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The Impacts of Training and Eye - Hand Coordination toward Smash Outcome of Volleyball Extracurricular Members

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Abstract

The purpose of this research is to find out and analyse: the different impancts of Plyometric Split Squat Jump and Jump to box trainings toward smash outcome of volleyball extracurricular members in Public Senior High School 01 Soe, Southern Middle Timor Regency. The different impacts of high and low eye-hand coordination toward smash outcomes of the members. This research uses experimental method using factorial 2x2 design. The technique of analysing the data uses Analysis of Variant (ANOVA) on level of significance (α) 0.05. The independent variables are Plyometric Split Squat Jump and Jump to box. High and low eye-coordination are the attributes of the variables and the variables are related to smash outcomes. The findings of the research are: there is significant different impacts between those trainings methods toward the outcome with significant score (0.032) < α (0.05) and the score of F_{value} (6.036) > F_{table} (3.35), There is significant difference between high and low eye-hand coordination toward the outcome in which the significant score is (0.042), < α (0.05) and F_{value} (4.696) > F_{table} (3.35), There is an interaction among training methods and the coordinations toward the outcome with significant score (0.034) < α (0.05) and F_{value} (7.234) > F_{table} (3.35). The conclusions of this research are: there is significant difference between the training methods toward the outcomes; there is significant different between the coordinations toward the outcomes; and there is an interaction among the training methods and the coordinations toward the outcomes.

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INTRODUCTION

Volleyball is a group sport and needs to master the basic technique individually. It is absolutely important. It means that training on early steps need to emphasize on mastering basic technique of the games. Komala & Rahayu (2008), sports by playing ball have various affective successive factors of a certain team to victor a game. One of them is individual ability to master skills and technique as well as physical endurance. In playing volleyball, the most important techniques to master are doing service, passing, smashing, and blocking (Sahabuddin, 2012). Volleyball is a familiar sport branch in Indonesia because the game is done both by adults and children. The game is not only for refreshing but also to get achievement.

Various efforts to develop volleyball in some regions can be started from schools or universities, both public and private, through clubs established in each institution, both Junior High School, Senior High School, and even Higher Education in regional area or province levels. It also happens in educational domain. Volleyball game is also given in physical and health course.

One of affective factors determining students' interests are the existence of course given by sport and physical health teachers at schools and also volleyball extracurricular in which preferred at schools since the sport also can be competed to get achievement. Thus, there is an increasing number of the members joining the extracurricular, proven by many competitions followed especially by among Senior High School Students in Southern East Timor regency.

The ability in this sport relies on combination of physical, functional, behavior, and skill characteristics of doing sport (Silva, Figueiredo, Carvalho & Malina. 2014). The extracurricular at schools are directed to be chosen based on the students' preference, talents, and skills so that their abilities can be developed. It is expected to have well athlete candidates to train and to face some events, such as PORKAB, POPDA, PORPROV or the others.

Smash is a dynamic movement in which someone jumping high, hitting a certain moving thing using directed force accurately to pass the net (Sahabudin, 2012). Sahudi and Sujarwo (2009) argue Smash is a basic technique allowing volleyball players to pass the ball above the net by jumping as high as possible to pass through the blockage and breach into the defensive area of the opponent. Therefore, Smash is needed to be supported by well jumping skill. Smash is an easy way to get score (Beutelstahl, 2007). If a player will score a number in the game, the player must master Smash technique perfectly. In the game, Smash is useful to attack. Therefore, each player should master this technique since it is the main attack option.

Smash is a strong fist using hand to contact on the ball maximally on its upper parts so that the ball will quickly accelerate. When the ball is over the net, the ball msut be hit to dive into the ground (Feri Kurniawan, 2012).

This technique requires perfect accuracy skill to quickly direct the ball in breaching the blockages so that it will not go backward into one's defensive area instead of the opponent's area. There are some smash types based on the ball services from tossers: semi spike smash, open spike smash, quick A and B smash, rear attack smash (Suhadi & Sujarwo, 2009; Feri Kurniawan, 2012). While smashing, some factors are need to be considered: initiation, jumping, hitting, and landing. Smash must be done continuously to get perfect outcome.

The understanding and mastering of good volleyball techniques will help athlete to hit correctly. Therefore, a trainer must pay attention on the athletes whose high and low eye-hand coordination. Thus, the athletes with those coordination will have good smash compared to the low coordination athlete. Those coordination are complex skills requiring movement to foster and improve coordination (Pritama, 2014)

This research will focus on 01 Soe Public Senior High School students in the extracurricular whose ability to play volleyball. Based on the observation toward the students while competing, there are problems when the students smash. One of them is failed smash to

breach opponent's defensive area. It is seen when the ball is blocked and cannot pass through the net so that the ball falls into their own defensive area.

Smash ability is also affected by external factors such as training methods, and internal factors such as eye and hand coordination. The coordination is cooperation between central neuron structures with moving limbs while contracting in finishing motoric tasks accurately and directed in each sport activity. The coordination ability will result in succession to accomplish motoric tasks based on the sport demands. In volleyball, for example, foot, hand, and eye coordination have active roles to finish servicing, passing, smashing, and blocking. Sajoto & Heryanto (2009) say "eye-hand coordination is a movement occurred from integrated information into moving limbs.

METHODS

This research uses pseudo experimental method with 2x2 factorial design. ANOVA is used to analyzed the data with significant level (α) 0.05. The independent variables are split squat jump and jump to box trainings. High and low eye-hand coordination is as the attribute of the variable. Meanwhile, the dependent variable is the outcome of smashing. The population of the research is the members of the extracurricular, consisting of 36 athletes. The sample uses purposive samples with 24 members. The variables are independent variables: plyometric training, the attribute of the variable (eye-hand coordination), while the dependent variable: the outcome of smashing.

Normality data test has purpose to show the data from the population distributed normally. The test uses kolmogrov-smirnov using assistance of SPSS program on significant level $\alpha > 0.05$.

Homogeneity test has purpose to show two or more groups from same population with same variety. The test uses levene test aided by SPSS 16.0 on significant level $\alpha > 0.05$.

From the data gained must be responsible, then the data collection uses post-test by doing smashing test. Before the program is promoted, firstly, a coordination test of eye-hand by throwing softball to find out the level of eye-hand coordination whether it is high or low. Then a pre-test is done by having smashing test. The test is used to measure the outcome of smash.

RESULTS AND DISCUSSION

The test of research hypothesis is done based on data analyzed and interaction analysis of the variety. To find out the differences, ANOVA test is needed. From ANOVA summary, it shows significant differences

Source	df	Mean square	F	Sig.
Corrected model	3	12.375	8.573	.009
Intercept	1	282317.042	2.9993	.000
Training	1	8.375	6.036	.032
Eye-hand coordination	1	442.042	4.696	.042
Eye-hand coordination * Training	1	22.042	7.234	.034
Error	20	94.125		
Total	24			
Corrected total	23			

Hypothesis 1 states there is a significant different impact between split squat jump and jump to box trainings toward smash outcome tested using ANOVA. It gains $F_{value} = 6.036$ with significant score 0.032. The result is consulted to table F with dk numerator = 1(b-1) dk denominator (kb(n-1)), with significant level 0.005 gained $F_{table} = 3,35$, because $F_{value} > F_{table}$ or $6.036 > 3.35$ with significant level $0.032 < 0.05$ then H_a says: "there is significant different impact between significant training method, split squat jump and jump to box" is accepted.

Hypothesis 2 states there is different impact between high and low eye-hand coordination toward the outcome of smashing of the extracurricular members tested by ANOVA and gained results $F_{value} = 4.696$ with significant level 0.042. The result is consulted to table F with dk numerator = 1 (b-1) and dk denominator (kb(n-1)), with significant level 0.05 gained $F_{table} = 3.35$, because $F_{value} < F_{table}$ or $4.696 > 3.35$ with significant level $0.042 < 0.05$ then H_a says: "there is significant difference between high and low eye-hand coordination toward the outcome of smashing of the members" is accepted.

There is also an interaction among training method and coordination toward the outcome. By using ANOVA test, F_{value} = 7.234 with significant level 0.034. The calculation result is consulted to table F with dk numerator = 1 (b-1) and dk denominator (kb(n-1)), with significant level 0.005 gained F_{table} = 3.35, because $F_{value} > F_{table}$ or 7.234 > 3.35 with significant level 0.034 < 0.05 then H_a says "there is interaction among training methods and eye-hand coordination toward the outcome of smashing of the members" is accepted.

According to Redcliffe and Farentinos that "plyometric training can improve power of movement limbs on lower parts in which can be done by hulling, tiptoe walking, jumping, and bouncing (in Budhiarta, 2012). Therefore, the method is suitable to train smash because basically it is one way to score in the game.

There is interaction among split squat jump and jump to box training, eye-hand coordination toward smashing outcomes. It is due to the trainings have similarities to jumping in each exercising part. It is also related to smashing test using jumps. Although trainings have been given appropriately, but without good physical endurance then the purpose of the training will go in vain because in giving the trainings, a coach needs to consider physical endurance and condition of the athletes.

A coach must be aware of selecting the appropriate training program for the athletes because a mistake in determining the training will not improve the athletes. Based on the explanation above, there is interaction among methods of training and eye-hand coordination toward smashing outcome. Player with high or low eye-hand coordination are suitable to train by having plyometric: split squat jump to improve smashing outcome rather than jump to box training.

CONCLUSION

Based on the analysis and discussion, the conclusions are: there is different impact between plyometric split squat jump and jump to box toward the outcome of smash of the members of the extracurricular; there is different impact between the players with high and low eye-hand coordination toward the smashing outcome; there is interaction among plyometric training method and eye-hand coordination toward smashing outcome of the members.

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