

Contribution of Arm Muscle Strength and Flexibility to Result in Radslag on Physical Education Students

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Abstract: This research is a quantitative research using survey method. This study aims to determine the contribution between arm muscle strength and flexibility either individually or collectively to the learning result of radslag gymnastic practice. This research was conducted at the Islamic University of Riau with the number of samples as many as 50 Physical Education Student. Research method using correlation design. From the results of data analysis proves that: (1) There is a positive contribution between arm muscle strength to radslag gymnastic practice with 64% contribution. (2) There is a positive contribution between flexibility to radslag gymnastic practice with a contribution of 28%. (3) There is a positive contribution between arm muscle strength and flexibility together to radslag gymnastics practice with 52% contribution. Thus the proposed hypothesis proves that the independent variables have contributed to the dependent variable either individually or collectively.

1 INTRODUCTION

We as human beings living in this era of globalization are faced with a reality of challenges in life. We are required to improve ourselves to face various challenges and problems that usually arise in everyday life. One of the way is exercising or sport activities. Exercise has positive values in building our character as human beings. Values such as discipline, responsibility, creative, critical, sportive, competitive, proactive, cooperative are things we can get from exercise other than health benefits, which are important for our physical fitness.

In addition, sports activities aims to create a completely physically, spiritually and socially healthy human. That is why sports activities are very closely related to nation and state' life. Therefore, it is required a sport guidance and development as stated in the Law of the Republic of Indonesia No.3 Year 2005 on National Sport System.

Guidance and development of sports is important especially among sports academics. Because socializing sports needs the role and participation of sports academics both at the government level and in conducting community service. In addition, sport development can also be done in the environment of Formal Education such as at the University having Sports Study Program. Sports Education teaches a variety of sports, such as athletics, gymnastics, swimming, martial arts and various types of sports

games such as basketball, football, volleyball, takraw, handball and so on.

From the above various sports, gymnastic is one growing and quite popular sport among the community, especially for sports students. This can be seen from the increasing interest of sports students who participate in gymnastics at the university and club. Currently, gymnastics development is also supported by the number of championship held regularly for certain age levels, from small to big scale, such as: POMNAS which organizes inter-university gymnastics to National Sports Week (PON) and international events from Sea Games, Asian Games to Olympics.

Gymnastics is one sport included in the learning curriculum of Physical Education Health and Recreation Study Program at the Islamic University of Riau. Gymnastics is studied by first grade students in the first and second semesters. In this learning, students are introduced to various kinds of gymnastics and way to learn them. The risk of gymnastic injuries seems to be proportional to the level of the athletes; the higher the level of gymnastics, the more hours are spent in practice, with a greater exposure time. With the increased risk in gymnastics, the incidence of acute injuries will also increase, and as the skill level increases, the load during the workout will also increase, providing more opportunity for chronic injuries (Meeusen, R. and Borms, J., 1992).

Considering the results of gymnastic practice is closely related to optimal repetition, the presentation is given once a week. In addition, students are provided and recommended to practice themselves or in groups in their own spare time.

However, with the various efforts undertaken in the implementation of this gymnastics course, scores obtained by the students are quite low. Students are generally got C and D while B only found a few. Students with A score are rarely found. Sometimes there are students who do not pass the course. Indirectly, students are difficult to get high scores in this course.

From another perspective, students in gymnastics practice classes have set the standard that will be achieved. For 100% practice exam, students get a maximum score of 60 (60%). While the theory score is maximum 30 (30%) and 10% of the task. So, for the practice score itself, students will achieve:

- 50 - 60 = Very Good
- 40 - 49 = Good
- 30 - 39 = Fair
- 20 - 29 = Poor
- 10 - 19 = Very Poor

Considering standard state or practice score mentioned above and relating to score got by students so far, it means that most students are in range 30-39. Given the low scores achieved by the students, several lecturers' assumption arise at the faculty especially lecturer at Physical Education Health and Recreation Study Program, Faculty of Teacher Training and Education, Islamic University of Riau (FKIP UIR).

Some of lecturer have assumed that most of the students are follow too many practice courses offered and must be taken in the relevant semester. Essentially, every type of sports that they participated has specific and different training and demand, both physically and mentally. Some lecturer argue that gymnastics movement is difficult to do by students having weight heavier than normal weight because most of the gymnastics movement depends on speed, strength, flexibility, and move weight from one point to another.

One taught gymnastics type is Radslag gymnastics movement. Its learning is conducted routinely every week with a pre-programmed training schedule. It is supported by facilities and infrastructure such as mattresses and equipment. To master Radslag movement, first is learning movement theory, then understand the movement steps and then practice the movement skills. Long training is required continually to master the movement. According to Peter Werner (2012: 5), "Gymnastic may be globally defined as any physical exercise on the floor or apparatus that promotes

endurance, strength, flexibility, agility, coordination, and body control". Moreover, to support it, it takes a fit physical condition including muscle flexibility and strength. Physical attributes were obtained by anthropometry and from tests of flexibility, leg power, maximum oxygen uptake and visuo-motor proficiency. Training and psychological measures were derived from self-administered questionnaires that included the Leadership Scale for Sport, Psychological Skills Inventory for Sport, General Health Questionnaire, Sport Competition Anxiety Test, and several questions on sport motivation and enjoyment (Hume, P.A., Hopkins, W.G., Robinson, D.M., Robinson, S.M. and Hollings, S.C., 1993).

The aim of the present investigation was to study the possible effects of specificity of training on muscle strength and anaerobic power in children from different sports and at different performance levels in relation to growth and maturation status. Hundred and eighty-four children of both gender participating either in swimming, tennis, team handball or gymnastics were recruited from the best clubs in Denmark (Bencke, J., Damsgaard, R., Saekmose, A., Jørgensen, P., Jørgensen, K. and Klausen, K., 2002).

Flexibility is often defined as one's ability to move the body or parts in the widest possible space, without injury to the joints and muscles around it. Due to flexibility is based on the extent of body movement around the particular joint, flexibility level needed will vary in each sport. According to Bompa (2015: 67), "Flexibility refers to the range of motion around a joint. Improving flexibility is a fundamental element of a young athlete's training program because good flexibility enables the athlete to perform various movements and skills easily and helps prevent injury".

Flexibility, as a component of physical fitness, is one's ability to move the body and its parts at the field movement without feeling tension in the muscles. In sports, flexibility is important, higher flexibility will tend to minimize injury. Low/high flexibility level of athletes is not determined by their posture, but training. Therefore, long and continual training is necessity to gain a good flexibility.

It also required strength of the excellent arm muscle. According to Paavo V Komi (2008: 6), "The term strength will be employed to identify the maximal force or torque that can be developed by the muscles performing a particular joint movement (e.g. elbow flexion, knee extension). Strength is a very important component in improving one's overall physical condition. The purpose of this study was to report the knowledge used by expert high-performance gymnastic coaches in the organization of training and competition. In-depth interviews

were conducted with 9 coaches who worked with male gymnasts and 8 coaches who worked with female gymnasts (Côté, J. and Salmela, J.H., 1996).

Maximal isometric muscular strength and anthropometric characteristics were studied among three random samples each containing about 180 Finnish men belonging to three generation cohorts, and having a mean age of 32.9 ± 1.4 , 53.1 ± 1.5 and 72.7 ± 1.4 years (Viitasalo, J.T., Era, P., Leskinen, A.L. and Heikkinen, E., 1985). Muscular strength is one of supports for achieving maximum performance. Referring to Thomas R. Baechle (2008: 4), "At the most basic level, the strength and conditioning professional is concerned with maximizing physical performance and must therefore conduct programs that are designed to increase muscular strength, muscular endurance, and flexibility". In the sport that mostly using arm muscles such as gymnastics, arm muscles strength is very significant because its movements requires good strength to master and present the movement properly and correctly. Flexibility and strength elements of Radslag are dominant, so it is proper that movement becomes the focus of learning. Increased interest in alternative approaches to thoracotomy has developed because of the considerable morbidity associated with the standard posterolateral technique. We conducted a prospective, randomized, blinded study of 50 consecutive patients to compare postoperative pain, pulmonary function, shoulder strength, and range of shoulder motion between the standard posterolateral and the muscle sparing thoracotomy techniques (Hazelrigg, S.R., Landreneau, R.J., Boley, T.M., Priesmeyer, M., Schmaltz, R.A., Nawarawong, W., Johnson, J.A., Walls, J.T. and Curtis, J.J., 1991).

Based on the observation made in teaching gymnastics on Students at Physical Education Health and Recreation Study Program, Faculty of Teacher Training and Education, Islamic University of Riau, the found problem is some students have not mastered Radslag movement skills. This is seen from students during Radslag training, the movement is still stiff and no balance on the foot. In addition, many students do not have excellent arm muscle strength which it can result to less than maximum mastery of Radslag movement. Based on the results above, we want to conduct a research that can prove contribution of arm muscle strength and flexibility against the radslag training result of the students at FKIP UIR.

2 METHODS

This research is classified as quantitative research by using correlation technique. This method was used to find a relationship between two different variables. Independent variables in this study are arm muscle strength and flexibility while the dependent variable is radslag gymnastics. It can be seen in the constellation below for more detail.

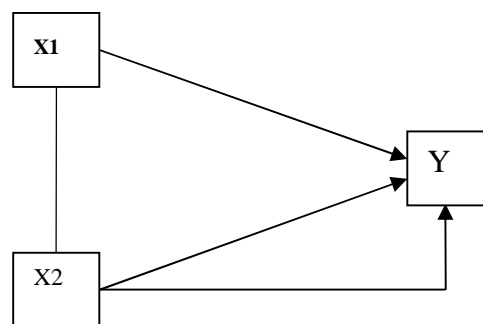


Figure 1. Constellation of Research Variables.

Remarks:

- X1 = Arm muscle strength
- X2 = Flexibility
- Y = Radslag

Population of this research was 50 undergraduate students class 2A who attended gymnastic course at Physical Education Health and Recreation Study Program, Faculty of Teacher Training and Education, Islamic University of Riau (FKIP UIR).

Table 1. Research Population.

NO.	CLASS	Amount
1.	2.A	50

Source: Observation Data

The sampling technique used was total sampling i.e. the entire population of 50 students were used as sample research. Data obtained in this study are primary and secondary data including arm muscle strength, flexibility and radslag gymnastics movement. In accordance with the data required in this study, the obtained source data are from Gymnastic Lecturers Team of FKIP UIR. Data collection in this research was done from the measurement test result. Radslag Gymnastics Test was observed morphologically from the initial, primary and final phases. Flexibility Test was measured by using Sit and Reach Test while arm muscle strength was measured by using Dynamometer.

3 RESULTS

In accordance with the problems described in the previous section, the research result will be explained. This study includes two independent variables which are arm muscle strength and flexibility; and one dependent variable i.e. Radslag Gymnastics. The research data described is related to the measurement results of all variables. Data obtained from it will be explained below.

Test results of the first hypothesis shows that the proposed hypothesis is accepted. This shows that there is a positive contribution between arm muscle strength to the radslag practice result on students at Physical Education Health and Recreation Study Program, FKIP UIR. In the hypothesis test, the results of correlation coefficient analysis is r value = 0.80 which states a high relationship between arm muscle strength variable with learning outcomes of radslag gymnastics practice while the contribution itself is 64%. This means that, if the students have excellent arm muscle strength, the result of radslag gymnastic training tends to be good and vice versa.

Test result of the second hypothesis shows that the proposed hypothesis is accepted. This shows that there is a positive contribution between flexibility to learning outcomes of radslag gymnastics practice on the students at Physical Education Health and Recreation Study Program, FKIP UIR. In the hypothesis test, the results of correlation coefficient analysis is r value = 0.64 which states a high relationship between flexibility variable with learning outcomes of radslag gymnastics practice while the contribution of variable on the results is 28%. This means that, if the students have good flexibility, the result of radslag gymnastic training tends to be good and vice versa.

Test result of the third hypothesis test shows that the proposed hypothesis is accepted. This indicates that there is a positive contribution between arm muscle strength and flexibility together to the result of learning practice of radslag gymnastics on student at Physical Education Health and Recreation Study Program, FKIP UIR. In the hypothesis test, the results of multiple correlation coefficient analysis is r value = 0.71 which states a very high relationship between arm muscle strength and flexibility variables to the learning practice results of radslag gymnastics. While the contribution of the variables to the learning outcome is 52%. This means that, if students have excellent arm muscle strength and supported with good flexibility, the learning outcome tends to be good and vice versa.

4 CONCLUSIONS

Based on data analysis and discussion in this research, it can be concluded as follows:

1. According to first hypothesis test result, it shows that there is a contribution of arm muscle strength to radslag gymnastic movement of students at Physical Education Health and Recreation Study Program, FKIP UIR as many as 64%.
2. According to first hypothesis test result, it shows that there is a contribution of flexibility to radslag gymnastic movement of students at Physical Education Health and Recreation Study Program, FKIP UIR as many as 28%.
3. According to first hypothesis test result, it shows that there is a contribution of both arm muscle strength and flexibility together to radslag gymnastic movement of students at Physical Education Health and Recreation Study Program, FKIP UIR as many as 52%.

The implications of the research results show that there is a contribution of arm muscle strength and flexibility individually and jointly to the learning practice result of radslag gymnastics on students at Physical Education Health and Recreation Study Program, FKIP UIR. As an implication or follow-up of the research, trainers who want to teach radslag gymnastics should know and train flexibility and arm muscle strength. Having excellent muscle strength and flexibility will make it easy to learn and master radslag gymnastics well. Therefore, training that can improve flexibility and work of arm muscles shall be prioritized to support the radslag gymnastic movement.

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