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RESEARCH PAPER

The Effect of Aerobic Training on the Agility of Football Players: A Study in Dera Ismail Khan, Pakistan

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ABSTRACT

The existing paper aims to gauge the effect of aerobic training on the quality of agility of football players. The main objective of the paper was to articulate the effect of aerobic training on male football player's agility. Thirty players were chosen from two schools in Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, and were equally distributed into two groups same in number. Both groups had 15 players in controlled and experimental. The first group underwent aerobic training three times a week over eight weeks, while the second group, serving as the control, continued with their regular activities without any additional training.The control group was placed in one group and give aerobic exercise Three time a week for eight weeks. A shuttle run test was used to assess each participant's agility both before and after the training session. The male football player's agility was greaterly enhanced by aerobic exercise. It was also concluded that regular aerobic exercise can help male football players became more agile. It was suggested that aerobic exercise incorporating into training regimen may enhance the agility of the football players. It was also suggested that providing of paper facilities of the training may improve the agility power of the players.

KEYWORDS Aerobic Training, Agility, Male Football Player

Introduction

Agility, defined as the capability to quickly alter direction and react promptly to ever-changing situations, is essential for football players, significantly boosting their on-field performance. Traditionally, agility is linked with anaerobic training, which involves intense, short bursts of activity that encourage explosive movements. However, recent research has underscored the importance of aerobic training in cultivating this key skill. Although aerobic exercise is primarily recognized for its role in enhancing cardiovascular endurance, it also contributes to improving agility. By building overall stamina, speeding up recovery times, and enhancing the body's ability to use oxygen efficiently, aerobic training aids in developing faster reflexes and more precise movements. This holistic approach to agility training provides football players with a well-rounded fitness program that promotes both endurance and quick reaction abilities, keeping them competitive during high-pressure game situations. Gaining a deeper understanding of the relationship between aerobic training and agility can offer valuable knowledge for fine-tuning training programs for football players, ultimately improving their performance on the field and lowering the likelihood of injuries. The Soccer or Football is a very famous team sport. In the game of football there are two teams in which eleven players from each side compete with each other for the purpose to score goals by kicking the ball into the goal post of the other opponent team. It is played on a rectangular shape field with a goalpost at each end of the court, it requires a variety of athletic skills, including strength, speed, endurance, and agility. One of the most popular games in the

world to play and watch, football has a deep cultural and historical significance in many nations (Sarmento, Anguera, Pereira, & Araújo, 2018). The ability to change direction rapidly and successfully without losing balance or control of one's body is known as agility (Acar, & Eler, 2019). It involves coordination, speed, and reaction time and is an important quality for athletes in many sports, including football, basketball, and soccer. Agility enables individuals to move in different directions, respond to stimuli and overcome obstacles, making it a critical aspect of overall athletic performance (Schmidt, & Lee, 2019).Aerobic training is vital for enhancing the agility of football players by improving their overall physical fitness and athletic capabilities. Although agility is commonly linked to anaerobic activities, which involve short, intense bursts of movement, aerobic training also has a significant positive impact on agility in several ways.

HypothesEs

H1. There is no significant difference in mean score between of the experimental and control group before intervention at pretest level with reference to agility.

H2. Eight weeks aerobic training will have significant impact on the agility of the experimental group players in comparison to control group at posttest level.

H3. There is a significant difference in the agility of the experimental group before and after the intervention.

Literature Review

The study in hand about "The Effect of Aerobic Training on the Agility of Football Players: A Study in Dera Ismail Khan, Pakistan" is important and justified for several reasons Firstly, aerobic training plays a vital role in the improvement of athletic performance, particularly in sports such as football that require continuous movement and high levels of endurance (Helgerud, Engen, Wisløff, & Hoff 2001). Football players need to have the ability to run and move at high speeds for long periods of time, and aerobic training can help them achieve this by increasing their cardiovascular fitness and endurance (Bahtra, Crisari, Dinata, Susanto, & Andria, 2023).

Secondly, agility is a essential element of football performance, as it enables players to change direction quickly and respond to various game situations. A player with good agility will be able to evade opponents, quickly get into position to receive a pass, and make quick movements to shoot or pass the ball (Asmara, Indrawan, Munir, Fitrian, & Isrsyad, 2023). Improving a player's agility can therefore have a significant impact on their overall performance on the field (Zouhal, Abderrahman, Dupont, Truptin, Bris, Postec, & Bideau,2019).

Thirdly, little study has been done on the assessment of effects of aerobic training on the quality of agility of football players, particularly in the region of District Dera Ismail Khan, Pakistan. By conducting this study, valuable insights can be gained into the training needs of local football players and the impact of aerobic training on their agility. This information can then be used to inform the development of training programs to improve their performance.

Finally, this study is relevant to the local community as it can contribute to the development of the sport in the region. By understanding the impact of aerobic training on the agility of football players, coaches and trainers can design programs that are

tailored to the specific needs of their athletes (Ltifi, Jlid, Coquart, Maffulli, van den Tillaar, & Aouadi, 2023). This can help to improve the overall standard of football in the region and foster a love for the sport among the local community.

So, the study in hand about "The Effects of Aerobic Training on the Agility of Football Players: A Study in Dera Ismail Khan, Pakistan" is here by justified from the above mention detail and hopefully now as it can provide a very valuable deep insights into the impact of aerobic training on the agility of football players and contribute to the development of the sport in the region.

Material and Methods

Participants

Thirty players were chosen from two schools in Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, and were equally distributed into two groups same in number. Both groups had 15 players in controlled (Daraban khurd) and experimental (Lunda Sharif). The first group underwent aerobic training three times a week over eight weeks, while the second group, serving as the control, continued with their regular activities without any additional training.The experimental group was placed in one group and give aerobic exercise Three time a week for eight weeks.

Data collection tool

A shuttle run test was used to assess each participant's agility both before and after the training session.

Training program

Week 1-2:

Warm-up for 10 minutes of jogging and light stretching

Interval Training for 5 sets of 4-minute intervals at a moderate pace, with 1-minute rest periods in between.

Cool-down for 5-10 minutes of light jogging and stretching.

Week 3-4:

Warm-up for 10 minutes of light jogging and light stretching

Interval Training for at least 5 sets of 4-minute intervals at a moderate pace, with 1-minute rest periods in between.

Agility related Training comprise 5 sets of specific agility related drills such as ladder drills used for agility, cone drills used for agility, and shuttle runs drills specific for agility.

Cool-down for 5-10 minutes of light jogging and stretching.

Week 5-6:

Moderate level of Warm-up for at least 10 minutes including low intensity jogging and similar light stretching of whole body.

Interval Training was of 6 sets of 4-minute intervals at a moderate pace, with 1-minute rest periods in between.

Agility Training included 6 sets of specific agility drills such as ladder type of drills, drills using cones, and shuttle run drills. For the purpose of Cool down it was 5-10 minutes of light jogging and stretching too.

Week 7-8:

First Warm-up for at least 10 minutes of jogging and with light stretching.

Interval Training of 6 sets of 4-minute intervals at a moderate pace, with 1-minute rest periods in between.

Similarly, Agility specific Training included 6 sets of agility specific drills such as ladder drills, drills on cone and shuttle runs drills.

Furthermore, Strength Training was of 3 sets of strength exercises for the legs and core, such as squats, lunges, and planks.

At the end Cool-down phase was of 5-10 minutes of light jogging and with stretching (Smith, 2020).

Pilot testing

Pilot testing for the purpose of reliability of the instrument used for data collection was conducted to measure the test-retest reliability of the instrument. Five football players were randomly selected for this purpose. Pretest was conducted before giving any intervention and then after two weeks of intervention post-test was conducted. Researcher use the ICC (Intraclass Correlation Coefficient} method because the test and retest method was used, which means the same instrument is assessed twice. The reliability of this test instrument is not tested using Cronbach's Alpha because it is more appropriate to be utilized to test a Likert scale questionnaire instrument (Darusalam, & Hussin, 2021).

Table 1
Reliability

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.860[a]	.296	.984	14.037	4	4	.013
Average Measures	.925[c]	.457	.992	14.037	4	4	.013

Two-way mixed effects model where people effects are random and measures effects are fixed.

a.The estimator is the same, whether the interaction effect is present or not.

b.Type A intraclass correlation coefficients using an absolute agreement definition.
c.This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

The above table is showing the reliability of the instrument by using intraclass correlation coefficient (ICC). The average measures ICC which was 0.925, showing excellent reliability. The 95% confidence interval for the ICC is ranging from 0.457 to 0.992, which is also supporting the robustness of the instrument.

Validity of the data collection instrument

The instrument used for data collection was validated from the expert in the field of sports sciences and physical education. Their input ensured that instrument is accurately measuring the desired construct.

Results

H1. There is no significant difference between of the experimental and control group agility before intervention.

Table 2
Group Statistics

Item	School	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Darabankhurd	15	11.3187	.88130	.22755
	Lunda	15	11.5327	1.10994	.28658

Independent Samples Test

Items		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Pretest	Equal variances assumed	1.409	.245	-.585	28	.563	-.21400	.36594	-.96359	.53559
	Equal variances not assumed			-.585	26.632	.564	-.21400	.36594	-.96533	.53733

The pretest average for the Darabankhurd participants was 11.3187, with standard deviation of value 0.88130 and a standard error recorded of mean of 0.22755, according to the results of the "Group Statistics" table. Participants from Lunda scored an average of 11.5327 on the pretest, with a recorded standard deviation of 1.10994 and a standard error of mean 0.28658.

According to Levene's Test used for the assessment of equality, the recorded assumptions of equal variance between the two groups experimental and controlled was not significant at ($p = 0.245$), as it is indicated by the results of the "Independent Samples Test" applied. With a t-statistic of -0.585 and degrees of freedom of 28, the t-test applied for the assessment of equality of means of both experimental and controlled group, results revealed that the difference between the mean scores of the both groups was not significant at ($p = 0.563$). The two both groups mean differences had a standard error of 0.36594 and a mean difference of -0.214. The true difference in means might lie anywhere within this range with 95% confidence, according to the difference's 95% confidence interval, which was -0.96359 to 0.53559. Thus the hypothesis ‘‘There is no significant

difference between of the experimental and control group agility before intervention'' is hereby accepted.

Table 3
Group Statistics

	School	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Darabankhurd	15	10.3727	.46316	.11959
	Lunda	15	10.9340	.86174	.22250

Independent Samples Test

Items		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest	Equal variances assumed	2.639	.115	-2.222	28	.035	-.56133	.25260	-1.07877	-.04390
	Equal variances not assumed			-2.222	21.466	.037	-.56133	.25260	-1.08596	-.03671

There were fifteen individuals/Participants in each group controlled and experimental, according to the group statistics shown in the table, the "experimental" group's mean of post-test score was 10.3727, whereas the 2nd group "controlled" group's mean score was 10.9340. The standard deviation was .86174 for the "Lunda" group and .46316 for the "darabankhurd" group. For each group, the standard error mean was .22250 and .11959, respectively. For the purpose to find out mean differences like if there is a significant difference in mean score between the two groups of the study, the independent samples t-test awes used in order to compare the both groups. And also to find out the if the variances of the two said groups discussed before were equal, and for the equality the Levene's test for equality of variance was run. The result shown in the above table. The test was conducted assuming equal variances were not equal, which produced a comparable t-value and p-value, but the findings also indicated that the equal variances were assumed (p =.115). At a t-value of -2.222 and a p-value of.037, the t-test revealed a significant difference between the two groups. This implies that the "darabankhurd" group's mean posttest score was lower than that of the "Lunda" group. The standard error difference was.25260, while the mean difference was -.56133. The difference's 95% confidence interval is between -1.08596 and -.03671. Thus the hypothesis '' Eight weeks aerobic training protocol will significantly improve the quality of agility of the experimental group participants players with the comparison to control group participants'' is hereby accepted.

Table 4
Paired Samples Statistics[a]

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	11.3187	15	.88130	.22755
	posttest	10.3727	15	.46316	.11959

a. school = darabankhurd

Table 5
Paired Samples Statistics[a]

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pretest - posttest	.94600	.75257	.19431	.52924	1.36276	4.868	14	.000

a. school = darabankhurd

The "darabankhurd" school's mean pretest score was 11.3187, while its mean posttest score was 10.4267, according to the Paired Sample t-test Statistics table data. The pre-test means scores' standard deviation was .88130, while the post-test means scores' standard deviation was .46756. The Paired Samples Test table results indicated that there was significant mean difference between the pre-test and post-test scores in the "darabankhurd" school. Thus the hypothesis about the significant mean difference in the agility of the experimental group before and after the intervention applied is hereby accepted.

Discussion

The results of this study propose that aerobic training has a significant impact on the agility of male football players. The results of the study are consistent with previous research by Iaia, Ermanno, and Bangsbo, 2009) and Sam, and Subradeepan, (2019), who also demonstrated the positive effects of aerobic training on agility in athletes. A similar study conducted on female players by Polman, Walsh, Bloomfield, and Nesti, (2004) also shows significant impact of aerobic training on agility and muscular power. Miranda, Aliberti, and Invernizzi, (2021) also found same results and found that 8 weeks aerobic training brought improvement in agility and overall sports performance of football players.

However, it is imperative to note that previous studies have shown that the specific type of aerobic training, intensity, and duration can impact the effectiveness of training on agility (Castagna, Impellizzeri, Chaouachi, Bordon, and Manzi, (2011). Therefore, further research is needed to determine the optimal training protocol to improve agility in football players. Additionally, factors such as diet, climate, lifestyle, and previous training experience can also play a role in the effectiveness of training and should be considered in future research.

Conclusion

The main aim of the study was to determine how aerobic exercise affects the male football players' agility and for this purpose 30 participants were randomly selected and divided into two groups experimental and controlled. Each group comprised of 15 participants. The study was carried out in district Dera Ismail Khan, Pakistan. A total of thirty players were chosen and split into two groups as mentioned before. The control group of the study was placed in one group and given the aerobic exercise for three times in a week and it was continued for eight weeks. A shuttle run test was used to assess each participant's agility both before and after the training session. It helped to collect accurate score for assessment and comparison. The male football players' agility was greatly enhanced by the aerobic exercise as evidenced by a significant mean difference ($p = .001$) between the pretest results and posttest results with reference to experimental group of the study as compared to controlled group. The t-test was applied for the assessment of equality of means, the results demonstrated that the differences in mean score regarding agility scores between the experimental and controlled groups was statistically significant at ($p < .05$), further supported this finding. The findings imply that regular aerobic exercise can help male football players become more agile. This study will prove helpful for players and trainers also to follow the protocol used in this study for the purpose of fruitful results in shape of improvement in agility which resultantly contributes in the overall performance.

Recommendations

In light of the study's findings, it is advised that players, trainers and coacher associated with football game by incorporating aerobic exercise into the training regimen of football players may enhance their agility and gives fruitful result as increase in overall performance. The outcomes of this vary study also demonstrated that aerobic exercise greatly enhanced the agility of the especially male football players in region of Dera Ismail Khan, Pakistan. However, it would be beneficial to conduct further research with larger sample sizes and to consider other factors that may influence the relationship between aerobic exercise and agility with reference to football game, such as diet for football players, climate of the region, lifestyle of the players, and previous training experience of football players. Additionally, further studies can be done to compare the results of several kinds of aerobic training associated with the especially the quality of agility of football players specifically and to investigate the optimal frequency of the training, duration of the training, and intensity of aerobic exercise specialized for enhancing the quality of agility in this population with reference to football game.

Consent to Participate

Permission and consent to take part in the study were acquired from all participants of the study for the purpose to protect the right of participation in study. And also, to ensure the ethical credibility of the study.

Furthermore, the study was designed carefully for the purpose to keep safe the participant from any type of harm or injury whether it was physically, emotionally etc.

Participants were clearly informed of their right to withdraw from the study at any point, without facing any negative repercussions. Assurance was provided that opting out would not impact their relationship with the researcher or the institutions involved, promoting a stress-free environment for participation.

References

Acar, H., & Eler, N. (2019). The Effect of Balance Exercises on Speed and Agility in Physical Education Lessons. *Universal Journal of Educational Research*, *7*(1), 74-79.

Asmara, M., Indrawan, W., Munir, A., Fitrian, Z. A., & Isrsyad, N. Y. (2023). Contribution of Agility and Flexibility to Football Dribbling Skills in Junior High School Extracurricular Students. *JUMORA: Jurnal Moderasi Olahraga*, *3*(1), 48-59.

Bahtra, R., Crisari, S., Dinata, W. W., Susanto, N., & Andria, Y. (2023). VO2Max in Soccer Players: Comparison of Interval Training and Continuous Running. *JOSSAE (Journal of Sport Science and Education)*, *8*(1), 46-53.

Castagna, C., Impellizzeri, F. M., Chaouachi, A., Bordon, C., & Manzi, V. (2011). Effect of training intensity distribution on aerobic fitness variables in elite soccer players: a case study. *The Journal of Strength & Conditioning Research*, *25*(1), 66-71.

Charee, J., Yupaporn, K., Khaothin, T., Kusump, S., & Ashira, H. (2022). The Effects of Step Aerobic Training on Muscle Power and Agility in Female Badminton Players. *International Journal of Exercise Science*, *15*(6), 1317.

Darusalam, G., & Hussin, S. (2021). Methodology penyelidikan dalam pendidikan: Amalan dan analisis kajian (third). *Penerbit Universiti Malaya*.

Helgerud, J., Engen, L. C., Wisløff, U., & Hoff, J. A. N. (2001). Aerobic endurance training improves soccer performance. *Medicine & science in sports & exercise*, *33*(11), 1925-1931.

Iaia, F. M., Ermanno, R., & Bangsbo, J. (2009). High-intensity training in football. *International journal of sports physiology and performance*, *4*(3), 291-306.

Ltifi, M. A., Jlid, M. C., Coquart, J., Maffulli, N., van den Tillaar, R., & Aouadi, R. (2023). Acute Effect of Four Stretching Protocols on Change of Direction in U-17 Male Soccer Players. *Sports*, *11*(9), 165.

Malaifani, Y. R., Sukamti, E. R., Arianto, A. C., & Nurdin, U. (n.d). Correlation Study between Speed, Agility, Leg Power, and Eye-Foot Coordination on the Dribbling Ability of Bali United Football Players in 2021.

Miranda, G., Aliberti, S., & Invernizzi, P. L. (2021). Effects of an 8-week intermittent aerobic training program on aerobic power in a professional soccer team.

Polman, R., Walsh, D., Bloomfield, J., & Nesti, M. (2004). Effective conditioning of female soccer players. *Journal of sports sciences*, *22*(2), 191-203.

Sam, V., & Subradeepan, A. (2019). Impact of resistance training and concurrent resistance and aerobic training on selected biomotor abilities football players. *Int J Yogic, Hum Mov Sports Sc*, *4*, 184-188.

Sarmento, H., Anguera, M. T., Pereira, A., & Araújo, D. (2018). Talent identification and development in male football: A systematic review. *Sports medicine*, *48*, 907-931.

Schmidt, R., & Lee, T. (2019). *Motor learning and performance 6th edition with web study guide-loose-leaf edition: From principles to application*. Human Kinetics Publishers.

Smith, J, (2020). The ultimate guide to football raining. New York: Penguin Random

Zouhal, H., Abderrahman, A. B., Dupont, G., Truptin, P., Le Bris, R., Le Postec, E., ... & Bideau, B. (2019). Effects of neuromuscular training on agility performance in elite soccer players. *Frontiers in Physiology*, *10*, 947.