

THE RELATIONSHIP BETWEEN ARM MUSCLE STRENGTH AND SHOULDER JOINT FLEXION WITH PITCHING BALL SKILLS IN SOFTBALL GAMES

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Abstract

There is a significant relationship between arm muscle strength and pitching ball skills in Semester V Students of the Department of Coaching Education FIKKM Unima Tondano. Thus it can be ascertained that arm muscle strength contributes meaningfully to ball pitching skills in the game of softball. There is a significant relationship between shoulder joint flexibility and pitching ball skills in Semester V Students of the FIKKM Unima Tondano Coaching Education Department. Thus it can be ascertained that the flexion of the shoulder joint contributes meaningfully to the pitching ball skills in the game of softball.

INTRODUCTION

Softball is a sport that has long been known in our country, and in recent years the sport has been increasingly improved, both in terms of the quality of the game and in terms of socializing it. This means that it is hoped that softball can be widely known by all levels of society as well as other sports. The problems mentioned above are not only experienced in our area, but also in FIK Unima, especially the Coaching Department, in softball lectures attended by many students, it is not supported by adequate facilities and infrastructure, so students in throwing catches wait their turn because gloves and balls are very minimal. Thus, softball achievements are impossible for us to expect. FIKKM Unima students, especially the Department of Coaching Education, mostly can and play softball, but according to the author's experience during lectures and current observations of good training in softball clubs, there are still many players who are unable to bounce the ball (pitching ball) well, resulting in a weak rebound and easy for the opponent to make a hard blow. If this happens, then in itself the chances for the opponent to get points are very large. But by not neglecting other factors, a player in order to play softball well, should first master the basic techniques of the game. The basic techniques that need to be mastered in softball according to Parno are: 1) Throwing techniques, 2) Catching the ball, 3) Hitting, 4) Sliding (sliding), 5) Base running. Among the basic techniques mentioned above, the technique of bouncing the ball for a pitcher is one of the very important factors in the game of softball, because a precise and hard bounce will make it difficult for a batter or batter to make a good shot.

There are two types of pitcher bounces: the slingshot technique and the windmill technique. Both types of ball bounce techniques mentioned above, have their own reliability and depend on the player's habits to choose and use in certain situations or conditions.

In addition to mastering good ball bounce techniques, a pitcher needs to have good condition skills to support the right and hard bounce results. This physical factor is often also referred to as a physical condition that can be divided into several components, namely :

1) Speed, 2) Power, 3) Endurance, 4) Explosive Power, 5) Flexibility, 6) Agility, 7) Accuracy, 8) Balance, and 9) Agility. One component of physical condition that is very important possessed by a pitcher is the component of arm strength and flexibility of the shoulder joint.

A pitcher who has strong arm muscles and good shoulder joint flexibility, automatically the results of the bounce will be harder, faster and right on target desired by a catcher. A pitcher should have long, flexible and strong arms. He must be good at coordinating the movements of his arms, shoulders and body. For the purposes mentioned above, the physical elements that contribute to ball pitching skills in the game of softball are arm muscle strength and shoulder joint flexibility. Softball players who have arm muscle strength and shoulder joint flexibility will easily perform and produce an effective and efficient pitching ball. From the description above, it is very clear that a softball player in addition to mastering the basic techniques of good pitching ball, is also required to have arm muscle strength and shoulder joint flexibility. To see if arm muscle strength and shoulder joint flexion or both contribute to pitching ball skills in softball, the authors wanted to conduct a study titled : The

relationship between arm muscle strength and shoulder joint flexibility with pitching ball skills in softball games in Semester V Students of the FIKKM Unima Coaching Education Department in 2022. Operationally in this study is to know:

1. Is there a relationship between arm muscle strength and pitching ball skills in softball games in Semester V Students of the FIKKM Unima Coaching Education Department in 2022?
2. Is there a relationship between shoulder joint flexion and ball pitching skills in softball games in Semester V Students of the Department of Coaching Education Department in 2022

Is there a relationship between arm muscle strength and shoulder joint flexibility together with pitching ball skills in softball games in Semester V Students of the FIKKM Unima Coaching Education Department in 2022?

METHODS

The method used in this study is an experimental method.

Research Variables

1. Independent Variable:

Arm muscle strength (X₁)

Flex of the shoulder joint (X₂)

2. Dependent Variable: Ball pitching skill in the game of Softball (Y)

Research Design

The research design used in this study is the correlation of product moment and multiple:

RESULTS AND DISCUSSION

A. Data Presentationsuring arm muscle strength (X₁), shoulder joint flexibility (X₂) and pitching ball ability can be seen in the following table:

No	Kekuatan Otot Lengan (X ₁)	Kelentukan Sendi Bahu (X ₂)	Pitching Ball (Y)
1	35	71,7	14
2	26	77,7	11
3	26	67,6	15
4	29	75,3	18
5	27	79,5	9
6	22	76,4	12
7	24	75,8	13
8	36	73,9	17
9	26	70,4	14
10	35	64,1	16
11	36	72,5	21
12	29	70,5	13
13	30	70,4	18
14	34	72,6	18
15	33	65,9	16
16	30	72,8	24
17	27	71,3	10
18	32	72,8	16
19	30	70,4	25
20	29	71,1	17

Table I The results of mea Variable Measurement Results X₁, X₂ and Y

1. Relationship Analysis X₁ and Y

The calculation of the relationship between X₁ and Y or between arm muscle strength and pitching ball skills of Semester V Students of the FIK Unima Coaching Education Department obtained the magnitude of the correlation coefficient = 0.47 or robs (rx_{1y}) = 0.47 while rtab with sample (n) = 20 at $\alpha = 0.05$ obtained rtab = 0.444. In accordance with the test criteria that accept Ho if robs < rtab (; n).

From this result shows that the robs value > rtab or 0.47 > 0.444, means Ho is rejected and accepts Hi. In accordance with the research hypothesis can be concluded; There is a significant relationship between arm muscle strength and pitching ball skills in softball.

2. Relationship Analysis X₂ and Y

The results of the calculation of the relationship between X2 and Y or between the flexion of the shoulder joint and the pitching ball skills of Semester V Students of the Department of Coaching Education FIK Unima, obtained the magnitude of the correlation coefficient = 0.31 or robs (rx2y) = 0.31 while rtab with sample (n) = 20 at = 0.05 obtained rtab = 0.444.

In accordance with the test criteria that accept Ho if robs < rtab (; n). From this result shows that the value of robs > rtab or 0.31 > 0.444, means Ho is rejected and accepts Hi. In accordance with the research hypothesis, it can be concluded that there is a significant relationship between shoulder joint flexibility and ball pitching skills in softball games in Semester V Students of the FIKKM Unima Coaching Education Department.

3. Relationship analysis X1, X2 and Y

The calculation results of the analysis of the relationship between X1 and X2 together with Y show the magnitude of the price Freg = 3.88. For degrees of freedom (db) equal to m versus (n-m-1) or 2 versus 17 at real level = 0.05 obtained the price F table (Ftab) = 3.59. These results show that the value obtained from observation is significant.

DISCUSSION

1. The relationship of arm muscle strength (X1) with pitching ball skills (Y)

Based on the results of the test analysis between arm muscle strength (X1) and pitching ball skills (Y), a correlation coefficient = 0.47 or robs (rx1y) = 0.47, while rtab = 0.444 or by showing that the relationship between arm muscle strength and pitching ball skills of Semester V Students of the Unima FIKKM Coaching Education Department There is a significant relationship, with the magnitude of determination R2 = 0.2209 showing that arm muscle strength can make a meaningful contribution to students' pitching ball skills by 22.09%.

2. Shoulder joint flexion relationship (X2) with full smash precision (Y)

Based on the results of the test analysis between the flexion of the shoulder joint (X1) and pitching ball skills (Y), the magnitude of the correlation coefficient = 0.31 or robs (rx1y) = 0.31, while rtab = 0.444 or by showing that the relationship between the flexibility of the shoulder joint and pitching ball skills of Semester V Students of the FIK Unima Coaching Education Department, There is a significant relationship, with the magnitude of determination R2 = 0.0961 shows that shoulder joint flexibility can make a meaningful contribution to the pitching ball skills of Semester V Students of the FIK Unima Coaching Education Department by 9.61%.

3. The Relationship Between Arm Muscle Strength (X1) and Shoulder Joint Flex (X2) With Pitching Ball Skill (Y)

The calculation results of the analysis of the relationship between X1 and X2 together with Y show the magnitude of the price Freg = 3.88. For degrees of freedom (db) equal to m versus (n-m-1) or 2 versus 17 there is a real rate = 0.05 obtained obtained price F table (Ftab) = 3.59.

These results show that the value obtained from observation is significant. Therefore, it can be concluded that the relationship between X1 and X2 with Y or between arm muscle strength and shoulder joint flexibility with ball pitching skills is significant. Thus, the pitching ball skills of Semester V Students of the FIK Unima Coaching Education Department are predicted by the strength of arm muscles and the flexibility of the shoulder joint.

CONCLUSION

A. Conclusion

Based on the results of the study, several conclusions can be drawn as follows:

1. There is a significant relationship between arm muscle strength and pitching ball skills in Semester V Students of the Department of Coaching Education FIKKM Unima Tondano. Thus it can be ascertained that arm muscle strength contributes meaningfully to ball pitching skills in the game of softball.

2. There is a significant relationship between shoulder joint flexibility and pitching ball skills in Semester V Students of the FIKKM Unima Tondano Coaching Education Department. Thus it can be ascertained that the flexion of the shoulder joint contributes meaningfully to the pitching ball skills in the game of softball.

3. There is a significant relationship between arm muscle strength and shoulder joint flexibility together with pitching ball skills in Semester V Students of the FIKKM Unima Tondano Coaching Education Department. Thus, it can be ascertained that pitching ball skills can be predicted by the strength of arm muscles and the flexibility of the shoulder joint.

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