



**STUDY OF RELATIONSHIP BETWEEN KICKED BALL
ANGLE AND KICKING LEG KINEMATICS AT THE
TIME OF EXECUTION OF CHIP SHOT OF MALE
SOCCER PLAYERS**

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ABSTRACT

In Soccer, for the Chip Shot the word “shot” is used as a synonym of Kick. The purpose of the study is to find the relationship between kicked ball angle and kicking leg kinematics of chip shot at the time of kick in soccer. In the kinematic parameters, angle and angular velocity of Kicking Leg’s hip joint, knee joint, and ankle joint were selected for the study of male players. Five male Bangladesh national team players were randomly selected in the study. Nonparametric Correlation ‘Kendall's tau_b’ has been opted as a statistical tool. Result reveals that in the angular kinematics of male players relationship between kicked ball angle and kicking foot ankle angle $r = -0.40$ & $p = 0.33$, kicking leg knee joint angle $r = -0.20$ & $p = 0.62$, and Kicking leg hip joint angle $r = 0.60$ & $p = 0.14$ at $\alpha = 0.05$ and $df = 3$. Further, in the angular velocity kinematics of male players relationship between kicked ball angle and kicking foot ankle’s angular velocity $r = 0.60$ & $p = 0.14$, kicking leg knee joint’s angular velocity $r = -0.40$ & $p = 0.33$, and Kicking leg hip joint’s angular velocity $r = 0.20$ & $p = 0.62$ at $\alpha = 0.05$ and $df = 3$. It is concluded that in the angular kinematic parameters there are negative weak relationships between kicked ball angle and kicking foot ankle angle, kicking leg knee joint angle, and positive moderate relationship between kicked ball angle and kicking leg hip joint angle in the sample. Moreover, kicked ball angle has a moderate positive relationship with kicking foot ankle angular velocity, moderate negative relationship with kicking leg knee joint’s angular velocity, and weak positive relationship with Kicking leg hip joint’s angular velocity in the sample.

Keyword: Kicked Ball Angle, Ankle Angle, Knee Angle, Hip Angle, Angular Velocity, Male.

1. INTRODUCTION

Eye-catching, spectacular, and highly mathematical kick in the game of soccer is Chip Shot. In Soccer, according to **Wiktionary (2019)** chip shot means “A shot in which the ball is kicked from underneath with accuracy but with less than maximum force, to launch it high into the air in order either to pass it over the heads of opponents or to score a goal” . Chip Shot also known as Drop Shot and the word “shot” is used as a synonym of kick in association football. It is a kick where the ball is kicked underneath with higher accuracy but with less than maximum force with the instep of the foot like stabbing action between ball and ground (**Mal & Kaka, 1986**). It results in backspin on the ball and gains a sharp angle of the trajectory aiming either to pass the ball to a teammate or to score over the opponent. It needs a certain amount of aptitude in technique and a high level of precision to performance, and a few very good quality players can execute it spectacularly (**Sporting Charts, 2020**). The term ‘chip shot’ also used widely in the Golf as a synonym of ‘short field goal attempt’ in which ball typically goes high for a short trajectory and usually attempted inside of 20 yards (**Sporting Charts, 2020**). Internal focus instructions to the novice children work better to perform acquisition, retention and transfer tactics in chip shot(**Arjmandi, Samadi, and Jalilvand, 2013**). It shows that training process of chip shot is a complex psychological phenomenon. In the association football to achieve mastery in performing a chip shot requires long practice, understanding of the magnitude of power to use on the ball, and understanding of where to hit the ball. In addition, the understanding of creating a swift downward swing of the kicking leg which has a direct effect on the bounce and the flight of the ball that intimately produces the desired level of backspin on the chipped ball (**Clarke, 2015**).

Kicking leg plays the most vital role among all body segments to kick a ball in soccer. Understanding the kicking leg’s kinematic variables that are correlated at which degree with the chip shot performance may provide a better outlook to train soccer players. The purpose of the study is to find the relationship between kicked ball angle and kicking leg kinematics of chip shot at the time of kicking in soccer.

Objectives of the study were to find the relationship among kicking leg angular kinematic variables and kicked ball angle of the chip shot in soccer as well as the relationship among kicking leg angular velocity kinematic variables and kicked ball angle of the chip shot in soccer.

2. METHODOLOGY

2.1 Selection of Subject

In this study, five subjects were selected randomly from Bangladesh Institute of Sports, Dhaka, Bangladesh in the year 2017 who were male soccer plays age range between 16 to 19 years and have played for the national team of Bangladesh. Players were free from any major injury in six months before the video filming day. The ball contact phase of the chip shot was studied for the reference of the final ground contact of the non-kicking foot phase.

2.2 Analysis of Captured Action of Chip Shot

For the quantitative analysis of the data, captured video clips were digitalized by the help of Kinovea 0.8.25 a 2D motion analysis software.

2.3 Statistical Procedure

Initially, data normality was checked. “Kendall's tau_b” statistical tool was adopted to establish the relationship among the variables. The significance level was set at $\alpha = 0.05$.

3. RESULTS

TABLE 1
RELATIONSHIP BETWEEN KICKED BALL ANGLE AND ANGULAR KINEMATICS OF KICKING LEG IN CHIP SHOT OF SOCCER.

Correlations			Kicked Ball Angle
Kendall's tau_b	Kicking Foot Ankle Angle at Ball Contact	Correlation Coefficient	-0.40
		Sig. (2-tailed)	0.33
	Kicking Leg Knee Angle at Ball Contact	Correlation Coefficient	-0.20
		Sig. (2-tailed)	0.62
	Kicking Leg Hip Joint Angle at Ball Contact	Correlation Coefficient	0.60
		Sig. (2-tailed)	0.14

Level of significance $\alpha = 0.05$, $N = 5$, $df = 3$, level of being significant $p \leq 0.05$

Above Table-1 exhibits the relationship of angular kinematics of male players to kicked ball angle and kicking foot ankle angle $r = -0.40$ & $p = 0.33$, kicking leg knee joint angle $r = -0.20$ & $p = 0.62$, and Kicking leg hip joint angle $r = 0.60$ & $p = 0.14$ at $\alpha = 0.05$ level of significance and at $df = 3$.

TABLE 2
RELATIONSHIP BETWEEN KICKED BALL ANGLE AND ANGULAR VELOCITY KINEMATICS OF KICKING LEG IN CHIP SHOT OF SOCCER.

Correlations			Kicked Ball Angle
Kendall's tau_b	Kicking Foot Ankle Angular Velocity at Ball Contact	Correlation Coefficient	0.60
		Sig. (2-tailed)	0.14
	Kicking Leg Knee Angular Velocity at Ball Contact	Correlation Coefficient	-0.40
		Sig. (2-tailed)	0.33
	Kicking Leg Hip Joint Angular Velocity at Ball Contact	Correlation Coefficient	0.20
		Sig. (2-tailed)	0.62

Level of significance $\alpha = 0.05$, $N = 5$, $df = 3$, level of being significant $p \leq 0.05$

Table-2 explains the relationship of the angular velocity kinematics of male players to the kicked ball angle and kicking foot ankle's angular velocity $r = 0.60$ & $p = 0.14$, kicking leg knee

joint's angular velocity $r = -0.40$ & $p = 0.33$, and Kicking leg hip joint's angular velocity $r = 0.20$ & $p = 0.62$ at $\alpha = 0.05$ level of significance and at $df = 3$.

McGhee et al. (2012) noted that Correlation Coefficient (r) $0.0-0.1$ = trivial, very small, insubstantial, tiny, practically zero; $r 0.1-0.3$ = small, low, minor; $r 0.3-0.5$ = moderate, medium, $r 0.5-0.7$ = large, high, major; $r 0.7-0.9$ = very large, very high, huge; $r 0.9-1$ = nearly, practically, or almost: perfect, distinct, infinite (**Hopkins,, 2002**). In this study among the angular kinematic parameters, kicked ball angle had a moderate negative relationship with kicking foot ankle angle, low relationship with kicking leg knee joint angle, and large positive relationship with kicked ball angle and kicking leg hip joint angle in the sample but statistically no significant relationship in the population. Moreover, kicked ball angle had a large positive relationship with kicking foot ankle's angular velocity, moderate negative relationship with kicking leg knee joint's angular velocity, and small positive relationship with Kicking leg hip joint's angular velocity in the sample but does not stand significant in the population.

4. DISCUSSION

In the angular kinematic parameters, there are negative weak relationships between kicked ball angle and kicking foot ankle angle, kicking leg knee joint angle, and positive moderate relationship between kicked ball angle and kicking leg hip joint angle in the sample but statistically no significant relationship was observed in the population. A kinematic outcome is the product of all the angles of all the body segments involved in normal kicking action. Nevertheless, in the chip shot, all body segments are involved in their optimal angular kinematics. Here, the researcher has only confined to the action of the kicking leg, hence, no highly significant value has been observed.

Moreover, the kicked ball angle has a moderate positive relationship with kicking foot ankle angular velocity, moderate negative relationship with kicking leg knee joint's angular velocity, and weak positive relationship with Kicking leg hip joint's angular velocity in the sample but does not stand significant in the population. The reason may be the same as described for the angular kinematic study not to be statistically highly correlated between kicking leg angular velocity parameters and kicked ball angle in chip shot performance of male players.

5. CONCLUSION

It is observed that male soccer players' performance of chip shot in the study in achieving kicked ball angle- decrease in angle of the ankle joint has a moderate effect, increase in kicking leg knee joint angle has a little role, whereas an increase in kicking leg hip joint angle contribute a large. Moreover, to achieve kicked ball angle in chip shot male soccer players increment in kicking foot ankle's angular velocity contribute largely, decrease of kicking leg knee joint's angular velocity has a moderate effect, and an augment of kicking leg hip joint's angular velocity has a little contribution.

6. RECOMMENDATION

Soccer trainers and coaches should pay attention to kicking leg kinematics along with the kinematics of other body parts involved in the execution of the chip shot while training male soccer players.

7. ACKNOWLEDGEMENT

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8. FUNDING INFORMATION

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9. CONFLICT OF INTEREST

There is no Conflict of interest.

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**DELIVERY STRIDE LENGTH AS A PREDICTOR OF
SHOULDER COUNTER ROTATION OF PACE
BOWLING IN CRICKET**
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ABSTRACT

The purpose of the study is to find out the relationship between Delivery Stride Length and Shoulder Counter Rotation in Pace Bowling in Cricket. To fulfill the purpose, 11 male university level pace bowlers (Aged 21.91 ± 1.64 ; Height 1.654 ± 0.07) of VisvaBharati University were filmed in an outdoor field in a standard (20.12 m) cricket pitch. Two Dimensional Kinematic (2-D) data were collected by pointing two standard cameras from the direction of two planes (Transverse and Sagittal). For the acquisition of kinematic data subject's Shoulder Alignment at Back Foot Contact and Front Foot Contact, Shoulder Counter Rotation and Delivery Stride Length was analyzed in Kinovea Software (8.25 version). In statistical analysis Pearson Product Moment correlation shows significant relationship ($r=0.59$) between Delivery Stride Length and Shoulder Counter Rotation of the pace bowlers. From the obtain result it is concluded that in Pace Bowling ,Delivery Stride Length and Shoulder Counter Rotation having significant relationship and Delivery Stride Length can be a strong predictor of Shoulder Counter Rotation.

Keyword: Pace Bowling, Cricket,Shoulder Counter Rotation, Delivery Stride Length

1. INTRODUCTION

Bowling performance in cricket has an attractive feature with accomplishment of multiple strenuous physical activities with multiple applications of mechanics. Fast bowling is a dynamic activity with following the steps of Run up, Backfoot contact, Frontfoot contact and deliver the ball with maximum speed and also with greater accuracy. Delivery Stride length is a component where the bowler transferring the running momentum to deliver the ball. A greater delivery stride length has no longer any advantageous effect on bowling performance outcomes such as ball release speed, accuracy and ball release height if it exceeded 75-85% of standing height (Wayne , Claire , Sean , Amy, & Portus, 2016). As a other factor stride length may have an effect on contact time, anteroposterior braking and propulsive force and impulse descriptors, and vertical impulse as the length increases (Martin & Marsh, 1992).A larger horizontal braking associated and key determinant of a faster ball (King , Worthington , & Ranson , 2016). As a result of this bowlers try to acquire a large delivery stride length.SCR is the change in alignment of the shoulders, rotating away from the batsman, between back foot contact (BFC) and front foot contact (FFC) during the bowling delivery stride (Ranson, Burnett, King, Patel, & O'Sullivan, 2008). Shoulder Counter Rotation(SCR) has a great impact on ball release speed and accuracy in fast bowling in cricket (Portus, Sinclair , Burke , Moore , & Farhart, 2000).

Main aim of the study was to find out the Relationship Between Delivery Stride Length and Shoulder Counter Rotation Of Pace Bowling in Cricket.

2. METHODOLOGY

2.1 Selection of Subject

Eleven (11) male Inter-university level pace bowlers (Aged 21.91 ± 1.64 ; Height(1.65 ± 0.07)) from Visva-Bharati cricket team were selected for the study.

2.2 Collection of data

To obtain data subjects were filmed in an outdoor field in a standard (20.12 m) cricket pitch. Subjects ask to ball with the six deliveries at good length spot . Six (6) markers were attached to all pace bowlers for the reduction of kinematic data.Two Dimensional Kinematic (2-D) data were collected by two standard camera operated at a frame rate of 50Hz and 120 fps from the direction of two planes (Transverse and Saggital) at a height of 8m above from the ground and distance of 8 m from the stump respectively(Portus MR et al.,2000). The data were analyzed in Kinovea (8.25 version) software. For the purpose of the study the selected kinematic variables were shoulder alignment at BackfootContact , shoulder alignment at Frontfoot Contact and Delivery Stride Length were measured. To reduce the obtained data all transverse plane angular measures were relative to the pitch alignment in the direction of bowling measured in an anti-clockwise direction.



2.3 Statistical Procedure

Descriptive statistic (Mean, SD) and PPM Correlation was applied in order to assess the influence the relationship between Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation of pace bowlers in cricket.

3. RESULTS & DISCUSSION

TABLE 1
DESCRIPTIVE AND CORRELATION OF DELIVERY STRIDE LENGTH (DSL) UPON HEIGHT AND SHOULDER COUNTER ROTATION OF PACE BOWLERS IN CRICKET.

Bowling Phase	N	Mean	SD	Maximum	Minimum	r
DSL upon Height (%)	66	66.76	3.5	75.15	59.25	0.59
SCR(degree)		37.65	13.86	64	8	

Table 1 reveals that the mean of percentage of Delivery Stride Length (DSL) upon Height was 66.76 ± 3.5 and Shoulder Counter Rotation was 37.65 ± 13.86 degree. There is significant positive relation between percentage of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation, $r(66) = 0.59$ at 0.05 level.

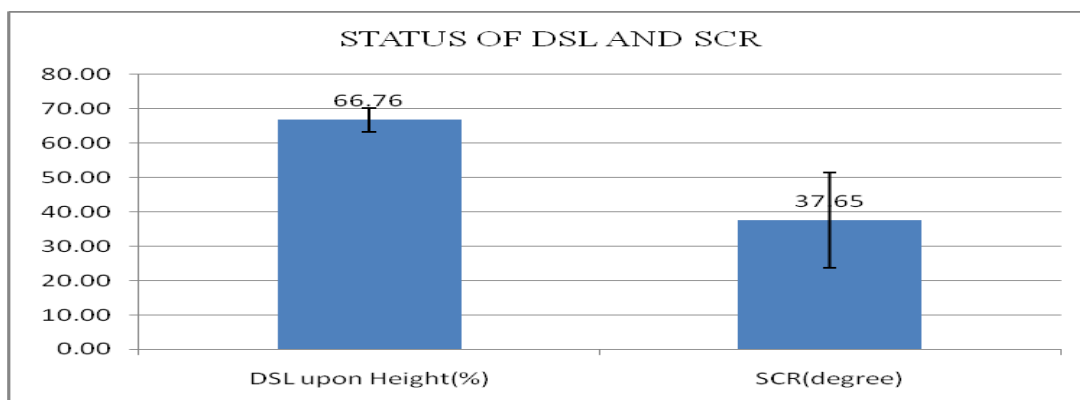


Figure-1: Graphical Representation of Mean and SD of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation of pace bowlers in cricket.

TABLE 2
DESCRIPTIVE STATISTICS OF DELIVERY STRIDE LENGTH (DSL) UPON HEIGHT AND SHOULDER COUNTER ROTATION AS PER THE CLASSIFICATION OF BOWLING ACTION

Bowling Action		N	MEAN	SD
Front on /Side on action(>30 degree)	SCR	20	20.7	7.3
	DSL upon Height		63.98	2.8
Mixed on action(<30 degree)	SCR	46	45.02	8.5
	DSL upon Height		68.0	3.1

Table 2 further analyzed the pace bowlers as per the bowling action where mean of front on and side on bowlers ($SCR \leq 30^\circ$) was 20.7 ± 7.3 degree of Shoulder Counter Rotation with a mean percentage of Delivery Stride Length (DSL) upon Height was 63.98 ± 2.8 whereas mixed on ($SCR \geq 30^\circ$) bowlers possess 45.02 ± 8.5 degree of Shoulder Counter Rotation with percentage of Delivery Stride Length (DSL) upon Height was 68.0 ± 3.1 . It reveals the SCR increases as the percentage of Delivery Stride Length (DSL) upon Height increases.

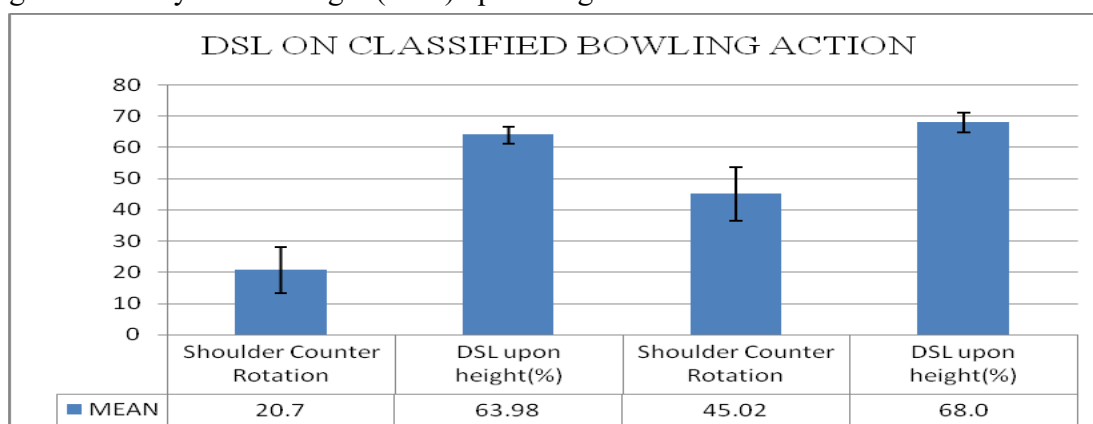


Figure-2: Graphical Representation of Mean and SD of Delivery Stride Length (DSL) upon Height and Shoulder Counter Rotation as per the classification of Bowling Action of pace bowlers in cricket

4. CONCLUSION

From the findings it can be concluded that there is positive significant relation between Delivery Stride Length (DSL) and Shoulder Counter Rotation. The Delivery Stride Length can be a predictor of Shoulder Counter Rotation.

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ROLE OF PILATES EXERCISES TO REDUCE BODY FAT PERCENTAGE OF OVERWEIGHT PEOPLE

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ABSTRACT

The purpose of the present study was to find the Role of Pilates Exercises to reduce body fat percentage of overweight people. For this study 30 overweight male subjects were selected between the age of 30-45 years from the General population of District Meerut of Uttar Pradesh and then selected subjects were divided into two groups i.e. 15 as experimental group and 15 as control group. In the present study purposive-random sampling technique was applied to select the subjects. For measuring body fat percentage the body composition analyzer and WHO's BMI norms table were used. The BMI was calculated easily from the following formula $BMI = \text{[Weight in kg / Square of height in meters]}$. After assessment of pre-test as experimental treatment Pilates exercises training was conducted for experimental group for ten weeks and no training to control group. After the completion of 10 weeks Pilates exercises training the post-test (measure body fat percentage) was conducted to know the significance difference. The 't' test was applied to find out the significance difference. On the basis of statistical analysis it was concluded that the Pilates Exercises play a significant role to reduce body fat percentage of overweight people.

Key words : Body composition, analyzer, Pilates, Body mass index.

1. INTRODUCTION

Throughout the human history, being fatty was not an option. The constant struggle to hunt, gather or harvest enough food to maintain life meant most people were always slim. Plumpness was a sign of excess, found only in the wealthy. So early on, being fatty was a status symbol. Still, for most people, just getting enough to eat was still the big issue. Whenever food is scarce, being able to eat was still the big issue. Whenever food is scarce, being able to eat well is something to talk pride. When food is routinely plentiful, it may be considered a sign of self-control to resist the temptation to over-indulge (**Fernandez Sot, Varsavsky 2010**). Human body composition refers to the assessment of the absolute and relative amounts of bone, muscles, and fat mass measured by different methods depending on the technology i.e. skinfold calipers, hydrostatic weighing, body composition analyzer, BMI etc. (**Areghan G. 2005**).

Body Mass Index (BMI) is a gross estimation for the amount of fat in the body. It tells whether one needs to lose weight or not all adults who have a BMI in the range labeled healthy are at their most healthy weight. They may have lots of fat but very little muscle. Similarly, if an athlete may have lots of muscles and less fat and if BMI is more than normal range, then still it may still be healthy. BMI tells whether body weight is appropriate for one's height. In Indians it is advisable that the BMI be not more than 29.9. BMI is normally a good indication for weight problems (**R.F. Zoeller 2007**).

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health. It is defined by Body Mass Index (BMI) and further evaluated in terms of fat distribution via the waist hip ratio and total cardiovascular risk factors. BMI is closely related to both percentage body fat and total body fat (**Dey, P. 1991**).

Pilates is a form of exercise, developed by Joseph Pilates, which emphasizes the balanced development of body through strength, flexibility and awareness in order to support efficient, graceful movement. Pilates is a body conditioning routine that helps build flexibility and long, lean muscles strength and endurance in the legs, abdominals arms, hips and back. It puts emphasis on spinal and Pelvic alignment, breathing to relieve stress and allow adequate oxygen flow to muscles, developing a strong core or center (tones abdominals while strengthening the back), and improving coordination and balance (**Anderson, B. 2000**). Pilates flexible system allows for different exercises to be modified in range of difficulty from beginning to advanced. Intensity can be increased over time as the body conditions and adapts to the exercises. No muscle group is under or over trained. It enhances core strength and brings increased reach, flexibility and agility.

Pilates help weight loss by building lean muscles while burning fat, weight is lost by creating a calorie deficit, burning more calories than take in. Pilates are designed to make the heart and lungs work harder, strengthening cardiopulmonary system in the process for good cardiovascular fitness it is greatly recommended to exercise 5 to 6 times a week and for 30 – 40 minutes daily, not including warming up at the start and cooling down at the end. The improvement in cardiopulmonary system can also be accompanied by an increase in good cholesterol, which helps to remove fatty acids from the body (**Freytag 2009 and Bernard 2007**). Keeping all the views in the mind regarding importance of Pilates exercise the present study was carried out to determine the role of Pilates exercises to reduce body fat percentage of overweight people.

2. MATERIAL AND METHODS

2.1 Subjects

To achieve the purpose of the study 30 male overweight people were selected as subjects from general population of Meerut (U.P.). Purposive sample technique was applied to select the subjects. Selected subjects were divided into two equal groups i.e., 15 as experimental and 15 as control group. Age group of the subjects ranged from 30 – 45 years. The study was conducted during summer 2019.

2.2 Variables and Instruments

For measuring body fat percentage the Body Composition Analyzer and BMI norms table were used. The BMI was calculated easily from the following formula.

$$\text{BMI} = [\text{Weight in kg} / \text{square of height in meters}]$$

As far as experimental training is concern the ten weeks specified Pilates exercise training programme was conducted in a systematic manner.

10 weeks training programme of various Pilates exercise

CATEGORY	DURTION	NAME OF EXERCISE
Beginner	3 Weeks	The Hundred, The Roll up, Standing Foot work Series
Intermediate	3 Weeks	The Double, Straight Leg Stretch, The Saw, The Criss Cross
Advanced	4 Weeks	The Saw Dive, The Shoulder Bridge, The Side Band, The Push ups.

2.3 Procedure

For the measurement of body fat percentage as percentage Body Composition Analyzer and WHO's BMI norms table was used. After assessment of pre-test as experimental treatment Pilates exercise training was conducted for experimental group for ten weeks and no training was given to control group. After the completion of specified training programme, the post-test (measure body fat percentage) was conducted to know the significance difference. To ensure uniform testing all subjects were testing by same tools (weighing machine and measuring tape).

2.4 Statistical Technique

The 't' test was used to determine the Role of Pilates exercises to reduce body fat percentage of overweight people. Further the level of significance was set at 0.05 level.

3. RESULT

To find out the significance difference between the pre-test and post-test means of control group and experimental group on BMI norms the 't' test was applied. The findings related to it are presented in table 1 – 4.

TABLE – 1
SIGNIFICANCE DIFFERENCE IN PRE-TEST (BODY FAT PERCENTAGE SCORE)
BETWEEN CONTROL AND EXPERIMENTAL GROUP

Group	N	Mean	S.D.	't' ratio
Control Group	15	32.70	2.88	0.88
Experimental Group	15	33.58	2.33	

Significant at 0.05 level 't' 0.05 (28) = 2.04

It is observed from Table – 1 that the calculated 't' (0.88) is less than the tabulated 't' (2.04). Hence, it may be considered that there was no significant difference found between the control and experimental group on pre-test scores of body fat percentage. The scores are also illustrated in the figure – 1.

FIGURE – 1

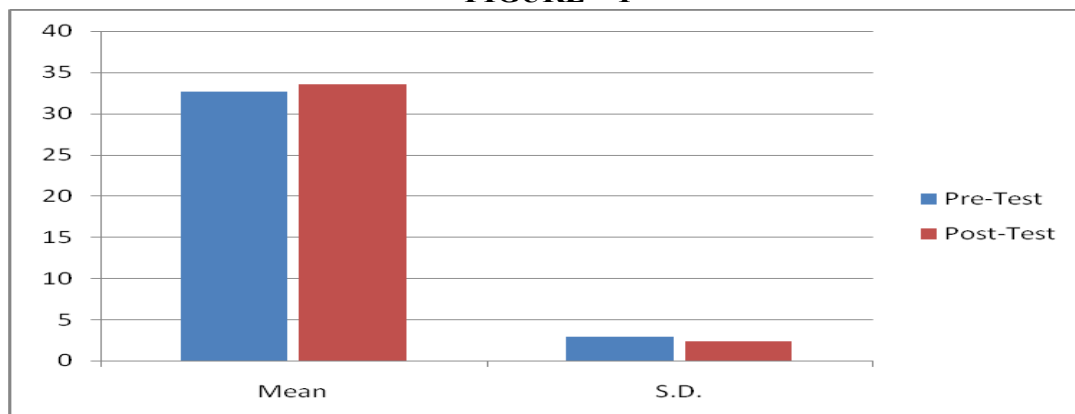


TABLE 2
SIGNIFICANCE DIFFERENCE IN POST-TEST (BODY FAT PERCENTAGE SCORE) BETWEEN CONTROL AND EXPERIMENTAL GROUP

Group	N	Mean	S.D.	't' ratio
Control Group	15	32.91	3.04	4.75
Experimental Group	15	28.27	2.02	

*Significance at 0.05 level 't' 0.05(28) = 2.04

It is observed from Table – 2 that the calculated 't' (4.75) is more than the tabulated 't' (2.04). Hence, it may be considered that there was significant difference found between the control group and experimental group on the post-test scores of body fat percentage. The scores are also illustrated in the figure – 2.

FIGURE – 2

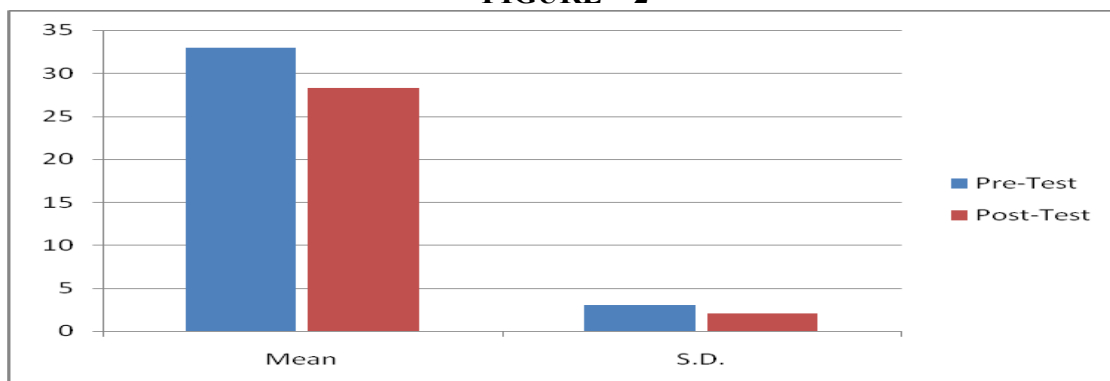


TABLE – 3
SIGNIFICANCE DIFFERENCE IN BODY FAT PERCENTAGE SCORE BETWEEN PRE-TEST AND POST-TEST OF CONTROL GROUP

Test	N	Mean	S.D.	't' ratio
Pre-test	15	32.70	2.88	0.26
Post-test	15	32.91	3.04	

Significant at 0.05 level 't' 0.05(28) = 2.04

It is observed from table – 3 that the calculated 't' (0.26) is less than the tabulated 't' (2.04). Hence, it may be considered that there was no significant difference found in body fat

percentage scores between pre-test and post-test of control group. The scores are also illustrated in the figure – 3.

FIGURE – 3

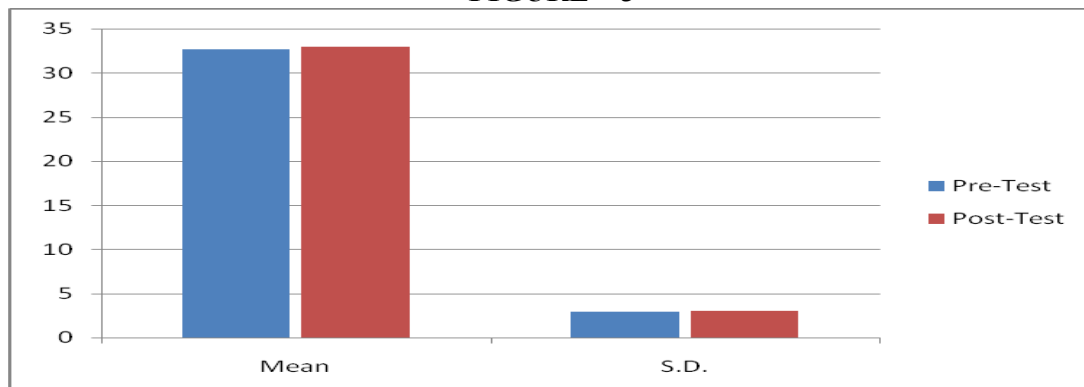


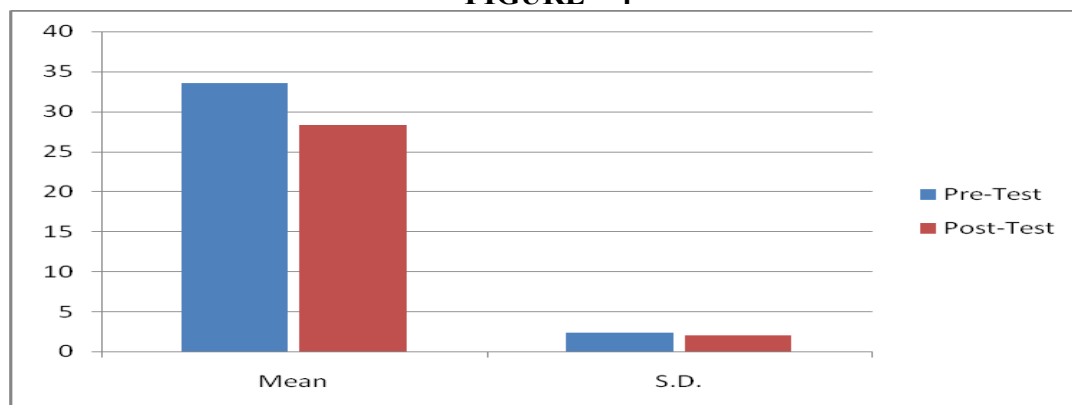
TABLE – 4
SIGNIFICANCE DIFFERENCE IN BODY FAT PERCENTAGE SCORE BETWEEN PRE-TEST AND POST-TEST EXPERIMENTAL GROUP

Test	N	Mean	S.D.	't' ratio
Pre-test	15	33.58	2.33	6.44
Post-test	15	28.27	2.02	

*Significant at 0.05 level 't' 0.05 (28) = 2.04

It is observed from table – 4 that the calculated 't' (6.44) is more than the tabulated 't' (2.04) Hence, it may be considered that there was significant difference found in body fat percentage between pre-test and post-test of experimental group. The score are also illustrated in the figure – 4.

FIGURE – 4



4. DISCUSSION

On the basis of obtain results, it has been observed that there was no significant difference found between control and experimental group on pre-test scores of body fats percentage. Results also revealed that there was no significant difference found in body fat percentage scores between pre-test and post-test of control group but as far as 10 weeks Pilates exercise training (experimental training) is concern there was significant difference found in

post-test scores of body fat percentage between control and experimental group as well as in pre and post-test of experimental group.

By the Pilates exercise training the body fat percentage of experimental group was reduced in comparison to control group which didn't have any training. So their performance with respect to Pilates exercise training programme was found to be significant because by the 10 weeks Pilates exercise training experimental group was also improved (reduce in body fat percentage) in comparison to pre and post-test of body fat percentage. This result is consistent with the findings of similar study conducted at **Barry University in Miami Shares Fla, cited by Freytag (2009)** which confirmed scientifically that Pilates reduce body fat percentage.

5. CONCLUSION

With the limitations of the study it was concluded that there was no significant similarities found between control and experimental group on pre-test scores of body fats percentage. Further it was concluded that by the 10 weeks Pilates exercise training the experimental group having low percentage of body fats in comparison to control group those having no training. The overall result showed that the effect of Pilates exercises was significant on body fat percentage of experimental group as compared to control group.

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EFFECT OF RECREATIONAL ACTIVITIES ON SELF CONCEPT OF DEAF AND DUMB STUDENTS

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ABSTRACT

The objective of the study was to find out the effect of recreational activities on self concept of deaf and dumb students. For the purpose of study, eighty boys & girls school going children, age ranged between 9-13 years, were randomly selected from Dr Sailendranath Mukherjee Mukavadhir Vidyalaya, Burdwan district and Suri Deaf and Dumb School, Suri, Birbhum District, West Bengal. Among them forty were randomly selected for experimental group and forty were selected as control group for the study. Self concept was considered as the selected variables for the study. Twelve weeks recreational activities were administered to the experimental group. The data was computed by paired sample statistics and ANCOVA. The result of the study revealed that the experimental group significantly improve the Self concept.

Key words : Self concept, recreational activities, Deaf and Dumb

1.. INTRODUCTION

Psychology is the science of behaviour and mind. The mental or behavioural characteristics of an individual or group. The study of mind and behaviour in relation to a particular field of knowledge or activity.

Psychology includes the study of conscious and unconscious phenomena, as well as feeling and thought. It is an academic discipline of immense scope. Psychologists seek an understanding of the emergent properties of brains, and all the variety of phenomena linked to those emergent properties, joining this way the broader neuro-scientific group of researchers. As a social science it aims to understand individuals and groups by establishing general principles and researching specific cases. In this field, a professional practitioner or researcher is called a psychologist and can be classified as a social, behavioural, or cognitive scientist. Psychologists attempt to understand the role of mental functions in individual and social behaviour, while also exploring the physiological and biological processes that underlie cognitive functions and behaviours. Psychology explore behaviour and mental processes, including perception, cognition, attention, emotion, intelligence, subjective, experiences, motivation, brain functioning and personality. This extends to interaction between people, such as interpersonal relationships, including psychological resilience, family resilience, and other areas. Psychologists of diverse orientations also consider the unconscious mind. Psychologists employ empirical methods to infer causal and correlational relationships between psychosocial variables.

Now a day's disability is the important issue in the world. We are hard and soul training to do fight against disability. But I don't know, how to reach our goal.

Recreational comes from the term recreation. It is an activity done for enjoyment when one is not working. Recreational means, relating or denoting activity done for enjoyment when one is not working. It refers to the time spent in an activity one loves to engage in, with intent to feel refreshed. Recreational activities help you to take a break from monotony and diversion from the daily routine. It gives people the benefit of a positive change from the stereotypical lifestyle and involves an active participation in entertaining activities that one is interested in. When one does engage in recreating activities that he or she likes, it would naturally give them enjoyment. Recreational activities provides source of joy and relaxation to one's mind and body.

Disability is a disadvantage for a given individual, resulting from impairment or a disability that prevents the fulfillment of a role that is considered normal (depending on age, sex and social and cultural factors) for that individual'. Disabled means "differently abled"; as they are popularly called. The world health organization (WHO) defines disability as: "disability is an umbrella term, covering impairments, activity limitations, and participation restrictions". Types of disabilities include various physical and mental impairments that can hamper or reduce a person's ability to carry out his day to day activities.

The aim of the study was to find out the effect of recreational activities on self concept of deaf and dumb students.

2. METHODOLOGY

For the purpose of study, eighty boys & girls school going children, age ranged between 9-13 years, were randomly selected from Dr Sailendranath Mukherjee Mukavadhir Vidyalaya, Burdwan District and Suri Deaf and Dumb School, Suri, Birbhum District, West Bengal. Among them forty were randomly selected for experimental group and forty were selected as control group for the study. Self concept was considered as the selected variables for the study. Twelve weeks recreational activities were administered to the experimental group. The data was

computed by paired sample static's and ANCOVA. The result of the study revealed that the experimental group significantly improve the Self concept.

2.1 Selection of Subjects

Eighty (80) hearing impaired school going children (boys 40 and girls 40) were selected as subject for the study. In this study the subjects (age ranged between 9 to13 years) were randomly selected from Dr Sailendranath Mukherjee Mukavadhir Vidyalaya, Burdwan District and Suri Deaf and Dumb School, Suri, Birbhum District, West Bengal. The age of the subjects were collected from school admission register. Among them forty were randomly selected for experimental group (EG) and forty were selected as control group (CG) for the study.

2.2 Description of Questionnaire

Self concept was considered as the selected variables for the study. It was tested by Self Concept- Self Concept Questionnaire method. The data was recorded in total no / 100.

2.3 Research Design

Simple randomized group design method was used for the study. They were randomly divided into two groups of equal number (N-40 in each), one experimental group and one control group. Pre-test data were collected from all the two groups. Thereafter applied the training programme of 3 alternate days in a week for 12 weeks to the experimental group and as well as the control group post test data were collected from all the two groups. The control group were not participated in any specific training but engaged in their regular practice.

2.4 Statistical Analysis

For the determining the effect of recreational activities, psychological variables, paired sample statistics and ANCOVA were used for the analysis of the data.

3. RESULTS

The findings pertaining to the study are presented in table-1, 2 and 3

Table 1: Paired Samples Statistics on Self concept of Different Groups

Treatment Group		Mean	N	SD	σ DM
Experimental Group	Pre-test	168.4500	40	5.89633	.93229
	Post-test	178.6750	40	6.23632	.98605
Control Group	Pre-test	161.4250	40	3.00331	.47487
	Post-test	166.7000	40	3.02299	.47798

Table- 1 describes the mean (M), Number of Students (N), Standard deviation (SD) and Standard error Mean of subjects in Self Concept. In the pre test phase, the mean of Self Concept of Experimental Group (EG) and as well as the Control Group (CG) were 168.4500 and 161.4250 respectively. In the post test phase, the mean of Self Concept of Experimental Group (EG) and as well as the Control Group (CG) were 178.6750 and 166.7000 respectively. The standard deviation for pre-test phase of Self Concept of Experimental Group (EG) and as well as the Control Group (CG) were 5.89633 and 3.00331 respectively. The post test standard deviation for Self Concept of Experimental Group and as well as the Control Group (CG) were 6.23632 and 3.02299 respectively. The numbers of students for Self Concept of experimental group (EG) were 40 and as well as the control group (CG) were 40 respectively.

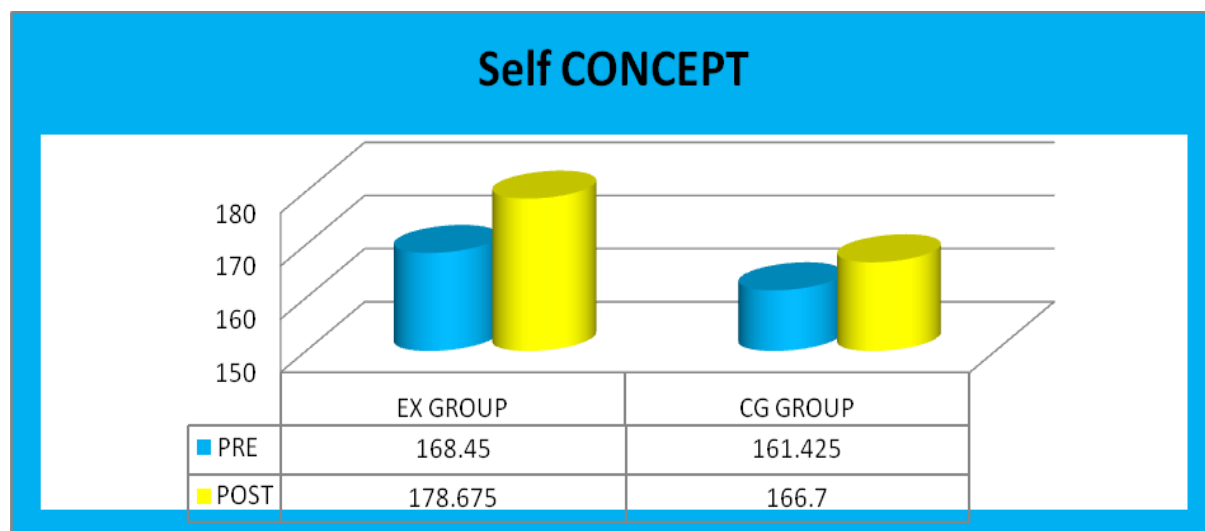


Figure-1 Scores of pre-test and post-test mean for Experimental Group and Control Group of self Concept.

TABLE 2
ANCOVA FOR DISTINCT GROUPS ON SELF CONCEPT TEST FOR PRE-TEST AND POST-TEST DATA

Source of Variation	df	SSx	SSy	SSxy	MSSx	MSSy	F _{yx}
Treatment Group	1	987.013	2868.013	1682.487	425.824	425.824	59.381*
Error	77	1707.675	1873.175	1501.950	552.166	7.171	
Total	78	2694.688	4741.188	3184.438	977.990		

Table value of F (1,77) = 3.97* Significant at the 0 .05 level

Table-2 reveals that the significant improvement in Self Concept ($F=59.381$) among the Experimental Group pre-test, post-test, and Control Group pre- test, post-test of the deaf and dumb students. The obtained F value 59.381 was found to be greater than that of tabulated F value 3.97 at 0.05 level of significance with 1, 77 degree of freedom.

TABLE 3
PAIR WISE COMPARISONS OF DISTINCT GROUPS OF ADJUSTED MEANS ON SELF CONCEPT TEST OBTAINED IN PRE-TEST AND POST-TEST DATA (N = 40)

Group	N	Pre-test	Post-test	Mean Adjusted Myx	Mean Difference	CD
Experimental Group	40	168.45\	178.68	175.59	5.8*	1.192
Control Group	40	161.43	166.70	169.79		

***. The mean difference is significant at the 0 .05 level**

Table-3 (Post hoc test), in the paired adjusted final mean differences in self concept test clearly indicates significant differences between Experimental Group and Control Group (MD-5.8) and where as the CD was 1.192. However, there was significant difference on intelligent test between the Experimental Group and the Control Group (MD-5.8) was observed where the critical difference was 1.192 at 0.05 level of significance.

4. DISCUSSION

The result of the study revealed that the recreational activities for twelve weeks improve self concept of deaf and dumb students. The result may be due to the effect of recreational training programme for 100-120 minutes per unit for three alternative days for twelve weeks. The result of the present study is supported by the study of **Choudhary (2012)** conducted a study on the “Psychological Perspectives on Physically Disabled Children”. She wants to compare the attitude and behavior of normal students and disabled students. For this purpose she took 200 students, out of those students 100 students were physically disabled and 100 were normal students. In this study through questionnaire and picture frustration test she shown that due to disabled individual had functional impairment, they had confined social relationship and also this quality they occupy few competency in the society than the others. Result of the study also revealed that the selected psychological variables of the training group were improved significantly to the control group.

5. CONCLUSION

On the basis, the result of the study, it may be reasonably be concluded that recreational activities improve self concept of deaf and dumb students.

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THE EFFECT OF RESISTANCE TRAINING ON STRENGTH OF UPPER LIMBS OF WHEELCHAIR BASKETBALL PLAYERS

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ABSTRACT

Wheelchair Basketball is a form of basketball usually played by the physically impaired. Participants play on specially designed wheelchairs, built specifically for the sport. Thus, there was a need for such a study especially in India. Parallel group experimental design was framed for this research study. The main purpose of this study was to find out the effects of resistance training on right hand and left hand grip strength, isokinetic strength of shoulder, bicep muscle, triceps muscles and explosive strength of shoulder of wheelchair basketball players. For this purpose, 10 male and 10 female wheelchair of national level wheelchair basketball players from various parts of Mumbai who volunteered to participate, were selected as the subject of study. The age of the subjects was between 20 years to 30 years. The selected ten male and ten female wheelchair bound basketball players underwent eight weeks of resistance training for three days in a week (Tuesday, Thursday, Saturday) in evening session for thirty minutes. Pre-test and Post-test were conducted on the selected upper limb strength variables administering Hand Grip Strength Measurement test of right and left hand (each separately) for Hand grip strength, Shoulder Dumbbell Press Test for Isokinetic strength of shoulder, Biceps curl test for Isokinetic strength of bicep, Triceps strength test for Isokinetic strength of triceps muscles, Medicine ball throw test for Explosive strength of shoulder of wheelchair basketball players. Significance differences were determined through “t” test and the result revealed that the resistance training has improved the strength of upper limbs of wheelchair players.

Keywords : Resistance Training, Strength, Upper Limbs, Wheelchair

1. INTRODUCTION

Anthropometry, Body Composition, and Performance in Sport-Specific Field Test in Female Wheelchair Basketball Players”) Thus female basketball players were also included in the research with male basketball players to find out the effects of resistance training method (Cavedon et al., (2018).

Wheelchair basketball is an intermittent sport which combines repeated high intensity sprints and rapid accelerations and decelerations with moderate and low intensity actions, with the purpose, among other aims, of achieving or maintaining a good position on the court (Molik et al., 2010). In this sense, both anaerobic and aerobic capacities are important for a better performance, during offensive and defensive situations (Molik et al., 2013).

Body composition is also a significant factor affecting performance in Wheelchair basketball. Several studies have determined the importance of anthropometry in sport, and it is perhaps even greater in adapted sports, where certain players with spinal cord injury may experience a loss of metabolic activity in active injury (Collins et al., 2010). For this reason some authors have studied body composition using skin folds in wheelchair basketball and tennis players (Sutton et al., 2009). In this regard, some researchers have stated that both the player’s functional potential (Vanlandewijck et al., 2004) and their body composition (Goosey-Tolfrey et al., 2003) will influence physical performance in Wheelchair basketball.

(Marios et al., (2006). examined the effects of a progressive resistance training program in addition to soccer training on the physical capacities of male adolescents. The results revealed that soccer training alone improves more than normal growth maximum strength of the lower limbs and agility. The addition of resistance training, however, improves more maximal strength of the upper and the lower body, vertical jump height, and 30-m speed. Thus, the combination of soccer and resistance training could be used for an overall development of the physical capacities of young boys. Faigenbaum et.al., (1996) evaluated the effects of an 8-week strength training program followed by an 8-week detraining period were evaluated in 11 boys and 4 girls, ages 7 to 12 years. The results suggest that participation in a short-term strength training program will increase the strength of children; however, strength gains regress toward untrained control values during the detraining period. Gorostiaga, et.al., (1999) suggested that the addition of 6-weeks of heavy resistance training to the handball training resulted in gains in maximal strength and throwing velocity but it compromised gains in leg explosive force production and endurance running. The tendency for a compromised testosterone and cortisol ratio observed in the ST group could have been associated with a state of overreaching or overtraining.

Resistance training is the best option to lean on for the development and the improvement of the strength and works on isotonic strength variables as well as the explosive strength variables of the athlete. Resistance training is also specialized method of conditioning that involves the progressive use of resistance to increase one’s ability to exert or resist force.

Sutton, Wallace, and Reilly (2009), indicated no difference between groups, but segmental analyses uncovered regional differences. The wheelchair athletes had greater BMD, more lean mass and a lower percent fat in their arms. The reverse was true of the legs. The trunk as a whole did not differ between groups. In general, the anthropometric equations showed a lack of transferability to the wheelchair group and tended to underestimate total percent body fat. Anthropometric measures such as body mass index (BMI) and waist girth showed strong correlations with body fat in the wheelchair group, but weaker results in the reference group. Flueck (2020) showed a significant difference between total fat and total fat-free mass between male and female athletes). In contrast, no significant difference in fat and fat-free

mass between paraplegic, tetraplegic and non-SCI athletes was found. Comparing different sports, the lowest fat mass was found in paracycling athletes whereas curling game players showed the highest total fat mass. Basketball game players showed the highest fat-free mass. In tetraplegic athletes, difference in fat-free mass between left and right arms correlated with the upper extremity motor score. **Iturricastillo, Granados and Yanci (2015)** showed a decrease in subcutaneous adipose tissue and there was an improvement in physical abilities such as sprinting with the ball (5 and 20 m), handgrip and aerobic capacity. However, the changes in physical fitness concerning sprinting without the ball and agility tests were low. **Gorostiaga et.al., (2006)** find out the effects of an Entire Season on Physical Fitness Changes in Elite Male Handball Players. They concluded that the handball season resulted in significant increases in maximal and specific strength of the upper-extremity but not in the lower-extremity actions. The correlations observed suggest that training time at low intensity should be given less attention, whereas the training stimuli for high-intensity endurance running and leg strength training should be given more careful attention in the full training season program.

The main purpose of this study was to find out the effects of resistance training on right hand and left hand grip strength, isokinetic strength of shoulder, bicep muscle, triceps muscles and explosive strength of shoulder of wheelchair basketball players.

It was also hypothesized that the resistance training will show significant improvement in right hand grip strength, left hand grip strength, isokinetic strength of left biceps, isokinetic strength of right biceps, isokinetic strength of shoulder, in isokinetic strength of triceps muscles and shoulder explosive strength, of wheelchair men basketball players.

2. METHODOLOGY

2.1 Selection of Subjects

Parallel group experimental design was framed for this research study. Ten male and ten female wheelchair of national level basketball players from various parts of Mumbai had volunteered to participate, were selected as the subject for this study. The age of the subjects was between 20 to 30 years.

2.2 Selection of Variables

To find out the effects of resistance training on strength of upper limb of wheelchair basketball players, the hand grip strength, isokinetic strength of shoulder, bicep muscles, triceps muscles and shoulder explosive strength were chosen.

2.3 Selection of Test

Hand Grip Strength Measurement test of right and left hand (each separately) for Hand grip strength, Shoulder Dumbbell Press Test for Isokinetic strength of shoulder, Biceps curl test for Isokinetic strength of bicep, Triceps strength test for Isokinetic strength of triceps muscles, Medicine ball throw test for Explosive strength of shoulder of wheelchair basketball players. The respondents were made aware of the purpose of the study in order to establish rapport with them. Scores obtained during all the tests were tabulated for further use.

2.4 Training program

The selected ten male and ten female wheelchair bound basketball players underwent eight weeks of resistance training for three days in a week (Tuesday, Thursday, Saturday) in evening session for thirty minutes. Pre-test and Post-test were conducted on the selected upper limb strength variables administering.

2.5 Statistical Analysis

To assess the effects of resistance training on strength of upper limb of wheelchair basketball players. mean, standard deviation and t-ratio were computed

3. RESULTS

To find out the significance of difference between pre-test and post-test mean of strength of upper limb of male and female wheelchair basketball players, mean, standard deviation and t-ratio were computed and data pertaining to this, has been presented in Table 1 and 2 and depicted in figure 1 & 2

TABLE 1
COMPARISON OF MEAN GAIN OF PRE TEST AND POST TEST OF STRENGTH OF UPPER LIMBS OF WHEELCHAIR MEN BASKETBALL PLAYERS

Variable	Pre Test		Post Test		“ t “
	Mean	SD	Mean	SD	
Right Hand grip strength	26.90	4.39	30.47	07.51	8.85*
Left Hand grip strength	26.33	06.06	29.45	6.47	12.85*
Isokinetic strength of left bicep	18.00	02.45	20.50	2.07	11.18*
Isokinetic strength of right bicep	16.60	02.95	19.10	2.85	15.00*
Isokinetic strength of shoulder	22.70	04.42	25.60	4.17	16.15*
Isokinetic strength of triceps muscles	16.20	01.75	18.80	1.75	15.92*
Explosive strength of shoulder	08.00	00.65	08.35	00.67	02.54*

*Significant at .05 level

t.05(18)=2.10

Table 1 reveals the significant differences between pre-test and post-test means of Right Hand grip strength, Left Hand grip strength, Isokinetic strength of left bicep, Isokinetic strength of right bicep, Isokinetic strength of shoulder, Isokinetic strength of triceps muscles and Explosive strength of shoulder of male wheelchair basketball players, as the obtained t-values of 8.85, 12.85, 11.18, 15.00, 16.15, 15.92 and 02.54 respectively were higher than the required t.05(18)=2.10

TABLE 2
COMPARISON OF MEAN GAIN OF PRE TEST AND POST TEST OF STRENGTH OF UPPER LIMBS OF WHEELCHAIR WOMEN BASKETBALL PLAYERS

Variable	Pre Test		Post Test		“ t “
	Mean	SD	Mean	SD	
Right Hand grip strength	27.10	04.69	30.47	04.75	09.90*
Left Hand grip strength	28.10	06.71	31.04	07.51	08.95*
Isokinetic strength of left bicep	15.10	01.66	17.70	01.64	15.92*
Isokinetic strength of right bicep	14.80	01.87	17.40	01.84	15.92*
Isokinetic strength of shoulder	12.50	01.72	14.80	01.81	15.05*
Isokinetic strength of triceps muscles	10.50	01.08	12.90	00.88	14.69*
Explosive strength of shoulder	07.16	00.94	07.54	00.93	10.58*

*Significant at .05 level

t.05(18)=2.10

Table 2 reveals the significant differences between pre-test and post-test means of Right Hand grip strength, Left Hand grip strength, Isokinetic strength of left bicep, Isokinetic strength of right bicep, Isokinetic strength of shoulder, Isokinetic strength of triceps muscles and Explosive strength of shoulder of female wheelchair basketball players, as the obtained t-values of 9.90, 8.95, 15.92, 15.92, 15.05, 14.69 and 10.58 respectively were higher than the required t.05(18)=2.10

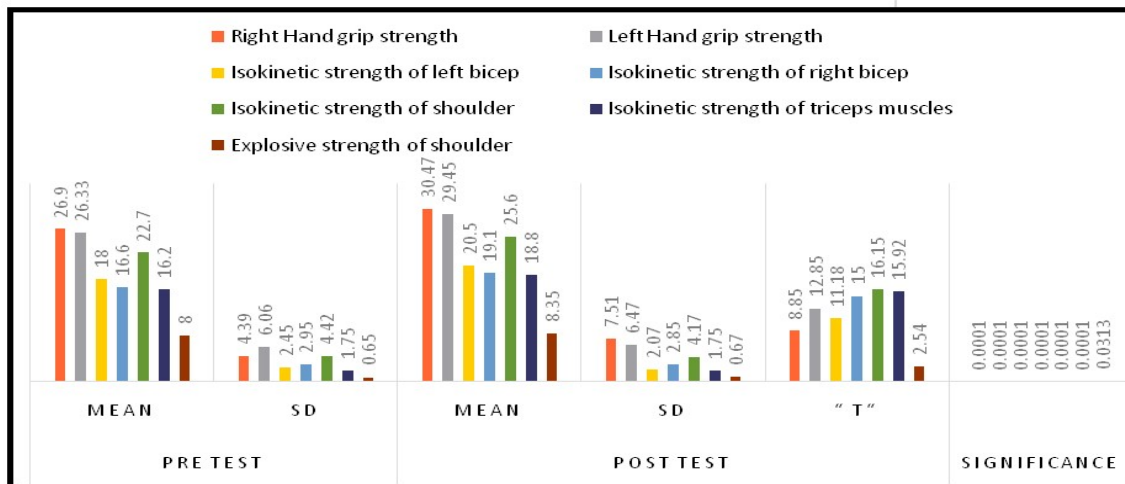


Figure 1 Comparison of Mean of Pre-test and Post-test of Strength of Upper limbs of Wheelchair men Basketball Players

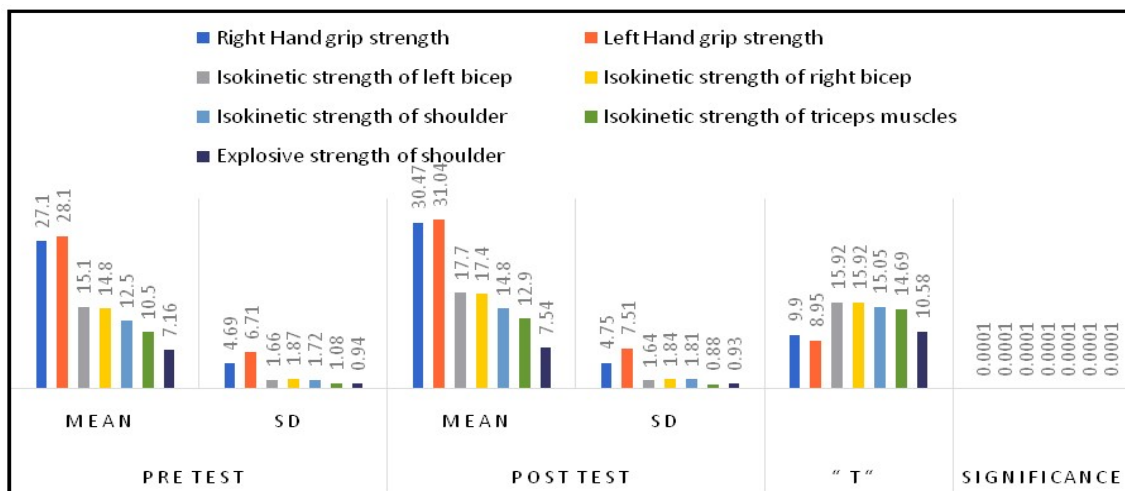


Figure 2 Comparison of Mean of Pre-test and Post-test of Strength of Upper limbs of Wheelchair Women Basketball Players.

4. CONCLUSIONS

1. Resistance training program contributed significantly for the improvement of hand grip strength of male and female wheelchair basketball players.
2. Resistance training program contributed significantly for the improvement of isokinetic strength of biceps of male and female wheelchair basketball players.
3. Resistance training program contributed significantly for the improvement of isokinetic strength of shoulder of male and female wheelchair basketball players.
4. Resistance training program contributed significantly for the improvement of isokinetic strength of triceps muscles of male and female wheelchair basketball players.
5. Resistance training program contributed significantly for the improvement of explosive strength of shoulders of male and female wheelchair basketball players.

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EFFECTS OF AEROBIC EXERCISE WITH NATURAL SUPPLEMENTATION ON LIPID PROFILES AND BODY COMPOSITION IN DESKBOUND

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ABSTRACT

Aim: This study was conducted to determine the effect of aerobic exercise with natural supplementation on lipid profiles and body composition in deskbound women. **Materials and methods:** Hence 30 obese women (BMI \geq 30, age 30-34) were included in two groups. Aerobic exercise with natural supplementation (AENS; n=15); control group (G_{CON}: n=15). The experimental group underwent their aerobic exercise with natural supplementation (raw onion, Tomatoes, Fenugreek seeds, ginger and garlic). These are in the form of chutney, was given daily as 75 to 100 gm per day for period of 10 weeks for all days. To identify total cholesterol, HDL, LDL and triglycerides levels (computerized Robotic semi auto analyzer), venous blood samples were obtained before and 48 to 72 h after last session of protocol. BMI was calculated the (body weight [kg]/height [m²]) and body fat percent was then calculated by using the Siri equation. **Results:** In observation, a significant decrease for total cholesterol, LDL, triglycerides, BMI and body fat percentage (P<0.05) and significant increase for HDL (P>0.05) in the G_{CON} after the 10 weeks period was unchanged. **Conclusion:** The study revealed a suggested aerobic exercise with natural supplementation training had been an effective beneficial plan for changes in lipid profiles and body composition in obese women.

Key words: Aerobic exercise, natural supplementation, lipid profiles, body composition

1. INTRODUCTION

The present way of life, characterized by abundance of energy-enriched foods coupled with deskbound lifestyles is linked with increased obesity.¹ Age is correlated with a raise in adiposity, reduce in muscle mass, and decline in fitness.² These age-related changes in body composition and strength given to the improved occurrence of dyslipidemia, glucose intolerance, hypertension, and coronary artery disease (CAD) in the aged.³ Physical exercise during aging to raise long life and decrease risk for age-related diseases, specific to women based on present study.⁴ Therefore, instituting weight loss or work out interventions to decrease obesity and its associated metabolic abnormalities might be an important health benefit to deskbound women.⁵ The aerobic exercises with natural supplementation interventions to reduce obesity and increase fitness were widely advocated⁶ but there was conflicting evidence in which of these interventions would improve CAD older, obese individuals.⁷ The standard of living interventions, such as natural supplementation weight loss and rising physical activity (PA), are advocated for the management of obesity and prevention of future chronic diseases.⁸ Few well controlled clinical trials had examined whether weight loss alone or vigorous aerobic exercise training alone was sufficient to improve CAD risk factors in older, sedentary individuals.⁹ The studies have shown that growing person levels of aerobic exercise involvement is successful for reducing insulin resistance and adiposity; especially among populations with stationary lifestyle and fatness.¹⁰

Obesity is the most prevalent dietary disorder in which there is extreme storage of energy in the form of fat as per height, weight, race and gender WHO 2005.¹¹ Obesity is common among all age groups and is on the rise among adults particularly the women in general urbanized and developing countries.¹² Obesity is absolutely linked with increased risk for lots of health issues like type 2 diabetes, cardiovascular disease, and psychosocial problems.¹³ The sensible and scientific definition of obesity is based on the Body Mass Index (BMI; weight (kg)/height (m²). It is usually decided that a BMI of greater than 30 is indicative of obesity, while a BMI of 25.0-29.9 is suggestive of overweight in an individual. BMI between 18.5-24.99 indicates normal BMI.¹⁴ Natural supplementations are nature's way of as long as hold up for in general health & well-being. A variety of natural plants (e.g., herbs, fruits, and vegetables), fight the battle against obesity have been widely explored.¹⁵

Onion: Onion (*Allium cepa*) is wealthy in phenolic compounds. In adding together, these are a main source of quercetin, a flavonol used as a dietary supplement for its anti-inflammatory and antioxidant properties.¹⁶ Onion has the ability to control lipid metabolism and suppress hyperglycemia and diabetes.¹⁷ **Tomatoes:** Tomatoes (*Solanum lycopersicum*) support suggests that tomato-based products could condense the danger of cardiovascular diseases. One of the major cardiovascular risk factors is low levels of high-density lipoprotein cholesterol (HDL-C).¹⁸ **Garlic:** (*Allium sativum*) Garlic is a herb with multifaceted action. Daily intake of garlic is helpful in fat metabolism and lowering of blood cholesterol levels. Garlic increases high-density lipoprotein (HDL), which protects heart and blood vessels, and lowers low-density lipoprotein (LDL) beside with triglycerides.¹⁹ **Ginger:** Ginger (*Zingiber officinale* Roscoe, Zingiberaceae) is one of the for the most part commonly used spices around the globe, especially in the Southern-Eastern Asian countries.²⁰ It has long been old in traditional medicine as a cure for glucose and anticancer activities.²¹ In adding, ginger reduction low density lipoprotein-cholesterol (LDL-cholesterol), very low density lipoprotein cholesterol (VLDL-cholesterol) and triglycerides levels in apolipoprotein-E deficient mice.²² **Fenugreek seeds:** Fenugreek (*Trigonella foenumgrae-cum*) is one of the oldest therapeutic plants²³ which has valuable effects in pancreatic and other tissues and improves glucose absorption, hyperlipidaemic state as well as reduce insulin resistance.²⁴ Insulin resistance is

regularly connected with increased triglycerides (TG)²⁵ and decreased high density lipoprotein (HDL-C) concentrations and increased small LDL particles.²⁶ Human investigations recommend that fenugreek could be valuable as an addition in controlling high blood glucose and lipid levels in people with diabetes and obesity.²⁷ However, there have been no direct comparisons of the effects of aerobic exercise with natural supplementation in deskbound women. Thus, hypothesized that aerobic exercise with natural supplementation would improve the levels of lipid profiles and body composition in obese subjects.

2. METHODOLOGY

2.1 Subjects

30 sedentary women (BMI \geq 30, age: 30-34) were selected as the volunteered for participation in this study after receiving a detailed explanation of the study. All participants had to meet the following criteria before enrolment in the study. i. No current chronic health trouble. ii. No cardiovascular, metabolic or respiratory disease and iii. No consumption of any antilipidemic supplements or drugs within the past 6 months.

2.2 Reserach design

In this study, interventions were made a 10 week period and subjects were evaluated at baseline and at the end of the study. The 30 participating obese women (age: 30 \pm 34) were assigned to two equal groups: aerobic exercise with natural supplementation (AENS; n=15); control group (G_{CON}; n=15). Thus, 15 obese women (AENS: raw onion, tomatoes, fenugreek seeds, ginger and garlic). These are in the form of chutney was given daily as 75 to 100 gm per day for period of 10 weeks for all days and participants in followed aerobic training for 10 weeks. Subjects were instructed not to change their physical activity routines or dietetic patterns during the course of the experimental.

2.3. Measures

2.3.1 Anthropometric measurements

All anthropometric measurements were performed by the same technical persons on the day that blood specimens were taken. Height, weight were measured while subjects were not putting on shoes. BMI (body weight [kg]/height [m²]) and body fat percent was then calculated by using the Siri equation (Siri, 1961).

2.3.2 Lipid profiles measurements

Blood sampling were collected from each subject at baseline and at 48 to 72 hour after exercise session in an overnight 12-hour fasting state. Both pre test and post test data are means of 2 separate measurements. All the chosen lipid profiles were estimated by using serum in computerized Robotic semi auto analyzer.

2.4 Aerobic exercise with natural supplementation training program

- Experimental group trained under supervision in the gym centre on a cycle ergometer (Universal Aerobicycle) for 45 minutes both morning and evening.
- 10 minutes warm-up.
- 15 minutes cooling down exercise.
- Raw onion, tomatoes, fenugreek seeds, ginger and garlic. These are in the form of chutney was given daily as 75 to 100 gm per day.

2.4 Statistical analysis

All results are reported as mean \pm standard deviations. Experimental group interactions were assessed by the two-way analysis of variance (ANOVA). When differences were detected, a Post hoc test was performed to decide pair wise differences. Before statistical comparison, all data sets were tested for normal distribution by a Kolmogorov-Smirnov test. A p value of <0.05

was used to conclude statistical significance. SPSS 16.0 software was used for all the statistical calculations.

3. RESULTS

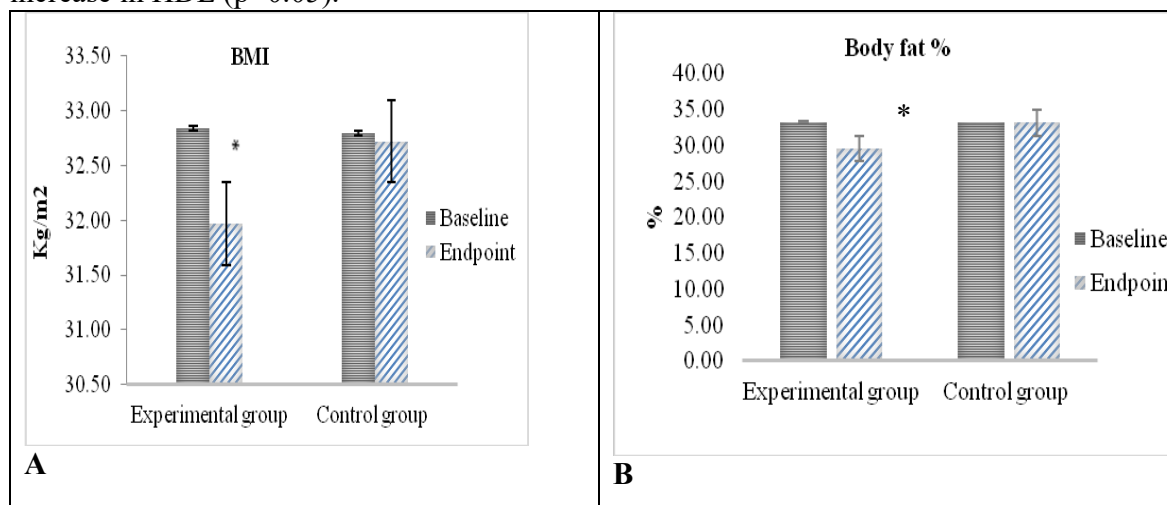
TABLE 1
BODY COMPOSITION AND LIPID PROFILES PRE-POST AEROBIC EXERCISE WITH NATURAL SUPPLEMENTATION INTERVENTIONS

	Aerobic exercise with natural supplementation		Control group	
	Pre	Post	Pre	Post
Body composition				
BMI (Kg/m ²)	32.84±0.35	31.97±0.50*	32.79±0.46	32.72±0.43
Body fat (%)	33.25±0.95	29.55±1.32*	33.17±1.15	33.12±1.11
Lipid profile				
Total cholesterol (mg/dl)	201.90±1.23	178.32±3.89*	201.87±1.25	200.5±2.10
LDL(mg/dl)	126.53±2.77	116.40±6.32*	127.31±3.53	126.11±3.45
HDL(mg/dl)	43.67±0.88	46.77±0.97*	43.52±0.73	43.80±0.68
TG(mg/dl)	174.81±2.22	168.19±2.48*	175.11±1.83	173.46±2.16

Values are mean ± SD. *P<0.05 vs. Pre test. BMI=body mass index; LDL= low density lipoprotein; HDL= high density lipoprotein; TG= triglyceride.

There were no significant differences among group at the beginning of the test for age, BMI and body fat % (p>0.05). Body composition and lipid profiles pre – post aerobic exercise with natural supplementation were statistically compared and are shown in Table 1.

In investigational groups, comparison with baseline values, mean BMI, body fat percentage, total cholesterol, LDL, and triglycerides decreased in the aerobic exercise with natural supplementation (p <0.05) independently of 10 weeks. In addition, there was a mean increase in HDL (p<0.05).



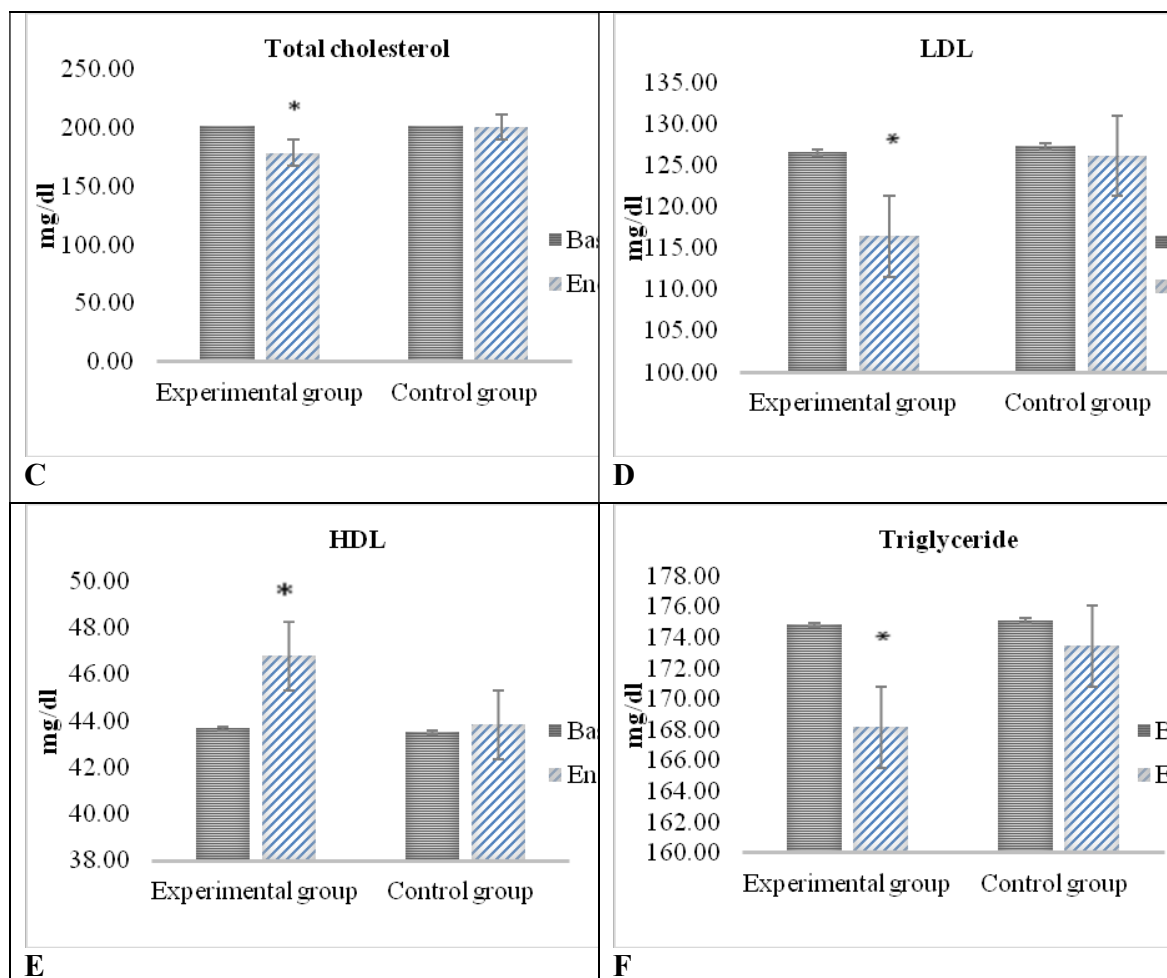


Fig. 1. Effect of aerobic exercise with natural supplementation on lipid profiles and body composition in deskbound woman. A: Effect on BMI (Body mass index). B: Effect on body fat %. C: Effect on total cholesterol. D: Effect on LDL (Low density lipoprotein). E: Effect on HDL (High density lipoprotein). F: Effect on TG (Triglyceride). Note. $P < 0.05$ were considered statistically significant (*).

4. DISCUSSION

The present investigation which confirms the effect of aerobic exercise decreases the body compositions. The reductions in body compositions could be due to the lipolysis activity of the body adipose tissues.²⁸ The aerobic exercise resulted in the increase density of adrenergic receptors at the cell level of fat tissue and their compassion toward the process of lipolysis, which could describe the reductions in the indicators of abdominal obesity (waist and hip circumference).²⁹ Moreover after 4 weeks intervention of aerobic training and fenugreek supplemental capsule consumption on cholesterol and triglyceride decline in blood.³⁰ Current studies on 8 weeks resistance-training with fenugreek seeds supplementation extracts support their success in promoting lean body mass, and lowering cholesterol.³¹ According to the Yang et al. showed that 10 female university students who took onion extract for 12 weeks training decreased weight, percentage of body fat, BMI, and waist circumference, which corresponds to the results of this study.³² In addition, the investigation reported in deceases in 12 weeks of taking the onion peel extract capsules, the overweight and deskbound adults showed significant decreases in weight;

BMI; waist, hip, and thigh circumferences; and skinfold thickness. The DXA measurements of body composition showed significant decreases in the percentage of body fat, particularly in the percentage of fat in the arm.³³ Noted similar significant reduced in 10-week aerobic activity with garlic supplementation reduces the weight, lipid percentage, cholesterol level BMI, and LDL-C in exercise and aerobic workout with supplementation groups were significantly decreases.³⁴ Several studies have shown decreased in 12 weeks of aged garlic supplementation with usual exercise body composition, lipid profile, and CVD risk factors considerably decreased in postmenopausal women.³⁵ Furthermore, research on the effects of onion significantly decreased the levels of total cholesterol in obese or overweight women.³⁶ The 3-month aerobic training with endurance strength training significant decreases in body mass, BMI, total body fat, total body fat mass, and waist and hip circumference amid women with abdominal obesity.³⁷ According to the present study, figueroa-colon showed a reduction in body weight and body fat after a 10-week of training with every day aerobic exercise jointly with a protein-sparing diet but no change in FFM.³⁸ Zhonqqu, (2010) investigated result of diet and aerobic exercise is more clear in the early phase of treatment for body weight and waist to hip ratio.³⁹ In view of the fact that, waist hip ratio is the key for abdominal fatness and there are relations between waist hip ratio changes, body fat percentage and sensitivity to insulin, it can be said that by reducing waist hip ratio, and the rate of body fat after aerobic exercise.⁴⁰ Therefore, previous studies concluded that 12 weeks of aerobic exercise, BMI, WHR, fat rate, weight and fat mass and triglyceride had significant reduction and HDL had significant increase. But no significant changes happened in LDL, VLDL, and cholesterol levels.⁴¹

5. CONCLUSION

The present study of aerobic exercise with natural supplementation training for 10 weeks resulted in significant body composition and lipid profile in deskbound women. Therefore, the previous study revealed the aerobic exercise with natural supplementation training had been an effective therapeutic plan to favourable changes in body composition and lipid profile and reduction of cardiovascular risk factors in deskbound individual. Further the study with lager number of subjects and different protocols should be performed, identified and the valuable result of natural supplementation and aerobic exercise the suitable programme for the management of obesity and its difficulties.

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Competing interests

None of the author declares competing financial interests.

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UNDERSTANDING THE EFFECTS OF COVID-19 QUARANTINE ON THE FITNESS OF SPORTSPERSONS IN BENGALURU

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ABSTRACT

The concerns over Corona virus have caused the entire world to adopt a strategy of social distancing and home confinement. With the world going into a shell, this has caused a turbulence in the general economy, along with disorder in the daily lives of the masses. This pandemic has left the sporting world also feel the brunt even more as their life depends on physical activities, outdoor as well as indoor. This pandemic has resulted in a shutdown of gyms, parks, practice arenas and sports fields. Subsequently, major sporting events have been postponed indefinitely. As a result, athletes around the world are feeling the pressure. Psychologists have started the process of studying the impact of this prolonged isolation on the general mental wellbeing of athletes alongside people from other walks of life. With the virulent spread of this virus and the possibility of an extended isolation, it is important to validate the impact of such an isolation on sportspersons and study their physical and mental fitness.

This paper proposes to study the coping strategies of athletes in Urban Bengaluru during this lockdown. The time frame chosen for the study is after the Government of India announcing a 21-day lockdown on the 21st March, 2020. The paper further tries to identify the ways in which they continue to work on their physical fitness during this 21-day period of isolation. Further the study proposes to explore the impact of the isolation on their physical and mental wellbeing. The final section highlights certain aspects such as virtual coaching and applications that help athletes to stay fit.

Keywords: Sports, Sportsperson, Quarantine, COVID-19, Fitness, Isolation

1. INTRODUCTION

Quarantine is generally perceived to be the control of the movement of people who might have been exposed to a disease, that might be infectious. This is done in order to prevent the transmission of the virus from one person to another. This method involves the restriction of movement of those people who are not sick and who may not have developed the sickness. The length of the quarantine is usually based upon the incubation period of the disease.

This method of quarantine was practiced in Italy during the 14th century, to control plague. Ships that arrived from infected ports in Venice were required to anchor for a period of forty days before the passengers were allowed entry in to the land. The method of quarantine however, was considered inhumane by many as it was unfair to isolate a person who was perfectly healthy. This method was slowly banished with the emergence of vaccines and medicines. Hence, containing the spread of infection became easier for various governing bodies. However, in recent times, with the increasing fear of bioterrorism after 9/11, the 2002 SARS (Severe Acute Respiratory Syndrome) outbreak, 2012 MERS-CoV (Middle East Respiratory Syndrome Coronavirus) outbreak and fear of H1N1 human influenza have brought back the centuries old method of quarantine. As a result, in order to limit the spread of various contagious illnesses in America, a system of quarantine was developed. These quarantine stations were made at various ports of entry into America. Here medical and public health care workers from America inspect and collect information from new migrants, refugees etc, who seek entry into the United States. Quarantine is not a casual hospital practice and thus Hospitals and various medical facilities along with the government may find themselves unprepared to handle such a situation (Martland, Mondelli, Gaughran, & Stubbs, 2020).

According to the World Health Organization, the novel coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. This virus causes mild to moderate respiratory illness and older citizens with underlying diseases are more likely to develop serious illness due to the virus. As on 31st March, 2020, this virus has infected 750890 individuals worldwide(World Health Organization, 2020). A total of 36405 individuals and counting have succumbed to this virus worldwide(World Health Organization, 2020). The concerns over Coronavirus have caused the entire world to adopt a strategy of physical distancing and home confinement. As a result, the global economy has shaken and has gone disarray.

This scenario has greatly affected the sportspersons too. They have isolated themselves, unable to actively involve in physical activities, indoor and outdoor. This is especially stressful when the virus outbreak has caused most of the sports events and tournaments around the world to be cancelled, postponed or modified. The worst scenario was the cancellation of Wimbledon which was to be held between 29th June and 12th July, 2020. This major sporting event was cancelled for the first time since World War II. All professional tennis events too have been suspended. The French Open is suspended until September 20,2020. The Olympics too is affected because of this pandemic. The International Olympic Committee along with Shinzo Abe, the Prime Minister of Japan postponed the Tokyo Olympic to 2021. The Euro 2020 Tournament has also been postponed till 2021. The National Basketball Association suspended all series till further notice after one of the players tested COVID 19 positive. The Paralympic Games in Tokyo too has been postponed to 2021.

In sports many things are left to chance as, sports are predictably unpredictable (Bhambri, Dhillon, & Sahni, 2005). For each and every sportsperson who enter the sporting field, physical fitness is extremely important to stay ahead in their game. In today's extremely competitive

sporting environment, mental fitness is of equal importance as physical fitness. Therefore, only by combining the two elements, that is, physical training and mental training, can players achieve consistency and peak in their performance each time. Thus, it is quite imperative that sportspersons train themselves every day. This training again depends upon the kind of sports each individual sportsperson is involved in. It is also the duty of the coaches to provide adequate training to these individuals depending upon their sport, ability and goal.

With the global outbreak of the novel coronavirus COVID-19 government authorities around the world have closed gyms, parks, practice arenas and sports fields. This has definitely caused a challenge to the sportspersons physical and mental wellbeing around the world.

Many psychologists are now in the process of studying the impact of this prolonged isolation on the general mental wellbeing of athletes. With the virus dangerously spreading and with a possibility of longer period of quarantine, it is important to estimate the impact of such a quarantine on individuals in the sporting field.

1.1 Literature Review

Many studies have shown the health benefits of specific types of sports and exercise, regardless of the individual or group participation (Tsuji, et al., 2019). Many studies have also shown the relationship between sports and group exercise participation and how it leads to benefits of social factors such as social capital, social influence etc, psychological factors like enhancement of self-esteem, decrease in tension and stress and increase in enjoyment, and benefits in physical activity like encouraging good behaviour and so on. (Kanamori S. T., 2015) There are a lot of health benefits of exercise as seen in many research articles. Therefore, it's quite needless to say that exercise improves attention of individuals, it helps in reasoning and processing speed (Kelly & Walsh, 2015). There are also many other researches that suggest that a structured exercise plan can help against mental disorders and also help in the treatment of it (Stanton, Happell, & Reaburn, 2014). Another study proved that there was a direct relationship between aerobic fitness, cardio-respiratory fitness and academic achievement (Buena, et al., 2019). Thus, as the above-mentioned research studies suggest there are a lot of benefits to exercise. Along with researchers, international and national organisations like the WHO have stated that adults should engage in around 75 to 150 minutes of moderate to heavy exercise per week. These exercises should not only include aerobic exercises but high intensity exercises with a recovery or rest period which includes, light exercises. This leads to increased improvement in fitness and also helps in the improvement of cardiovascular fitness (Milanovic, Sporis, & Weston, 2015).

With competition increasing in sports more than before, sportspersons are required to be fit all the time. Each sportsperson today has a specific exercise regime that the coaches make them follow according to their game and body type. With this there is also an increase in demand to have a well-trained mind as well. Without these players in today's competitive environment cannot ensure a definite win in their game. We also find, (Bhambri, Dhillon, & Sahni, 2005) in their research stating that coaches and players are recognizing the increasing need for mental fitness in order to be well advanced in their respective games. According to this study every competitive sport is 85-90 percent a mental game. Thus, a trained mind helps the sportsperson to reach his or her full potential, develop confidence and increase self-esteem. This is made easy with the introduction of psychology in sports. Unfortunately, the mental exercise aspect is often ignored and the physical exercise aspect gets overstated.

However, with the ever increasing research in sports it is clear that, sports performance is related to three aspects- sports physiology, sports psychology and biomechanics. And it is very important to concentrate on each of these three aspects in order to be able to excel in every game.

In India, sports psychology started to get more importance in 1970 at the Master's, M.Phil. and Doctoral research levels. It was with the introduction of Sports Psychology Association of India (SPAI) in 1985 that Sports psychology started to grow.

The environment that sportspersons are trained to be in is extremely tough and because of this it is more likely that they can learn to control situations that are not going the right way for them. This is possible only with both physical and mental training (Bhambri, Dhillon, & Sahni, 2005).

However, nothing could have prepared the sportspersons for a situation brought about by the contagious coronavirus COVID-19. And in this time of quarantine psychologists speculate how this prolonged period of isolation will affect sportspersons. Clinical physiologist KoketjoTsebe believes that, the quarantine could affect different people in different ways depending on their personalities. According to her, this period might impact an introvert player much more than an extrovert player as it is in their nature to interact with smaller number of people. (Mnganga, 2020).

According to the World Health Organisation, staying at home for a long period because of the COVID-19 can cause a lot of problems for the population. A sedentary lifestyle with a low level of physical activity can impact the well-being, health of an individual and quality of life in a negative manner. Thus, they recommend individuals to be involved in some type of exercise to protect their health during this time. This will be more applicable to sportspersons who now will not have access gyms, parks, fields, practice courts, etc. for their daily physical activity.

1.2 Statement of Problem

Sportspersons are constantly trained to deal with stress, but nothing could have prepared them for a quarantine for a prolonged period. Along with daily indoor and outdoor physical activities, most players also go through rigorous mental training. But this situation of quarantine has restricted their physical as well as mental training. That apart, the day to day news of cancelled or postponed sports matches have deflated the morale of many sportspersons around the world. The major focus of this paper is to understand the effect of COVID-19 quarantine on the physical and mental wellbeing of sportspersons. With 253 responses collected, this paper tries to yield descriptive data and helps in the addition to the body of work in this area and contributes to understanding sportspersons mental as well as physical fitness during the times of quarantine.

1.3 Objectives

To understand the effect of quarantine on the physical and mental fitness of athletes. To identify ways in which athletes stay fit during quarantine. To evaluate the emergence of virtual coaching and other applications.

2. METHODOLOGY

2.1 Sample

The study included sportspersons as well as coaches from various colleges in Urban Bengaluru City viz Christ Pre-University College, Christ (Deemed to be University), Jyoti Nivas Pre-University College, Jyoti Nivas College, Mount Carmel College, Jain College, PES University, Maha Lakshmi Ammani College for Women, St. Josephs College of Arts and Commerce, Deeksha Surana College and Alliance College. A sample of 253 coaches and sportspersons from these institutions were chosen as respondents for this study.

2.2 Sampling Technique

Convenient sampling technique was followed to select the respondents for the study.

2.3 Source of Data

The present study uses both primary as well as secondary data. Primary data is collected from select athletes with the help of a structured questionnaire. Secondary data are collected by referring to various journals, internet, research reports and newspaper and are incorporated wherever necessary to supplement the primary data.

2.4 Tool Used

A 5-point Likert scale (5-Always; 4-Often; 3- Sometimes; 2- Not Very Often; 1–Never) and (5-Strongly Agree, 4-Agree, 3-Neutral, 2-Disagree 1-Strongly Disagree) was chosen for the study.

2.5 Research Questions

1. What is the effects of quarantine on the fitness of sportspersons?
2. What are they ways in which they are staying fit during this quarantine?
3. What is the role of online applications in keeping sportspersons fit?

3. RESULTS

To assess the collected data from male and female respondents, frequency and percentage were computed with help of Statistical Package for Social Sciences (SPSS) software based on the information received from the questionnaire and data pertaining to this has been presented in Table 1..... And depicted in Figure 1.....

**TABLE 1
DEMOGRAPHIC PROFILE OF THE SPORTSPERSONS**

Variables	Categories	Frequency	Percentage
Gender	Male	145	57.3
	Female	107	42.3
	Transgender	1	0.4
	Prefer not to say	0	0
Age	15-20	97	38.3
	21-25	109	43.1
	26-30	38	15
	Above 30	09	3.6
Educational Qualification	High School	22	8.7
	Under graduation	154	60.9
	Postgraduation	71	28.1
	Diploma	04	1.6
	Doctorate	02	0.8
Occupation	Student	182	71.9
	Employed	49	19.4
	Coach	07	2.8
	Self Employed	11	4.3
	Full Time Athlete	04	1.6
Monthly Family Income	Less than 10000	80	31.6
	10000-25000	36	14.2
	25000-50000	47	18.6
	50000-75000	35	13.8
	75000-100000	21	8.3
	More than 100000	34	13.4
Marital Status	Single	228	90.1
	Married	19	7.5
	Others	06	2.4

The Table 1 shows that 57.1 percent of the respondents are male and 42.5 percent are female sportsperson respondents, 0.4 are transgender, there were no respondents who chose prefer not to say.

With respect to age of the respondents, 38.1 percent of the respondents are of the age group 15-20, 60.7 percent of the respondents are of the age group 20-25 years, 15.1 percent of the respondents are of the age group 26-30 years and 3.6 percent of the respondents are of the age group above 30.

With respect to highest education, 8.7 percent of the respondents are from high school, 60.7 percent of the respondents are undergraduates, 28 percent of the respondents are postgraduates, 1.6 percent of the population are diploma holders and 0.8 percent of the population are doctorate holders.

With respect to occupation, 71.8 percent of the respondents are students, 19.4 percent are employed, 2.8 are coaches, 4.4 percent are self-employed and 1.6 percent are full time athletes.

With respect to marital Status, 90.1 percent of yje respondents are bacheolar, 7.5 percent are married and 2.4 percent of respondents are others.

TABLE 2

MONTHLY INCOME FROM VARIOUS TOURNAMENTS AND SPORTING EVENTS

Monthly Income from Various Tournaments and Sporting Events	Less than 1000	188	74.3
	1000-4000	381	15
	4000-7000	12	4.7
	7000-10000	10	4
	More than 10000	5	2

As seen in Table 2, 74.3 percent of respondents earn less than 1000 rupees from tournaments and sporting events in a month. 15 percent earn between 1000-4000 rupees, 4.7 percent of the respondents earn between 4000-7000 rupees, 4 percent earn 7000-10000 rupees and 2 percent earn more than 10000 rupees per month.

TABLE 3

EXTENT OF AWARENESS OF CORONAVIRUS COVID-19

Extent of Awareness of Coronavirus	VARIABLE	FREQUENCY	PERCENTAGE
	Yes	233	92.1
	No	18	7
	Partially	2	1

As seen Table 3, 92 percent of the respondents are aware of coronavirus. 7 percent are partially aware of it whereas 1 percent are not aware of it.

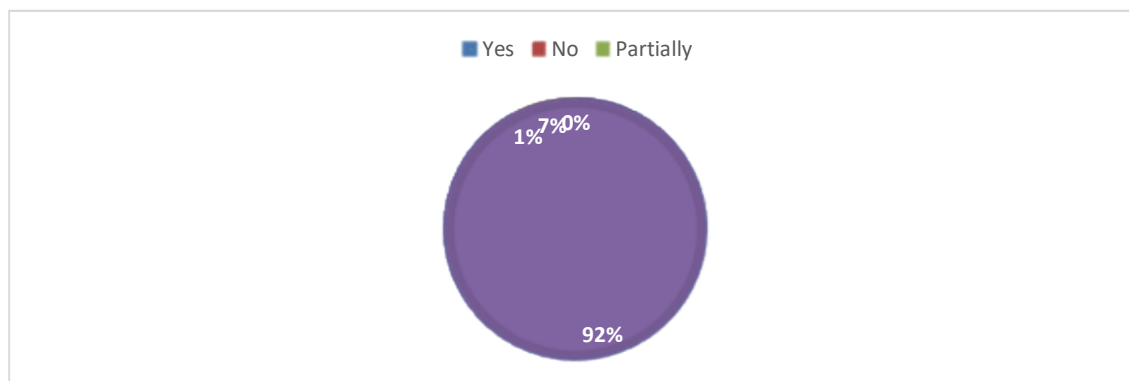


Figure -1: Extent of Awareness of Coronavirus

TABLE 4
SOURCE OF INFORMATION ON CORONAVIRUS COVID-19

Source of Information on Coronavirus COVID-19	VARIABLES	PERCENTAGE
	Friends Circle	0.8
	Government Department Announcements	37.5
	WHO	38.3
	Books/Newspapers	30.4
	Scientific research/Blogs/Articles	36
	Television	60.9
	Social Media	69.2

Table 4 indicates that around 69.2 percent get information from social media, 60.9 percent get information from television channels, 36 percent from scientific research/blogs/articles, 30.4 percent get information from books/newspapers, 38.3 percent gets information from WHO website, 37.5 percent gets information from government department announcements and 0.8 percent gets information from friends.

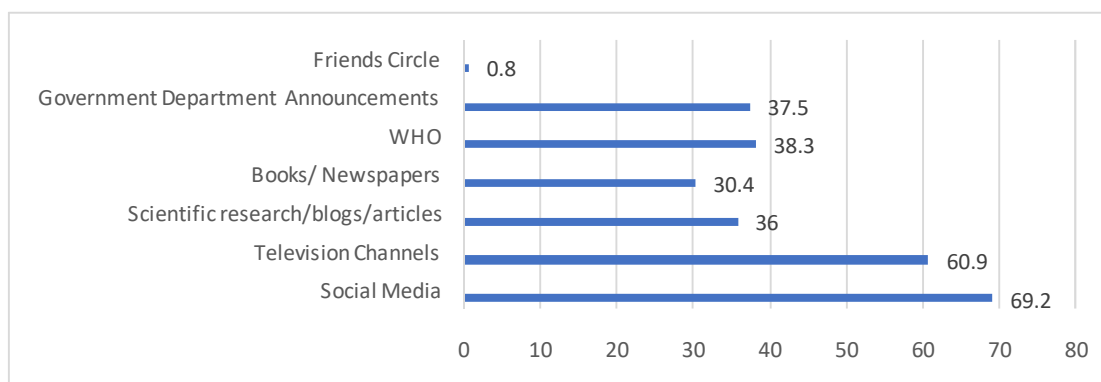


Figure-2:Source of Information on Coronavirus COVID-19

TABLE 5
WEIGHT OF RESPONDENTS BEFORE AND DURING 21 DAYS AFTER QUARANTINE

Weight of respondents before and during 21 days after quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	Yes	219	66.8
	No	34	33.2

Table 5 indicates that 66.8 percent of the respondents said that their weight did not increase during the time of the quarantine period. According to 33.2 percent of the respondents, their weight did increase during the time of quarantine.

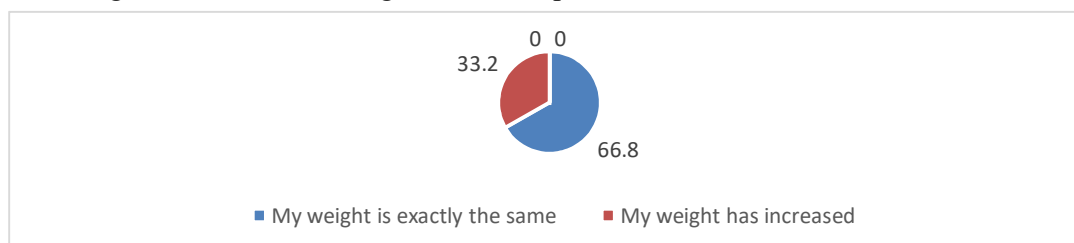


Figure-3: Weight of respondents before and during 21 days after quarantine

TABLE 6
VARIOUS SPORTING EVENTS RESPONDENTS ARE ASSOCIATED WITH

Different Sporting events the respondents are associated with	VARIABLE	PERCENTAGE
	Basketball	29.2
	Throwball	19
	Cricket	17.4
	Volleyball	15.8
	Football	15.8
	Athletics	14.2
	Tennis	11.1
	Badminton	4.4
	Hockey	4
	Kho-Kho	2.4
	Handball	1.6
	Shooting	1.2
	Kabaddi	1.2
	Cycling	0.4
	Swimming	0.4

Table 6 indicates that 29.2 percent of respondents play basketball, followed by throwball with 19.4 percent, 17.4 percent of the respondents play cricket, followed by football and throwball with 15.8 percent. 14.2 percent participate in athletics, 11.1 participate in Tennis. 4.4 percent participate in Badminton, 4 percent participate in Hockey, 2.4 percent respondents participate in Kho Kho. 1.6 respondents participate in Handball, 1.2 percent respondents participate in Shooting and Kabaddi and 0.4 percent each participates in Cycling and Swimming.

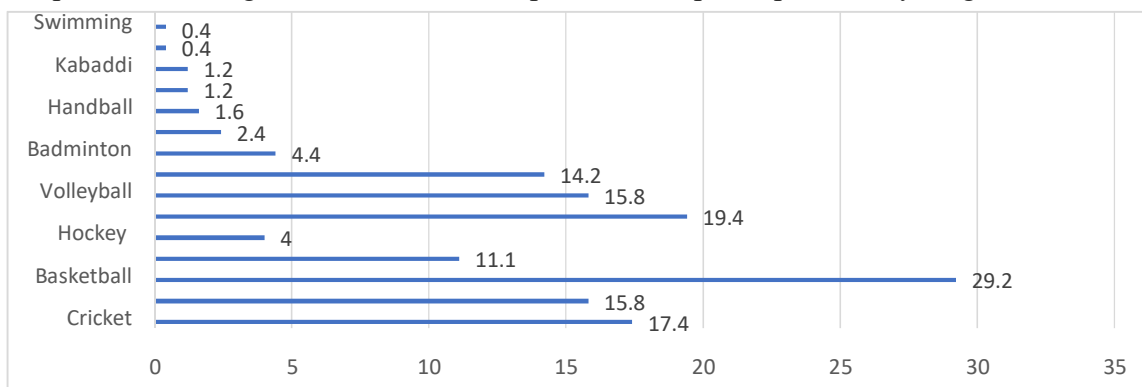


Figure-4: Different Sporting events the respondents are associated with

TABLE 7
MODE OF EXERCISE OF THE RESPONDENTS BEFORE QUARANTINE

Mode of exercise of the respondents before quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	Indoor	104	41.1
	Outdoor	50	19.8
	Both	99	39.1

Table 7 indicates that 41.1 percent of the respondents use indoor facilities to exercise, 19.8 percent use outdoor facilities to exercise and 39.1 percent of the respondents utilise both indoor and outdoor facilities to exercise.

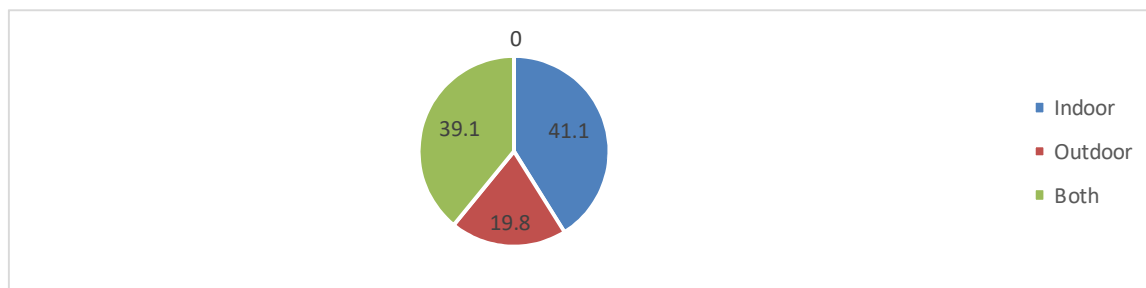


Figure-5: Mode of exercise of the respondents before quarantine

**TABLE 8
NUMBER OF HOURS A DAY THE RESPONDENTS TRAINED BEFORE
QUARANTINE**

Number of hours a day the respondents trained before quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	Less than 1 Hour a day	92	36.4
	2-3 Hours a day	139	54.9
	4-5 Hours a day	19	7.5
	More than 5 Hours a day	3	1.2

Table 8 with respect to number of hours a day the respondents trained before quarantine indicates that 54.9 percent of the population spent 2-3 hours training, 36.4 percent spent less than 1-hour training, 7.5 percent of the respondents spent 4-5 hours training and 1.2 percent of the respondents spent more than 5 hours training.

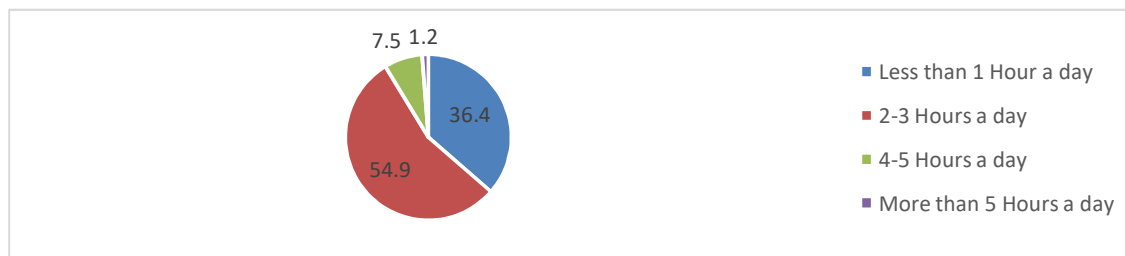


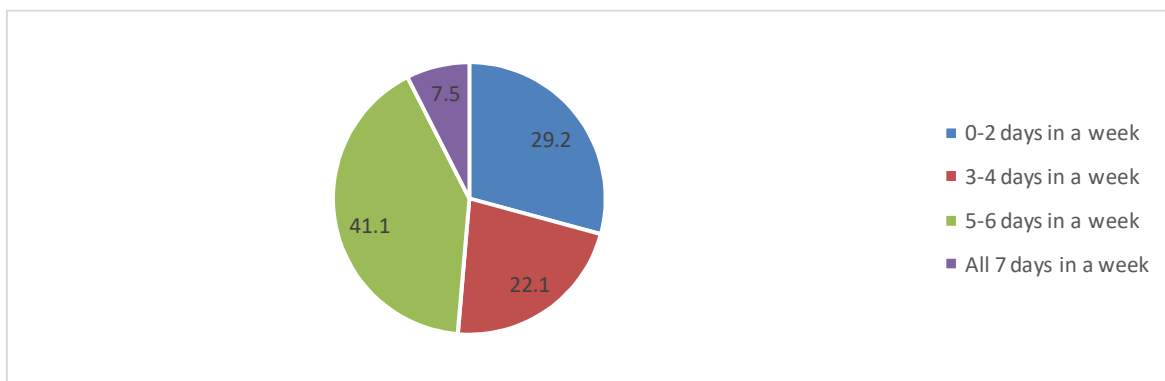
Figure-5: Number of hours a day the respondents trained before quarantine

**TABLE 9
NUMBER OF DAYS IN A WEEK THE RESPONDENTS TRAIN BEFORE
QUARANTINE**

Number of days in a week the respondents train before quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	0-2 days in a week	74	29.2
	3-4 days in a week	56	22.1
	5-6 days in a week	104	41.1
	All 7 days in a week	19	7.5

Table 9 with respect to number of days in a week the respondents exercised before quarantine indicates that 41.1 percent of the respondents exercise 5-6 days a week, 29.2

percent of the respondents exercise for 0-2 days in a week, 22.1 respondents exercise for 3-4 days in a week and 7.5 percent of the respondents exercise for all 7 days of the week.



F

Figure-6: Number of days in a week the respondents train before quarantine

TABLE 10

NUMBER OF SPORTS TOURNAMENTS/ EVENTS RESPONDENTS PARTICIPATE, PER MONTH

Number of Sports Tournaments/ Events Respondents Participate, Per Month	VARIABLE	FREQUENCY	PERCENTAGE
1	1	78	30.8
2	2	50	19.8
3	3	26	10.3
4	4	32	12.6
5	5	18	7.1
6	6	31	12.3
Depends	Depends	18	7.1

Table 10 reveals that 30.8 percent participate in at least 1 tournament, 19.8 percent participate in 2 tournaments, 12.6 percent of the respondents participate in 4 tournaments, 12.3 percent participate in 6 tournaments, 10.3 percent participate in 3 tournaments and 7.1 percent participate in 5 and another 7.1 percent have the opinion that it depended on various factors.

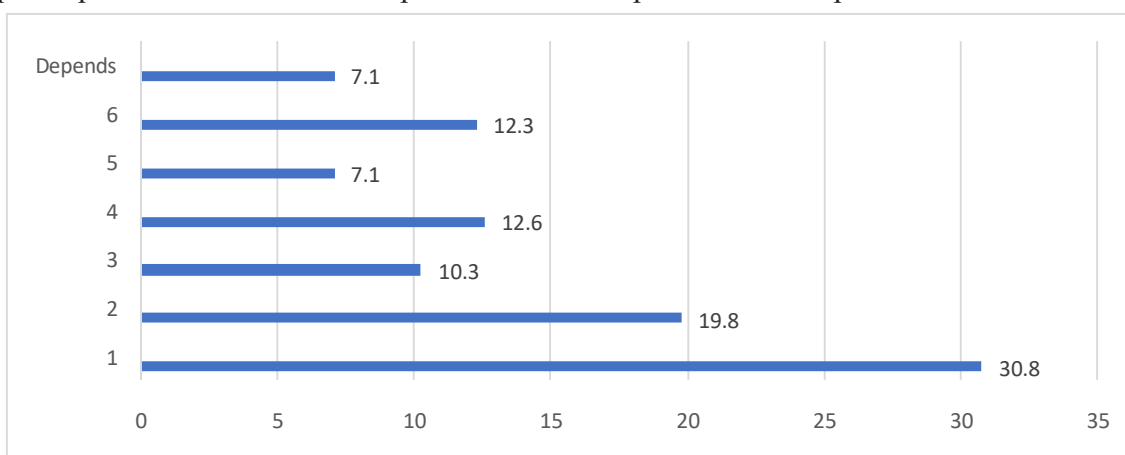


Figure-7: Number of Sports Tournaments/ Events Respondents Participate, Per Month

TABLE 11
NUMBER OF SPORTS TOURNAMENTS/ EVENTS RESPONDENTS PARTICIPATE IN A YEAR

Number of Sports Tournaments/ Events Respondents Participate in a Year	VARIABLE	FREQUENCY	PERCENTAGE
	1	27	10.7
	2	9	3.6
	3	15	5.9
	4	18	7.1
	5	31	12.3
	6	34	13.4
	More than 6	119	47

Table 11 reveals that 47 percent respondents participate in more than 6 tournament in a year, 13.4 percent respondents participate in 6 tournaments, 12.3 percent of the respondents participate in 5 tournaments, 10.7 percent of the respondents participate in 6 tournaments, 7.1 percent of the respondents participate in 4 tournaments, 5.9 percent of the respondents participate in 3 tournaments and 3.6 percent of the respondents participate in 2 tournaments per year.

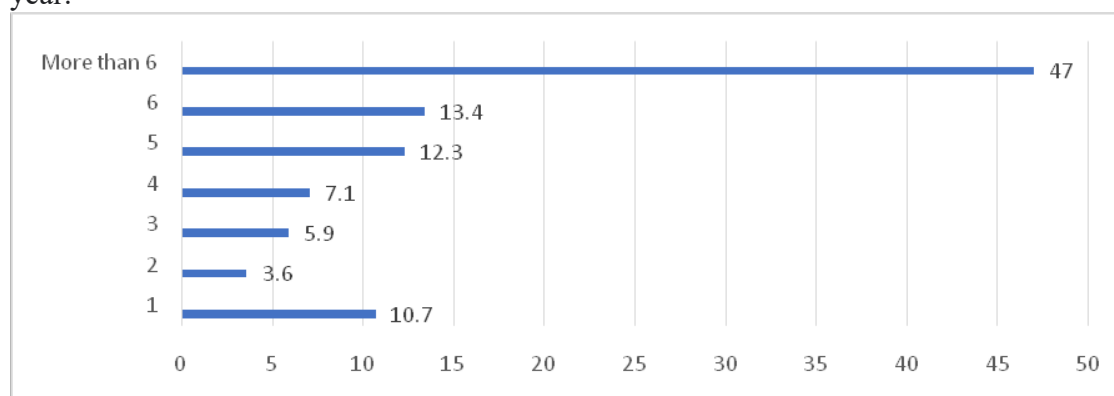


Figure-8: Number of Sports Tournaments/ Events Respondents Participate in a Year

TABLE 12
HOW THE RESPONDENTS DESCRIBE THE INTENSITY OF TRAINING, BEFORE QUARANTINE

How respondents describe the intensity of training, before quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	Moderate	133	52.6
	Heavy	79	31.2
	Light	41	16.2

Table 12 reveals that 56.6 percent of the respondents describe their intensity as moderate. 31.2 percent of the respondents describe the intensity as heavy and 16.2 percent describe the intensity as light.

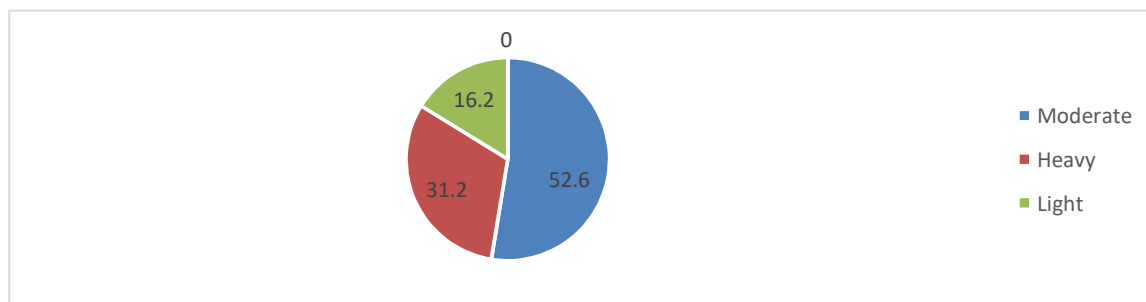


Figure-9: How the respondents describe the intensity of training, before quarantine

TABLE 13
MAJOR EXERCISES RESPONDENTS FOCUS ON WHILE TRAINING, BEFORE QUARANTINE

Major Exercises Respondents Focus on While Training, Before Quarantine	VARIABLE	PERCENTAGE
	Endurance Exercises	52.2
	Strength and Resistance Exercises	34
	Flexibility Exercises	24.1
	Balance Exercises	14.2

Table 13 reveals that 52.2 percent of the respondents focus majorly on endurance exercises like skipping, walking, jogging, dancing, biking, swimming and climbing stairs. 34 percent of the respondents focus mainly on strength and resistance training exercises like lifting weights, using resistance machines and bands at the gym and planks. 24.2 percent of the respondents focus on flexibility exercises like stretching, Pilates, yoga.14.2 percent respondents focus on balance exercises like heal to toe walking, standing on one-foot, tai chi poses.

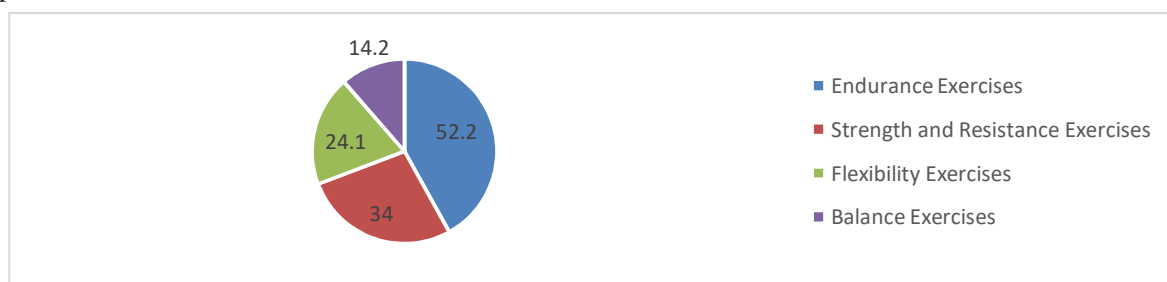


Figure-10: Major Exercises Respondents Focus on While Training, Before Quarantine

TABLE 14
RESPONDENTS ACCESSIBILITY TO EXERCISE AT HOME

Respondents Accessibility to Exercise at Home	VARIABLE	FREQUENCY	PERCENTAGE
	Yes	211	83.4
	No	42	16.6

Table 14 reveals that 83.4 percent have access to exercise at home. 16.6 percent of the respondents do not have access to exercise facilities at home.

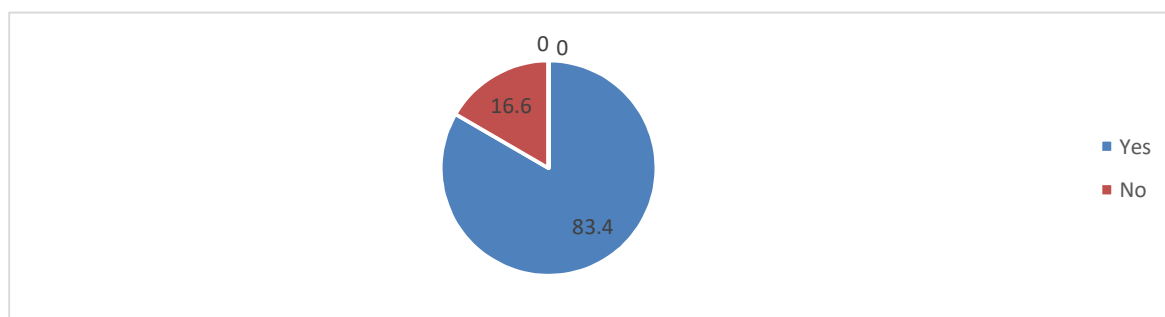


Figure-11: Respondents Accessibility to Exercise at Home

TABLE 14

TYPE OF EXERCISES DONE BY RESPONDENTS TO KEEP THEMSELVES FIT DURING QUARANTINE

Type of Exercises Done by Respondents to Keep Themselves Fit During Quarantine	VARIABLE	PERCENTAGE
	Stretching	49.4
	Walking	44.7
	Skipping	39.9
	Planks	37.9
	Jogging	27.7
	Climbing Stairs	26.1
	Yoga	21.3
	Dancing	18.2
	Weight Lift	15
	Resistance Training	13.4
	Standing on one foot	11.1
	Treadmill	10.7
	Pilates	5.9
	Head to Toe walking	5.9
	Tai chi Poses	2.8
	Swimming	2.4
	Body weight Exercises	0.8
	Others	3.6

From Table 14 with respect to type of exercises done by respondents to keep themselves fit during quarantine, they focus on a combination of exercises with 49.9 percent concentrating on stretching, 44.7 percent of the respondents focusing on walking, 39.9 percent of the respondents focussing on skipping, 37.9 percent of the respondents concentrate on planks. 27.7 percent respondents focus on jogging, 26.1 percent keep themselves fit by climbing stairs, 21.3 percent do yoga to keep fit, 18.2 percent of the respondents focus on dancing, 15 percent focus on weight lifting at home, 13.4 percent concentrate on resistance training, 11.1 percentage of the respondents practice standing on pone foot, 10.7 percent focus on exercising on the treadmill, 5.9 percent of the respondents focus on Pilates and heal to toe walking. 2.8 practice Tai Chi poses and 2.4 percent practice swimming. 0.8 percent of the population focus on body

weight exercises whereas 3.6 percent of the respondents concentrate on other forms of exercises.

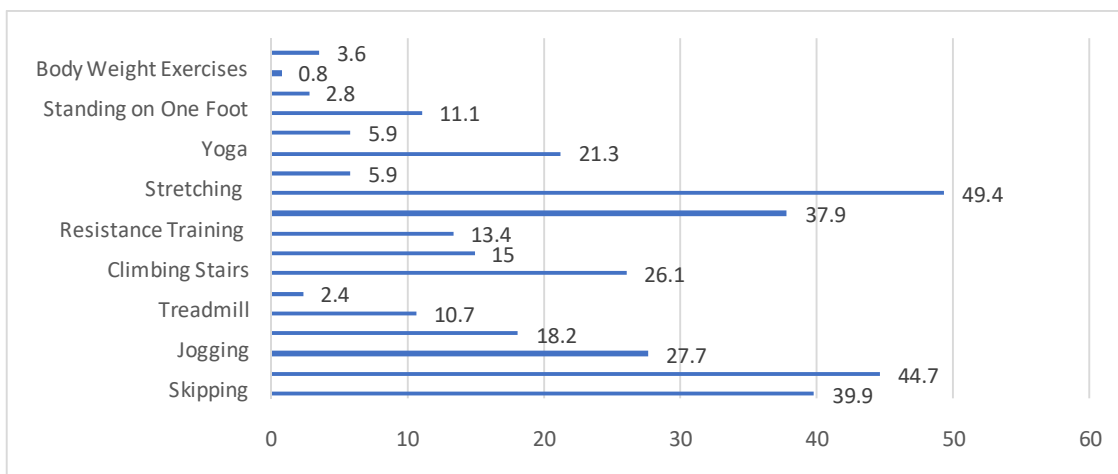


Figure-12: Type of Exercises Done by Respondents to Keep Themselves Fit During Quarantine

TABLE 15
NUMBER OF HOURS A DAY THE RESPONDENTS TRAIN AT HOME DURING QUARANTINE

Number of Hours a Day the Respondents Train at Home During Quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	Less than 1 Hour a day	191	75.5
	2-3 Hours a day	55	21.7
	4-5 Hours a Day	5	2
	More than 5 Hours a day	2	0.8

From Table 15 with respect to number of hours a day the respondents train at home during quarantine, 75.5 percent of the respondents spend less than 1 hour a day training at home, 21.7 percent of the respondents spend 2-3 hours exercising, 2 percent of the respondents train for 4-5 hours and 0.8 percent of the respondents train for more than 5 hours a day.

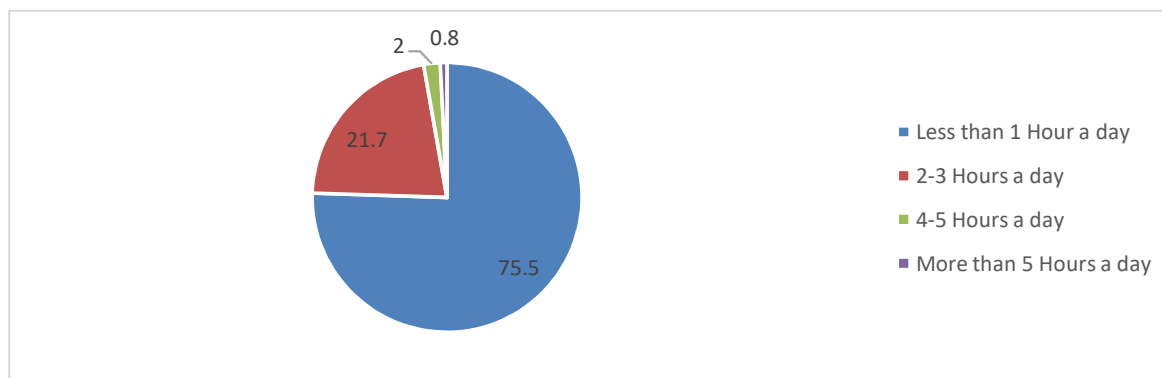


Figure-13: Number of Hours a Day the Respondents Train at Home During Quarantine

TABLE 16
WHERE THE RESPONDENTS EXERCISE DURING THE QUARANTINE

Where the respondents exercise during the quarantine	VARIABLE	FREQUENCY	PERCENTAGE
	At Home	144	56.9
	On the Terrace	97	38.3
	Others	12	4.8

From Table 16 with respect to where the respondents exercise during the quarantine, 56.9 percent of the respondent’s exercise at home, 38.3 percent of the respondent’s exercise on the terrace and 3.6 percent of the respondents use other places to exercise.

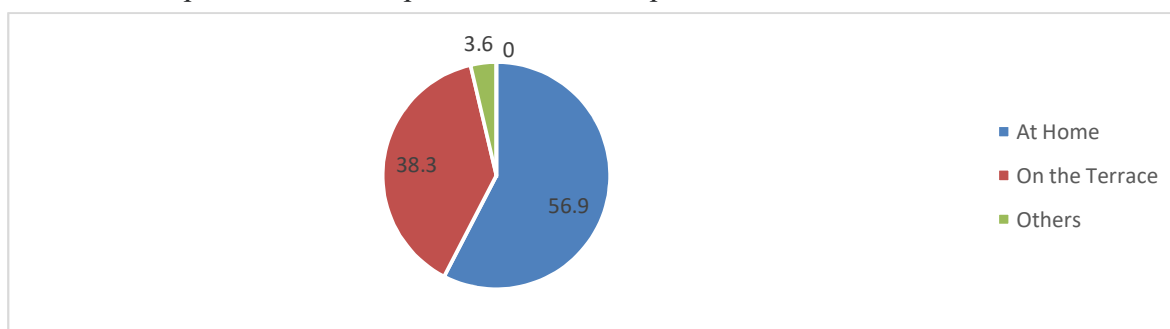


Figure-14: Where the respondents exercise during the quarantine

4. DISCUSSION

COVID-19 is a pandemic which has forced all the countries to go under a complete lockdown. The Prime Minister of India declared a nationwide lockdown on 22nd May, 2020 till 14th April 2020. This was again extended till 3rd May 2020. This study looks into understanding the effect of this quarantine on the fitness of sportspersons in the city of Bengaluru. The data shows that out of the 57.1 percent male, 42.5 percent female and 0.4 percent transgender respondents, are associated with a variety of sports activities like basketball, throwball, cricket, volleyball etc. All of them have some sort of earning from these sports activities ranging from less than rupees 1000 to more than rupees 10000 per month and participate in at least 1 tournament/ sporting event per month and more than 6 tournaments/sports events per year. 54.9 percent of the respondents trained for 2-3 hours per day, 41.1 percent train for 5-6 days per week and 52.6 percentage train at a moderate intensity with endurance exercises such as skipping, walking, jogging, dancing, swimming, etc taking up maximum respondent’s exercise routine.

After the onset of coronavirus with the enforcement of quarantine, the sportspersons accessibility to exercise spaces, gyms and sports fields has been limited. Only 83.4 percent of the respondents have the accessibility to exercise at home. According to data collected, 75.5 percent now spend only less than 1 hour exercising each day at home. Even though 16.6 percent of the sportspersons don’t have access to proper exercise facilities at home 49.4 percent make do with stretching exercises, and 44.7 percent exercise by walking and 39.9 percent by skipping.

With the help of Likert scale, the effects of the quarantine on sportspersons is further understood. Majority of the students feel anxious about their fitness during the quarantine. A sportspersons life revolves around fitness and he or she must be fit to be ahead in the game. With most gyms and exercise spaces and sports fields being closed it is causing a lot of agitation as they are not being able to train. This factor is also affecting their physical fitness to a great extent with 33.2 percent of the respondents stating their weight to have increased during the quarantine

period. This has created a lot of anxiousness among these sportspersons, with one of the respondents stating that “it is very difficult to sit at home in this void and not be able to exercise. It drains the mind and makes you feel lazy and lethargic.”

In addition, they also feel anxious about the possibility of a prolonged quarantine period. One of the respondents fears that “the future of sports might be in danger if this deadly virus prolongs for a long period of time.” Furthermore, they also fear the possibility of them losing their form and not being able to perform. According to one of the respondents, lack of access to gyms was a major cause of concern as they were not being able to keep fit and being fit is one of the top most concerns of a sportsperson. “Lots of sports events have been cancelled that would otherwise provide us with more opportunities to hone our skills and gain experience and exposure from various matches” said another respondent. Moreover, the constant news of international, national, regional and district level sports events being cancelled and postponed to next year is also a worrying concern for many and is affecting their motivation level to a great extent.

This period has also made them feel anxious about their financial income as most of the sportspersons lost out on income ranging from less than 1000 to more than 10000 per month, that they would have got through participation in various sports tournaments. This is a considerable loss to the sportspersons.

The fact that this is probably the longest these sportspersons have been away from physical exercise causes a lot of stress in their minds. Also, with the possibility of a prolonged quarantine and restricted or no access to gyms and other exercise places in the future looming over their heads, this is probably one of the toughest tests they have had to face. Being in the sports industry they are constantly being trained to handle stress and face all their fears. But there is nothing that could have prepared them for a situation of this magnitude.

Today we see a rise of use of social media. And this quarantine period has made us explore the various possible ways of utilizing the internet to keep us motivated and connected. Work from home is a common mode of work for the past one month. Be it meetings for corporate employees conducted via Zoom or Skype or teachers or professors from various schools and colleges conducting online classes using Web Ex or Zoom. Thus, in these uncertain times, online mode seems to have become the new way of conducting day to day work. Sportspersons too are seen using online modes to stay fit and connected with their team mates. Data from this research shows that maximum number of respondents uses Google hangout videos and other online modes to stay connected with their team mates which in turn help them to reduce their stress. Except for 41 respondents who never use these platforms at all the rest of the 253 respondents all use online platforms to stay connected with their team mates to reduce stress and anxiety created by this quarantine period. Staying connected with friends is extremely important as seen in the research by (Adams, Santo, & Bukowski, 2011) which states that friendships might have the ability to block the effects of negative experiences. It further explains that in the certain context of not having a best friend, there would be a very strong relationship between negative experiences and outcomes. On the contrary in a situation where an individual has many friends to rely on or where the quality of friendship support is high, there is seen to have no link at all or a very weak link to negative experiences and outcome. This is due to the protective qualities of friendship. Therefore, in the current study too there are high number of respondents who utilise the services of various online modes to keep in touch with team mates to reduce the impact of stress. They also use online workout videos in order to stay fit. Several mobile applications that focus on physical fitness has seen an increase in the last year. This trend has increase even more

during the quarantine period. According to one of the respondents “Instagram, Facebook and other social media applications are full of videos that suggest various physical fitness based and diet-based applications that help to lose weight and stay fit.” The current study shows 96 respondents always use online workout videos to stay fit when at home during the quarantine period. And 88 respondents use various mobile applications to exercise and stay fit. Even though online modes are popular among the sportspersons to stay fit, however, most respondents do not post their own workout videos to motivate themselves and also to motivate their team mates to stay fit.

When it comes to sports fitness during times of the COVID-19 quarantine, online applications play a very important role. As it is evident the sportspersons are quite distressed thinking about the possible prolonging of the quarantine. Thus, it is extremely important that the coaches and team members use these modes to stay connected and stay fit. Just like in the sports field the coaches inspire and motivate sportspersons to stay focussed and motivated, it is extremely important that coaches use various online virtual sessions to motivate the sportspersons to stay motivated during this time. This quarantine period has had a negative impact on the minds on the sportspersons as seen in the current study and this negative effect can be changed with virtual sessions where they connect with their team mates as well as coaches. The current data shows that only 64 respondents have their coaches use virtual sessions to help them stay active, whereas 42 respondents say that their coaches never use online sessions to stay active. Moreover, 65 respondents say that their coaches never use virtual sessions to help them stay motivated during the quarantine period. And 74 respondents say that even if they have counselling sessions, they do not take place every day.

5. CONCLUSION

After the announcement of a nationwide lockdown, there was definitely a sense of anxiety among all the citizens. However, this anxiousness increased further after the lockdown was extended further. Sportspersons to felt the brunt of this virus as their daily lives came to a standstill. Sportspersons entire profession depends one exercising both outdoor and indoor, playing on the sports fields and being out in the open. Thus, this lockdown has truly made it difficult for all sportspersons to lead their normal lives. The data in the current study shows that sportspersons are negatively affected by the quarantine as their mental as well as physical fitness is compromised. They feel anxious about the virus and their health as well as the health of their family members. They feel worried about being confined to their homes as theirs source of income is completely stopped. They are not able to dedicate time for their physical exercise which is making them nervous and depressed. However, help can be given to these sportspersons. As seen in previous researches, spending time with friends helps in the reduction of stress (Adams, Santo, & Bukowski, 2011). Therefore, coaches should involve virtual sessions to help them stay fit mentally during this time in order to keep sportspersons motivated. Constant virtual sessions should be conducted to handle every aspect of fitness of these sportspersons. Mental training sessions should be given major priority during these times and various sessions should be conducted by the team counsellors or coaches. Physical fitness is the next aspect that they should focus on with time being allotted to virtual workout sessions. Team workout sessions also help to boost the morale of team members and keep them fit. Past research has shown that exercise has a positive impact on the health, reduces severity of depression and improves psychosocial functioning of individuals (Alexandratos, Barnett, & Thomas, 2012). Physical activity has a positive effect on mental health, reduce anxiety and improve psychological wellbeing (Seppo, Iso, & Clair, 2000). Physical activity also stimulates the feeling of happiness

in individuals and it helps them handle stress in a much better way. Yoga and other forms of meditation can be used by the coaches to help the sportspersons handle stress and anxiety.

Thus, coaches play a very crucial role in motivating sportspersons both in the field and out. They should use online modes constantly to help sportspersons to use virtual mode more frequently to help sportspersons regain their mental strength and keep themselves fit for the game.

6. FURTHER RESEARCH

Further research can look into a deeper study of the effect of COVID 19 after a prolonged quarantine period of 3 months on the mental and physical fitness of sportspersons. It can also look at various aspects of virtual training and how coaches can make use of this platform to help sportspersons during times of emergency. Further research can also look into specific impacts of the quarantine on sportspersons.

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IMPACT OF SOURCE OF NUTRITION KNOWLEDGE ON SPORTS NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICES OF INDIAN ELITE ATHLETES

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ABSTRACT

Nutrition education is a significant factor impacting nutritional knowledge, attitudes and practices of sports athlete. It is extremely important from where the athletes receive this knowledge from. The present study was carried out on 322 Indian elite athletes from various sports disciplines like boxing, wrestling, diving, archers, weight-lifters, fencing and track and field athletes. They administered the knowledge, attitude and practice of sports nutrition questionnaire structured by the investigator which even had a question about the sources of nutrition knowledge. The data thus collected and compiled was analysed using the One-Way Anova to understand the impact of source of nutrition knowledge on sports nutrition knowledge, attitudes and practices of Indian elite athletes. The results should be that those who received sports nutrition knowledge from nutritionists and sports science staff had good knowledge, attitude and practice scores, those Indian elite athletes who received sports nutrition knowledge from social media had good attitude scores as well as the overall comparison was non-significant and lastly those who received nutritional knowledge from coaches had good practice scores.

Keywords: sports nutrition, nutritional knowledge, attitudes, dietary practices, Indian athletes

1. INTRODUCTION

Education about sports nutrition plays an important role in improving knowledge, attitudes and practices with respect to nutrition in elite athletes. Optimum sports nutrition knowledge can greatly influence performance of athletes (Nazni & Vimala, 2010). Good sports nutrition knowledge causes the athlete to have good practices towards it, thus causing improvisation in physical activity, athletic performance and recovery from conditioning (Burke & Read, 1993). Dr. David Costil, one of the renowned practitioners of exercise science quotes that, "Other than the limits imposed by heredity and training, no single factor plays a greater role in optimizing performance than diet" (Hawley, Dennis, Lindsay, & Noakes, 1995)

Physical performance is directly proportional to nutritional status of an athlete. The nutritional status of an athlete pretty much influences the level of performance an athlete is capable of delivering. Thus, the training and fitness levels of any athlete is clearly dependent on the nutrition of an athlete. The athlete should know the proper quantity, the nutrients and the supplements to consume for an overall physical conditioning. The athlete should be aware of consumption norms of various nutrients before, during and after any competition (Maughan, 2002).

A recent study had endorsed dietary guidelines for athlete for optimal intake, quantity and timing of food uptake. Even if there happens to be established guidelines for athletes, it is found that many athletes have an average level of nutrient uptake. This can be due to lack of time, financial constraints, lack of cooking skills, cultural influences or religious practices or simply bad habits of the athlete. Other factors such as taste preferences, appetite, attitude towards nutrition, and nutrition knowledge can influence and athletes' food choices as well (Birkenhead & Slater, 2015). The most important determinant of dietary behaviours is knowledge about nutrition. Knowledge about sports nutrition delivered by a sports nutritionist offers better awareness and compliance towards dietary habits in an athlete. A systemic review conducted in 2011 across recreational and elite athletes assessed sports nutrition knowledge using various questionnaires concluded an average of 45%-60% of knowledge in these athletes. There was a weak positive correlation between sports nutrition knowledge and dietary practices. One of the factors affecting this was the source of nutrition (Heaney, O'Connor, Michael, Gifford, & Naughton, 2011).

A survey by (Park, 2009) concludes that parents of athletes as one of the sources of nutrition. Other than that, athletes rely on coaches and trainers for sports nutrition knowledge. Other sources are magazines, online blogs, sports science staff and sports nutritionist. Few studies show that there is a varied difference of sports nutrition among parents, coaches and trainers. (Elbon, Johnson, & Fischer, 1996) in a study on random samples of 475 elderly Americans concluded that nutritional knowledge in the elderly affected the type of milk they consumed but not the amount of milk they consumed. Most of these elderly people were observed to be relied on food labels for their nutrition knowledge. The observing factor here is, even if it is food labels, it can affect the dietary practices. The possible wide scope of influence

of nutrition knowledge is further suggested by two studies. Other studies show that sports nutrition knowledge is an important predictor factor in elite athletes that impacts their health and ultimately their performance in their sports. In India, however, there are very less studies carried out to assess the association of source of sports nutrition knowledge in athletes and their knowledge, attitudes and practices towards dietary habits. Improper nutrition practices affect performance of athletes to the extent that they may be susceptible to fractures, injuries and anaemia (Thompson, 1998). Therefore, it is essential for elite athletes to receive appropriate nutrition education. Less research on the same is done in India and for a range of sports. India being a diverse country, has diversity in practices of food habits also. These tend to change regionally as well.

Hence, the present study aims to study the impact of source of sports nutrition knowledge on sports nutritional knowledge, attitude and practices of Indian elite athletes.

2. METHODOLOGY

2.1 Subjects

322 Indian elite athletes, out of which 247 males and 75 females, in the age group of 18-35 participated in the study. These Indian elite athletes have played at state, national and international levels and were assessed among different regions of the country. The participant athletes were from different sports disciplines like wrestling (20.80%), boxing (21.73%), track and field (16.45%), diving (4.03%), archery (13.04%), weight-lifting (7.76%), fencing (9.31%) and wushu (5.90%)

2.2 Structure of the KAP questionnaire

A structured questionnaire was used designed by the investigator to assess the variables. The questionnaire was divided into five sections. Each section specifying an attribute. Section 1 has seven questions which were subjective and demographic in nature like gender, educational status, marital status, native region, religion and monthly income. Section 2 is more subjective and had details about the sports profile of the athlete like the sports they belong to, years of play, level of game, details of organization, frequency of practice and participation in competition. Section 3 has 25 questions relating to the knowledge of athletes about nutrition. This section also contains a question about the source of nutrition. Section 4 has 15 questions spanning the attitude of athletes about their eating habits using a five point likert scale where the scores were 1-Strongly Agree, 2-Agree, 3-Neutral, 4-Disagree, 5-Strongly Disagree. The last section 5 has 24 questions that are about the Dietary Practices of athletes.

2.3 Data Collection

The highly reliable structured questionnaire was personally administered to each Indian elite athlete involved in the study after taking consent, explaining the purpose of the survey and clearing their doubts if any.

2.4 Data Analysis

The filled questionnaires were compiled, the data stratified in a mastersheet and then analysed using the SPSS 20.0 version. After the data was assessed for normal distribution, mean

and One-Way ANOVA was conducted to obtain the association between the specified parameters.

3. RESULTS AND DISCUSSION

TABLE 1
DEMOGRAPHIC DETAILS OF INDIAN ELITE ATHLETES

Variable	Frequency	Percentage
Gender		
Male	247	76.70%
Female	75	23.29%
Age		
18-22 years	142	44.09%
23-27 years	148	45.96%
28-35 years	32	9.93%
Educational Background		
8 th to 10 th	52	16.14%
11 th to 12 th	173	53.72%
Graduate	69	21.42%
Post-graduate	25	7.76%
Level of Game		
State	23	7.14%
National	192	59.62%
International	107	33.22%

The results of demographic data is presented in Table-1, in which out of the total participants in the study (322), the gender-wise distribution is 76.70% males(247) and 23.29% are females (75); most of the athletes i.e.90.06%(290) are in the age group of 18-29 years and 9.93%(32) athletes are in the age group of 29-35 years; 16.14%(52) have studied 8th to 10th, 53.72%(173) have studied 11th-12th, 21.41%(69) are graduates and 7.76%(25) are post-graduates; 7.14%(23) are state level athletes, 59.62%(192) are national level athletes and 33.22%(107) are international level athletes.

TABLE 2
DISTRIBUTION AS PER THE SOURCES OF NUTRITION

Source of Nutrition	Frequency	Percentage
Other Athletes	9	2.79%
Social Media	21	6.52%
Coaches	210	65.21%
Sports Science Staff	25	7.76%
Nutritionist	57	17.70%

Table 2 represents the distribution of data as per the sources of nutrition they selected. Majority of athletes i.e. 65.21%(210) selected coaches as their sources of nutrition, 17.70%(57) have nutritionists as their source of nutrition knowledge, 7.76%(25) have sports science staff as

their source of nutrition knowledge, 6.52%(21) have social media as their source of nutrition knowledge and 2.79%(9) athletes have other athletes as their source of nutrition.

TABLE 3
KNOWLEDGE, ATTITUDE AND PRACTICES IN INDIAN ELITE ATHLETES FROM DIFFERENT SOURCES OF NUTRITIONAL KNOWLEDGE

Source of nutrition knowledge	Knowledge	Attitude	Practice
Other athletes	43.88	34.88	52
Social media	44.52	39.57	47.8
Coaches	47.83	36.34	53.82
Sports science staff	49.64	39.6	53.76
Nutritionist	56.84	39.54	53.71

Table 3 represents that mean of knowledge scores for those receiving sports nutrition knowledge from nutritionists is 56.84, from sports science staff is 49.64, from coaches is 47.83, from social media is 44.52 and those who receive nutrition knowledge from other athletes is 43.88. This means that those who receive sports nutrition knowledge from nutritionists and sports science staff have higher scores compared to other sources. This can be because sports nutritionists and sports science staff give more elaborative in-depth knowledge of sports nutrition.

Table 3 represents that mean of sports nutritional attitude scores for those receiving sports nutrition knowledge from nutritionists is 39.54, from sports science staff is 39.6, from coaches is 36.34, from social media is 39.57 and those who receive nutrition knowledge from other athletes is 34.88. This means that those who receive sports nutrition knowledge from nutritionists, sports science staff and social media have higher scores of sports nutritional attitude compared to other sources. This can be because of good knowledge of sports nutrition directs good attitudes towards it. The impact of social media can be because of the growing trend of blogs, fitness portals promote the development of optimum attitude towards sports nutrition.

Table 3 represents that mean of sports nutritional practice scores for those receiving sports nutrition knowledge from nutritionists is 53.71, from sports science staff is 53.76, from coaches is 53.82, from social media is 47.80 and those who receive nutrition knowledge from other athletes is 52. This means that those who receive sports nutrition knowledge from nutritionists, sports science staff and coaches have almost similar scores of sports nutritional practices compared to other sources. This can be because of good knowledge of sports nutrition affects the dietary practices. The impact of nutritional knowledge on practices from coaches can be because of their experience.

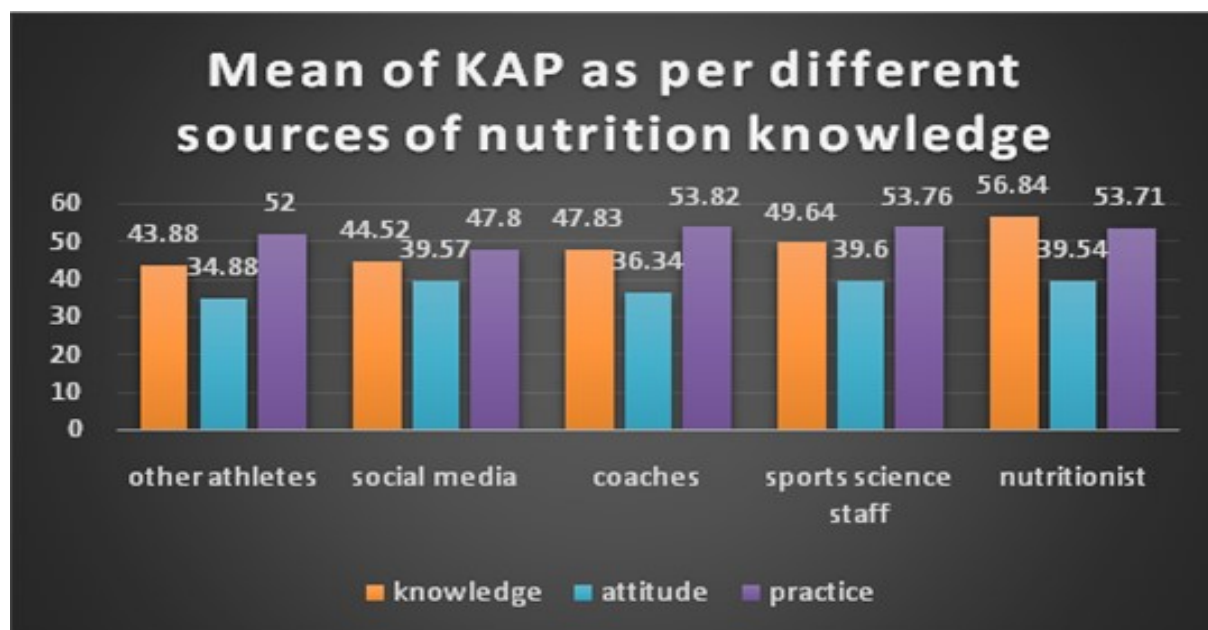


Figure 1: Mean of Knowledge, Attitude and Practices in Indian Elite Athletes from different sources of nutrition

TABLE 4
COMPARISON OF KAP AS PER DIFFERENT SOURCES OF NUTRITION KNOWLEDGE USING ONE-WAY ANOVA

Source of Nutrition	Frequency	P-value
Other Athletes	9	0.01
Social Media	21	0.06
Coaches	210	0.00
Sports Science Staff	25	0.01
Nutritionist	57	0.00

(Level of significance is kept less than or equal to 0.05)

Table-4 represents the results of sports nutrition knowledge, attitude and practice scores when compared among different sources of nutrition using One-Way ANOVA revealed there is a significant difference of sports nutrition knowledge, attitudes and practices of Indian elite athletes for those receiving nutritional knowledge from nutritionists, sports science staff, coaches and other athletes where as the scores of sports nutrition knowledge, attitudes and practices of Indian elite athletes for those having social media as their source of nutritional knowledge were found to be non-significant. This can be because not all information on social media about nutrition knowledge may be verified or there are chances that the athlete may misinterpret the information.

4. CONCLUSION

Indian elite athletes who received sports nutrition knowledge from nutritionists and sports science staff have good scores for all three parameters namely sports nutrition knowledge, attitudes and practices. Those Indian elite athletes who received sports nutrition knowledge from social media had good attitude scores as well as the overall comparison was non-significant and lastly those who received nutritional knowledge from coaches had only good practice scores. Hence, it can be concluded that sports nutrition knowledge from sports nutritionists and sports science staff have a positive and significant impact on sports nutrition knowledge, attitudes and practices. The limitation of the present study is that the comparison was not done among different sports disciplines and hence, further research is recommended in this domain.

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A COMPARISON OF SELF CONCEPT BETWEEN MALE AND FEMALE SPORTSMEN OF SATNA

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ABSTRACT

Self-concept is a factor which helps to study the human behavior and personality. There are several different components of self-concept: physical, academic, social, and transpersonal. The purpose of the study was to compare the self concept of male and female sportsmen belong to Satna . For this purpose, total 50 students (25 males and 25 females) were considered as the sample for the present study. For the assessment of self-concept of the subjects, “Swatva Bodh Parikshan”- a test of self concept, designed by Sherry ,Verma and Goswami (1988) was used. Descriptive statistics and t –test was computed to analyze the obtained data. The results of the study revealed that the self concept level of the male sportsman is higher than those of the female sportsmen. Finally the researcher concluded that the Psychological Variables like socioeconomic in self-concept of Sportsmen and Non Sportsmen is not similar and are very important factors to be successful.

Keywords: Male, Female, Self-Concept, Health, Sportsmen

1. INTRODUCTION

Self-concept refers to the experience of one's own being. It includes what people come to know about themselves through experience, reflection and feedback from others. The self-concept as an organizer of behavior is of great importance. It is an organized cognitive structure comprised of a set of attitudes, beliefs, values, variety of habits, abilities, out looks, ideas and feelings of a person. Consistency of behavior and continuity of identity are two of the chief properties of the self concept. Self-concept is positively related with their school achievement.

Self-concept is a factor which helps to study the human behavior and personality. There are several different components of self-concept: physical, academic, social, and transpersonal. The physical aspect of self-concept relates to that which is concrete: what we look like, our sex, height, weight, etc.; what kind of clothes we wear; what kind of car we drive; what kind of home we live in; and so forth. Our academic self-concept relates to how well we do in school or how well we learn. There are two levels: a general academic self-concept of how good we are overall and a set of specific content-related self-concepts that describe how good we are in math, science, language arts, social science, etc. The social self-concept describes how we relate ourselves to other people and the transpersonal self-concept describes how we relate to the supernatural or unknown **Wankhade (2016)**¹.

William explained the concept of self, at first taking into consideration self-observation and observations of daily routine of an individual. Hockins had studied about the concept of self in psychological laboratory using the method of self observation in. Kurt and Kofka had put forward the concept of self on the basis of consciousness. Adler, Freud, Jung and Sullivan have used the concept of Ego for the concept of Self. The concept of self has great importance in psychology for understanding of individual's ideas, feelings, thoughts attitudes and behavior. The self-concept includes the central picture of what I am, as a person with particular history and sets of aspiration. **William James (1890)**².

Chamundeswari (2013)³ found that there is a significant and positive relationship between self-concept and academic achievement among higher secondary students.

Agrawal Madhvi & Teotia Anil Kumar (2015)⁴, found that urban students had better self-concept than rural students. Another finding of the study revealed that socio-economic self-concept of the girls was better than boys. The finding also revealed that temperamental qualities, emotional tendencies and mental health of urban students were better as compared to rural students.

Balakrishnan (2011)⁵ determined the level of self concept among the higher secondary school students was unstable. There is negligible correlation among the higher secondary school student between social adjustment and self concept.

2. METHODOLOGY

2.1 Sample

For the study purpose, total 50 students (25 males and 25 females) were considered as the sample for the present study.

2.2 Description of tools

For the assessment of self-concept of the subjects, "Swatva Bodh Parikshan"- a test of self concept, designed by Sherry ,Verma and Goswami (1988) was used.

2.3 Data collection

All the subjects were instructed to respond the questionnaire independently. Once the instructions cleared by them, the questionnaires were distributed to the respondents. As soon as respondents completed the questionnaire, the questionnaire was collected from them and it was verified that no response was left without being answered.

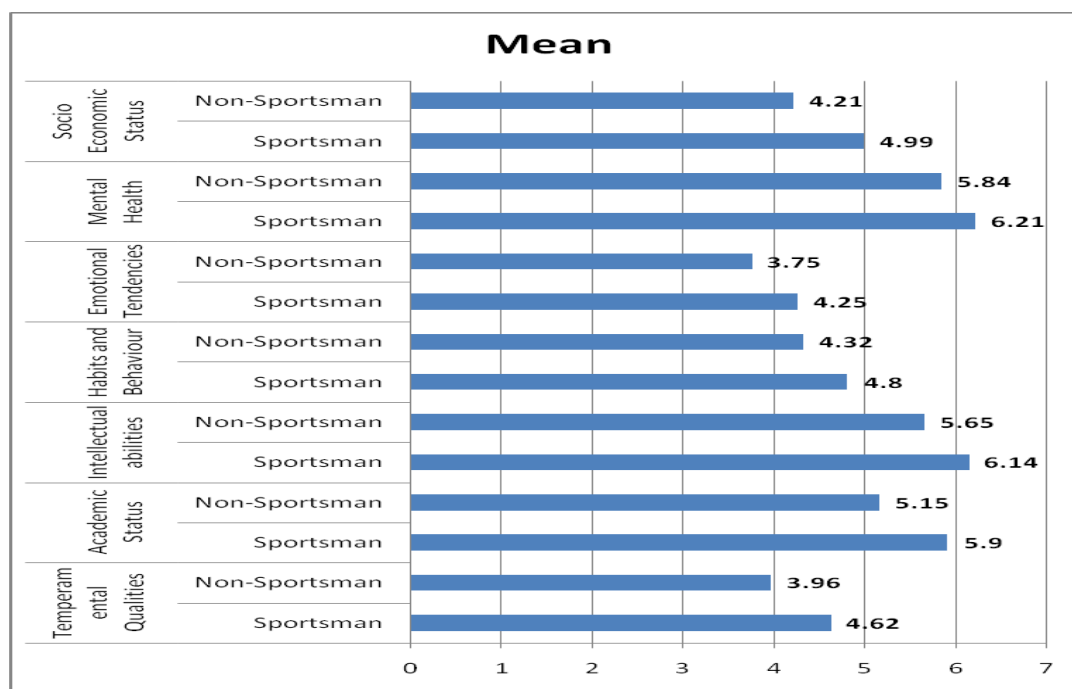
2.4 Statistical Method

Descriptive statistics and t –test was computed to analyze the obtained data.

3. RESULTS

TABLE 1
COMPARATIVE ANALYSIS OF SELF CONCEPT AMONG MALE AND FEMALE SPORTSMEN.

Subscales	Gender	Mean	SD	't'	'p'
Temperamental Qualities	Male	4.62	0.65	3.14	0.01*
	Female	3.96	0.25		
Academic Status	Male	5.90	0.65	3.53	0.01*
	Female	5.15	0.87		
Intellectual abilities	Male	6.14	0.75	5.53	0.01*
	Female	5.65	1.28		
Habits and Behaviour	Male	4.80	0.68	4.04	0.01*
	Female	4.32	1.11		
Emotional Tendencies	Male	4.25	0.42	3.95	0.01*
	Female	3.75	0.71		
Mental Health	Male	6.21	1.03	0.99	0.12
	Female	5.84	0.68		
Socio Economic Status	Male	4.99	0.66	1.65	0.04*
	Female	4.21	0.29		
Self Concept	Male	36.91	2.87	6.92	0.01*
	Female	32.88	2.91		



Data presented in above table clearly indicates significant difference between self concept of male and female sports person. Analysis of obtained data revealed significant difference in subfactors namely, Temperamental Qualities, Academic Status, Intellectual abilities, Habits, Emotional Tendencies and socio economic status. Comparative analysis on factors of self concept revealed score for academic status male sportsman had mean scores 5.90, SD=0.65 whereas female sportsman had mean scores 5.15, SD=0.87 and the obtained 't'=3.53. In intellectual abilities male sportsman had mean scores 6.14, SD=0.87 whereas female sportsman had mean scores 5.65, SD=1.28 and the obtained 't'=5.53. In habits and behaviour male sportsman had mean scores 4.80, SD=0.68 whereas female sportsman had mean scores 4.32, SD 1.11 and the obtained 't'=4.04. In Emotional tendencies male sportsman had mean scores 4.25, SD 0.42 whereas female sportsman had mean scores 3.75, SD 0.71 and the obtained 't'=3.95. In socio economic status male sportsman had mean scores 4.99, SD=0.66 whereas female sportsman had mean scores 4.21, SD 0.29 and the obtained 't'=1.65. Scores on Mental Health of male sportsman showed insignificant difference where they had mean scores 6.21, SD=1.03 and female sportsman had mean scores 5.84, SD 0.68 and the obtained 't'=0.99 which is lower than the tabulated 't' value to be significant at 0.05 level of confidence. Results on overall analysis of self concept revealed significant difference among the group as the obtained 't' =6.92 which is much higher than the required table value of 't' to be significant.

4. DISCUSSION

The observation of the surveyed data, with in limitation of the present study revealed that sportsmen have better Temperamental, academic, intellectual, habits emotional and socio economic self-concept than NonSportsmen. While the sports and non Sportsmen have do not differ significantly in mental health. Finally the researcher concluded that the Psychological Variables like socioeconomic in self-concept of Sportsmen and Non Sportsmen is not similar and are very important factors to be successful. In addition to their overall health and wellbeing, the inclusion of exercise activities appropriate for individuals will help this category develop their self-concept. This indicates that a reasonable exercise regimen will also support them mentally and physically.

5. CONCLUSION

In view of the findings of the present study following conclusion may be drawn from the result presented above. The self concept level of the male sportsman is higher than those of the female sportsmen.

6. RECOMMENDATION

Further studies may be recommended as a similar study on other states of India with larger sample size.

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