



Increased Speed and Agility Through Ladder Drill Variations

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ABSTRACT

This study aims to determine the effect of the ladder drill exercise with one foot in each and fight shuffle (group 1) and with the ladder drill with two feet in each and skiers (group 2) on increasing speed and agility. The method used in this research is Quasi Experiment. In this study, 30 samples were used which were divided into 3 groups which were given different treatments. This study uses the speed of measurement and agility. The results of this study showed that the speed and agility of the pretest and posttest results in group 1 showed an increase of 11% in speed and 14% in agility. while for group 2 there was an increase of 9% in speed and 16% in agility. Based on these results, it can be stated that the effect of the drill ladder exercise is one foot on each leg and a struggle to shuffle with the ladder drill two feet on each leg and skiers.

Keywords: *Ladder Drill; Speed; Agility.*

INTRODUCTION

The game of badminton is currently experiencing a lot of progress, change and very rapid development, both in terms of physics, technique, tactics in the game and the mentality of the players themselves. Physical condition is one of the factors that influence the increase in achievement. Thus the need for good training according to the goals and objectives of the exercise. As stated by (Bompa & Buzzichelli, 2015) in their book entitled "Periodization Theory and Methodology of Training" the purpose of training is to increase athletes' work capacity, effectiveness skills, and psychological qualities to improve their performance during competition. Development of any programmed physical exercise through general physical stages, special physical preparation, and building high-level biomotor abilities (Sahabuddin, 2017). The components in question are strength, endurance, speed, flexibility, agility, accuracy, coordination, reaction, and

balance (Ridwan et al., 2019).

Badminton is a sport that requires speed and movement mobility combined with agility which is usually used to cover the court (Asfiyani & Sulistyarto, 2016; Williyanto & Raharjo, 2016), or to chase the shuttlecock in all directions, the movement is fast and followed by a change of direction, both forward, backwards, left and right (Mangun et al., 2017; Farisi, 2018). Agility is a person's ability to change the direction of the body properly without affecting body coordination (Riyadi, 2021; Dionika, 2021).

Based on several components of physical condition, leg muscles are a very important component needed by most sports (Rubiyatno & Suganda, 2021). Badminton is a sport that requires leg muscle strength. The role of leg muscles in badminton is very important (Edmizal & Maifitri, 2021; Ishak et al., 2022). This is because badminton requires flexibility, speed, agility, endurance, strength, coordination, explosive power, balance, accuracy, and reaction, to meet biomotor needs (Nala, 2011; Soemardiawan et al., 2019; Rubiyatno & Suganda, 2021).

Training is a process of activities that are systematically arranged, programmed, and carried out repeatedly to achieve an increase to be achieved. Ardi & Rosmaneli, (2020) expressed the opinion that to improve athlete performance in badminton games (Lengga et al., 2020; Artha, 2021), physical fitness training is a very important thing to do, because no matter how good an athlete's technique is in playing if the physical condition is not good then the technique is lost (Hammado et al., 2020).

Therefore, training must follow the principles of gradual, systematic and programmed training (Kim, 2017). The main components in training are theory, practice, and the correct implementation procedures are then aimed at achieving a goal and objective (Rustandi & Safitri, 2019). Exercise is the implementation of repeated execution processes, exercises or jobs that increase the potential to achieve optimal performance (Bompa & Buzzichelli, 2015; Sari Helen Purnama, 2017; Dewi et al., 2021).

In doing an exercise there are elements of physical condition that cannot be separated, both in improving and maintaining it (Kusnadi et al., 2019). The main objective is to prepare physically for training to increase the functional potential of the athlete and develop biomotor abilities to the highest standard (Hana Puspita Santoso, 2017). Development of each programmed physical exercise through general physical stages, special physical preparation, and building high-level biomotor abilities (Bompa & Buzzichelli, 2015). The components in question are strength, endurance, speed, flexibility, agility, accuracy, coordination, reaction, and balance (Pritchard et al., 2019).

Based on the physical condition component, researchers were cornered in focusing on the speed and agility components (Putra et al., 2020). Because these two components are inseparable and are needed to support achievement in most sports, including badminton. Speed is a person's ability to move a distance in the shortest possible time (Juliyanto, 2016). Meanwhile, agility is a person's ability to change the direction of the body properly without affecting body coordination (Riyadi, 2021). Agility is not a single physical ability but consists of components of balance, coordination, speed, reflection, strength, endurance and stamina (Rahmad et al., 2020). These components interact with each other. An athlete's agility in fast body movements is a basic component in sports, including badminton (Subarjah, 2018). Badminton is a sport that requires speed and movement mobility combined with agility which is usually used to cover the court or to chase the shuttlecock in all directions, the movement is fast and followed by a change of direction, both forward, backwards, left and right (Al Farisi, 2018).

In recent years, along with the development of sports in the world, a form of training method known as the ladder drill has developed. A ladder drill is a form of exercise used to train SAQ (Speed, Agility, and Quickness) which involves progressive recipe exercises to develop an athlete's ability to become more skilled at a faster and more precise speed (Pandarwidi et al., 2020). Speed, agility, and quickness training allow athletes to work better on stimuli, more quickly and effectively, move effectively in multiple directions, and change direction or stop quickly to perform actions quickly, smoothly, efficiently, and promptly. Speed, Agility, and Quickness training has become popular way to work on the physical components of athletes, especially agility. In terms of needs, this type of sport is proven to be able to improve a person's ability in various sports.

This exercise uses a tool called a ladder, this tool is shaped like a ladder which contains ladder boxes, this box will be used as a footrest (Ramadhan et al., 2018). Ladder drills allow the feet to allow coaches and players to imagine and this exercise also has a pleasurable effect (Srinivasan & Saikumar, 2012).

This training ranges from general development to advanced skill development, from minutiae to faster movements (Firdaus et al., 2018). Given the working principle of slow and controlled movement and fast-moving, explosive movements used in teaching and learning development will have a greater chance of success (Rajendran, 2016). Ladder drills should be done earlier after warming up when the muscles have not experienced significant fatigue or are still fresh to perform good-quality movements (Khatri &

Valimurungan, 2015). Types of ladder drill exercises such as in-out shuffle, zigzag crossover, side right, one foot in each, two feet in each, fight shuffle, skier, ali shuffle, side to side jump and other ladder drills can increase speed and agility. This is following the opinion of Kusuma & Kardiawan (2017), who expressed the opinion that ladder drill training has a significant effect on increasing speed and agility in athletes (Promrit & Waijanya, 2019).

In addition, the results of observations that have been made show that UNDIKMA's badminton UKM has not carried out programmed training properly. So far, the exercise is done once a week, ideally, a good training program in the opinion of (Nurhasan, 2001) states that an effective exercise frequency is 3 to 5 times a week, if it is less than 3 to 5 times a week it will have no impact on the body.

In addition, during the training process, the practice was still conventional, that is, during the practice, the members of the Badminton UKM immediately wanted to play. This is also because the form of training is monotonous and makes members bored, therefore ladder drill is a fun and not boring exercise for badminton UKM members, and this exercise can help increase speed and agility according to research conducted by Pratama et al. (2018), with the title "The Influence of Ladder Drills And Jump Rope Exercise Towards Speed, Agility, And Power of Limb Muscle" and has been published in the IOSR Journal of Sports and Physical Education (IOSR-JSPE). The results of this study indicate that it can be concluded that ladder drills and jump rope exercises can increase a significant increase in speed, agility, and leg muscle strength. However, the ladder exercise was more effective than the jump rope exercise and the control group in increasing speed and agility.

So that these problems have an impact on the speed and agility of the members or athletes in chasing the shuttlecock in all directions to close the field. Speed and agility are very important components in supporting a good game. Badminton is a sport that requires speed and movement mobility combined with agility which is usually used to cover the court or to chase the shuttlecock in all directions, the movement is fast and followed by a change of direction, both forward, backwards, left and right (Al Farisi, 2018).

Based on the description of the background above, the researcher wants to help solve the problem with an alternative to providing training by improving physical conditions, especially in the components of speed and agility in members of the Mandalika Education University badminton UKM. So from that the researcher wanted

to conduct research with the title “The Effect of One Foot In Each Ladder Drill Exercise and Fight Shuffle with Two Feet In Each and Skier on Speed and Agility (Study at Mandalika Education University Badminton UKM)”.

METHOD

The type of research used in this study is quantitative research and the method used in this study is a pseudo-experimental method (Quasi Experiment). Maksum (2012) states that experimental research is distinguished by four characteristics: the presence of treatment, control mechanisms, randomization, and success measures, therefore if an experimental study cannot meet these four things it is called pseudo-experimental research (Quasi-experiment). This research design uses Matching Only Design, the design of this study does not use random like putting a subject into a group, but uses matching, i.e. pairing one subject with another based on a specific variable (Ali Maksum, 2012). The research design can be described in the table below as follows:

Table 1.
Research Design

M	T1 ₁	X1	T2 ₁
M	T1 ₂	X2	T2 ₂
M	T1 ₃	-	T2 ₃

The population in this study was all students of Mandalika University of Education (UNDIKMA) who participated in badminton UKM with a total of 120 people. The sample of all UNDIKMA students who actively participated in badminton UKM with a total of 30 people will be divided into 3 exercise groups. The sampling technique in this study is using the technique purposive sampling. The sample grouping technique in this study uses the technique of ordinal pairing. Ordinal pairing is the separation of samples based on the ranking of the results Pretest (Ali Maksum, 2012). The data analysis technique in this study is using a program Software application Microsoft Excel version 2010 and SPSS (Statistical Program For Social Science) version 21. The type of data collected in this study was a test of speed and agility from each group. Then the results will be recorded and calculated using the ANOVA Analysis Test Variance) with $\alpha = 0.05$ (Ali Maksum, 2012).

RESULTS AND DISCUSSION

Results

Table 2.
 Pretest and Posttest Group 1 Results Data

NO	NAME	SPEED		AGILITY	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>
1	SH	5.34	4.31	17.56	15.42
2	MIR	5.57	5.02	17.87	15.68
3	LIT	5.43	5.13	18.23	15.62
4	AAJ	5.34	4.89	17.56	15.51
5	AJ	4.91	4.62	16.68	14.72
6	MSR	5.18	4.52	16.67	14.32
7	AN	4.69	4.32	15.34	14.28
8	MPR	6.01	5.58	18.67	15.74
9	HP	4.12	3.66	15.12	13.33
10	MDY	4.57	4.23	15.73	14.65
Total		51.16	46.28	169.43	149.27
Average		5.116	4.628	16.943	14.927
Minimum		4.12	3.66	15.12	13.33
Maximum		6.01	5.58	18.67	15.74
Percentage		11%		14%	

Table 3.
 Pretest and Posttest Group 2 Result Data

NO	NAME	SPEED		AGILITY	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>
1	SA	5.05	4.84	17.29	15.12
2	RSP	5.52	5.21	18.12	14.81
3	ZH	5.24	4.92	17.89	15.34
4	HAM	5.72	5.31	18.78	16.59
5	AF	4.67	4.21	16.38	14.13
6	MIS	4.78	4.12	16.67	14.34
7	BAS	4.21	3.86	16.23	14.17
8	LMN	5.41	4.85	18.07	15.21
9	LS	5.25	4.91	17.58	15.42
10	AMP	4.15	3.82	15.16	13.25
Total		50	46.05	172.17	148.38
Average		5	4.605	17.217	14.838
Minimum		4.15	3.82	15.16	13.25
Maximum		5.72	5.31	18.78	16.59
Percentage		9%		16%	

Table 4.
 Data Hasil *Pretest* dan *Posttest* Group 3

NO	NAME	SPEED		AGILITY	
		<i>Pre Test</i>	<i>Post Test</i>	<i>Pre Test</i>	<i>Post Test</i>
1	AS	5.16	5.07	17.34	16.72
2	AK	5.77	5.63	18.42	18.17
3	LSB	5.32	5.27	17.83	17.41
4	FA	5.41	5.32	17.83	17.32
5	MPN	4.81	4.77	16.12	15.57
6	DM	4.83	4.72	16.39	15.72
7	MPN	5.61	5.38	18.17	17.53
8	W	4.23	4.12	15.62	15.29
9	S	5.28	5.17	17.39	17.12
10	IS	4.18	4.17	15.37	15.12
Total		50.6	49.62	170.48	165.97
Average		5.06	4.962	17.048	16.597
Minimum		4.18	4.12	15.37	15.12
Maximum		5.77	5.63	18.42	18.17
Percentage		2%		3%	

Table 5.
 Data Normality Test Results

Variable dan Test		Significant	Information	Status
Speed	<i>Pretest</i>	0,570	P>0,05	Normal
	<i>Posttets</i>	0,843	P>0,05	Normal
Agility	<i>Pretest</i>	0,549	P>0,05	Normal
	<i>Posttets</i>	0,321	P>0,05	Normal

Table 5.
 Data Homogeneity Test Results

	Levene Statistic	df1	df2	Sig.
Delta_Speed	3.184	2	27	.057
Delta_Agility	2.925	2	27	.071

Table 6.
 Test Results of Average Paired Sample Speed (Paired T-Test)

Speed	Sig. (2-tailed)	Information
Group 1	0,00	Significant
Group 2	0,00	Significant
Group 3	0,01	Significant

Table 7.
 Agility Paired Sample Average Difference Test Results (Paired T-Test)

Agility	Sig. (2-tailed)	Information
Group 1	0,00	Significant
Group 2	0,00	Significant
Group 3	0,00	Significant

Table 8.
 Levene's Test Results Of Equality Of Variances

	F	df1	df2	sig
delta speed	3,184	2	27	0,057
delta agility	2,925	2	27	0,071

Table 9.
 Multivariate Test Results

	Variable	P (sig)
Intercept	Pillai's Trace	0,000
	Wilks' Lambda	0,000
	Hotelling's Trace	0,000
	Roy's Largest Root	0,000
Group	Pillai's Trace	0,000
	Wilks' Lambda	0,000
	Hotelling's Trace	0,000
	Roy's Largest Root	0,000

Table 10.
 Hasil Test of Between-Subject Effect

Variable	P (sig)
Speed	0,00
Agility	0,00

Table 11.
 Post Hoc Test Results

Variable	Group	P (sig)
Speed	Group 1	Group 2 0,186
		Group 3 0,000
	Group 2	Group 1 0,186
		Group 3 0,000
	Group 3	Group 1 0,000
		Group 3 0,000
Agility	Group 1	Group 2 0,071
		Group 3 0,000
	Group 2	Group 1 0,071
		Group 3 0,000
	Group 3	Group 1 0,000
		Group 2 0,000

Discussion

Based on the results of the study, there is a noticeable influence with the results of ladder drill training with one foot in each and fight shuffle with two feet in each and skier on speed and agility. This is because judging from its implementation, both types of

exercises require the sample to perform fast, agile, precise movements, and change the direction of movement quickly.

Exercise Group Experiment 1 (Ladder Drill, One Foot In Each, and Fight Shuffle)

Based on the results of hypotheses about the effect of the ladder drill one foot in each and fight shuffle training on speed and agility, through a t-test or paired sample t-test. This can be seen from the significant value of < 0.05 , based on decision-making criteria, it can be concluded that the ladder drills one foot in each and fight shuffle exercises affect the increase in speed and agility in members of UNDIKMA Badminton UKM.

Group 1 treatment is a ladder drill with one foot in each and a fight shuffle, this movement is a dynamic training movement that requires athletes to run and jump through training aids in the form of ladders or training ladders quickly and continuously. Continuous contraction and increasing load every 2 weeks, make the speed and agility components increase. The results of this study are following previous research conducted by Sethu (2014), showing that ladder drill exercises can increase speed, agility, and explosive power. Ladder drills are an important part of team sports because they make it easier for athletes to move their legs during fast and precise movements (Chanrakumar, 2015).

Experimental Group Exercise 2 (Ladder Drill, Two Feet In Each and Skier)

Based on the results of hypotheses about the effect of two feet in each ladder drill and skier training on speed and agility, through a t-test or paired sample t-test. This can be seen from the significant value of < 0.05 , based on decision-making criteria, it can be concluded that the two feet in each skier ladder drill exercise affect increasing speed and agility in members of UNDIKMA Badminton UKM.

Group 1 treatment is an exercise ladder drill two feet in each skier, this movement is a dynamic training movement that requires athletes to run and jump through training aids in the form of a ladder or a quick and continuous exercise ladder. Continuous contraction and increasing load every 2 weeks, make the speed and agility components increase. The results of this study are following previous research conducted by Rajendran (2016), ladder drill is the best way to improve speed, agility, coordination, and overall speed.

Exercise Comparison

The difference in the results of the influence of each exercise can be seen through post hoc tests. The results of the post hoc test for ladder drill, drill, one foot in each and fight shuffle exercises have more influence on increasing agility. In terms of movement and selection of training forms, ladder drill one foot in each and fight shuffle have jumping movements of training ladder aids quickly and change directions to support agility in members of UNDIKMA Badminton UKM. Likewise, two feet in each ladder drill and skier exercises are more influential in increasing agility. The results of this study are following previous research conducted by Scrhirm (2011) said that ladder drill exercise is an exercise using a fitness tool in the form of a ladder where later a prospective athlete runs, jumps, and jumps with rapid foot movements through the stairs so that it can help develop the speed and agility of athletes. Ladder drill training can increase speed, agility, and explosive power (Sethu. 2014).

Thus, it can be concluded that one foot in each fight shuffle ladder drill exercise and two feet in each skier ladder drill exercise are suitable for improving biomotor speed and agility abilities. However, based on the selection of training forms, one foot in each fight shuffle ladder drill exercises and two feet in each ladder drill exercise and skier is more optimal in increasing agility.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the results of the analysis and discussion, it can be concluded that the ladder drill of one foot in each exercise and the fight shuffle with the ladder drill of two feet in each exercise and the skier has a significant effect on the speed and agility of members of the Mandalika Education University badminton UKM.

Suggestions

The ladder drill training method one foot in each and fight shuffle with two feet in each and skiers can be recommended and applied in club associations, organizations or school extracurricular training programs to increase speed and agility.

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