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Impact of Volleyball Participation on Agility and Speed Performance of Secondary School Level Players
(A Quasi-Experimental Pretest & Posttest Study in a Single Group Design)

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Abstract

The aim of this quasi experimental study was to evaluate the effects of volleyball participation on speed and agility of the secondary school level girls' volleyball players. The research study was conducted in the FG Girl's Public School of Chaklala Region. The non-probability sampling technique i.e. convenient sampling had been employed to choose the population. The population of interest was not too large so all the participants had been selected for the research study. Total 40 students were opting the physical education subject as their optional subject in their secondary level. These students were in their part one. They were selected as the intervention group and the rest were in control group. After recruitment the pre-test data regarding the speed and agility had been collected. After eight weeks, four days per day, following the coaching classes of volleyball, the post-test data had been collected from both the groups. The pre and post-test data was analyzed and compared using the SPSS. The findings of inferential analysis indicated that the t-test sign. P-vale of pretest and posttest scores was 0.000 which showed that the alternate hypothesis was accepted i.e. Volleyball participation was significant effects upon the speed of the secondary school level female volleyball players. The results also showed that the p-value of t-test of pretest and posttest scores of Illinois agility test was 0.000 which indicated that the volleyball participation was have significant effects upon the agility of the secondary school level female volleyball players. Hence the hypothesis was accepted.

Keywords: Volleyball, Speed, Agility, Secondary School Level Players

Introduction:

Sports and games are part and parcel of healthy life for all age groups. Sports are not only essential for good health but also necessary for physical development as well as emotional, social and mental development of individuals. Individuals regularly participate in sports or any other physical activity tends to reduce or manage weight more quickly as compared to others who do not participate in sports. The active individuals can avoid diseases. Volleyball is included in team sports. In volley ball there are two teams play in opposition to one another, each consisting of six players, a total of 12 players' game. Volleyball includes many technical skills like serve,

shooting, blocking, digging and passing. To play volley ball a player should be physically and mentally alert and physically fit. Volleyball is also included in the physical education curricula of federal board of intermediate and secondary education, Islamabad at secondary class level part one. Volleyball is recognized globally to enhance the physical fitness of a player. Participation in sports especially in volleyball improves the physical fitness components as well as the skill based components of physical fitness of payers. Regular participation in volleyball leads to significant improving in skill related fitness components like agility as compared to the individuals who mere take the physical education classes (ziyang, 2023).as we all know that the sports and physical activities increases and refines the gross as well as fine motor skills of the players, because the physical activities strengthens the muscles and increases the power of muscles to generate energy and produce the focused movements. Participation in volleyball develop the gross motor skills of the players (astute, 2018). Sports are essential not only for the physical development of the individuals but also holistic development of individuals in all aspects, physical, emotional and social. Sports and physical activities help in socialization of individuals. Sports man or players are social agents in the society. They promote the cultural values. Sports gives the players place for making the social terms and relationships with other persons. Sports activities provides the players a platform to make the social interactions with other players (bilgin and kurcan 2024). Motivation either intrinsic or extrinsic helps the individuals to energize and helps in goal directed activities. Beyond the social, emotional and physical aspects, volleyball is one of the sport who develop long term motivation of active participation in the players beyond the school or college environment (ziyang, 2023). From all above evidence based literature and discussion it can be concluded that the volleyball should be the essential component of sports programs at the school as well as college level, it fosters and inculcated the long term health and wellbeing among the school or college level players (ancog 2025; solijonovich et al, 2024). Volleyball is an important sport because of so many reasons. Volleyball sport increases the physical fitness of the players. It improves the speed and agility. Players who participate in volleyball sport develop their coordination, improves their reaction time and reactive power. In volleyball speed and agility are most important. Agility refers to the ability of an individual to quickly change the direction and speed means the maximum distance covered in a minimum duration of time. These both skills help in actively participating I many phases: receiving ball from unpredictable directions and responds quickly. There is research based evidence from the past researches that the volley ball helps in improving the speed and agility of the participants. According to literature a study on effects of exercise intervention protocol that includes the agility drills like zig zag and speed drills for six consecutive weeks improves the agility of female volleyball players (bassa et al., 2024). In another study it has been reported that agility ladder4 drills and shuttle run drills 10 meter to 20 meters in an intervention protocol for six weeks, three days a week, significantly increased the agility and speed of the elementary school level girl volley ball played aged 12 to 15 years (chang et al.,2019). In another study of impact of plyometric exercises on volleyball players, it has been reported and concluded that plyometric training for six weeks, three days per week, improves the agility i.e. quick change in direction of female players in volleyball and do not significantly improves the speed (samet sitti and yasar koroglu.,2022). By inculcating the core training with agility and balance exercises in an intervention protocol, improves the ability of players to quickly change the directions called agility (cakir and ergin, 2022). According to the report of BMC sports science, medicine and rehabilitation, the young female volleyball players are in deficiency of agility skill. Which needs to be improved.

Problem Statement:

Physical activity is associated with healthy life and in active lifestyle is associated with the increased rate of diseases. Now a days, due to number race in our education system, the physical fitness of young children become a focus of attention, due to very limited or no physical activity or sedentary school hours. It has been noticed that at school level there is very little or no attention towards the sports of girls as compared to the boys. Physical activity is important for girls as well. It has been observed that the inactivity of girls at adolescent age, is due to lack of sports opportunities at schools (WHO, 2020). Volleyball is a dynamic sport due to its unique role it plays to improve the physical fitness of the participants. It involves the continuous footwork, frequent jumps, speed sprints and rapid change in directions, improves the physical fitness as well as skill related fitness of the participants especially speed and agility. Evidence of research on volleyball participation effects on elite players is present but the effects of volleyball participation on secondary level girls' remains scarce. Moreover, the effects of volleyball participation on speed and agility of the secondary level girl players has not been explored especially in Pakistan and specifically in the territory of Rawalpindi and Islamabad. Therefore, there was a need to investigate the effects of volleyball on speed and agility to explore whether there is significant effect of volleyball participation on speed and agility or not, in secondary school level girl players. The findings of the study may be used to integrate the volleyball in the curricula at secondary level to improve the physical fitness of girls.

Objectives:

Objectives of the research study:

- To investigate the effects of volleyball participation on speed of secondary school level female volleyball players.
- To investigate the effects of volleyball participation on agility of secondary school level female volleyball players.

Hypothesis:

Following hypothesis of the research study:

- H_A1 volleyball participation will have significant effects upon the speed of the secondary school level female volleyball players.
- H_A2: volleyball participation will have significant effects upon the agility of the secondary school level female volleyball players.

Methods and Materials:

Study design:

The quasi experimental research design was adopted to investigate the effects of volleyball participation upon the speed and agility of the secondary school level female volleyball players. Two groups have been formulated one control and one experimental. The control group consisted of the participants who do not participated in the volleyball, merely was taking the classes of health and physical education. And the experimental group consisted of the girls who participated in the volleyball sport. And also a member of school volleyball team. They also took the classes of health and physical education classes with the control group members.

Workplace and facilities:

The study was conducted in the FG girls' public school, tariqabad, chaklala region.

Population:
The population of the research study titled "the effect of volleyball participation on the speed and agility of the female volleyball players", was all the female players of secondary school level who participate in the volleyball.

Sampling:
The non-probability sampling method, the convenient sampling has been used to choose the sample.

Sample population:
By using the convenient sapling technique, the secondary school level female volley players of FG Public School for Girls' Tariqabad, Chaklala Cantt was selected as population for the given study. As the population of interest was not too large so all the members have been selected as a sample.

Data collection procedure:
Before the final recruitment of the samples into the research study the informed consent had been obtained from the participants of the experimental group (the secondary level girls studying health and physical education subject but intends to participate in the volleyball as well). All the details about the research study "Effect of volley ball participation on agility and speed performance of secondary school level girl players", had been described in detail to all the participants. After obtaining the informed consent from the participants, they were enrolled in the experimental group. The control group consisted of the girls in secondary level part 1 class, opting or studying the health and physical education but were not willing to participate in the volleyball or any other sports program. After finalizing the members of both groups experimental and control, the pre-test data collection had been done to measure the speed and agility of participants of both groups and the pretest data had been recorded. As there were the two dependent variables of the study i.e. speed and agility. To measure the speed 30 dash test of speed had been conducted. To measure the agility of the participants, the Illinois test of agility had been conducted. After pre-test the next phase was the intervention phase. In the intervention phase both the groups were taught the subject health and physical education as a regular school task. But in addition to taking the classes of health and physical education, the experimental group participated in the volleyball coaching properly at school, by the researcher and school volleyball coach. The physical classes of volleyball were arranged in the four days a week for eight weeks. In these classes the participants were engaged and taught many skills of volleyball like passing, shooting, serve, digging and blocking. Special focus was given to the footwork and quickness of the participants. After following these physical classes schedule by the intervention group participants, the post-test was collected from the participants of experimental as well as control group.

Variables:
Dependent variables of the study were speed and agility. And the volleyball participation was the independent variables of the study.

Data analysis procedure:
To summarize and describe the characteristics of the collected data the descriptive statistics were used and the recorded data were tabulated and analyzed by using the SPSS version 21.

Descriptive Analysis:

Table 1: showing the Descriptive Statistics of pretest and posttest scores

	N	Minimum	Maximum	Mean	Std. Deviation
30m speed test-pretest(time in sec)	30	5.00	6.99	5.9790	.66393
30m speed test-posttest(time in seconds)	30	4.30	6.75	5.4227	.68024
Illinois agility test pretest scores	30	17.01	20.96	19.1780	1.19683
Illinois agility test post scores	30	15.95	20.16	18.2280	1.25295
Valid N (list wise)	30				

The table 1 showing the descriptive statistics of pretest and posttest scores of 30-meter sprint test and Illinois agility test. Total number of participants were 30. Mean scores in pretest of 30-meter sprint test was 5.9790 sec and the posttest scores of 30-meter sprint test was 5.4227 sec. the Illinois agility pretest mean score was 19.178 and the Illinois agility posttest mean score was 18.2280.

Table 2: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
30m speed test-pretest(time in sec)	30	100.0%	0	0.0%	30	100.0%
30m speed test-posttest(time in seconds)	30	100.0%	0	0.0%	30	100.0%
Illinois agility test pretest scores	30	100.0%	0	0.0%	30	100.0%
Illinois agility test post scores	30	100.0%	0	0.0%	30	100.0%

Table 2 show the case processing summary of speed test i.e. 30-meter sprint test and agility test i.e. Illinois agility test. The test scores of pretest and posttest of both the variables i.e. speed and agility were available for the analysis.

Hypothesis testing:

Hypothesis 1:

H_A1 volleyball participation will have significant effects upon the speed of the secondary school level female volleyball players.

Table 3: Paired Samples Statistics of speed test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	30m speed test-pretest(time in sec)	5.9790	30	.66393	.12122
	30m speed test-posttest(time in seconds)	5.4227	30	.68024	.12419

The table 3 showed the paired sample statistics of pretest and posttest scores of 30-meter sprint speed test. The mean score pretest of 30-meter speed test was 5.9790 and the mean posttest score of 30-meter sprint speed test was 5.4227.

Table 4: Paired Samples Correlations of speed test

		N	Correlation	Sig.
Pair 1	30m speed test-pretest(time in sec) & 30m speed test-posttest(time in seconds)	30	.967	.000

The table 4 showed the paired sample correlation of 30-meter sprint speed test. The significant value was 0.000 which indicate that this difference was not due to by chance.

Table 5: Paired Samples Test

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	
Pair 1	30m speed test-pretest(time in sec) - 30m speed test-posttest(time in seconds)	.55633	.17353	.03168	.49154	

Table 6: Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95% Confidence Interval of the Difference Upper			
Pair 1	30m speed test-pretest(time in sec) - 30m speed test-posttest(time in seconds)	.62113	17.560	29	.000

Table 6 showed the result of paired sample t test of pretest and posttest scores of 30-meter sprint speed test. The sign. P-value was 0.000 which indicates that there was significant effect of volleyball participation of speed on the volleyball players. Hence the hypothesis was accepted.

Hypothesis testing:

Hypothesis 2:

H_A2: volleyball participation will have significant effects upon the agility of the secondary school level female volleyball players.

Table 7: Paired Samples Statistics of Illinois agility test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Illinois agility test pretest scores	19.1780	30	1.19683	.21851
	Illinois agility test post scores	18.2280	30	1.25295	.22876

Table 7 shows the paired sample statistics of Illinois agility test. The mean pretest score was 19.1780 and the mean posttest score was 18.2280. The standard deviation was 1.19683 and 1.25295 respectively.

Table 8: Paired Samples Correlations of Illinois agility test

		N	Correlation	Sig.
Pair 1	Illinois agility test pretest scores & Illinois agility test post scores	30	.972	.000

Table 8 shows the correlation between the pretest and posttest scores of Illinois agility test. Total number of participants were 30 and the correlation was .972 and the significance was 0.000.

Table 9: Paired Samples Test

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	
Pair 1	Illinois agility test pretest scores - Illinois agility test post scores	.95000	.29357	.05360	.84038	

Table 10: Paired Samples Test

		Paired Differences				
		95% Confidence Interval of the Difference Upper	t	df	Sig. (2-tailed)	
Pair 1	Illinois agility test pretest scores - Illinois agility test post scores	1.05962	17.724	29	.000	

The table 10 showed the result of t test. The paired sample t test of Illinois agility test showed that the sig, p-value was 0.000 which indicated that there was significant effect of volleyball participation on the agility of the volleyball players. Hence the alternate hypothesis was accepted.

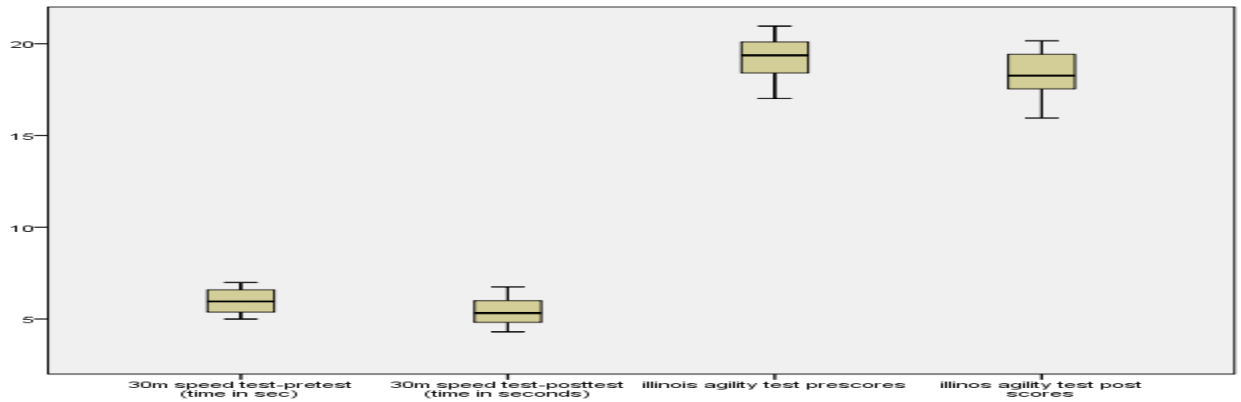

Figure1: showing the pretest and posttest scores of speed and agility test

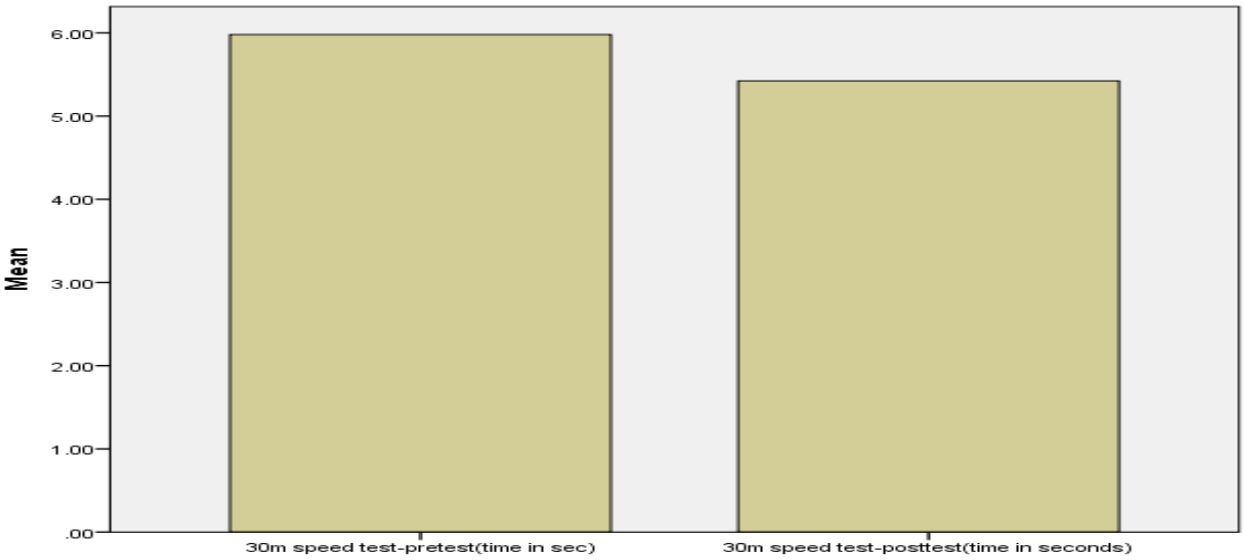

Figure 2: showing the mean difference of pretest and posttest scores of 30m speed test

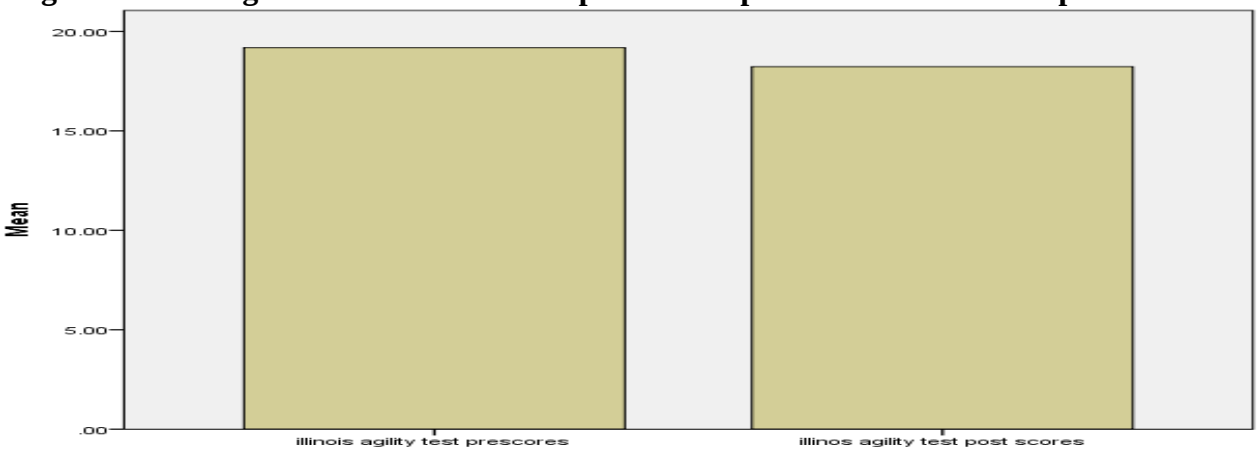

Figure 3: showing the mean difference of pretest and posttest scores of Illinois agility test

Summary:

Volleyball is a worldwide played sport. There are a lot of benefits of playing any sport. This paper was about a quasi-experimental research one group pretest and posttest design. The sample population was the female volleyball players' secondary level of the selected school of chaklala cantt. The participants were 30. All were meeting the inclusion criteria of given research study. After taking the informed consent from the sample participants, they were enrolled in the study. After recruitment, the pretest of all the participants were conducted to record the pretest score data. The 30-meter sprint test was conducted to measure the speed of participants and the Illinois test was conducted to measure the agility of participants. After the pretest data collection phase, the intervention or treatment phase started, in which the participants were implemented the structured volleyball training schedule at school for 8 weeks. The training plan was according to the scientific principles of training. After 8 weeks. The posttest data collection phase started in which the posttest data were collected. After arranging the pretest and posttest scores, the analysis had been performed. As the data was normal so the parametric tests had been applied for the comparison analysis. The paired sample t-test results clearly indicated that there was significant effect of volleyball sports participation on the speed and agility of female volleyball

players of secondary school level. The research study revealed the benefits of participation in volleyball in improving the speed and agility of participants, contributing to the improvement of their overall physical fitness.

Conclusion:

On the basis of analysis and findings of the given research study, the researcher concludes that there is significant role of volleyball sports participation on speed and agility of volleyball female players. The coaches and trainers should be aware of the benefits of sports participation for females and the female sports participation should be encouraged. As well as the volley sports is concerned the players should be aware of the benefits of volleyball participation, it improves the speed and agility of the players and hence contribute to overall physical fitness.

Recommendations:

The following recommendations are hereby proposed based on the results of the given research study:

1. As the importance of volleyball game have been proved through the given research, it has been suggested to consider the structured and planned volleyball training while updating the curriculum at the secondary level.
2. Physical education teachers and instructors should adopt volleyball coaching for girls at secondary level to improve the overall fitness of girls.
3. Efforts must be done to encourage the participation of girls in the volleyball and other sports.

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