W = x_{.max} - x_{Min}$$

W = amplitude

$x_{.max}$ = highest value

x_{Min} = lowest value

The coefficient of variability (Cv) is a measure of relative dispersion, in contrast to Am and S, which are absolute measures. It represents the percentage approximation of the quotient between the standard deviation and the arithmetic mean. The formula for calculating the coefficient of variability is:

$$CV = \frac{S}{\bar{x}} \text{x} 100$$

Where:

CV= coefficient of variability

S = standard deviation

$\bar{X}$= arithmetic mean

The absolute measure of dispersion (S, Am) alone doesn't provide information about the extent of scatter in the data. However, expressing the ratio between S and x as a percentage allows for comparisons of variability across different datasets. A smaller coefficient of variability (CV) indicates a tighter grouping of data around the median, representing a more confident population.

A dataset is considered:

- Homogeneous (low variability) if CV is less than 10%.
- Relatively uniform (moderate variability) if CV falls between 10% and 20%.
- Inhomogeneous (high variability) when CV exceeds 20%.

In the pedagogical process, where variability tends to be high, the level of scattering can be interpreted as follows:

- Low scattering: between 0-15%
- Moderate scattering: between 15-25%
- High scattering: between 25-35%
- Excessive scattering: over 35%

c) Interpretation involves critically assessing empirical data to determine the possibility of generalizing the obtained information to the original population and formulating forecasts regarding future developments in a given experimental situation. The application phases of the statistical method are interdependent and collectively influence the validity of conclusions.

Results and discussion

After conducting anthropometric measurements on the student cohorts within the study group, we collected the following average height and body weight data for boys and girls in rural areas.

Table 1.

Data obtained after performing anthropometric measurements of the study group

	BOYS		GIRLS	
Age	Height	Weight	Height	Weight
4	97.9± 4.8	15.2± 1.9	97.1± 4.9	14.2± 1.8
5	104.3± 5.3	16.9±2.2	103.4± 5.2	16.4± 2.2
6	109.8± 5.5	18.5±3.4	109.3± 5.5	18.2± 2.5
7	115.7± 5.5	20.6± 2.6	114.7± 5.6	20.2±0.8
8	120.9± 5.6	22.7± 2.9	120.2± 5.8	22.1± 3.1
9	125.8± 5.8	24.8± 3.3	125.1± 5.8	24.3± 3.4
10	130.3± 6.1	27.1± 3.4	129.7± 6.1	26.9± 4.1
11	134.9± 6.3	29.8± 3.8	130.4± 6.7	29.4± 4.5

Table 2 .

Data obtained from measurements of the height of students in the study group

Item No.	**Name and surname**	**Height**	**d**
1	A. B.	136	-6
2	B. P.	133	-9
3	B. J.	135	-7
4	B. V.	166	23
5	D. J.	134	-6
6	I. M.	135	-9
7	I. R.	141	-2
8	J. B.	137	-3
9	S. M.	130	-11
10	M. C.	144	2
11	M. D.	149	7
12	P. P.	146	4
13	P. F.	145	5
14	P. G.	152	8

15	Ş. T.	148	6
16	T. A.	131	-10
17	T. M.	141	-3
18	T. N.	137	-3
19	T. R.	153	10
20	T. E.	147	5
Average		**142**	
Deviation			**6,96**
CV			**4,90**
In		**115**	
Max		**166**	
Min		**131**	

Table 3 .

Data obtained from measurements of the size of students in the study group

Item No.	Name and surname	Wingspan	d
1	A. B.	134	-5,5
2	B. P.	140	-1,5
3	B. J.	141	-0,5
4	B. V.	165	24,5
5	D. J.	130	-10,5
6	I. M.	135	-4,5
7	I. R.	140	0,5
8	J. B.	140	-1,5
9	S. M.	134	-5,5
10	M. C.	149	7,5
11	M. D.	144	4,5
12	P. P.	139	-2,5
13	P. F.	141	-0,5
14	P. G.	131	-10,5
15	Ş. T.	160	20,5
16	T. A.	154	14,5
17	T. M.	121	-20,5
18	T. N.	121	-9,5
19	T. R.	144	3,5

20	T. E.	147	7,5
Average		**140,5**	
Deviation			**7,9**
CV			**5,62**
In		**35**	
Max		**165**	
Min		**130**	

Table 4 .

Data obtained from measurements of the weight of students in the study group

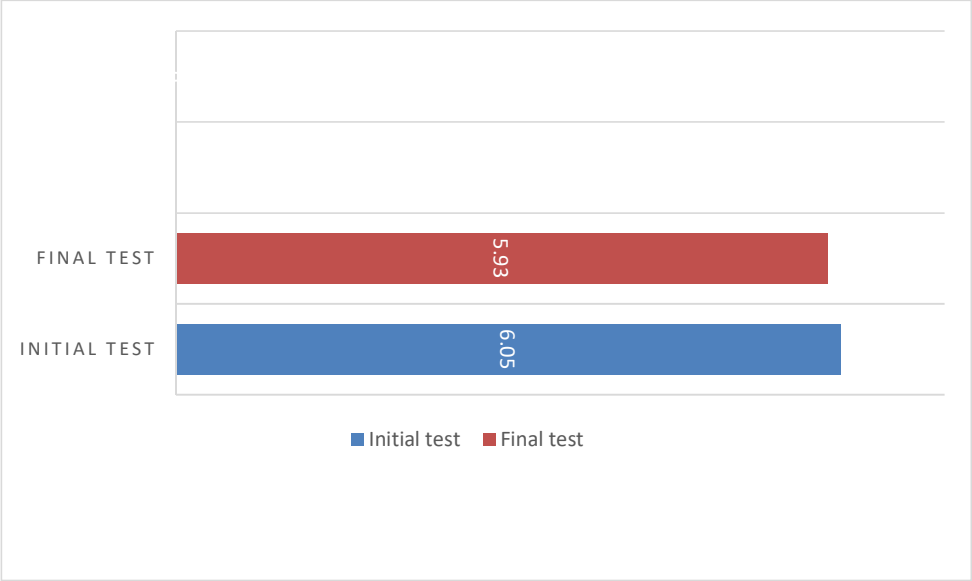
Item No.	Name and surname	Weight	d
1	A. B.	31	-5
2	B. P.	32	-6
3	B. J.	34	-4
4	B. V.	55	18
5	D. J.	30	-6
6	I. M.	32	-6
7	I. R.	31	-5
8	J. B.	42	4
9	S. M.	32	-4
10	M. C.	43	5
11	M. D.	41	5
12	P. P.	42	4
13	P. F.	37	1
14	P. G.	42	6
15	Ş. T.	52	14
16	T. A.	26	-11
17	T. M.	31	-5
18	T. N.	32	-4
19	T. R.	42	4
20	T. E.	35	-1
Average		**37**	

Deviation			**5,92**
CV			**16**
In		**29**	
Max		**55**	
Min		**26**	

After conducting the 25-meter speed tests, the following results were obtained and are illustrated in the figure below:

Fig. 1

Graphical representation of the speed at 25 m of the students in the study group

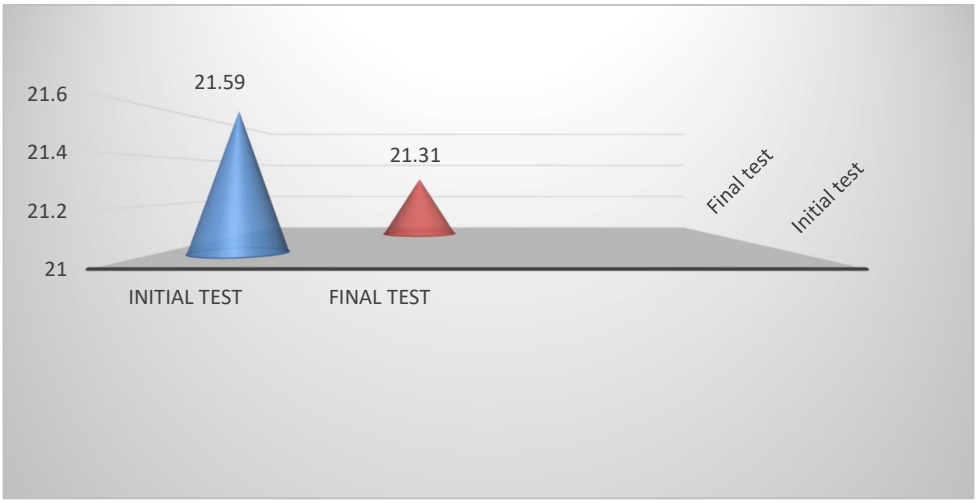


In the initial test, the average time recorded was 6.05 seconds, while in the final test, it improved to 5.96 seconds, indicating an increase in speed of 0.09 seconds over a 25-meter distance.

Following the shuttle race tests involving a 10x5 meter round trip, the results obtained are depicted in the figure below:

Fig. 2

Graphic representation of the 10x5 m round trip shuttle race of the students in the study group

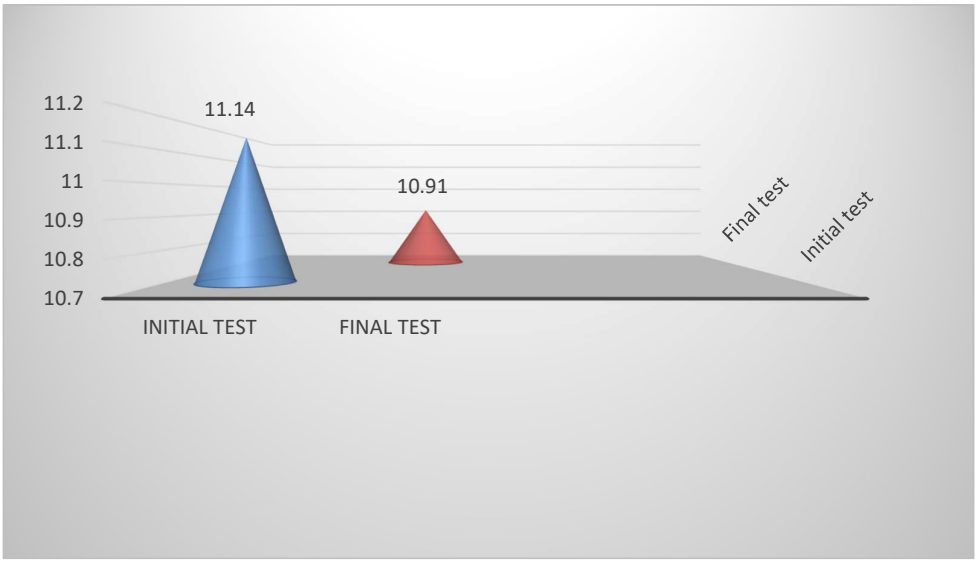


In the initial test, the average time recorded was 21.59 seconds, while in the final test, it improved to 21.31 seconds, indicating an increase in speed of 0.28 seconds during the test.

Following the tests on the touch-plates 25x2, the results obtained are illustrated in the figure below:

Fig. 3

Representation of graphics to touch -plates 25x2 of the students in the study group



"After conducting the tests and analyzing the data, we noted an improvement in motor quality (speed) in the experimental class compared to the control class. In Test 1, "Speed Running" (25 meters), there was a speed increase of 0.09 seconds in the control class compared to the experimental class. In Test 2, "Touch the Plates," there was a slight improvement in execution speed of 0.02 seconds. Finally, in Test 3, the "Shuttle Race" (10x5 meters round trip), the experimental class showed a speed increase of 0.11 seconds."

Conclusions

The analysis of anthropometric data revealed a slight increase, with measurements aligning closely with average height and weight standards for both boys and girls. Considering the rapid alternation of game phases at present, I believe that reaction speed development can be facilitated through certain procedures. This development relies on complex psychological processes, which are inherently linked to the speed at which these processes occur.

It is crucial to fully utilize this stage of childhood to foster the comprehensive development of necessary qualities, taking into account the current possibilities. The progress observed was influenced by the content of movement games employed, tailored to the interests, enjoyment, and focus of the participants, particularly when introducing elements of competition.

Therefore, when utilizing games, it's essential to maintain sustained attention for executing procedures at a steady pace – emphasizing speed – while ensuring that this pace remains within the realm of full mastery of the respective procedures. Exceeding this threshold risks ingraining incorrect executions that diminish efficiency, making later corrections very challenging or even impossible.

The games were introduced gradually, transitioning from easy to challenging, from familiar to unfamiliar, and from simple to complex, taking into account the class team's readiness for the game and their interest levels. Through these movement games, besides developing motor quality (speed), I aimed to cultivate in students the spirit of solidarity and teamwork, acclimatizing them to collaborative work.

Simultaneously, I seized the opportunity to gain a deeper understanding of students in all aspects, fostering skills that will prove beneficial to them in the future. It's worth noting that although some schools may lack adequate materials, many of the proposed games can still be conducted even in winter.

Play enriches and enriches life, serving as an essential biological function for individuals and as a cultural expression for society. It is indispensable both as a means of expression and as a cultural function.

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The Influence Of Practicing Martial Arts On The Development Of Rural Students

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Abstract

Throughout history, physical education has witnessed both periods of prosperity and times of decline. Dating back to the ancient world, it was held in high regard, as evidenced by well-known maxims like "Beautiful and good" (Kalos, Kai, Agatos) and "Mens sana in corpore sano", which encapsulate valuable ideals about the educational ideal. These maxims suggestively reveal the intrinsic unity between physical and mental well-being, highlighting their intricate interplay.

However, in the realm of physical education and sports for students, the development of psycho-motor qualities has not always received the attention it deserves. Often, solutions have been proposed without fully considering the educational objectives or precisely defining the role of motor qualities in achieving these objectives and molding students' desired training outcomes.

Introduction

The constructive aspect of the intricate process of training and shaping the younger generation is paramount, with physical education being acknowledged as a significant contributor to the holistic development of individuals across various stages of societal evolution (Barta A., Dragomir P., 1995). Moreover, through its means, organizational forms, and settings, physical education has been recognized as a key factor in fortifying and strengthening the body, as well as in compensating for intellectual activities and promoting recovery (Bompa T., 2002; 2003).

Martial arts offer numerous health benefits to practitioners, positively impacting their balance and longevity. Despite portrayals in the media as a violent sport, studies have shown that martial arts do not inherently attract violent individuals; instead, many practitioners are drawn to it to acquire self-defense skills (Galea I., 2014). Moreover, contrary to common misconceptions, engaging in martial arts has been associated with a decrease in aggression and hostile tendencies (Fuller C., 2020).

Martial arts are known to cultivate tranquility and wisdom, aiming to shield young individuals from aggression and inner turmoil (Belizna C., 2006; Bernat S.-E., 2003). Engaging in this sport presents a personal challenge for young practitioners to surpass their limitations and conquer their inner struggles, recognizing the inseparable connection between mind and body. Through rigorous training, martial arts facilitate the attainment of harmony within oneself and with the surrounding environment (Bica D.M., 2009; Bocos M., 2019).

Engaging in martial arts entails adhering to principles grounded in self-respect, respect for others, discipline, composure, and coordination, which serve as the cornerstone for fostering noble, upright, and resilient characters. In today's technologically driven society, where youth are increasingly influenced by media, these values are paramount. Cultivating compassion and sound judgment can only be achieved on such a robust foundation (Frumos F., 2008; Frazzei F.F., 1972).

Despite often being misconstrued as promoting violence, martial arts emphasize self-mastery and inner strength. The true victor in martial arts is the one who triumphs over their own inner conflicts, harnessing exercise to control impulses and advocate for peace (Epuran M., 2005). With its focus on spiritual growth, martial arts views opponents as partners rather than adversaries, discouraging conflict. However, should an individual face aggression, they possess the capability to defend themselves (Dragnea A., Bota A., 1999).

Martial arts play a significant role in shaping the character of children who engage in this discipline, fostering organization, empowerment, and the development of mature thinking and discernment, which prove invaluable when they encounter decision-making situations (Dragomirescu G., Kum S., Bojin E., 1972).

Beyond imparting self-defense techniques and cultivating physical health, the practice of martial arts instills in students special moral qualities. Decency, wisdom, and honesty are character traits inherent to martial arts practitioners (Neighborhood Encyclopedic Dictionary, 2004; Small Encyclopedic Dictionary, 1978). For instance, in disciplines like wushu, practitioners adhere to a principle of non-violence, refraining from causing harm while also defending themselves when necessary. This ethos promotes balanced reactions in situations of aggression (De Sensi J.T., 1995).

Martial arts have traditionally prioritized the cultivation of moral values, emphasizing virtues such as nobility and creativity, which, when integrated with technical training, contribute to overall health and conflict resolution (Demeter A., 1979).

Furthermore, an increasing body of research consistently demonstrates that regular physical exercise not only aids in the prevention of various illnesses but also serves as an effective adjunct in their treatment in some cases (Dragnea A., 2002).

The essence of martial arts lies in unarmed combat against any form of aggression (Encyclopedic Dictionary of Educational Sciences, 2007). Mastery of armed combat cannot be achieved without first mastering one's own body, as weapons are viewed as extensions of the body, particularly the arms (The Secret of Martial Arts, as described by Deshimaru, Bota, A., Virgil, T., 2004).

According to Deshimaru, the essence of martial arts lies in learning to focus the mind and direct it effectively, with Budo serving as the discipline that teaches this mental control (Bota, A., Virgil, T., 2004).

In martial arts, the mind must remain fluid, without any inclination toward aggression, yet fully focused on the opponent. Reactions occur instantaneously and automatically, facilitated by a deep awareness of the present moment. Actions unfold spontaneously, without conscious thought, as a result of pure awareness and readiness (Bugle S.C., 2003; Burlacu Gh., 2008).

According to Jigoro Kano, the founder of Judo, the spiritual and physical aspects of energy are interconnected and should be perceived as such. He emphasizes the importance of the body as the foundation upon which virtue is built, and stresses the alignment of physical

movements with moral values (Chaabene H., Hachana Y., Franchini E., Mkaouer B., Chamari K., 2012; Cheung T., 2020).

In martial arts, mastery is achieved through the control and direction of actions according to moral norms, aiming to establish good relations and social harmony (Burlacu Gh., 2008; Craşovan I. D., 2011).

Martial arts training engages all muscle groups, enhancing muscle tone, flexibility, and balance while also providing physical and mental strength. Additionally, martial arts can aid in weight regulation by influencing the brain's satiety center in the hypothalamus, which helps control hunger and appetite (Crețu T., 2005; Cristea S., 2010). Just one hour of moderate-intensity martial arts training can burn up to 500 calories.

Through the structured goal-setting, continual encouragement, and adherence to values inherent in martial arts programs, practitioners experience a boost in self-confidence, leading to an elevation in self-esteem (Carstea Gh., 1993).

Regular practice of martial arts not only enhances cardiovascular function but also fosters a positive mindset when it becomes a habit. Martial arts practitioners learn to recognize their weaknesses, maintain focus, and remain prepared to confront challenges (Cuckoo C., 2006; Cureteanu R., 2006).

During childhood, motor potential develops rapidly, with children displaying a diverse range of movements, a keen sense of rhythm, and a degree of precision in execution. Exposure to various outdoor activities plays a crucial role in shaping children's motor potential, providing them with extensive motor training beyond what is typically offered in physical education classes (Carstea Gh., 1993).

Material and methods

The progression of natural skills and fundamental motor abilities lays the groundwork for the acquisition and refinement of new, more intricate motor skills. Understanding the characteristics of both motor qualities and motor skills is essential for educators to effectively implement physical education programs.

The process of motor and somatic functional evaluation plays a pivotal role in ensuring quality and efficiency in the field of physical education. Through this evaluation process, specialists are able to assess human performance, taking into account the intricate interplay of various factors. It's important to note that determining human performance requires a nuanced approach due to the multifaceted nature of the contributing factors.

The study group consisted of 88 children ages 6 to 11 years who volunteered to undergo testing before and after 90 days of martial arts practice.

Test 1 Name: Trunk Lifts from Dorsal Lying

Purpose: This test assesses the strength and endurance of the abdominal muscles in a resistance regime.

Usage: It is utilized to evaluate the effectiveness of a training program by comparing an individual's strength with the population norms.

Materials Needed: A flat surface, typically a firm mattress, a stopwatch, and assistants.

Procedure: The subject lies on the mat with the ankles secured by one assistant. At the command of another assistant, the subject begins performing trunk lifts at a pace of 20 repetitions per minute. The stopwatch is started simultaneously. The assistant stops the timer when the subject is no longer able to perform the movement correctly, and the number of repetitions completed is recorded.

Test 2 Name: Long Jump from Standstill

Purpose: This test assesses the speed and force of the muscles in the lower limbs, specifically measuring explosive force or power.

Usage: It is used to compare an individual's strength with the population norms, providing insight into the potential for performance in sports.

Materials Needed: Sandpit, measuring tape (roulette), and an assistant.

Procedure: The subject stands in front of the sandpit and performs a jump, taking off from both legs and landing on both legs. The distance between the tips of the feet and the last

mark left by the subject in the sandpit is measured using a measuring tape. The distance is noted in meters and centimeters.

Test 3 Name: Vertical Jump

Purpose: This test measures the force in the speed regime of the muscles in the lower limbs, also known as explosive force or power.

Usage: It is used to assess the effectiveness of a training program and to compare the strength of an individual with the population norms.

Materials Needed: A wall marked with the vertical jumping area, denoted in centimeters.

Procedure: After a preliminary warm-up, the subject sits against the wall and performs the jump. It is recommended to perform three jumps and record either the best or the average of the three jumps. The height achieved is recorded in centimeters.

Performance Analysis: The performance is analyzed by comparing the results with previously obtained data or normative data.

Test 4 Name: Bosco Test

Purpose: This test measures the explosive force in the resistance regime of the muscles in the lower limbs.

Usage: It is used to determine the effectiveness of a training program, for selection purposes, as a forecast for performance sports, and for scientific research.

Materials Needed: Bosco or optojump platform, laptop, timer, assistant.

Procedure: The subject is positioned in the recording area of the device and will perform vertical jumps, aiming to jump as many times and as high as possible within a specified interval, typically ranging from 15 to 60 seconds. The estimation of the resistance regime force is made by calculating the mechanical power.

Performance Analysis: The performance is analyzed based on the recorded data, including the number of jumps and the height achieved, and compared with established norms or previous results.

Results

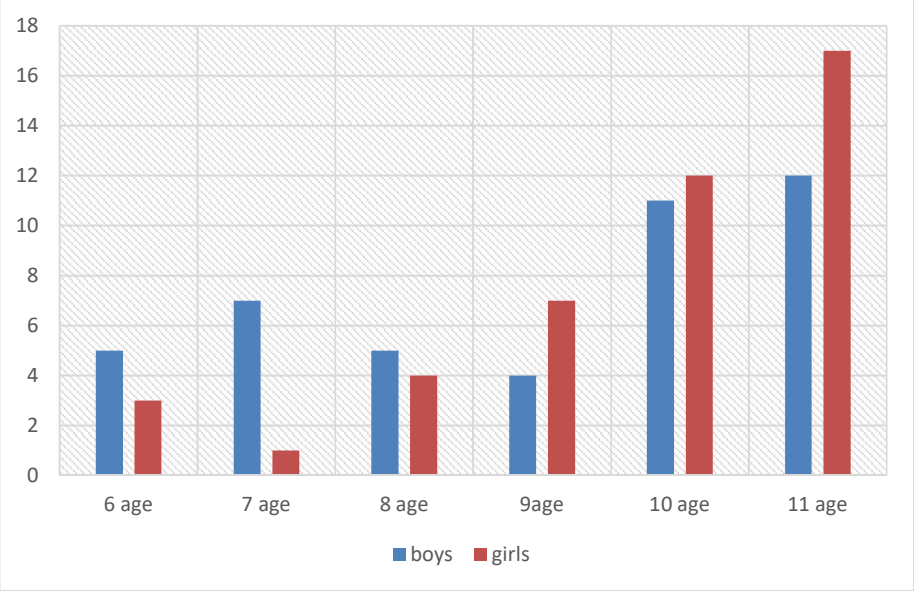
During the growth and development stages, different bodily elements exhibit varying rates of change. For instance, there is rapid growth in the cranial box and brain, with 6-year-olds already reaching 90-95% of adult values, while overall body dimensions are about half of those of adults. The child's locomotor system lacks the resistance of adults, necessitating the gradual introduction of exercises with varying difficulty levels.

During this period, the morpho-functional growth and development of schoolchildren are faster and generally more uniform compared to previous stages. Muscle mass develops relatively slowly, and muscle tone is lower, allowing for greater range of motion in various joints.

The study group comprised 88 children aged 6 to 11years, categorized as follows by age.

Fig. 1

Graphical representation of the study group according to sex and age of participants.



The study group comprised 59.53% boys and 40.47% girls of the total participants.

Fig. 2

Graphic representation of the study group by gender.

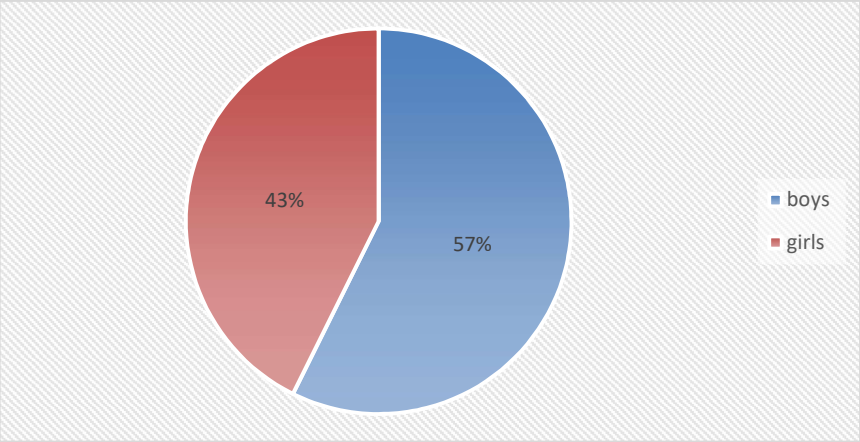


Fig. 3

Graphic representation of boys from the study group from the point of view of development and growth of body elements.

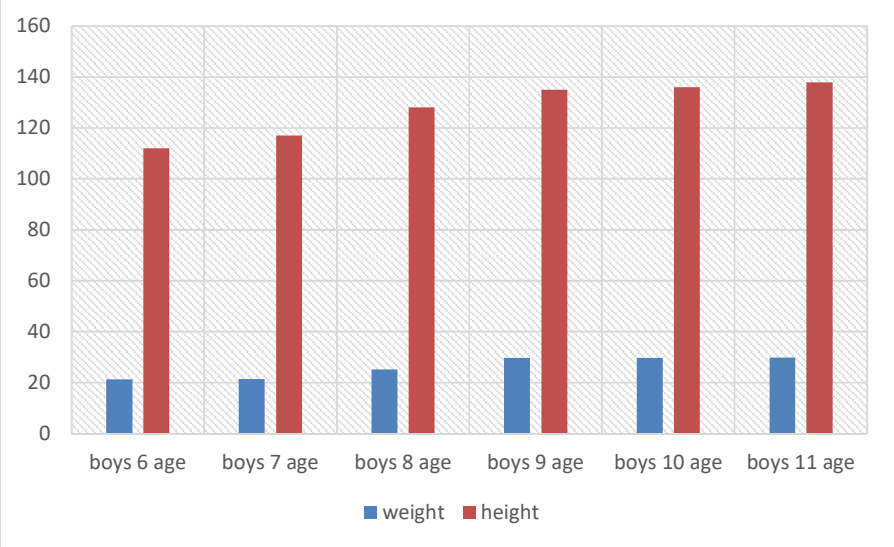


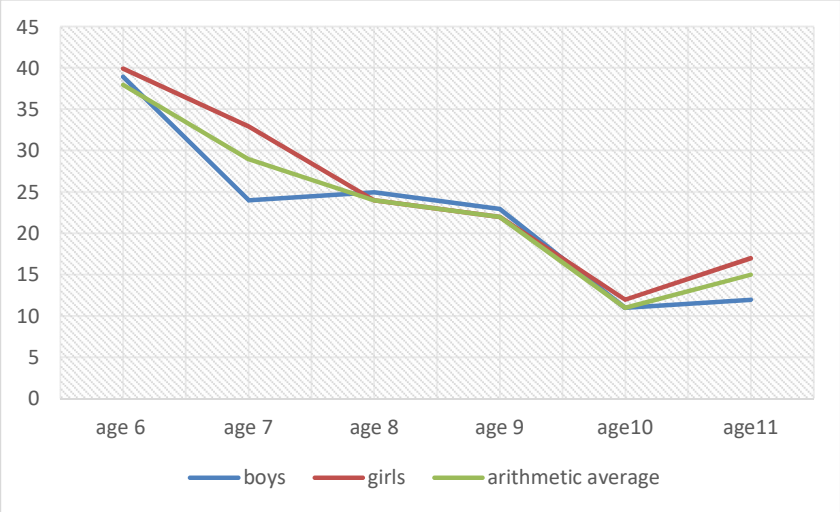
Fig. 4

Graphic representation of the girls in the study group from the point of view of development and growth of body elements.

According to the established criteria, it was observed that in primary school, girls are generally taller than boys at this age.

Fig 5

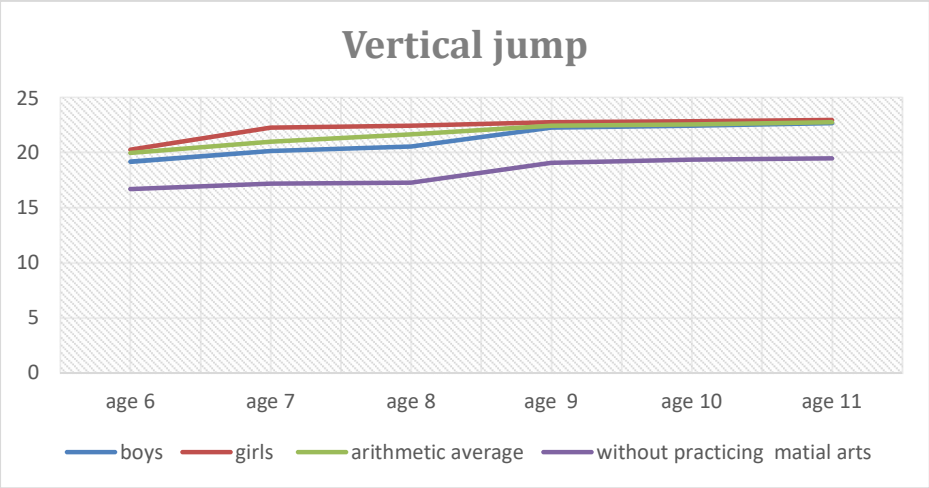
Graphical representation of participants in the study group at tEast No. 1- Trunk lifts from dorsal lying down.



Students who did not engage in martial arts training were below the average of those who did, indicating that such training contributes to enhancing the overall physical and mental well-being of students.

Fig 6

Graphic representation of the participants in the study group at the vertical jump test

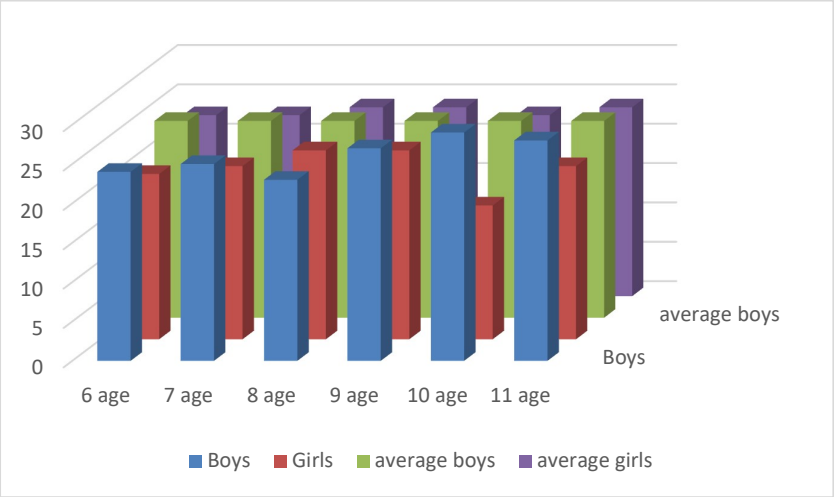


Students who did not engage in martial arts training were significantly below the average of those who practiced, highlighting the beneficial effects of such training on the physical and mental condition of students, as well as the development of their motor skills and coordination.

The Bosco test is the tool used to determine the explosive force in the resistance regime of the lower limb muscles of the students who were part of the study group.

Fig 7

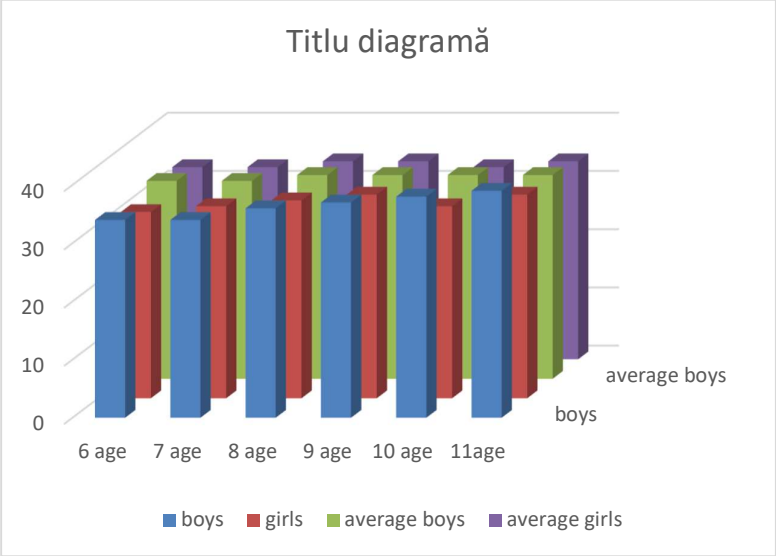
Graphical representation of the participants in the Bosco test study group at a time of 15 s.



Vertical jumps will be conducted within a 15-second interval, aiming to achieve as many jumps as possible and to attain maximum height. The estimation of the resistance force of the participants in the study group will be determined by calculating their mechanical power based on these vertical jumps.

Fig 8

Graphical representation of the participants in the Bosco test group at a time of 60 s timed



Vertical jumps will be executed, aiming to achieve as many jumps as possible and to reach maximum height, within a 60-second duration. The estimation of the resistance force of the participants in the study group will be determined by calculating their mechanical power based on these vertical jumps.

Conclusions

During primary school years, children undergo significant personal development, offering various models that can be effectively utilized in formal physical education activities. Psychic activity and its development at this age vary from one individual to another, influenced by factors such as pace, speed, energy consumption, and direction. Each aspect of mental activity plays a role in shaping and developing personality, impacting how children interact with others.

Children's development is manifested across three main domains: physical, cognitive, and socio-emotional. The study group in our research falls within the age range of 6 to 9 years, a critical period where we must capitalize on the diverse opportunities available through appropriate stimulation. These experiences contribute to shaping the child's physical, cognitive, and socio-emotional profile.

Research and scientific literature consistently demonstrate that martial arts do not attract violent individuals or promote violence. These ancient forms of combat, adapted into modern sports, self-defense practices, and recreational activities, benefit millions of practitioners by promoting health and inner balance. Contrary to misconceptions, martial arts do not encourage violence; instead, they serve as therapy for individuals with aggressive tendencies.

Martial arts offer numerous health benefits, contributing to overall well-being. They are safe activities, especially when proper equipment is used, and beginners are carefully initiated. Traditional martial arts schools often incorporate mental and meditation techniques into their training, promoting positive personal transformations.

In an age where obesity rates are rising due to sedentary lifestyles, martial arts provide enjoyable alternatives to traditional exercise. They offer unique opportunities to learn self-defense techniques while improving physical fitness. Middle-aged practitioners, in particular, experience significant improvements in aerobic capacity, balance, strength, body weight, and flexibility compared to sedentary individuals.

Many parents and martial arts instructors note that practicing these sports can serve as therapy for children with ADHD. Martial arts promote concentration, reduce impulsivity, and enhance discipline by engaging participants in intense physical exercises, following verbal and visual commands, and practicing in a structured environment.

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The Influence Of Physical And Mental Training Through Judo Activity In Arad School Students

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Abstract

If intellectual education serves as the foundation and central focus for shaping one's personality, aiming to cultivate rationality, moral education is centered on fostering moral conscience and ethical behavior within society. Religious education seeks to instill a religious culture and spiritual awareness, while aesthetic education concentrates on nurturing an appreciation for beauty. Technological and vocational education facilitates adaptation to a dynamic society, and physical education plays a fundamental role in fostering holistic development by achieving a balance between the physical and mental aspects of an individual.

Physical activities are regarded as vital components of everyday life, representing a comprehensive process of optimizing, evolving, and expressing the human essence.

Keywords:

Introduction

Judo is a sport suitable for individuals of all ages. Children are able to swiftly and effectively learn technical procedures; however, they may struggle to differentiate between similar technical processes and often overlook execution details, retaining only a general understanding of movement forms (Alexe, N., 1999).

Some medical professionals recommend practicing judo exercises during convalescence to instill self-confidence in many sick individuals (Zlate, M., 1999; Weineck, J., 1992).

From an emotional perspective, children of school age gradually develop greater stability and balance. Their actions begin to transition from pleasurable activities to those of necessity, leading to a shift in activity motivation (Ungureanu, A., 2003; Uțiu, I., Almășan, D., 1993).

During school age, play holds a fundamental role and occupies a significant space in a child's concerns. Consequently, it is imperative for teachers to ensure its consistent integration as a crucial component of physical education in schools (Gagea, 2010). The content of play should be directed towards fostering and expanding group relationships, nurturing various qualities, instilling moral behavior skills and habits, as well as broadening students' range of motives and needs (Epuran, M., 1990; 1996; 2005). It is essential to establish group rules that will later serve as primary objectives for selecting motor games, while simultaneously setting performance requirements. Additionally, apart from their role in fostering comprehensive development, selected sports exercises should also contribute to the enhancement of analytical perception, deliberate focus of observation and attention, and the development of motor memory (Hanta, I., 2000; Simion, Gh., Stănculescu, G., Mihăilă, I., 2011).

At this age, self-control, discipline, and willpower may be underdeveloped, and a lack of effort might be prevalent. However, with the implementation of stricter rules and higher demands, activities such as long runs and formation exercises can aid in their development (Dragnea, 2006). Judo training constitutes a pedagogical process aimed at learning and improvement through the specific means of this sport. Its organization should adhere to hygiene and sanitary norms, and regular medical evaluations are essential (Bompa, T., 2001; 2006).

The training process aims to enhance specific motor qualities to a higher degree while also refining technical, tactical, and psychological skills (Bota, 2007). To effectively conduct training sessions, a rational utilization of various methods is necessary, tailored to the specific team and working conditions at hand (Bugle, 2003).

Material and methods

The research took into consideration the protocol established between FRJ (Romanian Judo Federation) and the Association of Romanian Communes in Arad County, which initiated a national program for the promotion of judo in rural areas. This program received significant support from local rural communities, who responded positively to the initiative and ensured suitable conditions for the implementation and effective commencement of extensive judo practice among children aged 8-12 years within their communities.

Primary school students from various Secondary Schools across the Arad communes participated in interviews conducted as part of our research efforts. These schools were located throughout the entire Arad county, encompassing a total of 239 primary school students.

The questionnaire comprised the following inquiries:

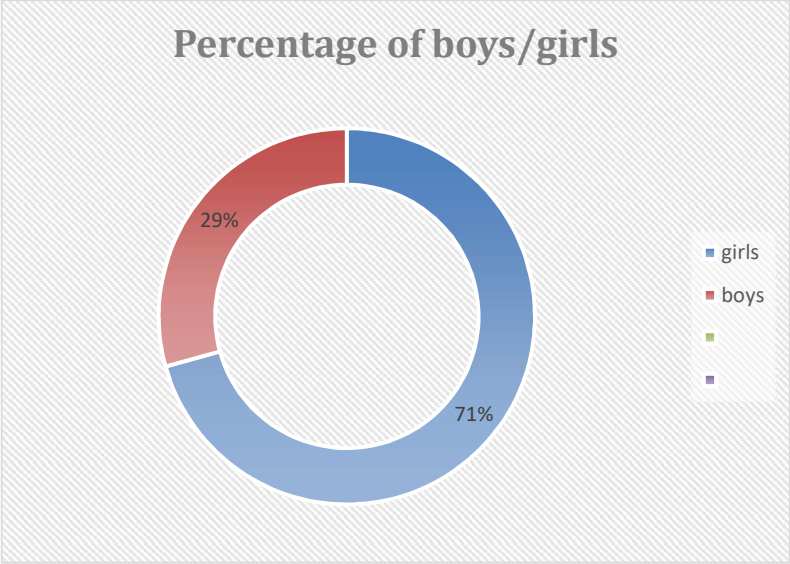
1. What is the level of interest in practicing judo within your community?
2. How many individuals express a desire to engage in sports, particularly judo?
3. How many children have previously attempted participating in sports activities?
4. Which sport do you believe holds greater significance in fostering the development of various skills among students?
5. What aspects of children do you think are enhanced through participation in sports, particularly judo?
6. What are your views on the role of discipline in sports?
7. How many different styles or types of judo are you familiar with?
8. Would your parents support your decision to pursue judo training?
9. Is there a designated judo facility available in your community?
10. Does your community have access to a gymnasium?

Results and interpretation of questions

From primary schools across the entire Arad county, there were a total of 239 students, consisting of 169 boys and 70 girls.

Fig. 1

Graphical representation of the ratio between boys and girls in the study group.

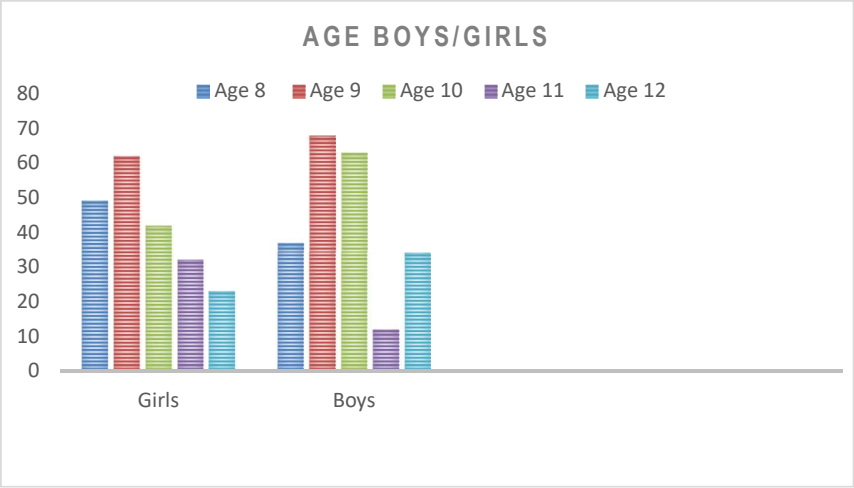


In schools, girls make up the majority, accounting for 29% of students, while boys represent 71%.

Across primary schools in the entire Arad county, there were a total of 239 children aged between 8 and 12 years.

Fig. 2

Graphical representation of the ratio between boys and girls in the age category of the study group.

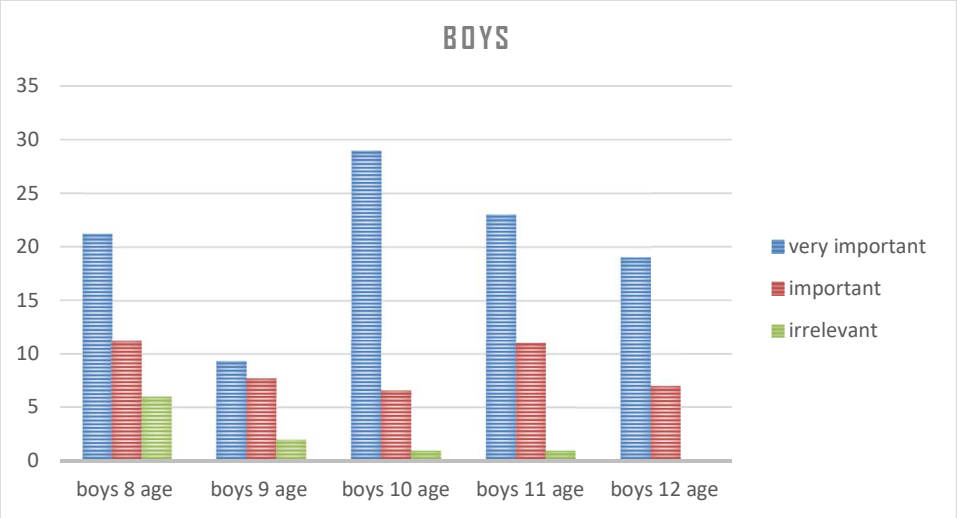


In schools, boys constitute 53.19% of students. On the other hand, boys make up 46.81% of students.

Regarding the attitudes towards sports among boys, analysis of responses reveals that 65.5% consider practicing a sport to be very important, while 25.5% find it quite important, and 9% do not consider it important to practice a sport.

Fig. 3

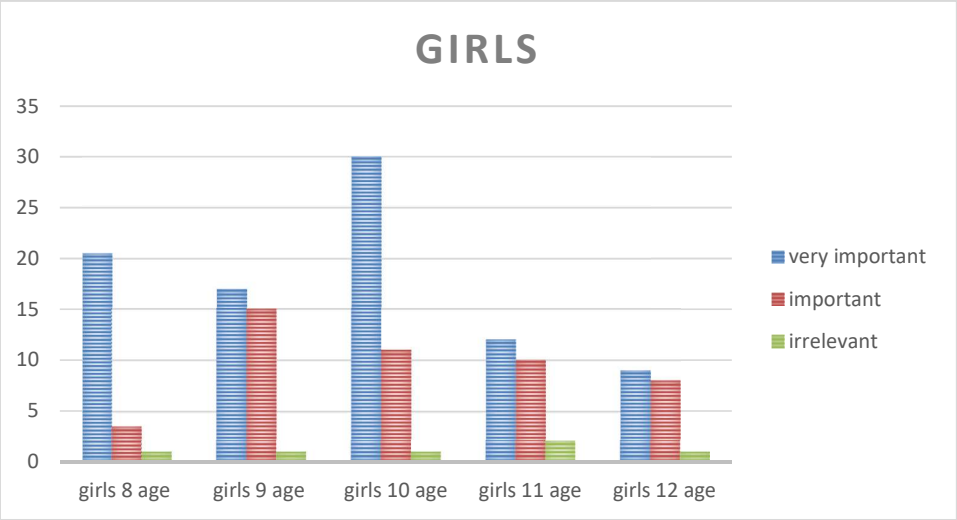
Graphical representation of the answer -boys- questionnaire regarding the relevance of practicing a sport of the study group.



Analysis of responses from girls reveals that 70.5% consider practicing a sport to be very important, while 26.5% find it quite important, and 3% do not consider it important to practice a sport.

Fig. 4

Graphical representation of the answer - girls - questionnaire regarding the relevance of practicing a sport of the study group.

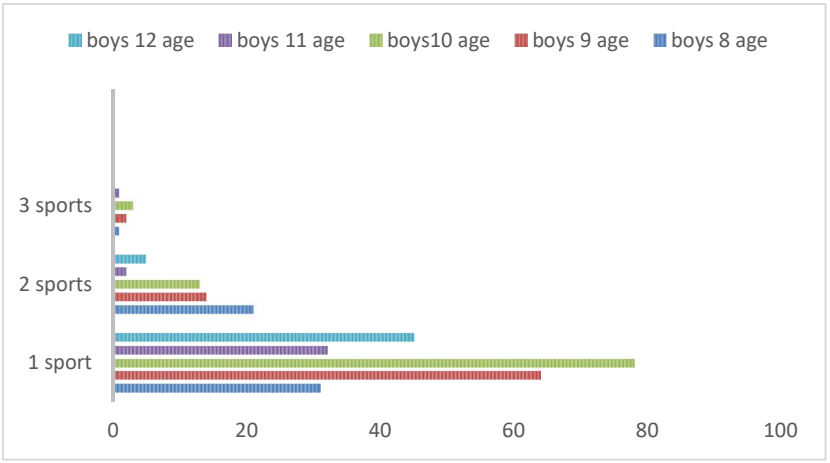


In rural schools, students responded to questionnaires regarding their participation in sports, categorized by age groups and gender. The responses from boys in the 8-year-old age group indicate that 16.96% practiced one type of sport, 12.98% engaged in two types of sports, and a negligible 0.05% participated in three types of sports.

Similarly, boys in the 9-year-old age group reported that 40.11% practiced one type of sport, 89.98% were involved in two types of sports, and only 0.12% participated in three types of sports.

Fig. 5

Graphical representation of the answer, -boys- questionnaire regarding the practice of one type of sport or several at once, of the study group.

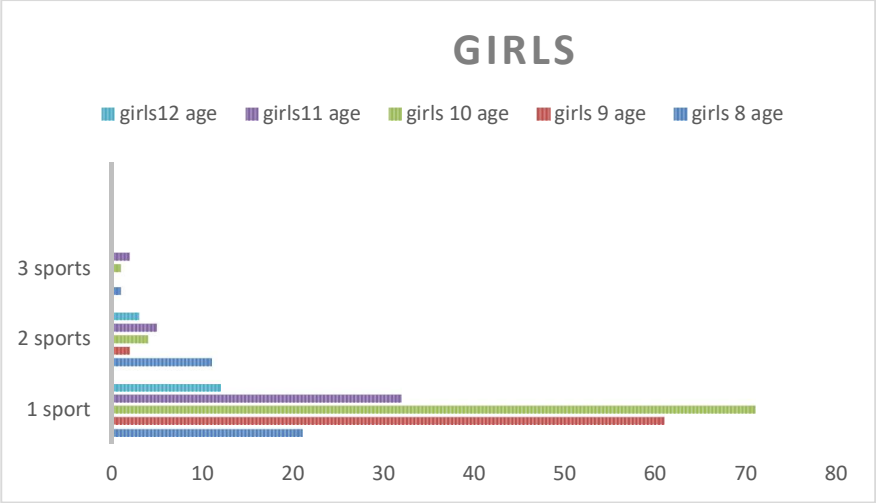


In the 10-year-old age group, boys reported practicing one type of sport at a rate of 47.11%, participating in two types of sports at a rate of 6.98%, and engaging in three types of sports at a minimal rate of 0.17%.

Regarding girls aged 8, the percentages were 16.06% for one type of sport, 5.5% for two types of sports, and 0.05% for three types of sports.

Fig. 6

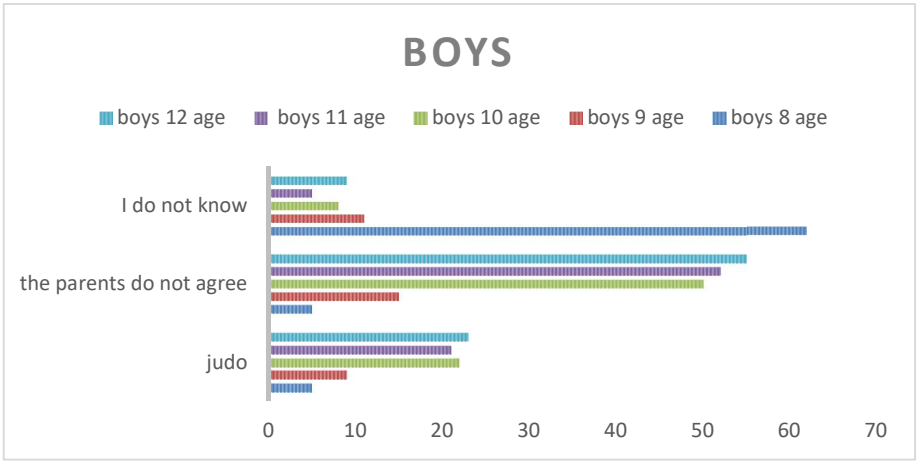
Graphical representation of the answer, -faces- questionnaire regarding the practice of one type of sport or several at once, of the study group



Upon analyzing the responses of boys regarding their interest in practicing judo and parental approval, a significant number expressed a firm desire to engage in this sport. However, a considerable portion also appeared undecided.

Fig. 7

Graphical representation of the answer, -boys- questionnaire regarding the practice of judo.

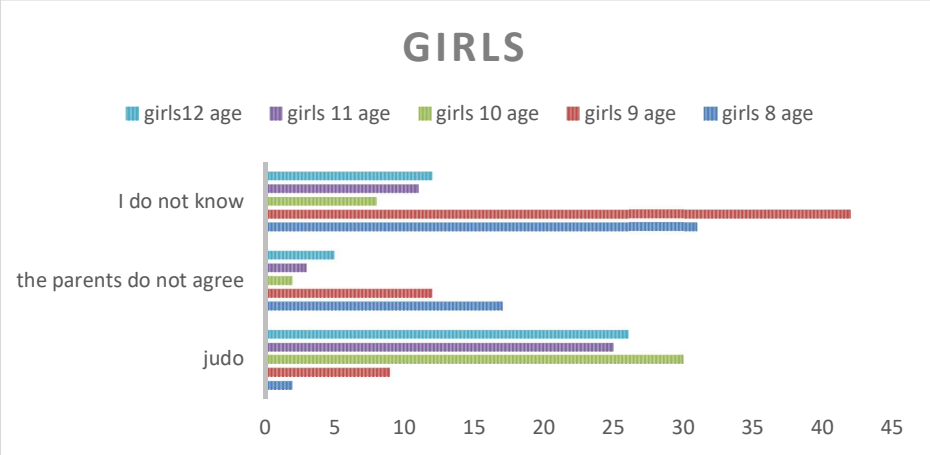


Analysis of responses from girls regarding their interest in practicing judo and parental approval revealed a similar trend to that observed among boys. Particularly notable was the prevalence of a firm affirmative response, especially within the 12-year-old age group,

indicating a desire to engage in this sport. However, a significant portion of girls also appeared undecided.

Fig. 8

Graphical representation of the answer to the questionnaire on judo practice.



Conclusions

From analyzing the responses of those surveyed, we found that there is considerable openness and support within local communities for the successful organization and implementation of the "Judo in Villages" program. This support stems from parents, schools, and coaches, indicating a collaborative effort.

A significant outcome of the questionnaire conducted among 320 rural students, comprising 167 boys and 153 girls, is that a substantial percentage - 66.5% of boys and 69.5% of girls - consider judo practice in rural communities to be very important. Conversely, only a small percentage view it as unimportant.

In the current Romanian context, it is noteworthy that coaches receive support from local village communities, both in terms of financial assistance and provision of training spaces, to the highest possible extent.

Given the general demographic decline in Romania, we believe that ensuring the primary human resource for practicing competitive judo can be facilitated. Engaging in performance judo in rural areas can serve as a foundation for nurturing future champions, providing a crucial "raw material" for talent development.

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The Importance Of Vo2 Max In Young Soccer Players

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Abstract

Soccer is a high-level skill sport that requires aerobic and anaerobic strength, as well as physical skills related to speed, agility, strength, and power. To meet these physical needs of soccer players, coaches now offer a variety of aerobic exercises that essentially use the lower and upper extremities, as well as large muscle groups. Correct technical performance of exercises protects not only from various injuries but also saves unnecessary energy consumption. For this reason, the purpose of this research is to critically analyze research that has examined the importance of aerobic endurance in young soccer players. The following databases were searched: Pub Med, Scopus, Google Scholar, CrossRef, etc. to find all relevant publications. The following keywords were used in this search: "soccer", "young soccer players", "VO_2 max", and "soccer performance", along with adjectives such as "effect", "change" and "impact". It was found that the aerobic demands of soccer players are crucial and strategic for the game.

Keywords: "soccer", "young soccer players", "VO2 max", "soccer performance", "effect", "change" and "impact".

Introduction

Soccer is the most popular global sport millions of men and women train and participate in this magical game. The line of creation of young footballers works without interruption with every individual who has dreams and aspirations to "reach the top" and emulate their superheroes. Many young people have bedroom walls full of posters of their heroes and live with the expectation of success at all levels of competitive sport. Moreover, the greatest emphasis is placed on discovering talents and training them from childhood until they appear in the top-level teams. The focus on youth soccer has increased since the huge financial investment in 'building a future star' together with the increase in professional levels of training and education which has encouraged coaches, parents, and administrators to support development programs of soccer. These approaches have emerged since the early 80s and the development of programs and structures in the new millennium are very sophisticated and well-funded. Over the years, there have been various studies and texts that have addressed the principles of youth soccer training. These books cover the principles and practices of the game with an almost endless number of soccer activities, skill practice, and strategic approaches. Today, there are thousands of dedicated soccer training sites on the web that reflect the global demand for the most attractive sport for every young man or woman. Facing the fact that there are few or no texts dedicated to the science of youth soccer in our country, there is a need to fill this gap with literature but also with contemporary studies that will serve to give an impulse and push scientific theories on soccer at young ages. Since its inception in 1987, the World Congress of Science and Soccer has been held once every four years. The first congress included a theme entitled "Facilities for young soccer players" which reflected the concerns of youth soccer at the time.

VO_2 MAX

Soccer is a very dynamic sport. As a result, the tension and effort during the game vary depending on the player's actions on the field, the essence of biomechanics, and quick movements (D'Elia et al., 2020). For this reason, aerobic power is a key element for a soccer player, as it allows for improving recovery capacity, especially after very intense efforts. As we have mentioned before, aerobic power is defined as the amount of oxygen that can be used by our body in the unit of time during progressively increasing physical activity, until it is exhausted. It is closely related to the heart rate, which can be obtained from the heart beats per minute. The aerobic and anaerobic capacity of an athlete can determine the outcome of the competition, precisely for this reason, it is important to evaluate the ability of athletes within this capacity. The player in the game undergoes periods of low intensity interspersed with periods of high intensity, including standing, walking, running, and sprinting with frequent changes in direction (Stølen et al., 2005). During these peaks of intensity, the aerobic mechanism alone is not sufficient to cover the energy demand, so anaerobic mechanisms must intervene, which creates immediate energy to meet the demand and immediately make the necessary amount of energy available to the muscle's ATP. The body at this point is in oxygen debt that needs to be replenished as quickly as possible, so improving aerobic power is key to achieving this. Even the study done by Di Salvo, emphasizes that the aerobic base $\dot{V}O_2$ max is

crucial in football. It serves to cope with high-intensity interplay activities, including accelerations, sprints, changes of direction, jumps, lateral steps, touches, and technical skills specific to the game, all associated with sufficient muscle strength, flexibility, and dexterity (Di Salvo et al., 2007). Contemporary soccer compared to previous decades is more intense, and nowadays players cover approximately 30% more distance at high intensity, this requires at the same time, faster recovery (Barnes et al., 2014). Aerobic fitness, on the other hand, is also associated with a lower risk of illness and injury throughout the preseason and competitive season, which is another crucial factor for soccer players (Watson et al., 2017). It is widely recognized that athletes with better aerobic capacity have a higher body capacity to recover from intermittent anaerobic activity such as that involved in soccer. Thus, one of the most important physiological mechanisms for the soccer player is the ability to recover through increased capillarization caused by aerobic exercise. This is achieved by improving the transport of oxygen to the muscles, consequently increasing the density of the mitochondrial muscles and removing the metabolic bi-products produced during the match, all this being based on aerobic training, that is, on the aerobic system as a whole. Therefore, as already proven, the player with higher $\dot{V}O_2$ max can run at higher intensity and longer distances, before glycogen depletion causes a decrease in intensity. Researchers have stated that in terms of team selection, individual responsibilities of players within the team, and tactical decision-making, coaches knowing the VO_2 max of the players will be able to make the right decisions (Jemni et al., 2018).

As a result, the aerobic demands of soccer are crucial and strategic. For this reason, aerobic exercise, also known as cardio, is widely used by trainers to improve the athlete's ability to use oxygen and continue activity for different periods of time. Another extremely beneficial effect of aerobic exercise is the modulation of parasympathetic-sympathetic activity. Self-restoration during the match is another extremely useful physiological feature provided by this exercise. Vagal reactivation is also associated with better aerobic performance. And bradycardia is a hemodynamic benefit for a soccer player who wants to make quick transitions, as it means that active muscles will receive more oxygen (De Araújo et al., 2018). Recently, it has been argued that aerobic exercise involves qualities such as speed, power, agility, coordination, strength, and game-specific skills in response to perturbations and adverse remarks. One could argue that these training techniques are ineffective and only energize distance runners. But do they understand the need to develop every muscle fiber and energy system, which most team sports frankly don't? However, research has not revealed any negative relationship between strength, jumping ability, and sprinting in soccer players after aerobic training, which challenges these erroneous and contradictory impressions (McMillan et al., 2005). One of the theories presented is that VO_2 max affects the agility of the soccer player. According to the findings of data analysis, VO_2 max contributed 39.24% to dribbling agility in the sport of soccer (Subrata, 2020). This implies that the dribbling skill of soccer players will increase as the VO_2 max increases. On the other hand, players need a high level of fitness to cope with the energy demands of the game. Training brings about changes and adaptations in the body and in the case of interval training, favors improved endurance and strength. Aerobic and speed resistance training can be used during the season to improve high-intensity interval exercise performance. Interval training is successful in improving VO_2 max in athletes who

already have good aerobic capacity, as it is a good training tool to maintain high levels of aerobic power (Raiola & D'Isanto, 2016). Since it is considered an efficient training method to improve the aerobic capacity of players during the competitive season (Belegišanin, 2017), players should develop their ability to perform maximal, or near maximal, repeated efforts, which can be achieved through aerobic training. high intensity, with resistance to speed. For this reason, the ability to play the ball with great skill becomes more and more important in today's soccer game. When the player is in control of the ball, these qualities relate to the pace with which the opposing player applies pressure. The one who controls the ball is under a lot of pressure and thus has little space to play the ball freely. In these conditions, the player must be able to escape from the opponent's control, guard the ball so that the ball is in his possession and coordinate the attack through quick passes ensuring that the ball is under his team's control (possession of the ball). Soccer is a sport that requires a specific set of skills, "ball technique" skills known as functional movement patterns in the game of soccer. These soccer playing skills must be supported by: 1) possession of the ball; 2) control; 3) deceptive skills; 4) speed variability; and 5) perceptual and cognitive skills (Galli et al., 2016). If not supported by these factors, the skills cannot be realized quickly and thus the ball will be easily possessed by the opponent. Therefore, to compete internationally in soccer requires not only talent but also a high VO_2 max level, because these players will not be able to compete internationally and professionally if they simply have the talent or skills to manage a good ball. The soccer player must run an average of eight to thirteen kilometers (km) during two 45-minute halves of soccer matches, running short distances and running at a moderate pace alternately (intermittently). If a talented soccer player is physically unable to constantly maintain his physical condition, he may not be able to play a good and fulfilling game (Azcárate et al., 2020). One of the current arguments used by physical training coaches in our country is that because soccer is a sport characterized by intermittent activities and short intense training, longer activities would not take into account these characteristics and aerobic training would slow athletes down. This line of reasoning turns out to be contrary to the findings of several important researchers (Tønnessen et al., 2013; McMillan et al., 2005; Helgerud et al., 2001) etc. With a 4-minute stimulus, one of the most reliable studies on soccer players found expressive physiological effects of long-interval training, including substantial improvements in VO_2 max of 11%, anaerobic threshold of 16%, and running economy of 6.7%. In addition, the amount of time spent interacting with the ball throughout the game increased by 24%, the number of sprints by 100%, and the distance traveled on the court by 20%. The improvement in cardiovascular capacity during submaximal activity, which went from 82% to 86%, was another important factor. As a result, the central and peripheral capacity of the players was strengthened by long-term interval training. In addition to all the benefits of extended interval training, this training program can be predicted to increase VO_2 max by 0.5% each training session, which is a very economical method (Helgerud et al., 2001). Consistent with this idea, a different study found that prolonged exercise in soccer players did not slow them down (McMillan et al., 2005). Without a doubt, VO_2 max is a crucial factor in how well soccer players perform during a match (Tønnessen et al., 2013; Helgerud et al., 2001; Ekblom, 1986). As a result, it is clear that the soccer players in the present study did not receive sufficient aerobic load to increase VO_2 max at the end of the preseason, and most likely not throughout the competitive season. Older research already concluded that

60-65 ml/1-min/1-kg was sufficient to compete internationally in men's soccer (Ekblom, 1986). Ten years later, (Reilly et al., 2000) made the statement, which is still relevant today, that mean VO_2 max values greater than 60 ml/1-min/1-kg in elite teams, which expected to be verified in the players we will take into the study, suggest the existence of a threshold below which an individual player is unlikely to be physically successful in modern first-class soccer. Another research that used the time frame found that a well-developed soccer player can maintain a good aerobic condition throughout the season (Tønnessen et al., 2013). Consequently, an interval training protocol with dedicated testing has been proposed to assess and improve players' ability to perform high-intensity activities during the game (Raiola & Altavilla, 2020). The aim is to test whether a training protocol can improve aerobic power in an elite or amateur soccer team. For both a coach and an athlete, it is very important to periodically monitor the results of training programs (Ceruso et al., 2019). For this, evaluation tests are used to analyze the initial situation and to plan and verify the results.

Conclusions

Research has shown that the aerobic demands of soccer are crucial and strategic to the game.

$\dot{V}O_2$ max: - serves to cope with high-intensity combined activities, - affects the agility of the soccer player, - favors the improvement of endurance and strength, - promotes parasympathetic-sympathetic activity, i.e. restoration during the match.

Bradycardia is a hemodynamic benefit for a soccer player who wants to make quick transitions, as it means that the active muscles will receive more oxygen (De Araújo et al., 2018).

The aerobic and anaerobic capacity of an athlete can determine the outcome of the competition, precisely for this reason, it is important to evaluate the ability of athletes within this capacity.

The researchers point out that to compete at the international level in soccer, not only talent is required but also a high level of VO_2 max. Soccer players, in addition to being talented, must also be able to continuously maintain good physical condition, in order to play well. Older research has already concluded that VO_2 = 60–65 ml/l–min/l–kg is sufficient to compete internationally in men's soccer. However, regardless of these values, it is suggested to take into account the positions that the player has in the field.

An important aspect is evidenced by the extensive use of aerobic training by coaches, with the aim of improving the athlete's ability to use oxygen.

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