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THE EFFECT OF EXERCISE USING RESISTANCE BANDS ON IMPROVING THE BALANCE OF BADMINTON ATHLETES

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Abstract

The game of badminton required good physical condition such as balance. This study aims to determine the effect of training using resistance bands on improving the balance of badminton athletes. The benefits of this study, 1) theoretically this research opens the paradigm in the field of coaching in general and specifically in the sport of badminton to use varied forms of exercise, 2) this research is expected to increase knowledge to trainers so that they choose a form of exercise that is simple but can improve various physical conditions, 3) as a reference value for the quality of further research because this research from the knowledge of researchers has not been carried out. This study uses an experimental method with a one group pretest-postest research design. The population in this study were 20 badminton athletes PB.PT.One. The sample in this study were 20 badminton athletes PB.PT.One with total sampling. Data collection techniques are carried out measuring balance with a strok stand measuring instrument. The data analysis technique used is using SPSS 26 software to test the Independent T-Test. The results showed that there was an increase from training using resistance bands to improving the balance of badminton athletes with a value of 0.00 < 0.05 and an increase from the treatment given of 63%. Training using resistance bands is the right alternative choice to improve physical condition abilities, and which includes balance. It can be an alternative for athletes or badminton coaches to use resistance bands as a medium and method to improve balance.

Keywords: Exercise, resistance bands, balance, and badminton

INTRODUCTION

Exercise is an activity that affects the health of the human body to be able to carry out daily activities (Finlay et al, 2022). Exercise is a physical activity that can avoid degenerative diseases such as diabetes, osteoporosis, and hypertension (Kanaley et al., 2022). Exercise is a physical activity that is a favourite by everyone for their daily needs (Marpaung & Manihuruk, 2022). Opinion from Goodyear et al., (2023) which says exercise is a physical activity that is done regularly to improve cardiovascular fitness which says exercise is a physical activity that is done regularly to improve cardiovascular fitness. Exercise is a physical activity to improve body health, but exercise can also improve performance (Lochbaum et al., 2022)

Sports training can stimulate growth and development, but on the other hand, the experience of practising and competing in sports coaching activities can lead to fatigue, feelings of discomfort and boredom if training is not varied (Sulistiyono et al., 2022). In today's modern life, humans cannot be separated from sports activities, both to improve performance and the need to maintain body condition to stay healthy and fit (Lestari & Nasrulloh, 2018). The sport that is currently developing and favoured by all circles of society is badminton. The development of badminton in Indonesia has reached a very rapid development and attracted the attention of many people, it has been proven that Indonesia's name is quite respected in the badminton branch, the fact is undeniable that Indonesia is a badminton giant country with its

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success in achieving achievements in various world-class championships, one of which is the Olympics and in Indonesia has a badminton parent called the Indonesian Badminton Association (PBSI) (Zulhendri & Sukoco, 2021).

Badminton is a sport that uses a shuttlecock, racket, net and competes in men's / women's singles, men's / women's doubles and mixed doubles (Chico et al., 2023). Badminton is one of the most popular sports in the world, and is a racket sport that does not have body contact with the opponent (Tong et al., 2023). Badminton games require good physical condition, good technique, and good tactics in training and matches. From the explanation above, in line with Munandar's opinion, the ability of badminton athletes is influenced by physical condition, technique, tactics and strategy (Munandar, 2021).

Physical condition is a factor that greatly affects a person's achievement, without good physical condition the technique cannot run perfectly in training or during the match and good physical condition is a requirement that must be possessed by an athlete (Agung et al., 2023). Physical conditions that must be possessed by a badminton athlete are agility, muscle strength, muscle endurance, aerobic exercise (cardiovascular endurance), anaerobic exercise (interval, circuit, and excessive speed training), flexibility, concentration (mental exercise), and balance (Arif & Wiriawan, 2022).

In badminton games, balance can be seen during the movement of chasing the shuttlecock, right and left forward movements, right and left side movements, right and left back movements that require very fast and accurate movements without reducing body balance (Marpaung & Manihuruk, 2022), in line with the above opinion, Muthiarani's opinion says that the movements of badminton players need to be trained with the correct and appropriate methods in order to improve the balance of badminton players well (Muthiarani, 2017). The physical condition that needs to be improved in badminton games is balance, because badminton requires players to run, jump, change direction quickly, hit precisely, and demand endurance (Okanansa et al., 2022).

In badminton athletes, balance plays an important role in overcoming the problem of controlling the motion of gravity and other situations that affect balance, such as turning movements when receiving a shuttlecock that is behind the body, movements when landing after a jump smash and when receiving an attack (Lu et al., 2022). Research conducted by Lutfiana et al who said balance is very important to be trained in badminton to improve athlete performance (Lutfiana et al., 2022), meanwhile, the opinion of Guo et al said that doing exercises for balance can improve performance movements in badminton athletes specifically to reach the shuttlecock from the opponent's attack and change the direction of body movement (Guo et al., 2021). From the above opinion, it can be concluded that balance in badminton athletes is very important and training for balance in badminton must be carried out programmatically. One form of exercise that can be done for the balance of badminton athletes is training using Resistance Band.

Resistance bands are an efficient and portable fitness exercise tool made of rubber and have many benefits (Abimanyu & Yusradinafi, 2021). Resistance bands are sports equipment made of rubber with the rubber tip being a fulcrum and causing the muscles to contract against external loads in order to increase endurance, agility, balance, strength and muscle mass (Mahardika, 2020). Resistance bands are an efficient and portable fitness exercise tool, made of rubber with a hand grip that becomes a fulcrum, and resistance band rubber has various elasticities (Nilhakim, 2022). Resistance bands are part of the exercise equipment using elastic rubber with handles as support (Wahono & Nasution, 2022).

Resistance band training as a form of loading can increase muscle strength,balance, agility and activate the sensomotor system through peripheral stimulation, muscle coordination, and neuromuscular adaptation (Gunawan et al., 2022). The exercise process using resistance

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bands remains based on the principles of exercisein general. The principle of training is also one of the success factors of training, these principles include (1) the principle of active participation, (2) the principle of readiness, (3) the principle of comprehensive development, (4) the individual principle, (5) the principle of adaptation, (6) the principle of overload, (7) the progressive principle, (8) the principle of specification or specialisation, (9) the principle of variation, (10) the principle of warm-up and cooling, (11) the principleof long-term training, (12) contrasting, (13) the principle of non-excessive, and (14) systematic principles (Rohmah & Purnomo, 2018). The principles of training havean important role in the physiological and psychological aspects of sportsmen (Lestari & Nasrulloh, 2018). Training carried out by athletes using the principles of training will have an impact on the athlete's own performance which can be seenin terms of playing on the field and being consistent in matches that play to the (Bauman et al., 2023) maximum peak performance is only achieved by using training that is planned systematically, continuously, and under the supervision andguidance of a good coach. (Batistuta & Wiriawan, 2021). From the above opinion,it is in line with research conducted by Gantois et al, who said that routine trainingis continuously carried out in a structured manner and in accordance with the principles of training, the physical condition of an athlete can improve such as increased balance, agility, cardiovascular and muscle strength (Gantois et al., 2023).

From the researchers' interviews with badminton coaches on the court that the coach said he had never applied exercises to improve balance using resistance bands and athletes did not understand how to do exercises using resistance bands. It can be seen that in the training process a trainer does not apply a variety of forms of exercise so that it can trigger athletes to feel bored. With varied forms of exercise using resistance bands, athletes get new learning in the form of exercises that improve balance. The problems above are in line with the opinion of Arif & Nasrulloh who said a trainer should have an understanding related to variations in training models so that athletes don't feel bored and are not disturbed by training with feelings of bored (Afif & Nasrullah, 2016), Nurhadi et al., 2022). With varied and structured exercises can also achieve the goals of the exercises carried out (Muladi & Kushartanti, 2018). This can also be seen from several literature reviews that the researchers found, that exercises varied using resistance bands can effect physical condition. During the exercise process carried out regularly and in accordance with the exercise program, it can affect physical condition (Yachsie, 2019).

The purpose of this study is whether the effect of training using resistance bands can improve the balance of badminton athletes. The benefits of this research, 1) theoretically this research opens a paradigm in the field of coaching in general and specifically in badminton sports to use a varied form of exercise, 2) this research is expected to add knowledge to the coaches so that they choose a simple form of exercise but can improve various physical conditions, 3) as a reference value for the quality of further research because this research from the knowledge of researchers has not been done.

METHOD

This type of research is experimental research, so it can be interpreted that experimental research has a treatment given to the sample in the study (Colombo et al., 2023). The experimental method is used to be able to see whether or not there is an effect of the treatment given to badminton athletes through training using resistance bands (Chang et al., 2023). The design in this study used a one-group pretest-posttest design.

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Table 1. Research Design (*The One Group pretest-postest*).

Pretest	Treat	Posttest
Q1	X	Q2

This research was held at the badminton court PB. PT. One Kisaran City, Asahan Regency, North Sumatra which is still actively practicing badminton athletes. This research was conducted for 8 weeks or 2 months, the research began on 03 October 2022 to 03 December 2022. Frequency of the training is 3 times a week. The number of training session as many as 16 times. PB. PT. One practice schedule on Monday, Wednesday and Friday. Training starts at 15-17 WIB. The population in this study were 20 badminton athletes PB. PT. One and all population used to be sample in this study. It was total sampling that total sampling is all the population in the population sampled to obtain research data (Joni et al., 2023). The instrument used in measuring balance is the stork stand with a validity value of 0.9330 and a reliability of 0.8680. The data analysis technique used the help of SPSS 26 software to test normality using the Shapiro-wilk test, homogeneity using the One Way Annova test and T-test (effect) using the Independent Sample Test.

RESULT AND DISCUSSION

Table 2 shows that significant results were obtained greater than > 0.05 so that it can be said that the data is normally distributed. Based on the results of statistical analysis in Table 3, the significant results are greater than > 0.05, so it can be said that the data is homogeneously distributed and hypothesis testing or t test (effect) can be done.

Table 2**.** Normality Test

Tests of Normality

	Shapiro-Wilk				
	Statistic	df	Sig.	Distribution	advanced test
pre	.957	20	.477	Normal	Independent T Test
post	.956	20	.459	Normal	Independent T Test

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 3. Homogenity Test Result

	Levene Statistic	**df1**	**df2**	**Sig.**
Pretest-Posttest	.011	1	38	.918

Table 4. Results of T Test Statistics

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Independent Sampel Test					
Equal variances assumed	**F**	**Sig**	**t**	**df**	**Sig (2-tailed)**
	.011	.918	-.879	33	.000

The results of statistical data analysis in Table 4 show significant 2-tailed < 0.05, so it can be interpreted that there is a significant effect of training using resistance bands on improving the balance of badminton athletes.

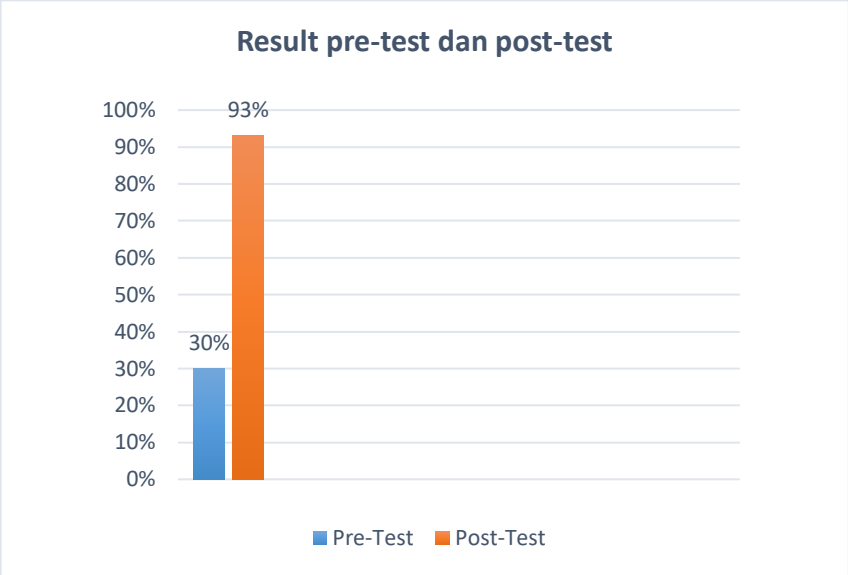

Figure 1. Descriptive data of pre-test and post-test exercise using resistance bands

Figure 1 shows that there was a significant increase from training using resistance bands to improving the balance of PB.PT badminton athletes. One with a pretest value of 30% and a posttest of 93% which increased by 63% from the treatment given to badminton athletes.

Physical ability is very important for badminton athletes (Falah et al., 2022). In badminton games have a high level of physical condition, especially in singles, badminton sports demand excellent physical condition and require aerobic stamina, expolotive strength, speed, accuracy and balance, and a physical condition is needed by an athlete in carrying out various forms of exercise or physical movement systematically and can make or grow an athlete's achievements (Aisyah, 2021). The opinion of Phomsoupha et al states that badminton is characterised by short lathan periods and repetitive exercises (1-9 seconds) and recovery (low intensity activities such as standing and walking for 6-15 seconds) interspersed with longer breaks in the game (time out 120s between games) (Phomsoupha et al., 2018). Research conducted by Fernandez et al stated that badminton athletes have good balance to be able to quickly change direction according to the direction of the opponent's shuttlecock (Fernandez-Fernandez et al., 2022).

Training in badminton is not only focused on training for field mastery and agility but coaches also pay attention to the balance of athletes. To achieve an achievement in badminton requires good physical conditions such as one of them is balance, has the aim of supporting the application of techniques, tactics and mentality when practicing and when competing (Aprilia, 2018). The above opinion is in line with Fildania & Jayadi who state that to reach the peak of achievement, the balance of badminton athletes must be trained from an early age, continuing to children or juniors, beginners, teenagers, cadets to adults (Fildania & Jayadi, 2022).

The results showed that there was a significant increase from training using resistance bands on the balance of badminton athletes PB.PT.One. Resistance bands training can also be used

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to train endurance, leg muscle power, balance and simply increase muscle energy potential which causes an increase in the overall quality of strength in the muscles while practical exercises with resistance bands improve accurate muscle control and harmonisation. Exercises using elastic rubber or commonly referred to as resistance bands have the purpose of starting an exercise programme or entering into core exercises in improving balance (Rohmah & Purnomo, 2018). The form of exercise using resistance bands given must resemble the anatomy and physiology of exercise (Pratama & Ismalasari, 2020).

Exercise using resistance bands is considered superior because it is more safe and easy to use in adolescents/juniors in improving balance (Nebahatqoru et al., 2021). Exercise using resistance bands has been shown to increase muscle activation and be an effective method for increasing muscle mass and balance (Yasuda et al., 2014). In addition, the opinion of Al Ghani states that resistance bands have been shown to improve balance (Al-Ghani, 2018). The better the balance that athletes have, the better it will allow athletes to perform technical movements in badminton, because we know that balance will allow muscles to perform explosive physical work (Pardilla, 2017).

The implementation of research using resistance bands was designed by researchers in accordance with the training periodisation to improve the balance of badminton athletes. Badminton players must step to all points of the court in a very short time, perform their strokes and return to the centre, then reach the point where the opponent sends the ball into the court in a short time requiring a high level of balance in athletes (Albayati & Kaya, 2023). The opinion of Kızılet et al that says after the athlete hits the shuttlecock and the foot steps towards the shuttlecock, the athlete maintains body position and balance to change direction quickly (Bozdoğan & Kizilet, 2017). It can be concluded from the explanation above that training using resistance bands can improve balance in badminton athletes in accordance with the results of research obtained by researchers, then reinforced by research conducted by Yoon et al who said training using resistance bands was effective for improving cognition, body ability, and balance (Yoon et al., 2017).

This study sought to explore whether training using resistance bands has an effect on improving the balance of badminton athletes of PB.PT.One. Several conditions were set for the sample and the coach in charge of providing treatment. The results showed that training using resistance bands had an effect on improving the balance of badminton athletes PB.PT.One. With the results obtained that so far from the knowledge of researchers there has been no research that uses resistance band exercises to improve the balance of badminton athletes. Research conducted by Jusran found that training using resistance band weights can affect the ability of badminton lob punches (Jusran, 2021), and research conducted by Aguss et al obtained training results using resistance bands can affect the results of badminton backhands and smashes (Aguss et al., 2023). From the results of the above research and some of the results of previous research it can be concluded that the research conducted by researchers so far from the knowledge of researchers no one has conducted research using resistance band exercises to improve the balance of badminton athletes. Sports training in badminton is currently achievement-oriented so far only aims to improve field mastery and agility, but to improve balance has not been implemented with the training programme so that from this study the coach can change the paradigm to do training with a variety of using resistance bands to improve balance. The trainers must vary the physical training model with the periodisation of sports training to be able to achieve physical condition and balance in badminton athletes (Kusuma & Jamaludin, 2022). From the things above, training using resistance bands to improve the balance of badminton athletes can be applied by badminton coaches in physical condition training.

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CONCLUSION

Training using resistance bands is the right alternative choice to improve physical condition abilities, and which includes balance. Based on the results of this research it can be concluded that there is a significant increase from training using resistance bands to improve the balance of badminton athletes. It can be an alternative for athletes or badminton coaches to use resistance bands as a medium and method to improve balance.

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