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Long-Term Retention and Skill Transfer Effects of Massed and Distributed Practices in Learning a Top Roll Technique in Arm Wrestling

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Abstract:

This research paper explores the comparative effects of massed practice and two distributed practices on learning and retaining the top roll technique in arm wrestling. The study investigates not only the immediate skill acquisition during practice sessions but also the long-term retention and transfer of the learned technique to different arm wrestling contexts. Novice arm wrestlers will be engaged in practice sessions and assessed at various intervals to understand the optimal training approach for skill development and performance enhancement.

Key Words: Long-Term Retention, Skill Transfer, Massed Practice, Distributed Practice, Learning, Top Roll, Arm Wrestling, Skill Acquisition, Motor Skill Development, Performance Enhancement, Skill Retention, Practice Interval, Practice Schedule, Novice Arm Wrestlers, Training Protocols, Skill Transferability, Competition Performance, Training Methodologies, Skill Acquisition in Sports, Practice Effects

Introduction:

Arm wrestling is a physically demanding sport that heavily relies on technique, strength, and endurance. The top roll technique is one of the most effective and commonly used techniques to gain leverage over an opponent's arm. Understanding how different practice schedules impact skill acquisition and retention of the top roll technique is crucial for arm wrestlers and coaches seeking to optimize training protocols and enhance performance.

Research Questions:

What are the short-term effects of massed practice and two distributed practices on the immediate acquisition of the top roll technique in arm wrestling?

How does skill retention differ between massed practice and two distributed practices over an extended period?

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To what extent does the top roll technique learned through massed practice and distributed practice transfer to other arm wrestling techniques and real competition scenarios?

Methodology:

Participants:

30 Male novice arm wrestlers with similar levels of experience and skill were Subjects for the present study.The age of the subjects were between 17 years to 21 years. The subjects were divided into three groups i.e. A , B and C of nine students each. Each of the group was randomly assigned to the different experimental groups. Group 'A' was assigned to the massed practice group where as, group 'B' and 'C' acted as a distributed practice groups.

Experimental Design:

Randomly assign participants into three groups: massed practice, two distributed practices, and a control group (no practice).

Training Protocol:

The massed practice group will undergo continuous, concentrated training sessions without rest intervals, while the two distributed practice groups will have their learning sessions spread over two separate days with rest intervals in between. The control group will not receive any specific training.

Training Sessions:

Participants in the practice groups received expert instruction on the top roll technique and engage in structured practice sessions. The experimental treatment was given in alternate days (thrice in a week) for a period of four weeks. Training was of thirty minutes duration.

Top Roll in Arm Wrestling was used to assess the comparative effect of three methods i.e. one massed and two distributed practices. Before starting the training session, all the subjects were fully instructed regarding their learning methods. The Investigator assembled all the subjects and explained about the massed and distributed practice to them.

In case of massed practice group 'A', the investigator explained the whole method. In this method subjects performed the skill continuously which was going to be learnt without any intermittent pauses up to twenty minutes of practice session with the instructions imparted by the investigator.

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In distributed practice groups 'B' and 'C', method was also explained in detail before staring the practice session to the subjects, which belonged to group 'B', that is, distributed method. In this method the skill was practiced in short but frequent practice sessions and these practice periods were divided by rest intervals of alternate skill learning.

It was also practiced for 30 minutes of practice session but in this method first there was five minutes rest, then 10 minutes practice, then again five minutes rest and again 10 minutes practice. There were, in total thirty minutes for the physical practice of the skill excluding the alternate five minutes of rest period in between the training session with instructions which was given by the investigator

For the distributed practice group 'c', method was also explained in detail before starting the practice session to the subjects who belonged to group 'c' that is other distributed method. In this method the skill was practiced in short but more frequent practice sessions and these practice periods were divided by rest intervals of alternate skill learning. It was also practiced for 30 minutes of practice session but in this method the time was first five minutes practice then five minutes rest and this was continued till the 30 minutes practice. In between the training session instructions were given by the investigator.

Data Collection:

Measure and record participants' top roll performance scores at the end of each training session and during retention tests at specified intervals (e.g., 1 day, 1 week, 1 month).

Skill Transfer Assessment:

Evaluate participants' ability to apply the learned top roll technique in arm wrestling matches against different opponents and in various arm wrestling scenarios.

Experimental Design

Post test only random group design was employed for the purpose of comparison of three groups namely Massed practice group and two Distributed practice groups on learning a straddle vault skill

Statistical Analysis

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To find out the comparative effect of the three practice groups on learning straddle vault skill, one-way analysis of variance (ANOVA) was employed at .05 level of significance. For inter group comparison, least significant difference test (LSD) was used.

Findings

To observe the difference between three different groups of one Massed and two distributed Practices, the analysis of variance was adopted and data pertaining to these has been presented in table 1 and 2.

TABLE – 1

ANALYSIS OF VARIANCE IN REALTION TO THREE DIFFERENT GROUPS OF ONE MASSED AND TWO DISTRIBUTED PRACTICES

Source of variation	DF	SS	MSS	F-Ratio
Between Groups	2	110.63	55.31	3.68*
With in Groups	24	360.17	15.00	

* Insignificant at 0.05 Level of Confidence

F 0.05 (2,24) = 3.40

Table – 1 revealed that there was significant difference between three different groups of one Massed and two distributed Practices, as obtained F ratio was 3.68, which was higher value than the value 3.40 required for F-ratio to be significant at 0.05 level with (2, 24) degree of freedom.

Since the one-way analysis of variance was found significant in relation to three different groups of one Massed and two distributed Practices, the least significant difference (LSD) test was applied to find out which of the differences of the means amongst the three different groups were statistically significant.

TABLE – 2

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LEAST SIGNIFICANT DIFFERENCE POST-HOC TEST FOR MEANS OF THREE DIFFERENT GROUPS OF ONE MASSED AND TWO DISTRIBUTED PRACTICES

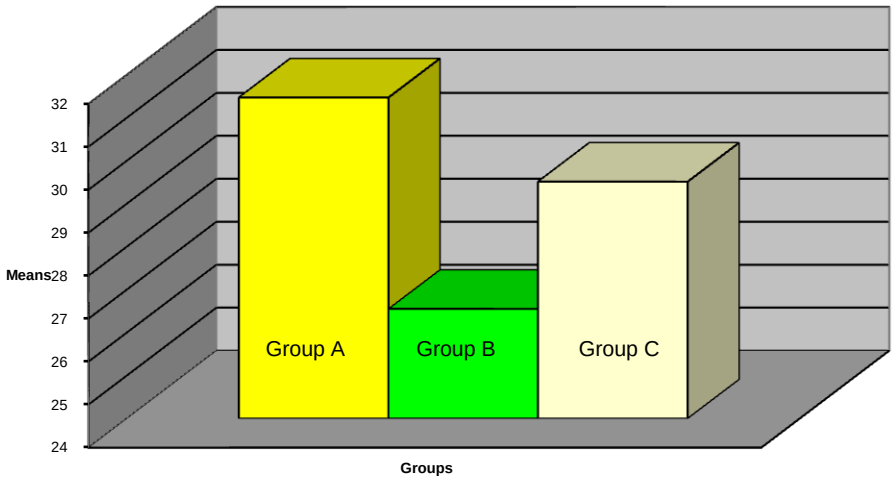
Means			M.D.	C.D.
Group A (Massed)	Group B (Distributed –1)	Group C (Distributed –2)		
31.47	26.55		4.92*	4.76
	26.55	29.51	2.92	
31.47		29.51	1.96	

*Significant at .05 level.

It is evident from table – 2 that mean differences of all the three groups was found to be significant between group A & group B

Mean difference between (table – 2) group B & group C; group A & group C did not prove to be significant at .05 level of confidence.

Figure-1: Comparison of the means of three different groups of one massed and two distributed practices



Conclusions

ISSN PRINT 2319 1775 Online 2320 7876
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(1) Massed practice proved to be superior than first distributed practice in learning straddle vault skill (F – value =3.68)

(2) The sequence of learning by the three groups was massed practice group (31.47) > first distributed practice group (26.55)= second distributed practice group (29.51)= Massed practice group (31.47).

Discussion

The analysis of data clearly reveals that massed practice group is superior over distributed practice group 'B'. Superiority of the massed practice group may be due to the fact that continuous practice of the skill affect the learning process of the skill. Because the continuity in practice make the Arm Wrestlers to understand the skill and have clear picture of the skill. Moreover continuity keep the Arm Wrestlers in touch with the process of learning which ultimately affect the learning process.

Insignificant difference was found between the massed practice group and distributed practice group 'c'. Probable cause may be due to the fact that the practice was given only for five minutes and followed by five-minute rest, short duration of practice was not sufficient to learn the skill for the beginners, because beginners need continuous practice to learn some skill.

Distributed practice group 'B' and distributed practice group 'c' were found to be statistically insignificant, this may be due to the fact that during rest period they did not involved in any other activity so inactivity during rest may be the probable cause.

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