

Effect of Application of Fitness App on Fitness of Physical Activity among Sedentary People from Barrackpore City in West Bengal

Dr. Mahesh Deshpande¹, Md Lokman Saikh²

¹Assistant Professor, ²M.Phil Student,
Chandrashekhar Agashe College of Physical Education (Savitribai Phule Pune University), Gultekdi, Pune,
Maharashtra 711037 India

Corresponding Author: Dr. Mahesh Deshpande

ABSTRACT

This research aimed at studying the effect of Google fit app on the Fitness of sedentary peoples and to compare the pre-test and post-test scores of the subjects participating in the experimental study. A group of 20 sedentary peoples were selected from the Barrackpore City W.B. West Bengal where the city was selected using non-probable sampling technique and the subjects were selected by applying snowball sampling method. Three fitness tests were conducted pre and post fitness app programme for 14th weeks. Descriptive analysis was done for fitness variables viz cardiovascular endurance, speeds and body composition. To determine the difference between pre-test and post-test, paired sample 't' test, was used. There was a positive effect found between pre-test and post-test. There was significant effect found in all most all variables tested. It was also found that subject's physical fitness parameters improved with the help of physical activity programme using fitness app.

Keywords: Fitness app programme, Fitness, Involvement, Beep test, Cardiovascular Endurance, Experiment, Snowball sampling

BACKGROUND OF THE STUDY

"Health is a state of complete physical mental and social well-being and not merely the absence of disease of infirmity" (WHO, 1946). According to this definition by the World Health Organization, health means overall well-being. The growing incidence of health problems attributed to contemporary lifestyles, and the limited resources of healthcare, has lead several stakeholders to look for alternative preventive healthcare methods. Physical exercise has many good effects for health, but people often lack intrinsic motivation towards it. Smartphone applications can act as intrinsic motivational tools, as they accessible mobile, and have suitable technological abilities. During past

few years ago, a large number of mobile exercise applications have been launched and increasingly, fitness and wellness technologies have been researched in the field of human - computer interaction (HCI). However the field lacks a comprehensive overview of the design strategies related to intrinsic motivational exercise applications. Additionally, research in the field has mostly been conducted in western cultures, and perspectives from the developing world are missing.

Increasing sedentary lifestyle has resulted in obesity and overweight. According to World Health Organization, worldwide obesity has more than doubled since 1980 and 3 million deaths from heart disease, diabetes and certain cancers are

caused by obesity and overweight. However obesity is preventable. The current healthcare system does not have sufficient resources to prevent and manage these preventable health risks. Therefore, individual effort is paramount in disease prevention, i.e., managing the risks before they develop into more serious health problems. Regular physical activity can not only help individuals to prevent these health risks, but also would enable them to lead a healthy lifestyle. Mobile phone based interventions hold promise for health behavioural change. As immediacy of consequences to a target behaviours is important for behaviour modification (Skinner, 1969), using mobile phones for promoting healthy behaviour is more effective. The mobile phone will be in the user vicinity almost all the time and enable immediate feedback to user's behaviour. Smartphone's and mobile apps latest mobile interventions. Smartphone apps are embedded with sophisticated sensors that could monitor the user's behaviour. Therefore mobile apps are a viable cost effective solution for self-health management.

Among the variety of available physical fitness applications, which includes all kinds of applications for improving eating habits, managing weight, reducing stress-levels, improving sleep, integrating relaxation, improving running, walking, sleeping and calories burn capacity etc. There are also applications targeted especially to promote physical activity. Those applications are usually called physical activity application or fitness application. Thousands of commercial applications related to health and physical fitness are available in the markets, for all the different purposes. Application such as Example of modern physical fitness app: Free apps is Samsung health, Google fit, sleep as, pedometer, lost it, mi- fit, 30 day fit, Nike run club, Rock my Run, women workout, walk mate, calories counter, fitness trainer, running distance runner, run tactic, mind body etc. Payable apps is Just

six weeks, Runtastic pedometer, Sleep set, Yoga studio, 30 days fitness, Daily workout, Guru Mann fitness, 7 Minute workout challenge, Beginner fitness, Push up, Total fitness etc.

Physical Fitness

Physical fitness refers to “a set of attributes that related to the ability to perform physical activity” (U.S. Department of Health and Human services, 1996). Physical fitness is the ability of the body systems to work together efficiently to allow people to be healthy and effectively perform activities of daily living (Corbin & Lindsey 2007). Physical fitness can be classified into health-related and skill-related fitness. Health related fitness consists five components: cardio respiratory endurance, muscular endurance, muscular strength, flexibility, and body composition and is determined by a combination of regular activity and genetically inherited ability. The amount of physical fitness ranges is from low to high. On other hand, skill-related fitness divided into six components: agility, balance, coordination, power, reaction time, and speed. In terms of prevention of diseases, the main emphasis of any fitness programs should be placed on the health- related fitness as skill- related fitness is crucial for success in sports and daily life activity and it also contributes to wellness (Hoeger & Hoeger, 2005).

Statement of Problem

Thus proper body fitness and good habit are highly essential for their daily life. Although physical activity programme using fitness app helps for improving body fitness but no study indicates its influence on intrinsic motivation and daily life habits. It was therefore thought desirable to undertake this study “Effect of Application of Fitness App on Fitness of Physical Activity among Sedentary People from Barrackpore City in West Bengal”

Significance of the Study

- The study will be beneficial to the sedentary people to improve physical

fitness and implementation in daily life habits.

- It will be needful to society to implement the physical fitness apps programme of their society.
- It will be helpful to the policy maker for constructive work and to form fitness app program in society.
- It will be helpful to the physical educator and other researcher to check and implement the mobile fitness apps on their respective students, teachers and other persons.

Objective of the Study

For the research undertaken, the researcher has considered the following objectives.

1. To design and implement the physical activity programme using fitness app.
2. To measure and analyze fitness of participants.
3. To study the beep test and effect of physical activity programme using fitness app on it.

Hypothesis of the Study

H1: There will be significant change in Beep test Level, Laps, Time, Speed, Calories burn capacity, VO2Max Score and Rating of the subjects due to physical activity programme using fitness app.

Delimitation of the

1. The study will be delimited to 30-45 years sedentary male of the Barrackpore city in West Bengal.
2. The intervention will be delimited to Google Fit physical fitness app.
3. The experimental period will be delimited to 14th weeks.
4. The measurement Level, Distance, Time, Speed, Calories, Total score, Laps, Rating and VO2Max through Bleep test. The subjects will be told not to use in the other fitness app during intervention period.
5. Only android OS 4.4 or above mobile set/smart mobile set will be used.

Limitation of the Study

1. The findings of the study will be solely based on subject's response.
2. Always require will be carry the mobile set by the subjects.
3. The environmental situation during the period of program implementation will be considered as limitation of the study.
4. Mobile mechanical condition during the period of program, implementation will be considered as limitation.
5. The follow up study of the experimental could not be extended further due to the study of time.
6. The investigator could not conduct the experiment on the large sample due to insufficient management power and limited time.
7. The competence of the fitness app may affect the daily life activity performance; it is controlled by using the Google Fit App throughout the intervention.

Operational Definition of the term used:

Physical Fitness: Physical fitness is considered as capacity of subjects participating in the particular research, which is measured by Beep Test, Harvard Step Test and Omron Body Composition HBF-212 Monitor.

Calories: Calories is a physiological factor which is measured by Beep test and Google fit app, with the help of fitness app the number given by fitness app is consider as calories burn in that day after that session.

Fitness apps: Fitness app is an application that can be downloaded on any mobile device and used anywhere to get fit, which is store in mobile of subjects. Which is used for workout, which records in this fitness app. So that fitness app is considered as fitness app. They can be used as a platform to promote healthy behaviour change with personalized workouts, fitness advice and nutrition plans. Such as muscle gaining, gym coach, endomondo, total fitness, total training, My Fitness Pal, Achivex, Sleep cycle, Charity miles, Strava, Fit Radio, Happify, Ma MPY Run, Lose it, Runkeeper, Fooducate, Pocket Yoga, DietBet, Clam, Fitnoet, Fitpaa etc.

Sedentary People: A sedentary lifestyle is a type of lifestyle involving little or no physical activity. A person living a sedentary lifestyle is often sitting or lying down while engaged in an activity like reading, socializing, watching television, playing video games, or using mobile phone/computer for much of the day.

Research Design (Pre – Experimental Design)

This experimental research will be carried out by following experimental design.

Pre-test Post-test Equivalent group design
N= 20 (experimental group)

One Group Experimental Design

O1 X O2
Pre-test using program post-test

Population

A population is any group of individuals that have one or more characteristics in common that there are interested to the researcher. In this research, the population is all the sedentary people's age range between 30-45 years; from in Barrackpore City of West Bengal will be considered as population of this study.

Sample

The sample is a small population of the population that is selected for observation and analysis. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it was drawn. In this study the researcher are selected 20 sedentary peoples ranging from 30-45 years in Barrackpore city (West Bengal). With the help of Snowball sampling Method. The whole selected sedentary peoples will be considered as a single experimental group. For this sample physical fitness app (Google Fit) will be used as dependent variable. The researcher has selected one group pre-test post-test single group of 20 sedentary male to be tested before and after the intervention of the Google Fit app. Hence the researcher has selected this pre experiment.

Description of Test Items

Beep Test

Purpose: to measure the VO2 Max, Calorie consumption, Level, Distance, Speed and laps of the subjects.

Required Resources: Flat, non-slip surface, marking cones, 20 meters measuring tape, beep test audio, music player, recording sheets.

Table No 1 Criterion of Beep Test

9 or Bellow	Not enough to keep pace for long games.
10	Good enough to play comfortably at amateur level games.
11	Better than most amateur 5-a-side players.
12	Minimum requirement for elite level.
13 or Above	Very high fitness levels.

Table No 2 Criterion of Men VO2 Max Norms

Rating/Age	20-29	30-39	40-49	50-59	60+
Superior	52.4	49.4	48	45.3	44.2
Excellent	46.5	45	43.8	41	36.5
Good	42.5	41	39	35.8	32.2
Fair	36.5	35.5	33.6	31	26.1

Methods of data analysis

The data was collected and descriptive tool were used to ascertain the effectiveness of physical activity programme using fitness app. The statistical tools used in this study were simple descriptive tools like mean, median, standard deviation. To find out the difference between the pre-test and post-test, the researcher employed the inferential tool paired sample 't' test. Cross tabulation for non-parametric data analysis. Wilcoxon test is used for comparing pre-test and post-test.

Physical Fitness App Program

Name of the Physical Fitness App: Google Fit

Program Duration : 14th weeks

Number of Session : 84 days

Duration of the Session : 24 hours

The Frequency of Session : 6 days perweeks

Analysis and Interpretation of Data

Table No 1 Descriptive Statistics of Beep Test Pre-test and Post-test Laps

Statistics	Pre Laps	Post Laps
Mean	33.50	33.50
SEM	2.896	2.896
Median	30.00	30.00
SD	12.95	12.95
Minimum	14	14
Maximum	66	66

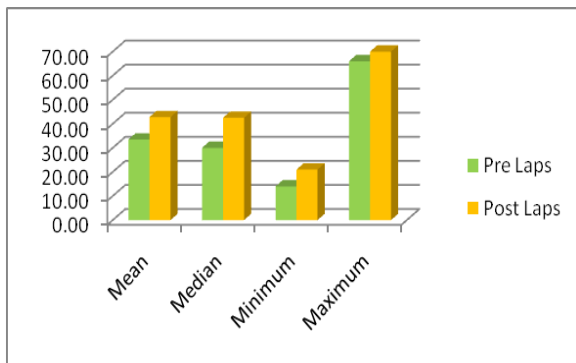


Fig. 1: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Beep Test Laps

1 Description of Descriptive Statistics of Beep Test Pre-test and Post-test Laps

The table 1 reveals descriptive statistics of sedentary people in Bleep-test Laps. There were 20 subjects tested who had Pre-test mean of 33.50 and std deviation 12.95, similarly to post-test mean is 42.80 and std, deviation was 11.91. Median of pre-test 30.00 and for post-test was 42.50. Minimum, Maximum mean and Standard Error of Mean of pre-test 14, 66 and 2.89. Similarly post-test minimum mean, maximum mean and standard error of mean were 21.00, 70 and 2.66. It is seen that the mean of post-test greater than that of pre-test of Bleep test Laps. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 2 Descriptive Statistics of Bleep Test Pre-test and Post-test Levels

Statistics	Pre Levels	Post Levels
Mean	5	6
SEM	0.321	0.282
Median	5	6
SD	1.44	1.26
Minimum	3	4
Maximum	8	9

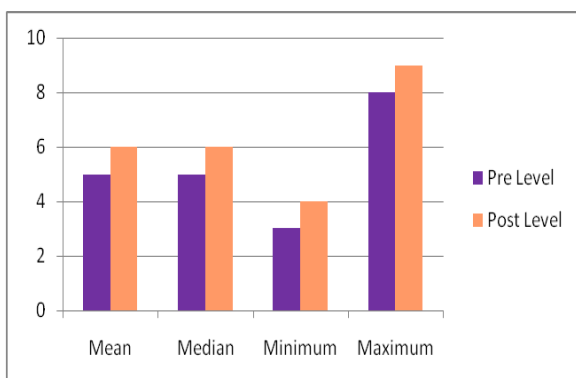


Fig. 2: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Beep Test Levels

2 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Levels

The table 2 reveals descriptive statistics of sedentary people in Bleep-test levels. There were 20 subjects tested who had Pre-test mean of 5 and std deviation 1.44, similarly to post-test mean is 6 and std, deviation was 1.26. Median of pre-test 5 and for post-test was 6. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 3, 8 and 0.32. Similarly post-test minimum mean, maximum mean and standard error of mean were 4, 9 and .28. It is seen that the mean of post-test greater than that of pre-test of Bleep test Levels. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 3 Descriptive Statistics of Bleep Test Pre-test and Post-test Times (Sec) of Sedentary Peoples.

Statistics	Pre Times	Post Times
Mean	256.55	319.20
SEM	19.74	17.63
Median	237.50	318.50
SD	88.27	78.85
Minimum	117.00	191.00
Maximum	471	496

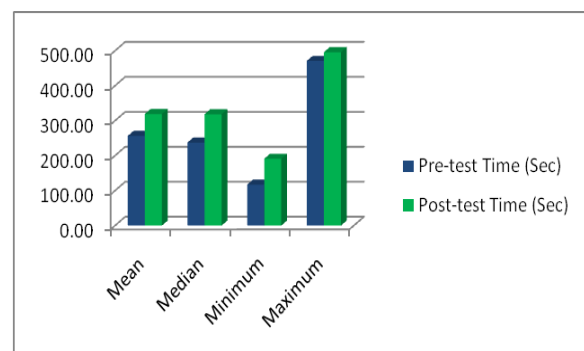


Fig. 3: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Beep Test Times (Sec)

3 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Times (Sec) of Sedentary Peoples.

The table 3 reveals descriptive statistics of sedentary people in Bleep-test total Times. There were 20 subjects tested who had Pre-test mean of 256.55 and std deviation 88.27, similarly to post-test mean is 319.20 and std. Deviation was 78.85. Median of pre-test 237.50 and for post-test was 318.50. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 117.00, 471.00 and 19.74. Similarly

post-test minimum mean, maximum mean and standard error of mean were 191.00, 496.00 and 17.63. It is seen that the mean of post-test greater than that of pre-test of Bleep test total times (sec). As compared to mean of post-test there was an improvement in pre-test mean.

Table No 4 Descriptive Statistics of Bleep Test Pre-test and Post-test VO2 Max of Sedentary Peoples

Statistics	Pre VO2Max	Post VO2Max
Mean	32.60	35.72
SEM	1.00	0.88
Median	31.65	35.65
SD	4.46	3.92
Minimum	25.30	30.00
Maximum	43.20	44.50

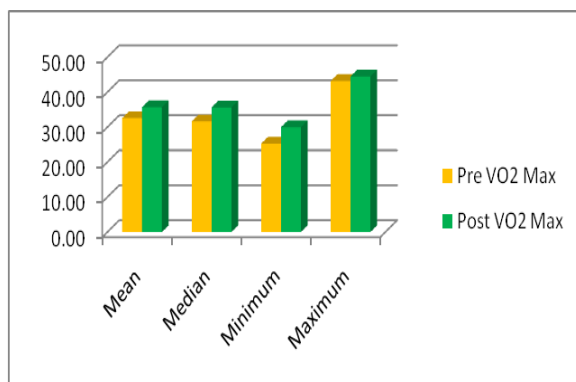


Fig. 4: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Bleep Test VO2Max

Table No 5 Summary of Pair Sample 't' test for Comparing VO2Max

	Mean	SEM	SD	Pearson Correlation	df	't'	Sig.
Pre Total	32.60	1.00	4.46	0.958	19	10.48	0.00
Post Total	35.72	0.88	3.92				

5 Description of Summary of Pair Sample 't' test for Comparing VO2Max

The table 5 consists of score analysis of experimental group VO2Max pre-test and post-test through which conclude the difference between mean of pre-test and post-test was -3.11. This mean difference was tested with standard deviation was 1.33 and this difference was tested paired two sample 't' test were 't' value was 10.48 and $df = 19$. Which was statistically significant at 0.05 significant level ($p = 0.001$) therefore it is interpreted that there is significance in pre-test and post-test performance. Which proves that physical activity programme using fitness app has effect on VO2Max and it is improved.

4 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test VO2 Max of Sedentary Peoples

The table 4 reveals descriptive statistics of sedentary people in Bleep-test VO2Max. There were 20 subjects tested who had Pre-test mean of 32.60 and std deviation 4.46, similarly to post-test mean is 35.72 and std. Deviation was 3.92. Median of pre-test 31.65 and for post-test was 35.65. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 25.30, 43.20 and 1.00. Similarly post-test minimum mean, maximum mean and standard error of mean were 30.00, 44.50 and 0.88. It is seen that the mean of post-test greater than that of pre-test of Bleep test VO2Max. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 6 Descriptive Statistics of Bleep Test Pre-test and Post-test Speed of Sedentary Peoples

Statistics	Pre Speed	Post Speed
Mean	10.33	10.78
SEM	0.16	0.14
Median	10.00	10.50
SD	0.71	0.62
Minimum	9	10
Maximum	12	12

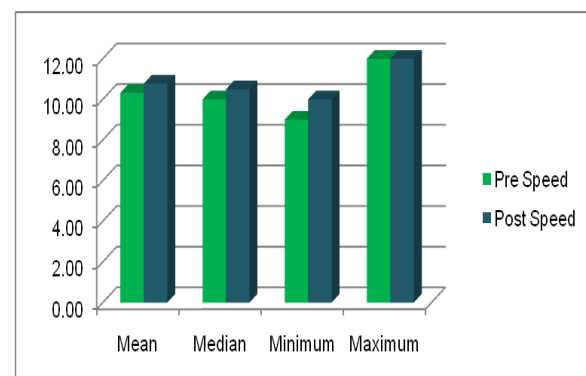


Fig. 5: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Bleep test Speeds

As the correlation is very close to 1, it is seen that each and every sedentary people is affected by the physical activity programme using fitness app. It is observed that correlation between pre-test and post-test of VO2Max is 0.958, which shows very high correlation.

6 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Speed of Sedentary Peoples

The table 6 reveals descriptive statistics of sedentary people in Bleep-test speed. There were 20 subjects tested who had Pre-test mean of 10.33 and std deviation 0.71, similarly to post-test mean is 10.78 and std. Deviation was 0.62. Median of pre-test 10.00 and for post-test was 10.50. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 9, 12 and 0.16. Similarly post-test minimum mean, maximum mean and standard error of mean were 10, 12 and 0.14. It is seen that the mean of post-test greater than that of pre-test of Bleep test speed. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 7 Descriptive Statistics of Bleep Test Pre-test and Post-test Total Score of Sedentary Peoples

Statistics	Pre Distance	Post Distance
Mean	32.58	35.75
SEM	1.00	0.87
Median	31.60	35.65
SD	4.46	3.91
Minimum	25.30	30
Maximum	43.20	44.50

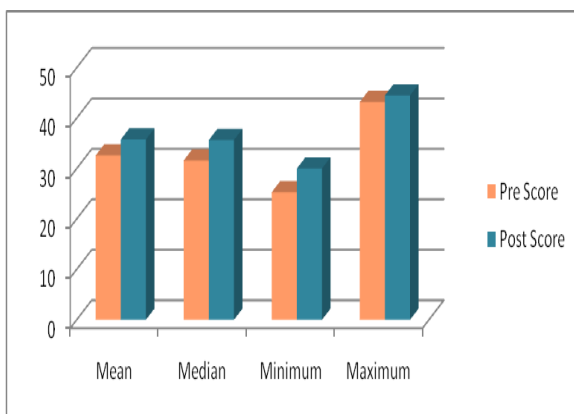


Fig. 6: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Bleep Test total Score

7 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Total Score of Sedentary Peoples

The table 7 reveals descriptive statistics of sedentary people in Bleep-test total score. There were 20 subjects tested who had Pre-test mean of 32.58 and std deviation 4.46, similarly to post-test mean is 35.75 and std. Deviation was 3.91. Median of pre-test 31.60 and for post-test was 35.65. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 25.30, 43.20 and 1.00. Similarly post-test minimum mean, maximum mean and standard error of mean were 30.00, 44.50 and 0.87. It is seen that the mean of post-test greater than that of pre-test of Bleep test total score. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 8 Descriptive Statistics of Bleep Test Pre-test and Post-test Total Score of Sedentary Peoples

Statistics	Pre Distance	Post Distance
Mean	32.58	35.75
SEM	1.00	0.87
Median	31.60	35.65
SD	4.46	3.91
Minimum	25.30	30
Maximum	43.20	44.50

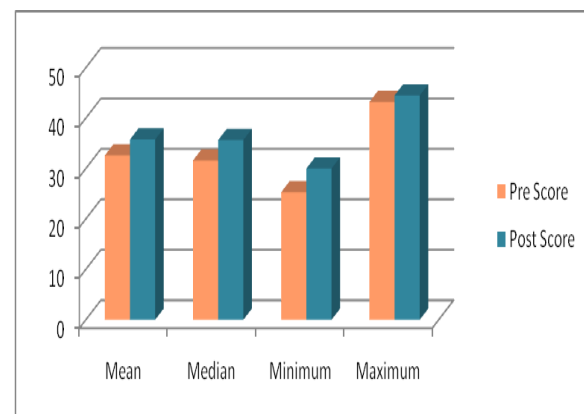


Fig. 7: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Bleep Test total Score

8 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Total Score of Sedentary Peoples

The table 8 reveals descriptive statistics of sedentary people in Bleep-test total score. There were 20 subjects tested who had Pre-test mean of 32.58 and std deviation 4.46, similarly to post-test mean is 35.75 and std. Deviation was 3.91. Median

of pre-test 31.60 and for post-test was 35.65. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 25.30, 43.20 and 1.00. Similarly post-test minimum mean, maximum mean and standard error of mean were 30.00, 44.50 and 0.87. It is seen that the mean of post-test greater than that of pre-test of Bleep test total score. As compared to mean of post-test there was an improvement in pre-test mean.

Table No 9 Descriptive Statistics of Bleep Test Pre-test and Post-test Calories Burn of Sedentary Peoples

Statistics	Pre Distance	Post Distance
Mean	65.57	84.34
SEM	5.66	4.86
Median	60.40	81.15
SD	25.29	21.75
Minimum	27.30	52.70
Maximum	128.70	136

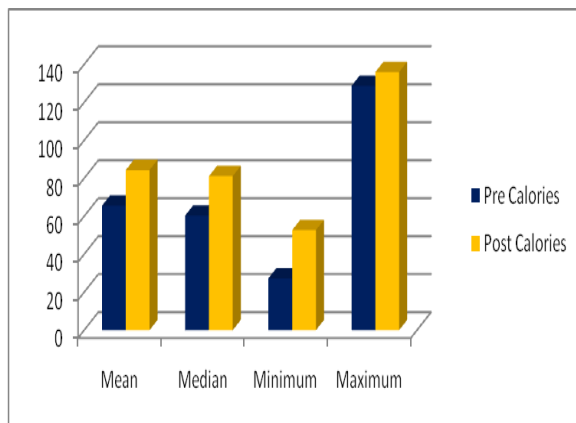


Fig. 8: Graphical Presentation of Pre-test & Post-test Mean, Median, Minimum and Maximum of Bleep Test Burning Calories

9 Description of Descriptive Statistics of Bleep Test Pre-test and Post-test Calories Burn of Sedentary Peoples

The table 9 reveals descriptive statistics of sedentary people in Bleep-test calories burn. There were 20 subjects tested who had Pre-test mean of 65.57 and std deviation 25.29, similarly to post-test mean is 84.34 and std. Deviation was 21.75. Median of pre-test 60.40 and for post-test was 81.15. Minimum mean, Maximum mean and Standard Error of Mean of pre-test 27.30, 128.70 and 5.66. Similarly post-test minimum mean, maximum mean and standard error of mean were 52.70, 136.00 and 4.86. It is seen that the mean of post-test

greater than that of pre-test of Bleep test calories burn. As compared to mean of post-test there was an improvement in pre-test mean.

Table 10 Cross tabulation of Pre Test and Post Test Bleep Test Rating

		Post Ratings			Total
		Fear	Good	Excellent	
Pre Ratings	Fear	10	6	0	16
	Good	0	1	2	3
	Excellent	0	0	1	1
	Total	10	7	3	20

10 Description of Cross tabulation of Pre Test and Post Test Bleep Test Rating

Every participant use to get ratings. Researcher used cross tabulation technique for comparing rating before and after experiment. There were fears, good and excellent ratings.

Table 10 shows that during pre-test out of 20 participant 16 received 'fear' rating from which six have shown improvement and reached Good rating in post-test. There of 2 subjects received good rating during pre-test. Out of which two which two could get 'excellent' rating on post-test. Rest of one subjects kept his 'excellent' rating during both pre and post-test.

There were 16 with 'fear' rating during pre-test and found only 10 fear rating during post-test. While three and one subject received good and excellent rating respectively during pre test and out of them three were found with excellent ratings in post-test. It is therefore found that there was improvement is ratings but to check significance researcher applied willcoxon test.

Table 11 Pre test and Post test Change in Bleep test Rating

Rating	Post test Ratings - Pre Test Ratings
Z	-2.828
Sig. (2-tailed)	0.005

11 Description of Pre test and Post test Change in Bleep test Rating

From table 11, it is found the 'z' value is 2.828 is significant at 0.005 level of significant which interprets that there were significant difference between pre-test and post-test ratings.

It is therefore said that there is improvement found in Beep test ratings after implementation of physical activity programme using fitness app and rating has improved.

Major Finding

After analysing the data,

- i. Post-test proved that there was increase in Beep test performance of all eight parameters; those are beep test levels, distance, time, Vo2Max, speed, score, calories and rating.
- ii. It is found that the Google fit app daily activity performance of the subjects was improved and maintain this workout through fitness app programme.

CONCLUSION

- i. The physical activity programme using fitness app has shown a positive effect on the cardiovascular endurance of the sedentary peoples.
- ii. The fitness of the subjects has improved physical activity programme using fitness app.
- iii. The physical activity programme using fitness app has shown a positive effect on beep test levels, distance, time, VO2Max, speed, score, calories and rating of the subjects.

It is therefore concluded that physical activity programme using fitness app is effective and improves fitness, day to habits of sedentary peoples.

REFERENCES

- Ashtekar, R.P. (2015). *Effect of Suryanamkar Breathing Exercise and Omkar Chanting on Swimming Performance of Swimmers Aged 8 to 16 years*(Unpublished Doctor of Philosophy Thesis). Chandrashekhar Agashe College of Physical Education, Pune, Maharashtra.
- Bansode, S. V. (2013). *Effect of Yogaand Aqua Exercises Training Programme on Performance*

and Selected Phycho-Physiological Profiles of Basketball Players (Unpublished Doctor of Philosophy Thesis). Chandrashekhar Agashe College of Physical Education, Pune, Maharashtra.

- *Beep Test Apps* – Topend Sports: Retrieved from – <https://www.topendsports.com>.
- Direito, A., Jingn, Y., Maddison, R., and Whittaker, R. (2015 April 21). *Apps for Improving Fitness and increasing Physical Activity Among Young People: The AIMFIT Pragmatic Randomized Controlled Trial*. Retrieved from- <https://preprints.jmir.org/preprint/4568>.
- Garrett, H.E, & Woodworth, R.S. (2011). *Statistics in Psychology and Education*. New Delhi, 14th: Nav prabhat Printing press.
- Kratzke, C., & Cox, C. (2012). “*Smartphone Technology and Apps: Rapidly Changing Health Promotion.*” International Electronic Journal of Health Education. 15(2). 72-82.
- Kumar, R. (2014). *Research Methodology A Step by Step Guide for Beginners*, 4th Ed. New Delhi: Sage publications India Pvt. Ltd.
- Rodney, M.L. (2013). *To Study the Effect of Strength Training on the Kicking Distance of Under-14 Players* (Unpublished Masters Dissertation). Chandrashekhar Agashe College of Physical Education. Pune, Maharashtra.
- Sabdra, A. M and Lestie, A.M. (1983). *Foundation of Psychological Testing A Practical Approach*. New Delhi: Saga Publication, PP 361
- Suinn, R. M. (1989). *Psychology in Sports Methods and Application*. New Delhi Delhi: Surjeet Publications.
- Suresh, T. (2007). *A Comparative study of Physical Fitness Component of Kho-Kho Players and Selected Foreign Games Players of Under 14 Boys* (Unpublished Masters Dissertation). Chandrashekhar Agashe College of Physical Education. Pune, Maharashtra.
- Zhao Z., Ali Etemad S., Arya A. (2016) Gamification of Exercise and Fitness using Wearable Activity Trackers. In: Chung P., Soltoggio A., Dawson C., Meng Q., Pain M. (eds) Proceedings of the 10th International Symposium on Computer Science in Sports (ISCSS). Advances in Intelligent Systems and Computing, vol 392. Springer, Cham

How to cite this article: Deshpande M, Saikh L. Effect of application of fitness app on fitness of physical activity among sedentary people from Barrackpore city in West Bengal. International Journal of Research and Review. 2019; 6(8):415-423.
