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Effect of Dynamic Stretching on Flexibility of Hamstring Muscles in Male College Students of Sindh Province

Muhammad Aijaz Siraj^{1*}

Prof. Dr. Soniha Aslam²

¹ Director Physical Education, Govt. College of Physical Education, Karachi, Pakistan. PhD Scholar, Centre for Physical Education, Health & Sports Sciences, University of Sindh, Jamshoro, Sindh, Pakistan. Corresponding Author Email: aijazsiraj@yahoo.com

² Professor, Centre for Physical Education, Health & Sports Sciences, University of Sindh, Jamshoro, Sindh, Pakistan. Email.- Soniha.aslam@usindh.edu.pk

Abstract

To determine whether a dynamic stretching training program is useful for evaluating young adults' hamstring muscular flexibility. Using a non-probability convenience sampling approach, an experimental investigation was conducted on 12 students in good health between 16 to 19 years old. All participants were notified of their involvement in the study and informed consents were taken. Prior to the start of the training program, the PAR-Q (physical activity readiness questionnaire) was also applied as a fitness examining instrument. Twelve randomly chosen individuals who participated in a dynamic stretching exercise program made up Group A. Scores from sit-and-reach tests were gathered. Over the duration of two weeks, the 40-minute training program was conducted. The frequency, mean, and standard deviation of the collected data was established using

descriptive analysis. Additionally, the Paired T-test was employed to ascertain the data's significant value at a P-Value of less than 0.05. The participants' average age was 17.8, and their standard deviation was 0.9. Pre-score for group A was 16.87, while post-score was 17.93. Group A's mean score showed a significant difference ($p < 0.0171$). A dynamic stretching training program improved hamstring muscular flexibility. One may choose a dynamic stretching training program if they want to quickly increase their hamstring muscle flexibility. It is fair to believe that dynamic training programs are helpful.

Key Words: Hamstring muscle, Flexibility, Stretching, Dynamic.

INTRODUCTION

In order to expand a flexibility of a muscle or muscle group, stretching is a form of physical exercise that involves positioning a body part in a certain way (Afonso et al., 2021). Stretching exercises are used extensively in both sports and rehabilitation. Although the precise process is still unknown, stretching has been demonstrated to change the joint's maximum range of motion (ROM), commonly referred to as flexibility, both instantly and over time (Cornelius et al., 1992). Dynamic stretching is a popular stretching method that enhances the trained muscles' physiological function and aids in estimating the amount of energy and effort required of them (Faelli et al., 2021). Since dynamic stretching replicates the motions performed in the subsequent activity and there is currently no proof that dynamic stretching reduces functional performance during activities or exercises, it is believed to be better than other stretching approaches for warming up (Samson et al., 2012).

Maximum muscular performance is enhanced by dynamic stretching; yet, differences in the stretching's time and motion may be misconstrued as differences in the effects that occur right away (Mine et al., 2016). Prior research has demonstrated that 30 minutes after stretching, the impact of stretching on functional performance, as shown by power, reduced. This suggests that less than 30 minutes following stretching is the maximum functional performance assessment that may be seen. Acute effects occur immediately after stretching (de Medeiros Barbosa et al., 2018). While short-duration dynamic stretching is advised to prevent performance from being impacted, long-duration dynamic stretching is advised to enhance performance (Behm & Chaouachi, 2011). The ability to move a joint over its full range of motion (ROM) is

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known as flexibility without experiencing discomfort or limitations (Silveira et al., 2011), and it significantly affects how well athletes perform (Gunaydin et al., 2020). Being flexible is essential to physical wellness. Age, gender, Flexibility is influenced by joint type, tendon, ligament, muscle extensibility, and degree of physical fitness. (Amiri-Khorasani et al., 2011). Muscle stiffness is determined by dividing the muscle's length by its change in strength (P. J. McNair et al., 2001).

The detrimental effects of inactivity and sedentary behavior on one's health are a common concern (Hall et al., 2021). Fewer than 1.5 metabolic equivalents of energy expenditure that involves in any awake activity when standing, sitting, lying down, or reclining is considered sedentary conduct (Tremblay et al., 2017). An adult should engage in moderate-intensity exercise for at least one hundred and fifty minutes and vigorous-intensity activity for seventy five minutes, or a comparable mix of both each week in order to be deemed physically active (Organization, 2010). Numerous non-communicable diseases are linked to physical inactivity and significant worldwide economic implications (Lee et al., 2012).

METHODOLOGY

An experimental investigation that lasted two weeks was carried out (Ross, 1999) after obtaining the students' consent via a consent form. Twelve students (Ross, 1999) of young adults made up the study's sample size between the ages of 16-19 years. Using a non-probability convenience sampling approach, the study's sample was obtained. Every person who was selected for the research was in good health; those who were unwell were excluded. Prior to starting the dynamic stretching training program, the physical activity readiness questionnaire (PAR-Q) form was selected to be adopted as a fitness assessment instrument. Each participant was assigned to a single group and given the responsibility of doing a dynamic stretching exercise program. The following method was used to acquire the data: Everyone was instructed to warm up for 10 minutes before training started, and they were then given the same amount of time to quickly cool down. The participants were required to execute each activity for 30 seconds, followed by a 20-second recuperation period. The entire training session lasted forty minutes, including the warm-up and cool-down periods and was done twice over the course of two weeks (Ammann et al., 2014). Data was

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collected through sit and reach test(Ayala et al., 2012).

S. No	Activities	Exercises performed	to be Intensity	Duration
1.	Warm-up	Jogging	Slow	10 min
2.	Exercises	Dynamic Flexibility Exercises 1. High Knee, 2.Forward Lunges, 3.Front Leg Swing, 4. Single Leg Romanian Deadlift.	Stretch until you feel restricted or a little uncomfortable.	20 min
3.	Cool down	Walking and Jog with simple body stretching exercises		10 min

(Ammann et al., 2014). Frequency and percentage tables, as well as the paired t-test, were utilized to display the descriptive data. The significant value was $P < 0.05$.

RESULT

Table 1. Shows the participants' mean age, which was 17.8 having a standard deviation of 0.9.

Table 2. Shows the research participants' genders as a percentage and frequency.

Table 3. Shows the mean results of the sit-and-reach test before and after the training session.

The sit and reach test's before and post values show a significant difference (p-value < 0.0171).

Table 1 shows the participants' mean age.

N	Minimum	Maximum	Mean	Std. Deviation
Age in 12 years Valid N 12 (listwise)	16	19	17.8	0.9

Table 2 shows the study participants' genders as a percentage and frequency.

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	Male
Group A	12 (100%)

Table 3 shows the mean sit-and-reach test scores before and after the training session.

	Mean (SD) Inches		
	Pre	Post	P-value
Group A	16.87(2.57)	17.93(2.73)	0.0171

DISCUSSION

It's crucial to understand that Stretching may affect other metrics of value than flexibility. While static stretching may actually have the opposite impact, dynamic stretching has been demonstrated to get better performance measures including power, speed, and agility (Shrier, 2004). Neither the patients nor the researcher were kept in the dark about the stretching procedures. However, this prejudice was lessened by using an unbiased observer to measure the ROM (Willy et al., 2001). Due to the nature of dynamic stretching the active group spent less time in a prolonged position after stretching, even though researcher tried to possess both groups stretch for a comparable time frame (3 × 30 seconds). Furthermore, the amount of repetitions in the dynamic stretching exercise might vary from person to person. (Gabbe et al., 2003). It's also unclear how long you haven't worked out, how long it has been since the injury, and what rehabilitation methods you have used. Those who had been injured within the last months were not included since it was believed that their normal recuperation of range of motion subsequently an accident would have skewed the results. It was also believed that those who had not experienced an injury within the last 12 months were less likely to exhibit symptoms of reduced flexibility. Researcher haven't examined every dynamic stretching technique, so results from different stretching protocols may vary. While there is ongoing disagreement over the optimal number of repetitions and stretch time(P. McNair, 2007), the methodology chosen here is in line with conventional.

Additional research is required to determine how other agents, such eccentric training(Nelson & Bandy, 2004) or other stretching techniques, like PNF (Funk et al., 2003), might improve hamstring flexibility. This is especially important since eccentric exercise may potentially affect other potential risk variables, including muscular

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strength, during recovery (Proske & Morgan, 2001). Based on the facts now available, it makes logical to advise against stretching just before to strength and power workouts (Cramer et al., 2004). Although this claim has been disputed, Any detrimental impacts on strength performance can be reversed by dynamic stretching or a general warm-up that follows static stretching(Holt & Lambourne, 2008). Dynamic stretching, however, is advantageous before a force-dominant exercise (Carvalho et al., 2012). Dynamic stretching either doesn't affect or even diminishes strength and power performance(Bradley et al., 2007). After the findings, data analysis, result and discussion of the current investigation, the hamstring muscles' flexibility is significantly impacted after the training of dynamic stretching in group A.

CONCLUSION

An effective strategy for engaging in physical activity and achieving physical well-being is the dynamic stretch training program. To provide efficient training programs, its scope can be expanded to other regions of the nation. The dynamic stretching exercise program's efficacy and potential, which can be completely leveraged in the future, are still untapped, as evidenced by the significant differences in the parameters examined in this study. Following the study's results, data analysis, and discussion, it is determined that group A's hamstring muscles' flexibility is significantly impacted by dynamic stretching.

SUGGESTIONS

- According to the study's findings, dynamic stretching training is forms of effective stretching and clearly beneficial. The current study may be adjusted to target different age groups, such as elderly people and students at universities and schools, because it is evidence-based and student-focused. Future research projects could also look at other elements.
- This training is more economical and cost-effective and may be easily applied in any location regardless of the location, the great majority of women in contemporary culture find it difficult to participate in any type of fitness training program. In most civilizations, they are not authorized to participate in any training program or be admitted. Dynamic stretching activities make it possible to do stretching exercises without visiting a gym, club, or academy. They may sign up and accomplish their health and fitness goals with ease. Because they may be done whenever

it's most convenient for them, dynamic stretching are excellent options for working women who don't have much time for their exercise routine. Housewives may easily perform dynamic stretching at home, which makes it perfect for their way of life.

- We also have the opportunity to physically promote the fitness program at establishments such as companies, organizations, colleges, universities, and multinational firms.
- With the advent of COVID-19, in particular, our lifestyle will grow more sedentary and less physically active over time. Therefore, promoting these activities is essential to building a healthy society. These stretches may be promoted by electronic and social media platforms, such as television, which may broadcast the fitness training program daily during the morning show. Given the sedentary lifestyle of today's world, hamstring injuries will become a major problem for our children. We need to raise awareness of this issue and educate others about it. By stretching, we can reduce the severity of this problem.

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