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Block practice therapy of football players' passing ability post ankle injury

Terapia blokowa rozwijająca umiejętność podawania wśród piłkarzy po urazie stawu skokowego

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Abstract

Purpose. The study aimed to analyze the relationship between systolic and diastolic blood pressure and cardiovascular capacity in the elderly. **Method.** This research is an analytical observational study conducted with a cross-sectional approach. The sample involved 43 elderlies with characteristics: age 66.79 ± 4.24 ; weight 62.4 ± 11.66 ; and height 157.83 ± 6.77 . The blood pressure measurements were carried out using a tensimeter, while the cardiovascular measurements were carried out using a 2-minute step test based on the senior fitness test procedure. Pearson's correlation test was applied to determine the relationship between cardiorespiratory ability and blood pressure. **Results.** The Pearson's data analysis test results showed a negative correlation between cardiorespiratory capacity and systolic blood pressure ($r(41) = -0.516$, $p = < 0.001$) and diastolic ($r(41) = -0.442$, $p = 0.003$). **Conclusion.** The higher the cardiorespiratory level in the elderly, the lower the systolic and diastolic blood pressure. Thus, good cardio respiration is known to provide positive benefits in better blood pressure regulation in the elderly. Exercise may be needed so that the elderly obtains good cardiorespiratory fitness and, at the same time, normal blood pressure.

Keywords

blood pressure, systolic, diastolic, cardiovascular, elderly, fitness

Streszczenie

Cel. Celem badania była analiza związku między ciśnieniem krwi skurczowym i rozkurczowym a zdolnością układu oddechowo-kръżeniowego u osób starszych. **Metoda.** Badanie to jest obserwacyjnym badaniem analitycznym przeprowadzonym z zastosowaniem podejścia przekrojowego. W próbie uczestniczyło 43 osób starszych o następujących charakterystykach: wiek $66,79 \pm 4,24$; waga $62,4 \pm 11,66$; wzrost $157,83 \pm 6,77$. Pomiar ciśnienia krwi przeprowadzono za pomocą tensometru, natomiast pomiary zdolności układu oddechowo-kръżeniowego przeprowadzono przy użyciu testu dwuminutowego marszu w miejscu opartego na procedurze testu sprawności seniorów. Do określenia związku między zdolnością układu oddechowo-kръżeniowego a ciśnieniem krwi zastosowano test korelacji Pearsona. **Wyniki.** Wyniki testu analizy danych Pearsona wykazały ujemną korelację między zdolnością układu oddechowo-kръżeniowego a ciśnieniem skurczowym ($r(41) = -0.516$, $p = < 0.001$) oraz rozkurczowym ($r(41) = -0.442$, $p = 0.003$). **Wniosek.** Im wyższy poziom zdolności układu oddechowo-kръżeniowego u osób starszych, tym niższe ciśnienie krwi skurczowe i rozkurczowe. Zatem dobra kondycja układu oddechowo-kръżeniowego jest znana jako zapewniająca pozytywne korzyści w lepszej regulacji ciśnienia krwi u osób starszych. Ćwiczenia mogą być potrzebne, aby osoby starsze uzyskały dobrą kondycję układu oddechowo-kръżeniowego i jednocześnie normalne ciśnienie krwi.

Słowa kluczowe

ciśnienie krwi, skurczowe, rozkurczowe, układ oddechowo-kръżeniowy, starsi, sprawność

Introduction

Football, involving joints, ligaments, bones, and muscles for complex movements like running, kicking, jumping, throwing, and avoiding opponents, poses a high risk of injury for athletes [1,2]. Football players must also make motions to block opponents to acquire the ball and stop their opponent's movements [3]. Football players also need to be nimble and quick-witted to adjust to shifting conditions and play during a game rapidly. To score a goal, each player must alternate between sprinting, walking, passing, dribbling past opponents, and shooting directly at the goal opponent. An athlete views an injury as a serious matter that requires medical attention; some even compare it to a terrifying ghost [4]. This is because an injury can negatively impact an athlete's performance, which can hurt the team's chances of winning [5].

Sports injuries are pain from physical activity, which can harm the body's muscles, joints, and other tissues [6]. In order to improve athletes' physical qualities, physiotherapy plays a crucial role in offering guidance, suggestions, and training regimens [7]. Ankle injuries are the most common concern for athletes whose foot is their primary body part during competition. The ankle is the most mobile joint in the human body since it supports the weight of the entire body and is most vulnerable to impact injuries. 27 cases, or 34.6% of athletes with hip injuries, 37 cases, or 47.4% of players with ankle injuries, and 28% of other injuries were reported [8].

Football players between the ages of 13 and 19 frequently sustain one to five different kinds of injuries for every 1,000 hours of training, and the number of injuries increases with age. Approximately 60 to 90 percent of injuries occur in the lower limbs, with the ankles suffering more injuries than the knees and thighs [9]. The foot is one of the anatomical areas most prone to injury in football [10]. Acute injuries to the ankle are typically brought on by abrupt pressing or turning forces that make it challenging to maintain proper body alignment [11]. Players in team sports and on the field are more likely to get ankle injuries [12]. The most frequent injury sustained in football games across all competitions is an ankle injury, with 53.2% of injured players over the last seven years. This is in contrast to other team sports like handball, floorball, and other team sports, where only 7% to 21% of players sustain ankle injuries [13].

The most frequent type of sprains of the ankle are called lateral ankle sprains (LAS) [12], [14], [15]. They are characterized by excessive inversion-internal rotation occurring with or without plantar flexion. Having the lowest load tolerance [16], the Anterior Talofibular Ligament (ATFL) [17] is also the most commonly injured. The deltoid ligament, the posterior inferior tibiofibular ligament (AITFL) [18],[19], the anterior inferior tibiofibular ligament (AITFL) [16], [18], and [19] are all involved in more severe ankle sprains.

Ankle sprains are caused by trauma to the lateral ligament complex or overstretching (hypermobility). They can also result from sudden inversion and plantar flexion forces during sports or other physical activities when the foot does not land perfectly on the ground or floor. This causes the structural ligaments to be stretched beyond their normal physiologic and functional length. When the lateral complex ligaments contract after being stretched, discomfort results. Immobilization brought on by this pain results in a reduction in muscular strength and restricted range of motion [21].

Since the ankle is the most crucial joint for the body to maintain balance when performing tasks, it is also a body part that frequently sustains injuries. Ankle injuries typically happen when the foot bends or turns, stretching the ankle to the point where ligaments are torn or the ankle joint's bones are broken. Football players are particularly vulnerable to ankle injuries, and their chance of suffering one rises with an opponent's degree of forward-facing skill. Football players who suffer from ankle injuries may need surgery to treat them [22]. Treating ankle injuries in football players requires significant time and financial resources [23].

Sports injuries require prompt and accurate attention; in these cases, physiotherapy is required. Physiotherapists can offer guidance and direction, as well as a location where coaches can collaborate to monitor injured players [24]. For injured sportsmen, physical therapy plays a crucial role as a nurse, a physical condition counselor, a coach, and an assessor [25]. Exercise therapy and medical care for the injury are necessary to facilitate full recovery. This exercise therapy aims to prevent athletes from suffering the same injury shortly [26]. In a functional injury rehabilitation program, exercise therapy is a useful technique for reducing joint scope owing to injury and restoring strength and sensory function [27]. This is necessary because every athlete should be extremely mindful of ankle injuries, as these injuries may affect their ability to continue with their activities after retirement [28].

The capital of Indonesia's Central Java province is Semarang. PSSI Semarang City is the name of the Semarang organization of football associations in Indonesia. This association hosts the ASKOT Cup (City Association Competition) every year. Every Football School (SSB) in the City of Semarang and its environs, comprising sixteen football teams, participated in the ASKOT Cup. Every coach in this tournament faces the same issue: the players' constant ankle problems. Four players on each team sustained ankle injuries due to competing in the tournament.

Collisions that occur during games, subpar pitches, insufficient warm-ups, and players' poor physical health are the root causes. According to the most recent information gathered during the ASKOT competition in 2023, 16 athletes had ankle injuries. This is extremely concerning, so management needs to address the issue head-on. Physiotherapy and specialized training plans should be implemented to get player performance back to normal, particularly passing ability, as passing is a crucial football technique for winning games, particularly for strikers and midfielders.

According to actual statistics, passing accounts for 80% of a football game's outcome [29]. Passes in football games are closely related to tactical and substantial tactics in football matches [30].

Athletes who use block practice only learn one skill technique at a time until they master it [31]. A series of exercises known as "blocked practice" involves people repeating the same activity repeatedly [32]. Block practice is conducted in line with the standard method of creating a timetable, which involves doing one activity – task 1, task 2, or task 3 – before going on to another. Before moving on to the following exercise in this instance, students execute one movement ability [33]. In light of these issues, this study aims to describe how football players who sustain ankle injuries during their sports injury treatment are handled by physical therapy.

Research methods

Participants

This study was carried out at the Semarang football school. Data collection for the pretest was done on May 23, 2023, and data for the posttest was collected after 12 treatments. 288 players make up the study's population. A total of 16 participants were included in the sample due to the use of purposeful sampling, which was applied to players with ankle injuries who were between the ages of 14 and 15.

Procedure

The research was a quantitative study employing an experimental design. In this study, all subject groups received treatment, highlighting its experimental nature. In this case, what was used was a quasi-experiment, because this research did not use a control group and randomization [34] using a quantitative approach that revealed block practice exercises on the passing abilities of new star football academy football players. The Researchers used a one group pretest post-test design, where the first thing the researcher did was to conduct an initial test on the sample to determine the ability of the inner leg passing in the post-injury condition of the ankle, then the sample was given treatment by carrying out block practice

exercises as a solution to improve the passing technique ability of post-ankle injury players. The block practice exercise consists of 5 tasks that must be completed by each player. each task has activities to perform passing techniques whose levels are increasing. Task 1 performs passing and control using the inner foot in pairs with a distance of 2 meters carried out for 1 minute as many as 5 sets. Task 2 involves passing and controlling the ball using the inner foot in a rectangular formation, with each player positioned 2 meters apart, performed for 3 minutes in 5 sets. Task 3 performs passing and control using the instep of a rectangular formation for 3 minutes as many as 6 sets. Task 4 performs passing and control using the inner foot, instep and outer foot with a rectangular formation for 5 minutes as many as 5 sets and task 5 performs passing and control techniques in the form of a 1 on 3 game, 3 players perform passing control and 1 player tries to snatch, when the ball is touched by the player who snatches it, the player who is touched takes turns trying to snatch it, this is done for 10 minutes as many as 3 sets. This block practice exercise was carried out for 4 weeks with details of 3 meetings in 1 week and at the final stage the sample carried out the final test, this aims to see the development of the inner foot passing ability before being given block practice exercises and after being given treatment. The following is a description of the research design:

Table 1. Study design

Group	Pretest	Treatment	Posttest
Experiment	O1	X	O2

O1: pretest passing ability data,
X : treat practice block practice
O2: posttest passing ability data

22 application was used in the normality test and data analysis in this study using the Shapirowilk formula.

Results

The results of this study are described based on the player's position, age, body mass index (BMI) and the player's willingness to be given block practice training. The following is a table of research results.

Table 2. Data of research subject

Category sample	Information	f(n)	Percentage (%)
Player Position	Center Forward	4	25
	Wing Forward	3	19
	Center Midfielder	4	25
	Ringt Back	2	12
	Left Back	3	19
Amount		16	100
Age	14	9	56
	15	7	44
Amount		16	100
Body Mass Index	Thin	3	19
	Normal	9	56
	Obesity	4	25
Amount		16	100

In table 2 it can be seen the position of football players aged 14-15 years who suffered ankle injuries, namely center forward 4 players, wing forward 3 players, center midfielder 4 players, ringt back 2 players and left back 3 players. The percentage results can be seen in Figure 1. Of the 16 players who suffered ankle injuries by age, there were 9 players aged 14

years and 7 players aged 15 years. The percentage results can be seen in Figure 2. Based on the body mass index of the 16 players, there are 3 players in the thin category, 9 players in the normal category and 4 players in the obesity category. The percentage results can be seen in Figure 3.

■ Center Forward ■ Wing Forward
■ Center Midfielder ■ Ringt Back
■ Left Back

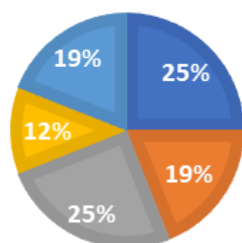


Figure 1. Percentage of player ankle injuries based on player position

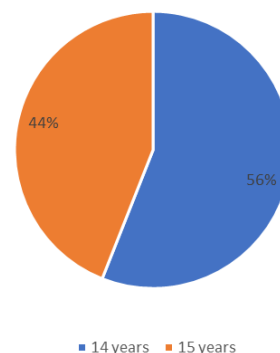


Figure 2. Percentage of players' ankle injuries by age

■ Thin ■ Normal ■ Obesity

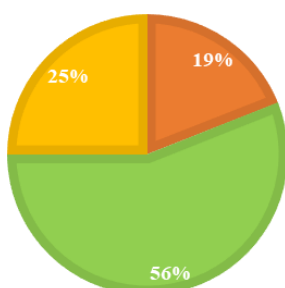


Figure 3. Percentage of players' ankle injuries based on body mass index

The results of the research were that players who had ankle injuries were then tested for passing before being treated with

block practice exercises and after being given treatment, the data from the passing test is presented in Table 3.

Table 3. Data pretest and posttest

Pretest						Posttest					
Mean	Median	Variance	SD	Minimum	Maximum	Mean	Median	Variance	SD	Minimum	Maximum
9.44	9.00	3.73	1.931	6	13	13.81	13.50	3.63	1.905	11	17

Once the data was collected, prerequisite tests were conducted. The results are described as follows.

Table 4. Normality test

Group	Data	Significance	Information
Block practice exercises	Pretest	0.540	Normal
	Posttest	0.168	Normal

Based on the table 4 above, is the significance value of each data obtained pretest and posttest. Obtained data show all data a is distributed normal Because significance level bigger than

0.05. Then the data were analyzed for homogeneity. The following description of the homogeneity results can be seen in table 5.

Table 5. Test of homogeneity of variance

Results	Levene Statistic	df1	df2	Sig.
Based on Mean	0.033	1	30	0.857
Based on Median	0.087	1	30	0.769
Based on Median and with adjusted df	0.087	1	28.734	0.770
Based on trimmed mean	0.034	1	30	0.855

From Table 5, it can be concluded that the data falls into a homogeneous category, as the significance value based on the mean is 0.857, which is greater than 0.05. After the data is declared homogeneous, then the homogeneity test is carried

out using a type of statistical testing to determine whether there is a difference from the estimated value with the value of the statistical calculation called the Paired Samples T-Test. The results are explained in table 6.

Table 6. Paired samples test

Mean	SD	Paired differences			t	df	Sig. (2-tailed)
		Std. Error Mean	95% confidence interval of the difference				
			Lower	Upper			
−4.375	1.025	0.256	−4.921	−3.82	−17.078	15	0.000

The results in table 6 show that the significance value is 0.000 < 0.05, so it can be concluded that there is a significant difference between the passing results before being given block practice training and after being given block practice training to football players who have ankle injuries.

Discussion

This study reports post-analysis treatment from physiotherapists for football players with ankle injuries. This research proves that there is an effect of block practice on improving the passing ability of football players who have ankle injuries. The results of this research analysis show that block practice is proven to have a significance value $0.000 < 0.05$, which shows that there is a significant increase in the passing ability of football players who have ankle injuries. Athletes who suffer ankle injuries must carry out recovery mass by continuing to carry out training activities but must do so with light intensity and very easy movements [35].

Blocked practice is carried out according to the general method in make a schedule, that is, finish one other thing first, namely task 1, task 2, task 3 before move on to something else. Exercise therapy as a physiotherapy modality uses active or passive body movements with the aim of maintaining and improving strength, cardiovascular endurance, mobility, flexibility, stability, relaxation, coordination, balance and functional abilities.

In this case, each exercise a student performs one ability move before you get to the next section [33]. The key to skill success is block practice, because with block practice athletes

will focus on one skill so they can quickly improve a skill [36]. Block practice has advantages for athletes who want to master a skill, because this training has the principle of continuously repeating one skill until the athlete is proficient [37]. Block practice is a training method that requires athletes to concentrate on performing one aspect or various techniques repeatedly until the athlete can perform the technique correctly in one session [31]. Exercise-based rehabilitation reduces the risk of recurrent ankle sprains compared with usual care, but existing data are insufficient to determine the optimal content of exercise-based interventions [38]

Conclusion

The results showed that the application of block practice exercises can help accelerate the healing of ankle injuries and restore the technical skills of football players after ankle injuries. This means that football coaches who have players with ankle injuries can use the block practice method to restore their players' performance so that they can return to contributing to the team in every match. However, researchers found that block practice is most effective for players who have high motivation, researchers do not recommend block practice to be applied to players who have moderate or low motivation. This is because block practice has the characteristics of a blocked practice, making players who are not highly motivated feel bored because they have to complete the stages of the practice according to the tasks given. Based on this, it is highly recommended for similar experiments to consider the level of motivation of each indi-

dual. In summary, this research produces a new reference regarding the handling and recovery of ankle injuries in football players so that football players can recover quickly and continue to excel, namely by applying block practice exercises. The optimal application of block practice for ankle injury recovery should involve a physiotherapist.

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Piśmiennictwo/ References

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