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Evaluated the Agility Test in School Football Players in Moradabad

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Abstract

Agility is the ability to quickly change direction and body movement, closely linked to physical qualities like strength, power, and speed. It involves physical and cognitive elements and is essential for improving movement, coordination, balance, and skills like jumping. Good physical fitness, including muscle strength, is necessary to perform agility tests effectively.

Regular physical activity improves overall well-being, but intense activity may lead to musculoskeletal pain. This pain often impacts adolescent health, leading to mobility, anxiety, and depression issues. The occurrence of musculoskeletal pain in children and adolescents ranges from 7% to 15%, with girls generally experiencing more pain and multisite pain than boys. Bone growth in adolescence is marked by rapid skeletal development, with significant changes occurring during puberty. Girls and boys experience differences in muscle development, with boys having a greater increase in muscle mass during puberty. Psychosocial changes also occur, with adolescents focusing more on self-definition, independence, and forming relationships.

The study of agility in young adult school football players is crucial due to the increasing importance of physical fitness and agility in sports performance. Football requires quick direction changes, balance, coordination, and speed, making agility a key factor in success. Additionally, the physical and cognitive demands of agility are significant for reducing injury risk, improving overall performance, and developing essential skills like jumping and coordination. As musculoskeletal injuries can significantly affect adolescent athletes, it is important to observe the role of physical fitness and its connection to musculoskeletal health. Understanding how agility impacts their physical and psychological development is also important for developing better training regimens and preventing injuries.

The purpose of this study is to examine the development of agility, physical fitness, and musculoskeletal health in adolescents, focusing on how these factors relate to growth, injury risk, and psychosocial changes during puberty.

AIM OF THE STUDY-

The study aims to provide insights into the effectiveness of agility training and its benefits for young adult school football players

OBJECTIVES OF THE STUDY-

- To assess the impact of agility training on the overall performance of school football players.

- To evaluate the relationship between agility and overall physical fitness in football players.

NEED OF THE STUDY-

To understanding how agility impacts their physical and psychological development is also important for developing better training regimens and preventing injuries**.**

HYPOTHESES

Experimental Hypothesis: There is a significant relationship between the agility levels of young adult school football players and their overall football performance.

Null Hypothesis: There is no significant relationship between the agility levels of young adult school football players and their overall football performance.

REVIEW OF LITERATURE

1. Jinsong Wu et al [2024]: The study uses a set theory approach to investigate how different subsystems of gross motor skills can enhance children's ability and balance. The research analyzed data from 84 children aged 3 to 6 years, utilizing fuzzy-set Qualitative Comparative Analysis (fsQCA) to assess how six subsystems of gross motor skills (running, jumping, throwing, catching, kicking, and striking) contribute to improving children's agility and balance. Analysis of necessary conditions shows that no single subsystem of gross motor skills can alone promote agility and balance in children. Configuration analyses reveal two pathways to enhance agility (Overall Consistency = 0.889, Overall Coverage = 0.337) and two pathways to improve balance (Overall Consistency = 0.875, Overall Coverage = 0.346. To improve agility, a combination of jumping, running, and catching activities is advised, while enhancing balance should focus on kicking, jumping, and running activities. Additionally, prioritizing balance can further aid in improving agility.

2. Galih Yogi Handar et al [2019]: The aim of the study was to correlation of agility and musculoskeletal injury in teenage badminton athletes. 26 players are involved and musculoskeletal injury measured by examination and questionnaire and agility measured by BAT [Badminton Agility Test]. No significant relation between agility and musculoskeletal injury.

3. Erika Zemkova et al [2012]: The aim of this study to compare a agility time in group aged 7 to 18 years. 553 children performed an agility test and equal no of boys and girls. Their task was to touch, as soon as possible. Result of this test is the agility decrease with increasing age up to early maturity.

4. Julia S. Malmborg et al [2022]: The aim of the study was to identify risk factors of musculoskeletal pain at adolescent sports school student. 79 boys and 52 girls, aged 14 years and performed the t test, counter movement jump and grip strength at weekly follow up. A higher percentage of girls than boy's frequent pain. Pain associate in counter movement jump, but not in agility test [t-test and grip strength].

5. Dane COETZEE et al [2016]: The purpose of this study was to determine the strength, running speed and agility in 9- to 10-year-old school children. Inclination of random 20 school with different socio-economic background. 862 children's [457 boys and 405 girls tested in educational district]. Performing standing long jump, push-ups, sit-ups, shuttle run. Results showed boys performed better than girls and significant gender difference.

6. Bojan Masanovic et al [2020]: It is systematic review aimed to analyse the physical fitness among the school-aged children and adolescents. The search was undertaken in 4 international databases [ERIC, PubMed, Scoopers and Web of science] to identify the studies reporting. Total 485 potential article, 19

were relevant, 1746,023 children and adolescent's from 14 countries. Result improvement of physical fitness

7 Michele A Raya at al [2013]: The aim of the study of the comparison of the 3-agility test T test, ESST and IAT. It involves athletes and nonathletes, nondisabled army services members and execution of disabled person. Result of these compression study is the relationship of IAT and T Test positive relation and the ESST and T Test negative relation.

8. Brittany Nicole at al [2020]: The aim of the study was Sprint Speed and Musculoskeletal Fitness Test performance in youth. Involvement of athlete's, 402 boys and 148 girls [aged 7 to 18 years] participating in a musculoskeletal fitness evaluation. Sprint speed was assessed via a 10 yard and 20-yard sprint, Agility was assessed via a 200-yard shuttle run, Muscular strength and endurance was via a vertical jump, broad jump and 5-hop jump test. Strong relation with agility and anaerobic capacity musculoskeletal fitness test.

9 Julia S Malmborg at al [2018]: The aim of the study to investigate the prevalence of pain and relationships with maturity offset, health status and sports performance among 14 year old students at a sports school. This study used a cross sectional involving 178 students [180 boys and 70 girls] who underwent anthropometric assessments for maturity offset [including height, weight] filled out questionnaires on pain perception and health status and participated in sports performance tests[sprint, agility, grip strength and counter movement]. Results showed 31 students experienced infrequent pain, 85 frequent pain and 51 constant pain. Boys experience constant pain had a lower average maturity offset compare to boys with in frequent pain and it category reported poorer health status . Pain was linked to reduced sports performance. There was no notable difference in maturity or sports performance between girls with constant pain and those infrequent pain.

10. Amit Ahmad Dewan at al [2023]: The aim of this study to examine impact of the Speed Agility Training Aids Set on physical fitness of physical education student. Innovation in physical fitness are crucial for enhancing speed and agility, which ultimately contribute to the overall physical fitness of physical education students. It involves the students and athletes [40 students]. The SATAS [SPEED AGILITY TRAINING AIDS SET] is an effective indicate tool for enhancing physical fitness performance and merits further exploration.

11.Thomas B Walker at al [2011]: The influence of agility training on physiological [physical fitness] and cognitive performance [mental fitness]. 22 subjects are involved undergoing military technical training were divided randomly into 2 group for 6 weeks of physical fitness training. One group participate military technical school physical training, which distance linear running and second group duplicate duration and volume of exercise. Vertical jump, Illinois agility these components are involved. No significant difference in groups and the physical agility training is effective.

12. John S. Carlson at al [2020]: The aim of this study was to test reliability and validity. Study 1 tested reliability of the reactive agility test with 20 junior football players and Study 2 tested validity by comparing performance of 60 participants spread over three aged. 20 athletes participate under 18 Australian football leagues represent state at national competitions, 20 athletes participate in same league but not represent state and 20 healthy males did not play Australian football. Test-retest reliability reports a strong correlation, with no significant difference.

13.Garhammer at al [2000]: The study investigated the reliability and validity of the T-test as an assessment tool for leg power, leg speed and agility. A total of 304 college-aged participants, comprising 152 men and 152 women from different levels of sports involvement, completed four skill tests [40 yard dash[leg speed], counter movement vertical jump [leg power], hexagon test [agility] and T-test]. T-

test demonstrated high reliability and effectively incorporates multiple components, including leg speed, power, and agility, making it useful for distinguishing between individuals with low and high levels of sports participation

14. Linda Susan Holbeche at al [2018] : The aim of this to promote the innovation thinking regarding future organizational effectiveness. Agility Defined as the ability to swiftly respond, adapt, and succeed in a dynamic environment and this understanding of agility must be accompanied by resilience, concepts involve shared purpose, renewal, learning, risk management, networks and engagement. We are transitioning from simply seeking increased flexibility and speed to pursuing true organizational agility. The prevailing model, which emphasizes "hard" output metrics like productivity, financial performance, and shareholder value, along with internal alignment, is being challenged, including the functions of the HR field. To effectively define organizational success, there must be a greater emphasis on the methods used to achieve different objectives. These shifts in methods are significant. Concepts like agile structures will necessitate adjustments in work processes, organizational structures, skill requirements, management practices, technology, and cultural norms.

15. Pranjal Gogoi at al [2024] :- A cross-sectional study was carried out in various schools located in Guwahati, the capital city of North East India. The average age of the participants was 9.49 ± 2.53 years. The prevalence of musculoskeletal (MSK) pain was evaluated using the Faces Pain Scale–Revised and the pediatric Gait Arm Leg Spine (PGALS) assessment, while physical fitness was measured using the Fitness gram test battery. The rate of musculoskeletal pain among school students is reported to be 38.28%. There is a notable correlation between musculoskeletal pain and a child's level of physical fitness, indicating that children with lower physical fitness are more prone to experiencing musculoskeletal pain.

16. Ioan Sabin SOPA at al [2015]:- This study focuses on assessing balance and agility in volleyball and exploring how these combined motor skills affect the performance development of volleyball players. The participants included 12 female volleyball players aged 10 to 12 from the mini volleyball team ACS Force Sport Bucharest. A series of six tests—three for balance (stork balance stand test, standing balance test, and modified bass test of dynamic balance) and three for agility (side step agility test, hexagon agility test, and 505 agility test)—were conducted to evaluate the players at the beginning and after nine months of training that included exercises aimed at enhancing these two motor qualities. The findings indicated significant improvements across almost all tests, showing that the balance and agility levels of the players increased in direct correlation with the development of these skills. The results support the research hypothesis that enhancing balance and agility in female volleyball players leads to better performance and results during game.

Study type: Survey research
Sample Size: 180
Sampling method: Random sampling
Study duration: 2 months
Study settings: In or around Moradabad City, (Uttar Pradesh)

INCLUSION CRITERIA: -

- School football players (both boy and girl)
- Aged 16-18 years
- Players actively participating in school football teams (at least six months)

EXCLUSION CRITERIA: -

- Players with severe injuries
- Any medical conditions (Mental and Physical)
- Any surgery
- Any Hereditary diseases

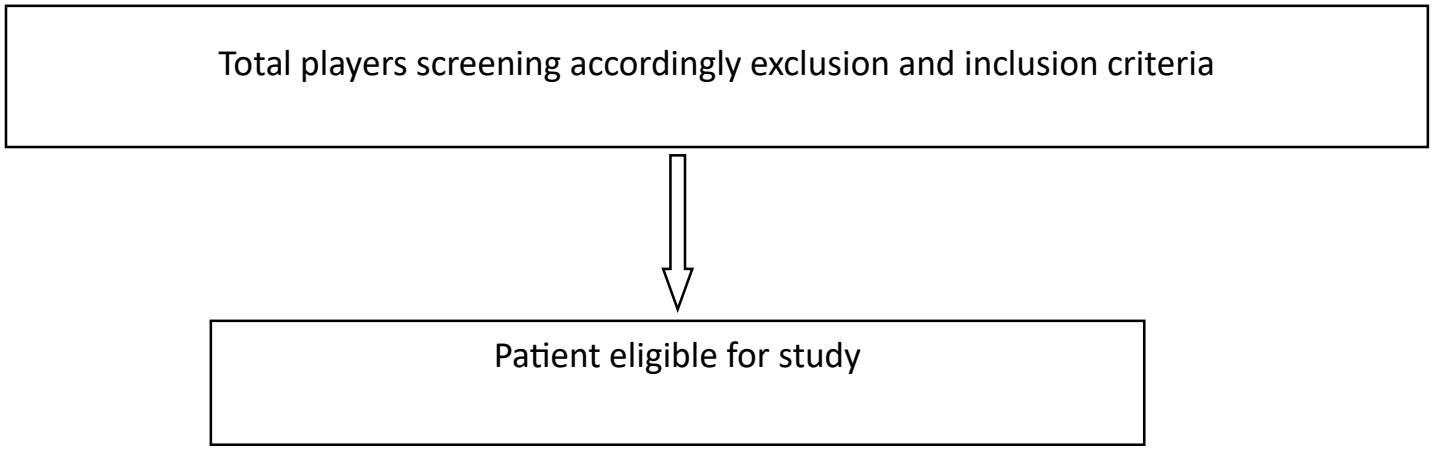
INSTRUMENTS USED: -

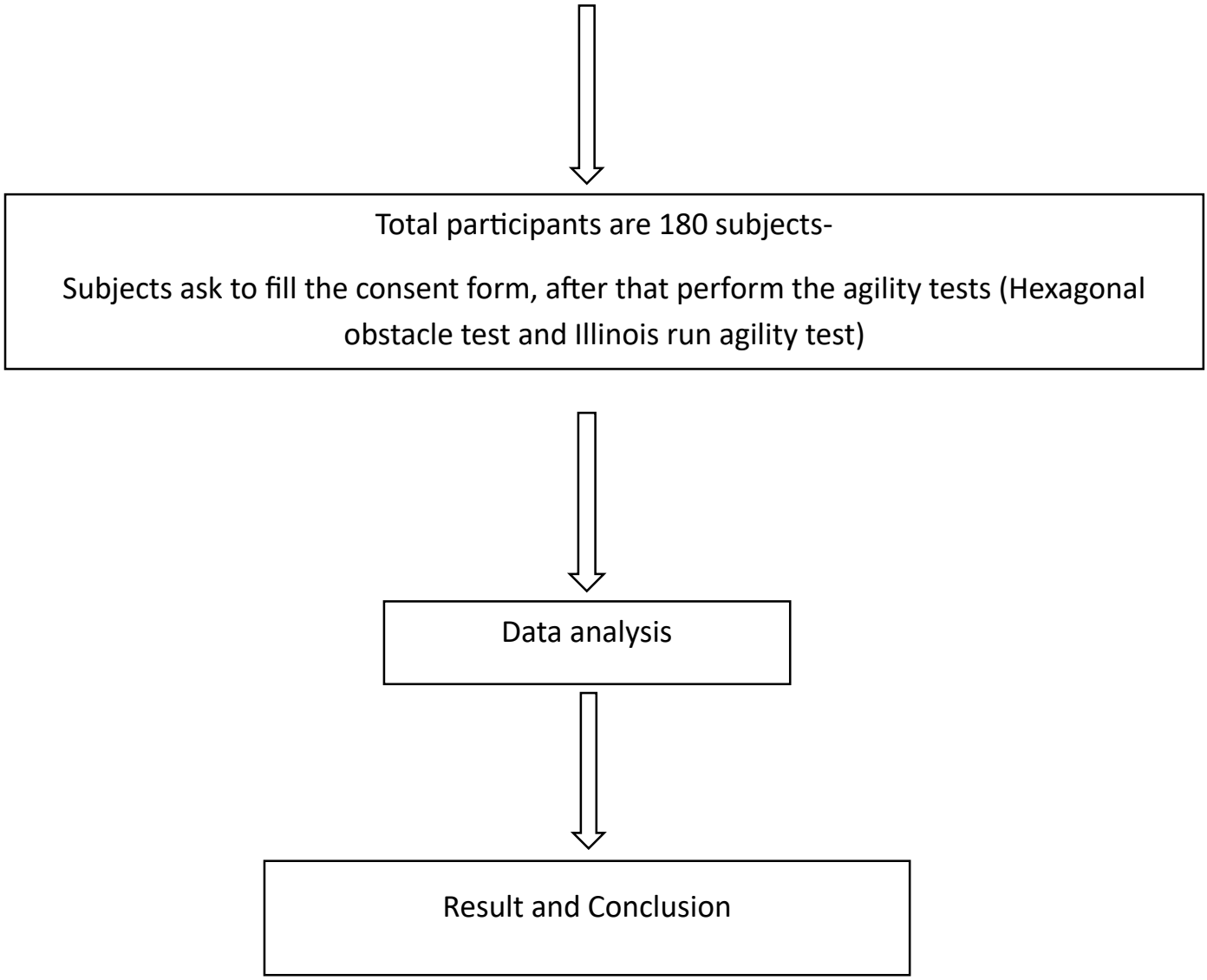
- Pen and Paper
- Consent form
- Cone
- Board Marker
- Stop watch

PROCEDURE

- Subjects will be recruited from Department of Physiotherapy, Teerthanker Mahaveer University, Moradabad selected conveniently keeping in mind the inclusion and exclusion criteria.
- Subjects will be explained about the purpose, methodology related to the risk of the study. They will be given informed consent explaining their rights as research subject.
- Explain the procedure to the subject.
- Patient should be relaxed, should not have done exercise prior to testing and should be wearing loose clothes that do not restrict stretch of muscle.
- Therapist firstly explain the agility test [HEXAZONAL OBSTACLE TEST, AND ILLINOIS AGILITY RUN TEST] and after that two best trails were recorded.
- All timings noted by therapist, then we compare this with the normal value.

FLOW CHART





Data analysis was performed by using SPSS (version 22.0). Quantitative variables were described by descriptive statistics using mean and SD. At 0.05, the levels of significance were established.

		AGE	GENDER	HEXAGONAL_OBSTACLE_TEST_SCORING	ILLINOIS_AGILITY_TEST_SCORING
N	Valid	174	180	154	148
	Missing	6	0	26	32

Table 1- Statistics analysis of demographic detail

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16	26	14.4	14.9	14.9
	17	47	26.1	27.0	42.0
	18	39	21.7	22.4	64.4
	19	62	34.4	35.6	100.0
	Total	174	96.7	100.0	

Missing	System	6	3.3		
Total		180	100.0		

Table 2:- Statistics analysis of age .

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	38	21.1	21.1	21.1
	2	142	78.9	78.9	100.0
	Total	180	100.0	100.0	

Table 3:- Statistics analysis of gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Vali	15.00	8	4.4	5.4	5.4
	15.50	2	1.1	1.4	6.8
	16.00	4	2.2	2.7	9.5
	16.50	4	2.2	2.7	12.2
	17.00	9	5.0	6.1	18.2
	17.50	6	3.3	4.1	22.3
	18.00	31	17.2	20.9	43.2
	18.50	5	2.8	3.4	46.6
	19.00	45	25.0	30.4	77.0
	19.50	5	2.8	3.4	80.4
	20.00	2	1.1	1.4	81.8
	20.50	4	2.2	2.7	84.5
	21.00	8	4.4	5.4	89.9
	21.50	7	3.9	4.7	94.6
	22.00	2	1.1	1.4	95.9
	22.50	1	.6	.7	96.6
	23.50	4	2.2	2.7	99.3
	24.00	1	.6	.7	100.0
	Total	148	82.2	100.0	
Missing	System	32	17.8		
Total		180	100.0		

Table 4:- Statistics analysis of Illinois agility test

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11.00	7	3.9	4.5	4.5
	11.50	4	2.2	2.6	7.1
	12.50	1	.6	.6	7.8
	13.00	9	5.0	5.8	13.6

	13.50	11	6.1	7.1	20.8
	14.00	31	17.2	20.1	40.9
	14.50	4	2.2	2.6	43.5
	15.00	50	27.8	32.5	76.0
	15.50	7	3.9	4.5	80.5
	16.00	6	3.3	3.9	84.4
	16.50	8	4.4	5.2	89.6
	17.50	2	1.1	1.3	90.9
	18.00	5	2.8	3.2	94.2
	18.50	2	1.1	1.3	95.5
	19.00	2	1.1	1.3	96.8
	19.50	2	1.1	1.3	98.1
	20.00	1	.6	.6	98.7
	22.00	2	1.1	1.3	100.0
	Total	154	85.6	100.0	
Missing	System	26	14.4		
Total		180	100.0		

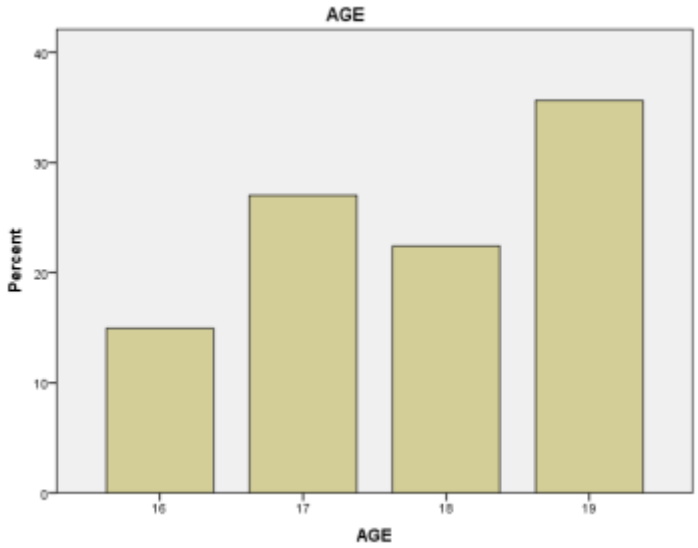
Table 5:- Statistics analysis of Hexagonal Obstacle test

		GENDER	HEXAGONAL_OBSTACLE_TEST_SCORING	ILLINOIS_AGILITY_TEST_SCORING
GENDER	Pearson Correlation	1	-.342**	-.408**
	Sig. (2-tailed)		.000	.000
	N	180	154	148
HEXAGONAL_OBSTACLE_TEST_SCORING	Pearson Correlation	-.342**	1	.686**
	Sig. (2-tailed)	.000		.000
	N	154	154	125
ILLINOIS_AGILITY_TEST_SCORING	Pearson Correlation	-.408**	.686**	1

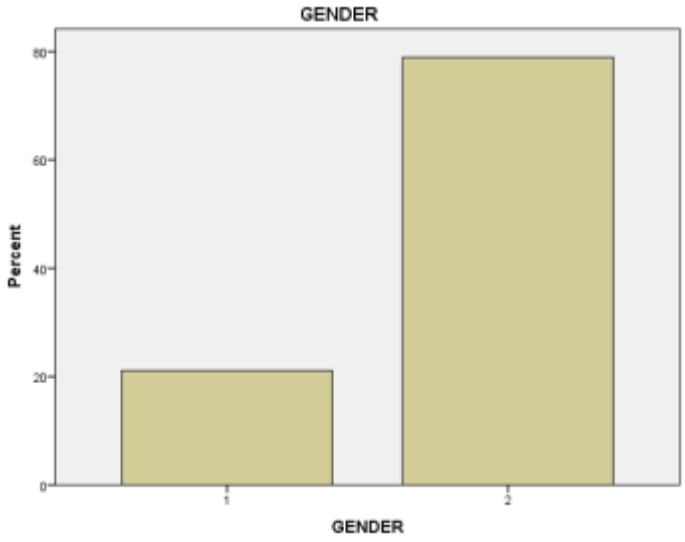
	Sig. (2-tailed)	.000	.000
	N	148	125	148

**. Correlation is significant at the 0.01 level (2-tailed).

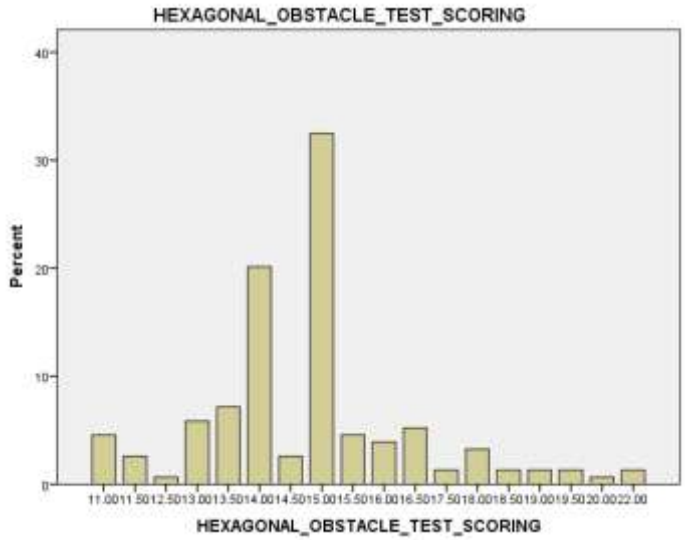
Table 6:- Correlation of Hexagonal obstacle test and Illinois agility test score



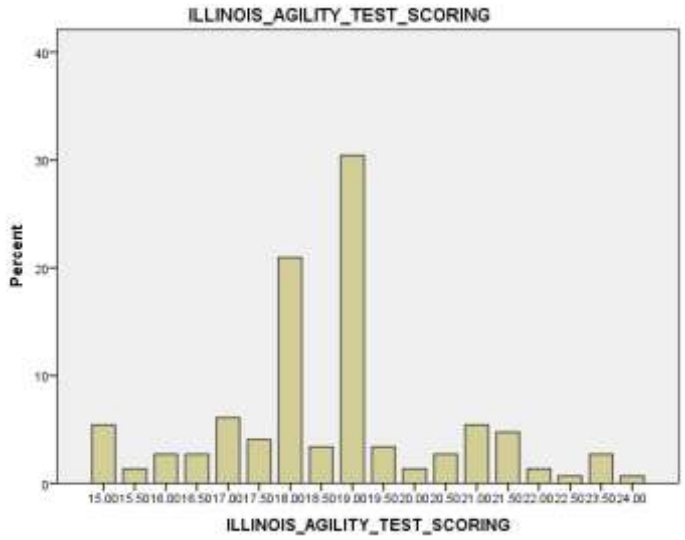
Graph 1:- It shows the Age 16- fewer individuals, Age 17- significant increase, Age 18- slight dip, Age 19- tallest



Graph 2:- Gender 1 approximately 20% and Gender 2 approximately 80%



Graph 3 :- Most participants achieved scores between 14.5 and 15.5, with the largest concentration in this range, encompassing about 35-40% of the group. A notable portion scored between 13.5 and 14.5, accounting for roughly 20%. Only a small number of participants scored below 12 or above 18. The scores are primarily grouped around 14.5 to 15.5, indicating that the majority performed similarly on this test. The distribution resembles a normal curve but is slightly right-skewed, indicating that a few participants obtained higher scores, which might imply slightly poorer performance, depending on the scoring criteria of the test.



Graph 4:- The typical score range is approximately 19.00–19.50 sec where the highest conc. of individuals (just over 30%) is found, between 18.00 and 18.50 sec, accounting for about 20–25% of participants, very few scores below 17 sec or above 22 sec, indicating that these times are relatively rare

The research titled "Evaluate the Agility Test in Football Players in School" included 180 school football players: 142 males (78.9%) and 38 females (21.1%). Most participants were 19 years old (35.6%), followed by 17 years (27%), 18 years (22.4%), and 16 years (14.9%), with 6 participants lacking age information. The agility of these players was measured using two standardized tests: the Illinois Agility Test and the Hexagonal Obstacle Test. For the Illinois Agility Test, data from 148 participants was recorded, with 32 lacking values. Scores varied from 15.50 to 23.50 seconds, with the most common times being 19.50 seconds (25 participants, 16.9%), 20.50 seconds (23 participants, 15.5%), and 20.00 seconds (20 participants, 13.5%). This suggests that a majority of participants had a moderate agility level, typically within the 19.50–20.50 seconds range. In the Hexagonal Obstacle Test, valid scores were available for 154 participants, while 26 scores were missing. Participants had times ranging from 11.50 to 22.00 seconds, with the most frequent times being 14.00 seconds (31 participants, 20.1%), 15.00 seconds (27 participants, 17.5%), and 16.00 seconds (22 participants, 14.4%). These results indicate that most players exhibited agility within the 14.00–16.00 seconds range for this test.

Correlation analysis showed a statistically significant positive relationship between scores on the Illinois and Hexagonal tests ($r = 0.686$, $p < 0.001$), indicating that performance on one test was closely linked to performance on the other. Furthermore, there was a notable negative correlation between gender and test scores for both the Illinois test ($r = -0.408$, $p < 0.001$) and the Hexagonal test ($r = -0.342$, $p < 0.001$), implying that male participants generally achieved better (i.e., faster) times than female participants in both agility tests.

According to Galih Yogi Handar et al [2019] review the study that correlation of agility and musculoskeletal injury in teenage badminton athletes. 26 players are involved and musculoskeletal injury measured by examination and questionnaire and agility measured by BAT [Badminton Agility Test]. No significant relation between agility and musculoskeletal injury. Other author,Jinsong Wu et al [2024]: review the study that uses a set of theory approach to investigate how different subsystems of gross motor skills can enhance children's ability and balance. The research analyzed data from 84 children aged 3 to 6 years, utilizing fuzzy-set Qualitative Comparative Analysis (fsQCA) to assess how six subsystems of gross motor skills (running, jumping, throwing, catching, kicking, and striking) contribute to improving children's agility and balance. Analysis of necessary conditions shows that no single subsystem of gross motor skills can alone promote agility and balance in children.

The primary findings of the study indicate significant differences in agility performance between male and female football players. For the Illinois Agility Test (IAT), male players recorded an average time of 15.56 ± 0.80 seconds, while female players recorded an average of 17.75 ± 1.37 seconds. A statistical comparison revealed a significant difference between the sexes ($p < 0.001$), with male players demonstrating superior agility. While specific aver age times for the Hexagonal Obstacle Test (HOT) for the study's football players were not explicitly detailed, normative data for this test also exist, which generally indicate similar performance trends.

The observed gender differences are not merely statistical but are described as "clinically less agile" for female players. This implies that the difference in agility performance is substantial enough to have real-world consequences for athletic performance, extending beyond simple statistical significance to functional relevance. This observation prompts a deeper examination of the underlying physiological or biomechanical factors that might contribute to these disparities, moving the analysis beyond a mere description of outcomes to an understanding of their practical implications.

Further interpretation of the findings reveals an important characteristic of the Illinois Agility Test The results of the study demonstrate that both the Illinois and Hexagonal Obstacle Tests are effective methods for assessing agility in school football players. The significant correlation between the two tests shows their reliability in measuring agility, while the impact of gender underscores the necessity for performance evaluation norms based on gender. This information offers essential insights into standard agility performance among adolescents aged 16 to 19 and establishes a foundation for future athletic evaluations and training initiatives in school football.

LIMITATIONS

- Small sample size
- Intervention group were included
- No follow up and home programme were included
- Shoes material need to justify.

FUTURE RECOMMENDATIONS

- There will be better results if the study performed with large sample size over a long period of time.
- Study sample can be taken from different region
- Improve agility by sprint speed test (200 yard shuttle, vertical jump etc).
- Promoting children's agility.

REFRENCE-

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