AJEB
journal.amca2012.org

AMCA JOURNAL OF EDUCATION AND BEHAVIORAL CHANGE
e-ISSN 2776-1185
Vol 2, No 1, April 2022, 45-50
DOI 10.51773/ajeb.v2i1.153

The effect of training models and flexibilities on the performance of service in sepaktakraw game

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KEYWORDS
exercise Model
leg Flexibility
service performance

ABSTRACT This study aimed to look at the differences in the effect of exercise models and leg flexibility on service performance in sepaktakraw games. This research was conducted at FIKK UNG Gorontalo. The method used was an experimental method with a 2x2 simple factorial design. Through simple random sampling, this study involved a number of 40 samples. The results showed that: 1) The gradual training model had a better influence on the performance of upper service in a sepaktakraw game than that of the actual service training model ($p \leq 0.05$), 2) For the group of high limb flexibility, the gradual training model had a better effect on performance top service in sepaktakraw games than the actual service training model ($p \leq 0.05$), 3) For low flexibility, the actual service training model has a better effect on the performance of top service in sepaktakraw games than the gradual service training model ($p \leq 0.05$), 4) There is an interaction between the training model and the flexibility of top service performance in sepaktakraw play ($p \leq 0.05$).

1. INTRODUCTION

Sepaktakraw is a traditional sport owned by the people of Indonesia. Proven in history, its existence is known in several regions with various terms such as *Maraga Akraga* in South Sulawesi, *Rago Tinggi* in Riau, *Soccerrago* in West Sumatra and Bengkulu, and *Sepak Raga* across Indonesia. Judging from its proper history, Sepaktakraw belongs to the category of superior sports that can scent and elevate the nation's dignity at international events.

The achievements of the Indonesian horizons began to be seen at the 2001 Sea Games in Kuala Lumpur. The Indonesian team only won bronze medals in the male and female team numbers, while the Indonesian men's team numbers were still below Thailand and Malaysia. Likewise, in the implementation of the 2005 Sea Games, Indonesia's achievements are not much different from the previous Sea Games. While the 2007 Thailand Sea Games, the Indonesian team won silver in the team number, team, and Doeble event. For hoop numbers, Indonesia is only able to win a bronze medal. When the match of 3 numbers in the final game at that time, Indonesia lost to Thailand with a score (0 - 3); in the men's team numbers, Indonesia lost (2 - 0) with a score in the first set (10-21) and the second set (9-21) while in the doeble event number, the Indonesian Team lost with a small score (0-2) and a large score (14-21) and (16-21). Based on the results obtained by the Indonesian team, it cannot be denied that the Indonesian *sepaktakraw* team is still below Thailand.

Based on the results of the coaches' evaluation and psychological aspects, the defeat of the Indonesian team was also caused by the lack of service appearance. Several times when serving at the multi-event sea games event, it can always be overcome by Thai athletes. It is due to the service provided by the Indonesian Team lacking accuracy in the target points that are difficult to reach by opponents. The intended target point is on the left side of the left wedge, the right side of the right wedge, the gap between the player *tekong* with the wedge right and left, to the back corner on the left and right side, towards the front of the net from the position of *tekong*, the right and left wedge. *Tekong* should do good service and be able to find weak and difficult targets to accept and control the ball (Persetasi, 1999). In addition, defeat also occurred given that the service performed did not cross the net and even went out of the playing field (out).

From the data recorded by the Indonesian Team coach, from 14 times serving in one set, 10 times entered, nine of which can be overcome by opponents and only one point, while the ball is out two times and the ball is caught on the net two times. Not comparable to the Thai Team of 19 times serving in one set, 16 times entering, of which eight times directly generate points, seven times can be overcome, and three times the net. From this data, it can be said that the defeat of the Indonesian team from the Thai team was due to weakness in the *tekong* sector.

This incident provides evidence that weakness in the *tekong* sector is a national problem so that losses often occur at each event for the Indonesian *sepaktakraw* team. With this in mind, *tekong* should do good service and be able to find targets that are weak and difficult to accept and control the ball (Persetas, 1996). That issue cannot be

viewed unilaterally, meaning that the defeat of the Indonesian team is part of the joint responsibility of the coaches and sports stakeholders. It means that the training must be intensified in the regions, especially in organizing and designing training materials to improve service performance.

According to Jamalong & Syam (2014), servicing is the initial kick carried out by passing the net and going into the opponent's field area. A good service is a service that can disrupt the opponent's defense, meaning that the service must have a varied ball speed, sharp and accurate, so that it can generate numbers without any resistance from the defense team. Servicing is an integral part of playing *sepaktakraw*, seeing that with a high service ability, it will allow the attacking team to get points without any resistance or counter-attack from the defending team, thereby increasing the number of points while winning a match. Even service is one of the basic techniques in the game of *sepak takraw*, which has a vital role for the success in the team (Syam, 2019).

For the development of technical performance in *sepaktakraw* games, variations of training models such as drills smashes, bait drills, block drills, and service drills are developed (Alfiandi et al., 2018). Team sports have many training models that are applied in games that are related to each other, where training lessons are generally carried out under conditions similar to the specifications of the game (Bomba, 1994). A well-planned and programmed training program will have a better impact on athlete performance (**?**).

The training model is a variety of exercises done by individuals and groups to develop techniques in accordance with the objectives to be achieved. In its application, this model can be carried out with trainers, playmates, and sparing partners who are prepared, and with the environment, for example by walls or using targets.

The staged distance training model is one of the many forms of training to improve serviceability in *sepaktakraw* games. In this model, the athlete performs the melee service training from the net or close to the target and then gradually continues to serve from the actual distance. It will be easier to see the service target area at this service distance. By this, the tekong will get used to directing the ball and swinging his feet towards the desired target, producing an accurate service to the target area. Adopted from the game of tennis, what is meant by a gradual distance twist service exercise is a service twist exercise in a gradual way from the middle of the field to gradually backward dividing the three stages of the service line, and given three service punch targets, right, middle and left. The purpose of this exercise is to practice accuracy in doing twist services (Prastyo et al., 2012).

The actual distance training model is a form of service training that athletes often do. The model of service training at actual distances is prevalent in conventional terms. Conventional training is an activity that is designed as usual and taught without modification (Gobbard etc, 1987). Adopted from the game of tennis that the staged distance twist service training exercise is a twisted service exercise in a gradual way from the middle of the field to gradually backward dividing the three stages of the service line, and given three service punch targets, right, middle and left. The purpose of this exercise is to practice accuracy in doing twist services (Prastyo et al., 2012).

This model is no different from the implementation of service during play, where the tekong serves from a distance in accordance with the rules of the game in *sepaktakraw*, which is carried out in a tekong circle line which is 4.25 meters from the center line and 2.45 from the back line. If this exercise is carried out continuously, it will have an effect on improving the ability of service, especially in directing the ball to the desired target by tekong. Appearance can be mastered by someone if learned or practiced and carried out continuously for a certain period of time (Edwin et al., 1992). With a good appearance, an athlete directly has a relationship in making efficient and efficient movements. Appearance is the degree of success in achieving a goal efficiently and effectively (Singer, 1980).

Based on the foregoing, service training at this actual location is a conventional training model, meaning that this exercise is carried out the same as performing service in play, where tekong performs service after getting the ball bounce from the left or right wedge, in the circle of tekong circles. 30 cm in diameter. So, this service training model is carried out in accordance with the rules in the *sepaktakraw* game, which aims to improve the ability to service by tekong so that it can direct the ball of service results to the target area systematically.

In addition to the service training models above, there are biomotor elements that affect the appearance of the service, namely flexibility. Flexibility is one of the physical components that everyone must possess to realize flexible movements. Flexibility is the ability to make movements in the joints or as far as possible as in the thigh joints or spinal joints (Herbart & Housh, 2013). Yassis (1992) says that flexibility is a measure of how far a person can move his arms, legs, and body at each joint.

Flexibility is crucial for almost all sports, because it shows the quality that allows a muscle segment to be able to move as much as possible according to its possible motion (Saleh, 2011). Moreover, in the *sepaktakraw* game, flexibility is important because this game uses movements to bend, bend and bend. Flexibility is the ability to move muscles and joints in all areas of movement (Alter, 1996).

2. METHOD

This study used an experimental method with a 2x2 factorial design. The independent variables are a gradual distance service training model and service model of actual distance, while the dependent variable is the appearance of upper service in sepaktakraw, and the categorical variables are high limb flexibility and low limb flexibility. The study population was male students in the Physical and Health Education Study Program Faculty of Health and Sport Science of the State University of Gorontalo (FIKK UNG) who had passed the Sepaktakraw course with a sample of 40 people. This sample was divided into four groups, where each group consisted of 10 people. The front split was utilized as the leg flexibility test. Furthermore, the service performance used was a process test and product performance service for the soccer takraw game made by researchers with a reliability level (r) of 0.95.

3. RESULT & DISCUSSION

TABLE 1. Summary of Service Performance Results of the Four Groups

	Exercise Model (A)		
Flexibilty (B)	Staged service (A_1)	Actual Service (A_2)	Amount
High (B1)			
n	10	10	20
$\bar{X}$	115.90	86.70	101.30
S	8.99	7.07	16.92
$\sum$ X	1159.00	867.00	2026.00
Low (B2)			
n	10	10	20
$\bar{X}$	91.20	106.00	88.90
S	5.59	3.62	8.87
$\sum$ X	912.00	1060.00	1972.00
Total			
n	20	20	40
$\bar{X}$	103.55	96.35	
S	14.62	11.31	
$\sum$ X	2071.00	1927.00	3998.00

3.1 Result

The results of data analysis conducted using Anava are summarized and presented in the following table.

TABLE 2. Summary of Results of Two Way Anova Performance of top service

Source of Variance	JK	db	RK	Fh	Ft(0.05)	Ft(0.01)
JKA (b)	72.9	1	72.9	1.66^{NS}	4.11	7.39
JKA (k)	518.4	1	518.4	11.84 **	4.11	7.39
JKA (bk)	4840	1	4840	110.52**	4.11	7.39
JKD	1576.5	36	43.794			
Total (R)	7007.9	39				

Based on Table 2, the results of a two-way variance analysis can be explained as follows.

3.1.1 Differences in Upper Service Performance between the Gradual Service Exercise Model Group and the actual Service Exercise Model Group

Based on the results of Anava calculations regarding the differences in the effect of the gradual service training model rather than the actual service training model on the appearance of the service in Table 2, there are differences between treatment treatments Fh = 11.84 $\geq$ Ft = 7.39. This result means that the null hypothesis (H0) which states that there is no difference in the appearance of the service between the group of gradual service training models and the group of service training models, is rejected. In other words, it can be stated that there is a very significant difference in the appearance of top service between the group of gradual service training models and the actual service training model groups. Service performance on the gradual training model group is higher (better) than service performance on the actual service training group (XA1 = 103.55 $\geq$ XA2 = 96.35). Furthermore, the level of difference using the Tukey test is summarized, as in Table 3.

TABLE 3. Results of Two-Way ANAVA with Advanced Tukey Test

Group	Mean Difference	Dk	Q_h
A1 and A2	7.2	2 ;40	6.575*
B1 and B2	2.7	2 ;40	2.465^{NS}
A1B1 and A2B1	24.7	4 ;40	16.700*
A1B2 and A2B2	57.3	4 ;40	13.049*

Note: * significant

Based on further tests carried out using the Tukey test, it is obtained the price of Q count (Qh) = 6,575 $\geq$ Q table (Qt) = 3.79 (α = 0.05). Regarding this result, there is a significant difference between the phased service training model and the actual service training model, the performance of the service to the group of the phased service training model has a greater influence than on the group of the actual service training model.

3.1.2 Differences in Top Service Performance that has High Flexibility between the Staged Service Training Model Group and the Actual Service Training Model Group

Based on the results of Anava calculations and continued with the Tukey test, it is proven that there is a difference for groups that have high flexibility between the phased service training model groups (A_1B_1) and the actual service training model (A_2B_1). In the A1B1 and A2B1 groups, the value of the Q count stands at 16,700 (Qh = 16,700), where this value is higher than the value of the Q table which is 3.96 (Qh $\geq$ Qt = 3.96), with the level of significance (α = 0.05). The results of top service performances that have high flexibility with a gradual service training model are higher (better) than those trained with actual service exercises (XAIBI = 115.90 $\geq$ XA2B1 = 86.70).

3.1.3 Differences in service performance over those with low flexibility between the Gradual Service Training Model Group and the actual Service Training Model Group

Based on the results of Anava calculations and continuing with the Tukey test, it is evident that there is a significant difference in low flexibility between the group of gradual service training models (A_1B_2) and the group of actual service training models (A_2B_2). In the A1B2 and A2B2 groups, the price Q count is 13,049, signifying that the Q count is higher than the Q table (Qh $\geq$ Qt = 3.96) with α = 0.05. There appears to be a difference in the results of top service performance that have low flexibility between the groups of trained models, with gradual service exercises being better than the actual service training groups (XA2B2 = 106.00 $\geq$ XA1B2 = 91.20).

3.1.4 Interaction between the exercise model and flexibility with top service performance

Based on the Anava calculation results as seen in Table 2, there is an interaction between the exercise model and flexibility, as shown by the obtained value of Fh AB = 110.52 $\geq$ Ft = 4.11. This result denotes that the achievement of the level of service performance is affected by the interaction between the training model and flexibility. The interaction between the training model and Flexibility in the appearance of top service can be seen in the following figure.

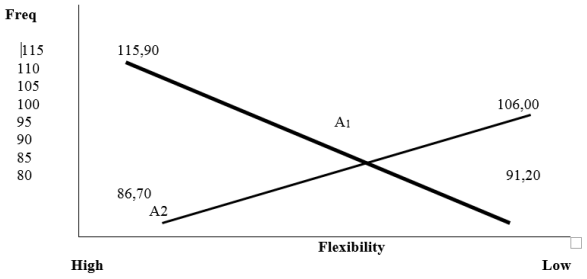

FIGURE 1. Interaction of the exercise model with split front flexibility

3.2 Discussion

3.2.1 The step-by-step training model has a better influence on top service performance in a sepaktakraw game than the actual service-exercise model.

The first hypothesis states that the gradual service training model (A1) has a better effect than students trained with the actual service practice model (A2) on the top service skills in *sepaktakraw* games. This truth can be accepted because it is in accordance with the results of the significant analysis.

A step-by-step training exercise is done by modifying the target distance in service, which is the stage I at a distance of 1.41 m from the center line of the field, stage II that is serving at a distance of 2.83, and stage III is at a distance of 4.25 meters with the help of a ball bounce from a coach or athlete the other. This distance variation is also intended so that athletes can adapt to the level of difficulty of implementing service accuracy training. In the initial stage, the distance between the blow (the server) and the target service area is closer; then, the server will easily direct the ball to the target service target area. Then move to the second stage and then to the third stage at the actual distance. This form of exercise is very effective for improving top service skills. Because in this exercise, athletes perform services that start from the easier implementation to the more difficult. At close range from the target field, the athlete will easily see the desired target. Then gradually, the athlete serves at a more difficult distance i.e. at the actual service line distance. However, if this training model is carried out continuously and systematically, it will be able to influence the athlete's ability to direct the ball correctly in serving. Thus theoretically proven to be able to provide special abilities to the top service skills in this game.

Step-by-step service training is one of the models of service-training drills performed at varying distances. The distance can be interpreted as the space (length, distance) between two objects and places. Staged from the origin of the word "stage" means level. Hence, the word "gradual" means multilevel. By this, it can be concluded that the gradual distance is the length of a place that is traveled in stages or stratified from the closest place to the real place.

The gradual range of service training model is carried out in a patterned, systematic, and continuous way to develop service capabilities in *sepaktakraw* games. This model is a specific exercise variation in the *sepaktakraw* game according to the principle of specifications. In coaching methods for technical development in general, *sepaktakraw* coaches are still oriented to the principle of physical training, namely the principle of specification training, for example, to increase the smash given a variety of specification exercises according to the objectives to be developed, including drill smash with ball bounce, smash with bait, or with direct application to attack tactics. Therefore, the gradual distance service training model is a variation of training for service skills development.

The gradual service training model is a creative, guided skills training model. Students receive assistance in the form of a gradual distance so as to facilitate the concept of movement of each student in accordance with the broad joint flexibility (range of movement) of each individual besides being given an assessment and evaluation of the results of service that the trainer has done and in the end, gives a very positive influence service appearance in the game *takraw*. At the same time, the fixed distance service provides independence to individuals so that it adapts to the natural atmosphere. This training model provides independence so that individuals do not know in detail the location of the shortcomings when doing service, both when the initial movement to the stage of follow-thrue. This statement is with Hakim (2013) research that the soccer takraw service training using gradual distance has a better influence than the exercise using fixed distance on the ability of *sepak takraw* service on extracurricular male students of SMP Negeri 1 Banjarmangu, Kab. Banjarnegara Academic Year 2011/2012. Group 1 (service group using fixed distance) had an increase in service ability by 45.71%, while group 2 (group training exercises using gradual distance) had an increase of 79.28%.

3.2.2 For groups of high limb flexibility with a gradual service training model, the effect is better than the actual service training model.

The results of the second hypothesis test showed that a group of students who have high flexibility with a gradual service training model has a better influence on top service skills than actual service training. This result is accepted as true because it is based on the analysis result that shows high significance.

These results are reinforced by the theory that flexibility is the ability to make the elongation of the joint motion as wide as possible. In addition to the joint space, flexibility is also determined by whether or not the muscles, tendons, and ligaments are flexible. Students with high flexibility will adjust to the gradual service exercise because this exercise requires a wide, flexible, and elastic range of motion. Thus, specific movements that require strength and speed will be better when the results have high flexibility.

High flexibility athletes who are given service training need time to adjust the movement in directing the ball to the service target area. Thus, the gradual service training model better influences the group of students with high limbs. This result is supported by Syam (2019) research that

groups of students who have a high motor ability, mastery of top service skills in the game of takraw football groups of students who follow learning by playing strategy methods are better than those groups of students who take lessons with drill strategy.

One's internal capacity greatly influences the mastery of the performance of the service; in this case, it depends on the flexibility of the muscles that will contract during service, especially the Musculus adductor. Age increase is one of the dominant factors in the development of motion, but the internal factor is the ability of one's motion cannot be ignored because it is closely related to the capacity of each individual (Syahruddin & Suyuti, 2016).

3.2.3 For low flexibility given a model of service training is actually better influence than the model of a gradual service exercise on the appearance of top service in a sepaktakraw game

The results of the third hypothesis test state that the gradual service training model (A1B2) is more or less influential in the group of students who are trained with the actual service training model (A2B2) at the level of lower limb flexibility of upper service skills in sepaktakraw games. This result is acceptable because it is based on an analysis that shows a significant significance.

The gradual service training model for students with low flexibility will experience few problems in implementing the exercise model due to the limitations in extending joint motion to the widest distance nearer the target service area, which is limited to a net height of 155 cm. Thus students who have low flexibility are better given actual distance service training than with actual service training in terms of improving top service skills in sepaktakraw games. This result is supported by Semarayasa (2016) research that groups of students who have low motor skills and service mastery of students who take lessons with drill strategies are better than groups of students who take learning with play method strategies.

There is an interaction between the training model and limb flexibility on the upper service skills in sepaktakraw games. It can be accepted in terms of the analysis results that have been carried out showing statistical significance.

Based on the results of the analysis where the average score of the gradual service training group with an average of 115.90 is greater than the actual service training with an average of 86.70, at a high level of limb flexibility. While the group of students who have low limb flexibility with the actual service training model = 106.00 is greater than the group with the gradual service training model = 91.20, which means that students who have high flexibility when given the gradual service training model are better than students who are given the training model real service. Whereas students with low flexibility are given a model of service training, the results are better than the gradual service training model. With these results, it can be concluded that there is an interaction between the exercise model and limb flexibility.

Munir et al. (2015) research results show that trainers to improve the quality of students' service performance should prioritize increasing leg muscle strength and flexibility because this factor is most influential in improving the service quality. Because of the wide flexibility of the hip joint and groin, it is very useful to reach the ball higher when servicing up and when performing basic tread techniques. This element of flexibility is always practiced repeatedly at the beginning of a workout or during a warm-up activity by doing stretching exercises. (Nur et al., 2019).

4. CONCLUSION

1. The step-by-step training model has a better influence on top service performance in a *sepaktakraw* game than the actual service-exercise model.
2. For groups of high limb flexibility training in a step-by-step service exercise model, the effect is better than the students who are trained in the actual service-exercise model,
3. For low flexibility given, a model of service training has a better influence than a model of a gradual service exercise on the appearance of top service in a *sepaktakraw* game
4. There is an interaction between the training model and the flexibility of the top service performance in the *sepaktakraw* game.

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