

4.0 AIM AND OBJECTIVES

4.1. AIM

The study aimed to evaluate the effect of a 16 week yogic practices and physical fitness training program on the performance of college football players.

4.2. OBJECTIVES

The Objective of this study is to find out the changes in fitness components, skills, and performance of college football players.

To evaluate the effect of yoga and physical fitness training on physical fitness components of football players.

To study the effect of yoga and physical fitness training on their muscle strength.

To assess the effect of yoga and physical fitness training on their muscle endurance.

To measure the effect of yoga and physical fitness training on their cardiovascular endurance.

To evaluate the effect of yoga and physical fitness training on their body mass index.

To study the effect of yoga and physical fitness training on their flexibility.

To determine the effect of yoga and physical fitness training on football skills.

To evaluate the effect of yoga and physical fitness training on dribbling.

To find out the effect of yoga and physical fitness training on the lofted pass.

To measure the effect of yoga and physical fitness training on shooting.

To study the effect of yoga and physical fitness training on short passing.

To assess the effect of yoga and physical fitness training on juggling.

3. To study the effect of yogic practices and physical fitness training on football player's performance.

4.3 RESEARCH QUESTION

- a) Do yogic practices and physical fitness training improve the health-related physical fitness components like muscle strength, muscle endurance, cardiovascular endurance, body mass index, and the flexibility of football players?
- b) Do Yogic practices and physical fitness training help footballers to improve their skills?
- c) Do Yogic practices and physical fitness training helps football players to improve their game performance?

4.4 RESEARCH HYPOTHESIS

Regular physical fitness training and yoga practices will improve the physical fitness qualities.

Regular yogic practices, physical fitness training will help to improve the football skills.

Systematic carry out of yogic practices physical fitness training will increase the overall game performance.

4.5. NULL HYPOTHESES

H₀ 1. Regular physical fitness training and yoga practices will not improve the physical fitness qualities.

H₀1a. There will be no change in muscle strength in the training group.

H₀1b. There will be no change in muscle endurance in training group.

H₀1c. There will be no change in Cardio-Vascular endurance in training group.

H₀1d. There will be no change on Body Mass Index in the training group.

H₀1e. There will be no change in Flexibility in the training group.

H₀2. Regular yogic practices, physical fitness training may not help to improve the skill.

H₀2a. There will be no change in dribbling skill in the training group.

H₀2b. There will be no change on lofted pass skill in the training group.

H₀2c. There will be no change in shooting skill in a training group.

H₀2d. There will be no change in short passing skill in a training group.

H₀2e. There will be no change in juggling skill in a training group.

H₀3. A Systematic practice of selected yogic practices will not increase the overall performance of football players.

5.0 METHODS

5.1 PARTICIPANTS

5.1.1 Sample Size

The sample size was measured based on an effect size (0.5) gained from a previous pilot study of changes in college football players (Zakir, & Murugavel, 2011). The sample size was measured by using G*Power software, Version 3.0.10, where the level of alpha was $\alpha = 0.05$, power $\beta = 0.80$ and the suggested sample size was $n=34$.

Eighty-two male college football players age 18 to 24 years were volunteered for the present study. They were divided into Treatment ($n=41$) and Control ($n=41$) groups. The players were not involved in any other training program considered in the treatment group and control group continued to participate in their regular day to day activities. Before this study, all the players underwent selection criteria to determine their fundamental skills by using Bobby Charlton's Soccer skill tests. Five football experts supervised and carried out the tests as per selection norms. The medical officer of the college was available throughout the intervention.

5.1.2 Inclusion Criteria

The football players, who:

1. Studying in the college
2. Age 18-24 years
3. The previous participation in school/college/club
4. Knows fundamental football skills

5. Agreed to follow Bobby Charlton soccer skill tests and scores minimum points.

5.1.3 Exclusion Criteria

The players

1. Apart from college
2. Who does not know the basic skills and fail to meet expert opinion on the given norms.
3. Who are suffering from any of the major disease, major surgery
4. Deformity in lower and upper extremities

5.1.4 Source of Participants

The participants are from college football players and the study was conducted between 1stJan. to 30th April 2016 at Karnataka Law Society's Gogte Institute of Technology, Udyambag, Belagavi, Karnataka. The prior permission of the Principal was taken before starting the research work and then the participants were informed and invited to participate in the research program. The players who were satisfied with inclusions and exclusions criteria are included in the study.

5.1.5 Ethical Considerations

The study protocol was approved by the Institutional Ethical Committee of SVYASA Yoga University in accordance with the declaration of Helsinki research ethics and reviewed by the Institutional Review Board. The written informed consent letter was collected from the subjects before the pre-test and freedom is given to withdraw from the study at any point in time. The subjects were given detailed information about the

experimental study prior to intervention. They were not provided with any incentives for their participation.

5.2 DESIGN

5.2.1 Randomization

The present study was randomized with the two groups. The football experts listed out the players to make two different groups through the lottery method. Both groups were assessed at baseline and after 16 weeks. The yoga group participated in one hour of yoga practice, six days per week, while the control group was not given the yogic treatment but, they are allowed to have their day to day activities.

Table 5.2: Design for research study

Design			
Pre Assessment (Baseline)	RCT	Experimental group (Yoga practice along with PFT)	Post Assessment (Alter 16 weeks)
		Training for 16 weeks (60 min/session)	
		Control group (Not provided any training)	

5.3 INTERVENTION

The treatment group was given alternately yogic practices and physical fitness training for 60 minutes, six days/week, for four months under the direction of certified yoga expert and qualified Physical Education Director/Coach. Each session comprises of warm-ups, loosening, and stretching exercises, *Sūryanamaskāra*, yoga postures (*Āsanās*), *Prānāyāma*, deep relaxation technique (DRT). The various components of the yoga program are mentioned in the table 5.3.1. Control group participants were requested to maintain their routine activities and not to begin yoga or fitness program related to present study.

Table 5.3.1: Various yoga practices and fitness components		
Sl. No	Variable	
1	Yogic & Dynamic <i>Sūryanamaskāra</i>	Whole body
2	<i>Ustrāsana</i> , <i>Paścimottānāsana</i> , <i>Matsyasana</i> , <i>Halāsana</i> , <i>Dhanurāsana</i> , <i>Bhujaṅgāsana</i>	Flexibility
3	<i>Tadasana</i> , <i>Vṛkṣāsana</i> <i>Trikoṇāsana</i> , <i>Veerabhadrasana</i>	Balance
4	<i>Utkatasana</i> , <i>Uthita Dwipadasana</i> , <i>Naukāsana</i>	Muscular strength
5	<i>Kapalabhati</i> & <i>Nadishuddhi</i> , <i>Bhramari Pranayama</i>	Vital Capacity

Table 5.3.2: Yoga program schedule

Sl. No	Intervention components	No. of Rounds	Approx Time (60 min)	Schedule	Rationale of the practices	Target area
1	Yogic Prayer, Session on basic concepts of Yoga and Instructions for the class		5 min	3 days /week (Monday, Wednesday, Friday)	Give directions and motivation for practicing yoga	Mental, Intellectual state
2	Preparatory practices: a) Loosening: for toes, ankle, knee, hips, fingers, wrist, elbow and neck b) Stretching with Breathing exercises: Hands in and out, hands stretch, Ankle stretch, Hip stretch, Backstretch, Tiger stretch (Spinal ups- down), Supine straight leg raising, Cycling, Lumber stretch, Rocking and rolling	One each	10 min	3 days /week (Monday, Wednesday, Friday)	Preparatory practices for <i>asana</i> and <i>Pranayama</i>	Physical and Vital energy body
3	Sun salutation (<i>Suryanamaskāra</i>) Dynamic and Yogic	2 sets each	5 min	3 days /week (Monday, Wednesday, Friday)	Gives an all-round benefit by balancing physiological systems and removing mental rigidity(<i>Tamas</i>)	All levels

4	<p>Postures (<i>Āsana</i>):</p> <p>A. Standing postures: Tadasana Half waist rotation posture (<i>Ardhakaṭi cakrāsana</i>) Foot palm posture (<i>Pādahastāsana</i>) Half wheel posture (<i>Ardha cakrāsana</i>) Triangle posture (<i>Trikonāsana</i>) Tree posture (<i>Vṛkṣāsana</i>) Veerabhadrasana</p> <p>B. Sitting postures Diamond (<i>Vajrāsana</i>) Camel posture (<i>Ustrāsana</i>) Posterior stretch(<i>Paścimottānāsana</i>) Spinal twistposture (<i>Vakrasana</i>)</p> <p>C. Prone postures: Cobra posture (<i>Bhujaṅgāsana</i>) Grasshopper posture (<i>Salabhāsana</i>) Bow posture (<i>Dhanurāsana</i>) Plough posture (<i>Halāsana</i>)</p> <p>D. Supine postures Utthita Dwipadasana Boat posture (<i>Naukāsana</i>)</p>	1 each	20 min (around 1 min each posture)	3 days /week (Monday, Wednesday, Friday)	For culturing the body and mind	Physical & mental levels
5	Kapalabhati (60 strokes) Breathing with forceful exhalation with passive inhalation	3 sets	5 min	3 days /week (Monday, Wednesday, Friday)	Open up Respiratory track & preparatory for Pranayama	Respiratory, mental level
6	Pranayama (regulation of breath): a) Slow & rhythmic alternate nostril breathing (<i>Nāḍīsodhana</i>) b) Exhalation, with a female honey bee sound (<i>Bhrāmarī</i>)	3 times each	10 min	3 days /week (Monday, Wednesday, Friday)	Improve lung capacity, balance vital energy, regulate emotions with reducing anxiety & stress	Physiological, vital and mental levels
7	Deep Relaxation Technique (DRT)	1set	5 min	3 days /week (Monday, Wednesday, Friday)	for total rest to the body and mind.	All levels

Table 5.3.3: Physical Fitness Training Program In Detail				
S N	Physical exercises	Duration	Physical exercises	Duration
1	General Warm-up Jogging, jumping, hopping, forward & backward bending, Side bends, Twisting	10 min.	General warm-up Jogging, jumping, hopping, forward & backward bending, Side bends, Twisting	10 min.
2	Push-up	7 min	Sand Training	7 min
3	Specific exercise	10 min	Rhythmic exercise	8 min
4	Sit ups	8 min	Squat thrust	8 min
5	Circuit training	15 min	Circuit training	15 min
6	For relaxation:	10 min	For relaxation:	10 min
	Warm down &Shavasana		Warm down &Shavasana	
	Total timings	60 min	Total timings	60 min

5.4 ASSESSMENTS OF PHYSICAL FITNESS PARAMETERS

Assessment sessions were arranged pre and post the intervention for both groups. Participants were assessed on anthropometric measures, physical fitness parameters are as described below.

Table 5.4: Physical Fitness Parameters				
Sl. No	Variable	Training	Test	Criterion Measures
1	Muscular strength	Push-ups / Sand Training	Grip Dynamometer	Kilograms
2	Muscular Endurance	Pull ups / Squat thrust	Sit ups (Bent knees)	Counts
3	Cardiovascular Endurance	Circuit training	Harvard step test	PEI=Duration in seconds/2*sum pulse count during recovery
4	Body Mass Index	-	BMI	Wt.(kg)/Ht. (mt) ²
5	Flexibility	Rhythmic exercise	Sit and reach	Centimeters

Anthropometric Measures

Participants were asked to wear light clothes or football uniform and stand with bare feet against a wall. Height was measured to the nearest centimeter using a non-stretchable measuring tape (Stadio-meter, Model 67031, Fitness Mart Country Technology, Inc, P.O Box 87, Gays Mills, WI). Weight was measured using the In Body R20 Composition Analyzer (from Gym Company) and Body Mass Index (BMI) calculated.

5.4.1 Hand Grip Muscle Strength

Instrument- By using handgrip dynamometer, both right and left hand grip strength was measured (SKU No. B01E5MAIT6, Mohak Hand grip Exerciser Device, Hyderabad, India). It measures strength from 0 to 130 kg.



Figure: 5.4.1

Data Extraction- The participant was standing straight and keeping the right elbow at 90°. After the command 'go', the participant starts pressing the instrument (handgrip dynamometer) with the fullest possible strength.

Scoring- Participants were tested for the three trials from the right hand, and the score was recorded (with 10 seconds of the gap) for three all three trials. The maximum value obtained during the three trials was recorded for subsequent statistical analysis.

5.4.2 Muscle Endurance (Abdominal)

This test determines endurance of abdominal muscles. The subjects were asked to lie on their back with knees bent, hands were kept crossed behind the head and feet flat on the floor hold by the co-subject. After the command ready 'go', the subject starts sit-ups as shown in the figure.

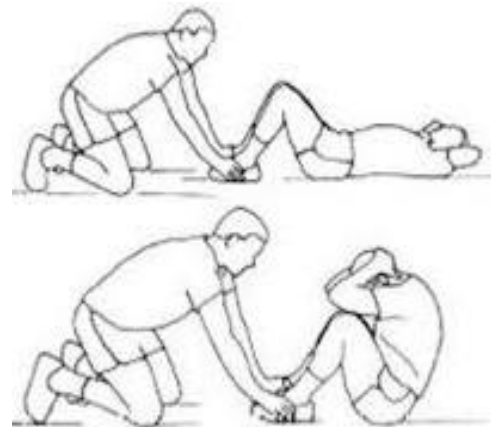
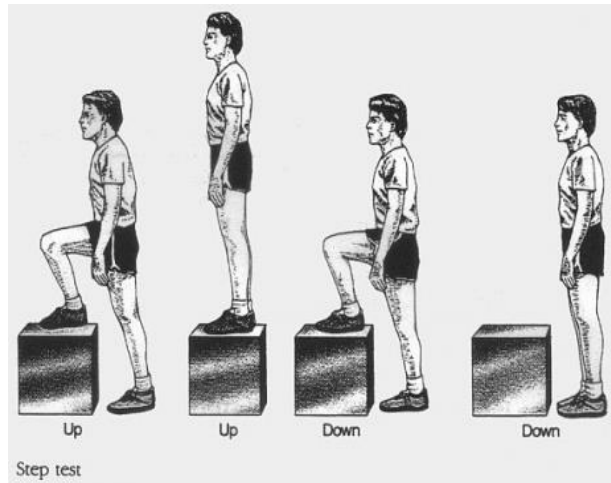


Figure: 5.4.2

Scoring: The number of complete sit-up test cycles (lifting the body into the sitting position and returning to the starting position) performed as much as possible by the subjects. The total counts shall be recorded.

5.4.3 Cardiovascular Endurance - Harvard step test

This test is a type of cardiac stress test for finding cardiovascular endurance. The platform or a stool is kept in front of the subject at a height of about 50 cm or 20 inches. On the command 'start', the subject steps up and down on a platform with the rhythm for which metronome



instrument was used. The subject will continue

Figure: 5.4.3

the exercise for five minutes. Immediately after exercise, the subject was asked to lie-down on back. After one minute rest, start counting the pulse from one to one and half a minute, two to two and half a minute and three to three and half a minute. The sum of the pulse count shall be recorded.

$$\text{Physical efficiency Index (PEI)} = \frac{(\text{Total duration in seconds}) \times 100}{2 \times (\text{sum of pulse during recovery})}$$

5.4.4. Body Mass Index

The subjects were asked to stand straight in front of the Stadiometer. Heels, hip, upper back, and skull should be touched and height in meter was measured and recorded.

The subjects were allowed to stand on the weighing machine with front eyesight. The weight in kilogram was



Figure: 5.4.4

recorded in the recording sheet. The body mass index (BMI) was calculated as per the weight of a person in kilogram divided by height in meter squared.

5.4.5 Sit and Reach Flexibility Test

The subject was asked to sit on the floor with bare feet and instructed to put the feet flat against the closed end of the box through the

open end of the box with the knees fully extended. The subject then extends his both arms ahead as far as possible along with the measuring scale which was fixed on the top of the box.

Scoring: The distance covered (plus or minus) is measured and recorded.

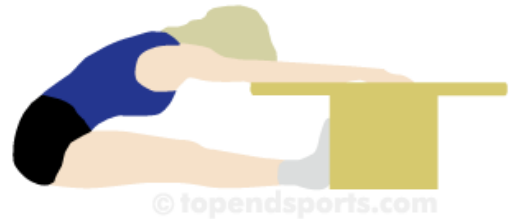


Figure: 5.4.5



5.5. Bobby Charlton soccer Skill tests

5.5.1 Dribbling

Purpose: This test is designed to improve close control over the ball at pace.

Equipment: Cones, measurement tape, football, and a stopwatch.

Procedure: The ground marking shall be done as per the requirement of the test shown in figure 5.5.1. The researcher and subject shall be standing near the starting line. After the command Ready-Go, researcher starts the stopwatch and the subject begins with dribbling the ball around each cone in a zigzag manner. After clearing the final cone, the player has to run along with the ball towards the end line as shown in the figure.

Scoring: Researcher records the time taken to complete the test with stopwatch. The subject scores 200 points for finishing the test in 30 seconds. 10 additional points shall be scored for every second under and 10 points shall be for every second over 30 (eg. If dribbling time is 29 sec, the score shall be 210 and if the time taken is 31 sec, the score shall be 190).

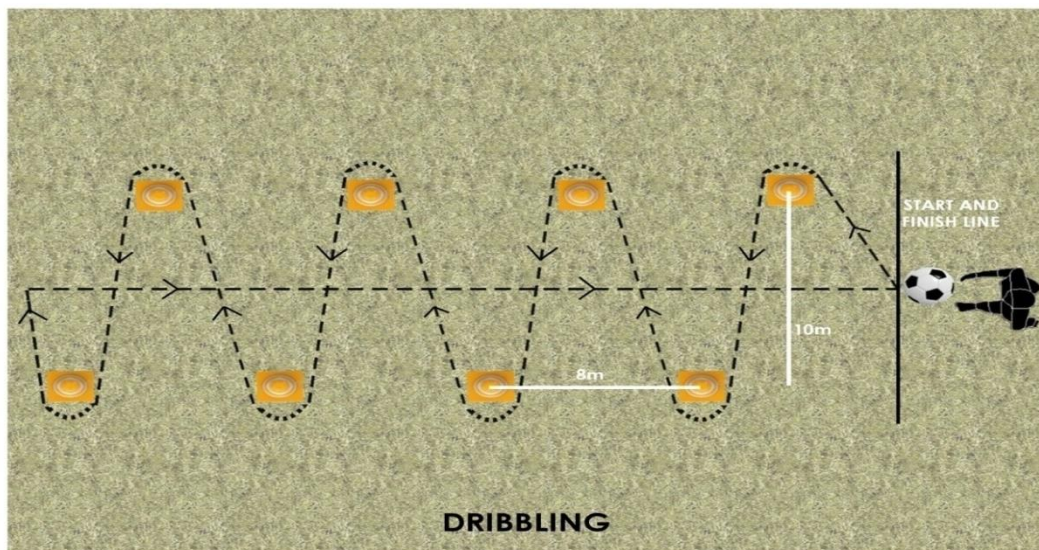


Figure: 5.5.1

5.5.2 Lofted pass

Purpose: This test is designed to develop accuracy.

Equipment: Measurement tape, 4 footballs.

Procedure: The ground marking shall be done as shown in figure 5.5.2. The researcher and subject shall be standing near the starting line and four balls shall be kept on the starting line. On the command Ready- start, the subject starts kicking the ball one by one towards the center mark. If the ball passes at the center without bouncing, 100 points shall be given.

Scoring: The subject is allowed to attempt with weaker foot and double points shall be given if the attempt is successful. Total 4 attempt scores shall be recorded.

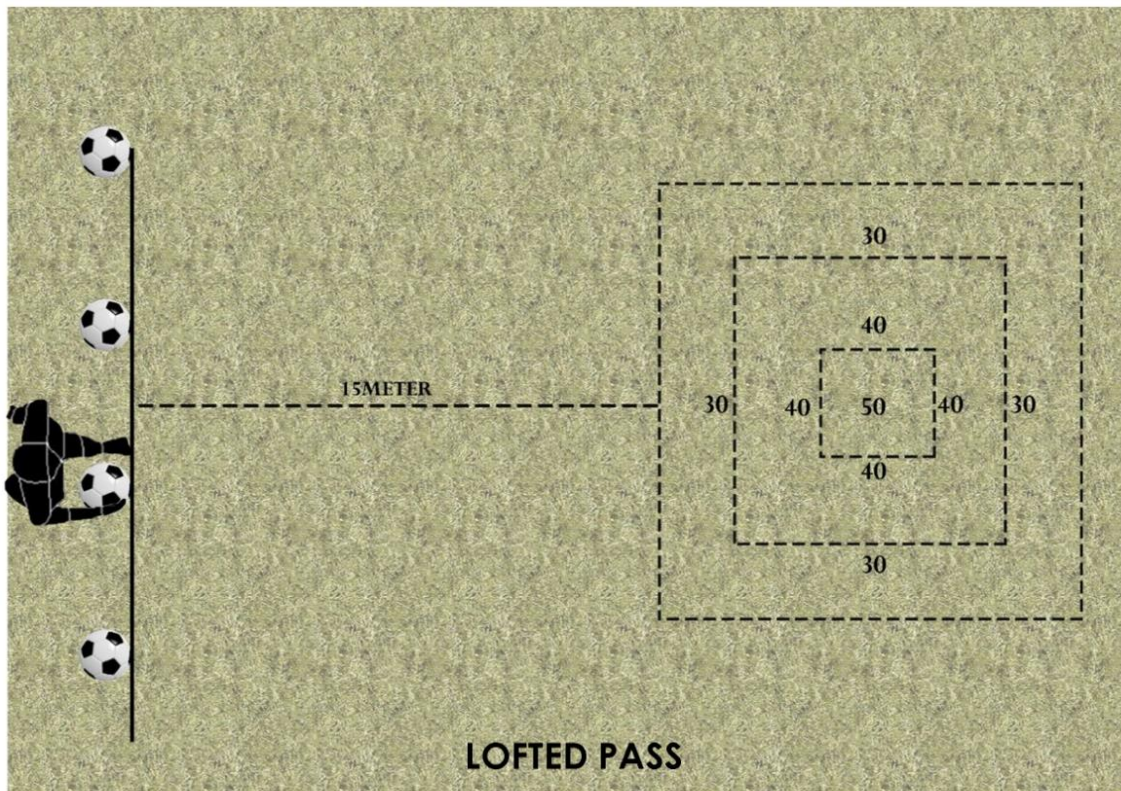


Figure: 5.5.2

5.5.3 Shooting

Purpose: This test is useful for measuring accuracy in shooting.

Equipment: Football goal post, 4 cones, measuring tape, stopwatch.

Procedure: The ground marking shall be done as per the requirement of the test as shown in figure 5.5.3. The researcher and subject shall be standing near the starting line. After the command Ready- start, the subject start shooting the ball at the corner of the goal post to score maximum points as shown in figure.

Scoring: Every subject will be given 4 attempts and score shall be recorded successful attempts within 15 seconds.

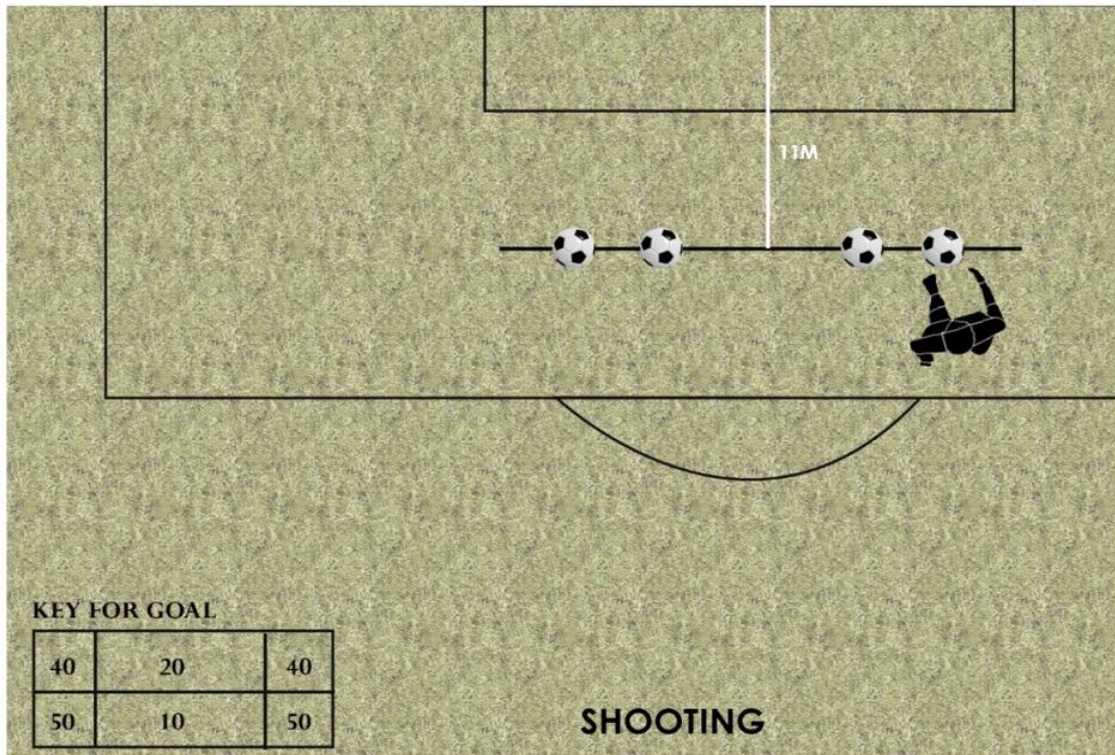


Figure: 5.5.3

5.5.4 Passing

Purpose: This test is useful for measuring short passing accuracy.

Equipment: 4 Footballs, cones, measuring tape, stopwatch.

Procedure: This test promotes the subject to use his both feet for passing a short distance. The ground marking shall be completed as per the requirement of the test shown in figure 5.5.4. The researcher and subject shall be standing near the starting line. After the command Ready- start, the subject starts passing the ball to the designated distance and takes next attempt with alternate leg and completes the test by crossing the finishing line.

Scoring: Each successful pass shall be given 50 points. If the subject able to pass all 4 attempts successfully, he shall be given 50 bonus points. The researcher records successful attempts for the same.

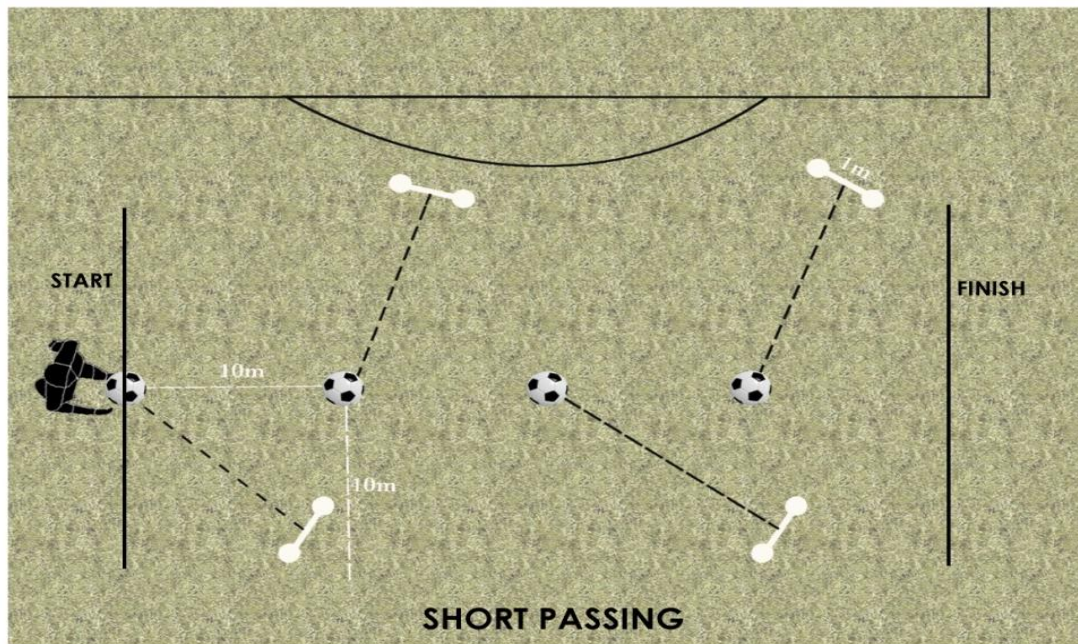


Figure: 5.5.4

5.5.5 Juggling

Purpose: This test measures the skill of controlling the ball off the air.

Equipment: Football and stopwatch.

Procedure: On the command ready-start, the subject starts juggling the ball from various parts of the body except by hands as shown in the figure 5.5.5. The subject was asked to hold the ball in the air as long as possible. When the ball falls on the ground, researcher records the time in seconds.

Scoring: The points shall be as per the norms of Bobby Charlton's Soccer skill test.

Up to 5 seconds- 50 points, up to 10 seconds - 100 points

Up to 20- seconds - 120 points, up to 30- seconds - 140 points

Up to 40- seconds - 160 points, up to 50- seconds -180 points,

Up to 60- seconds -200 points.



Figure: 5.5.5