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## **A Study of Genomic Services Industry and Customer Relationship Management Practices**

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### **Abstract**

This research is formulated to study the Genomic service industry in India. Genomic services include sequencing, Next generation sequencing, customized services such as primer walk, library construction etc. In today's world advance research is being performed that includes a variety of the above mentioned technologies as one of the steps including some of the basic steps. To match up with the requirements of the researchers, the service industry needs to be updated with so many competitors in the field. In this project several factors related to the customers were studied keeping the following objectives as:

- To study the various genomic services and the general customer relationship management practices/ trends followed in the industry at present
- To identify the parameters considered by the customers while outsourcing their samples.
- To study the importance of sales person in brand development in genomic service industry.

The entire study gives a clear idea about the customer psychology and their needs which are to be fulfilled by the service provider. This research comprises an orientation of market to know about various attributes related to the customer's psychology and the current requirements. Customer's needs are never ending and are increasing at a linear pace, to match up with them the service industry must gear up.

### **Methodology**

Research methodology used:

- **Exploratory research:** This method allows the marketer to gain a greater understanding of something that he doesn't know enough about. Exploratory research can help in this instance. Differing mainly in design from descriptive research, exploratory research is used principally to gain a deeper understanding of something. The design is far more flexible and dynamic than that of descriptive research which means it is fact finding activity concerned with understanding the nature of an incidence or knowing features of an institution, entity etc.
- Exploratory research leads to Applied Research, where Applied Research objective is find out solutions to real life problems. The research is "Action-Oriented" and is used for "Policy Framing".
- Primary and secondary research.
- Qualitative research(Pilot survey)

### **Measurement and scaling procedures**

- Within the survey tool that is the questionnaire, several measurement scales are used such as rating scales, multiple choice scale, fixed sum scale, summated scale etc, which helps to analyze the collected data in a proper and systematized manner.

### **Sampling process:**

- Stratified sampling and here the strata was a defined one which represented scientists and that to working on genomics.

- Other than this snowball sampling approach was used along with convenient sampling at some stages of the market survey as many of the principle scientists recommended to meet their colleagues
- Data collection: Data collection is a vigorous field work which was done with the help of simple survey tools such as interview and questionnaire method. The region allotted was Pune, so all the possible research institutes were covered which helped to gather a sample size of 65. The institutes visited along with the number of samples collected per institutes are listed below. The samples were mainly principle scientists.

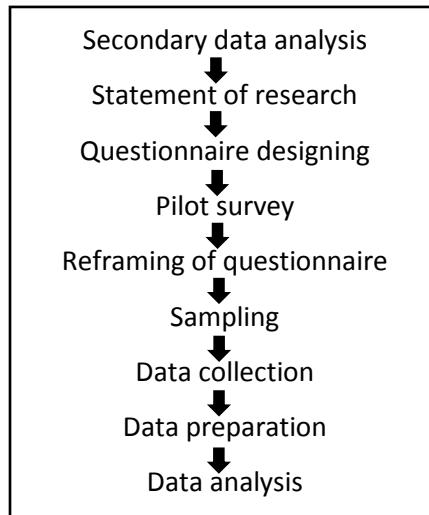


Figure: Flow chart of the research design

**Findings/ Data analysis/ conclusions:**

Data preparation includes the editing, coding, transcription, and verification of data. Each questionnaire or observation form is inspected, or edited, and, if necessary, corrected. Number or letter codes are assigned to represent each response to each question in the questionnaire(See Appendix).

1. The data described below gives us the information of the various techniques that are being used and that are being outsourced majorly.

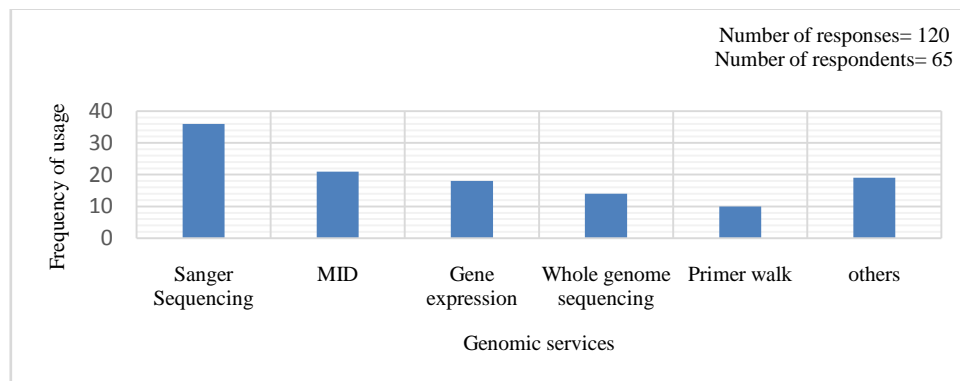


Figure 1.1: Various services required

The above mentioned are the top five genomic services being used by the customers, other services, according to the analysis are less used comparatively

This concludes that Techniques such as Sanger sequencing, gene expression, whole genome and transcriptome sequencing, etc. are required for the ongoing and future projects as seen from the collected data. So frequency of outsourcing of these techniques is quite good which helps in building up this service industry. As the platforms required for these techniques are very costly so many institutes cannot afford them, the contract research organizations help the scientists by providing the services using the required platforms. As the demand for the techniques can be observed from the frequency of ongoing and future projects which gives an indication of an immense potential for this industry.

2. Form the survey very important and useful information can be formulated which relates to what exactly a customer is looking forward in a service provider. Based on certain parameters such as brand name, pricing factor, on time delivery etc. the wants, needs and fulfillment can be related and a comparative study can be made possible.

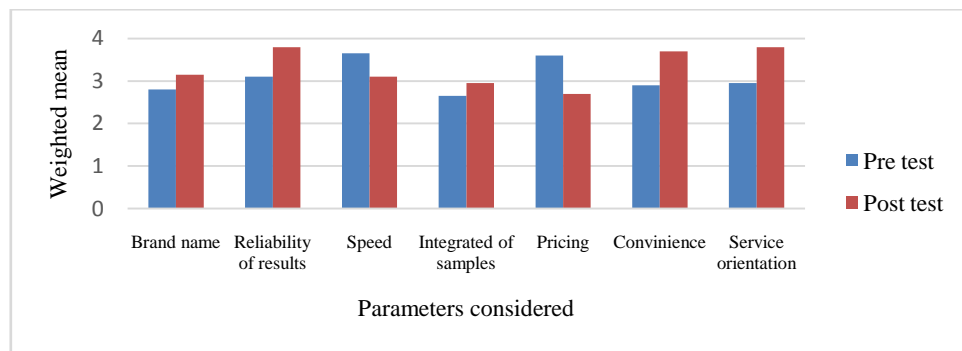


Figure 2.1: Pre and post test comparison for the mentioned attributes.

3. Expectation from the sales person was also identified by using various attributes to be rated by the customers. The below graph shows that the most needed attribute amongst the sales person should be of technical knowledge and later on query satisfaction amongst the sales person is the much needed attribute.

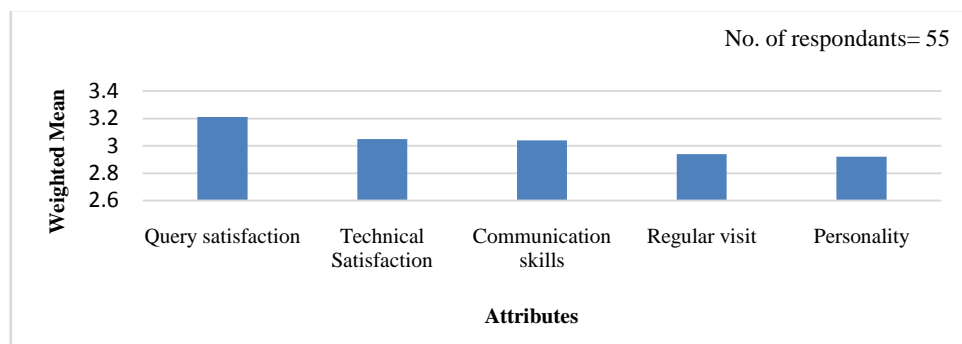


Figure: 3.1

The attributes considered for expectations evaluation of a sales person can be correlated with the only parameter of brand name of the company to see the role of these attributes of a sales person in brand building(from the post test results)

Correlation analysis: it was done by applying the formula to find out the correlation coefficient values for the ratings of the attributes of sales person and the ratings given to the

brand name by the customers (figure: 2.1). This is to find out the effect of various attributes of the sales person on the brand name of the company.

Correlation between the attributes	Correlation coefficient
Technical knowledge with the parameter of brand name of the company	0.85
Regularity in visits with the parameter of brand name of the company	0.74
Query satisfaction with the parameter of brand name of the company	0.91
Communication skills with the parameter of brand name of the company	0.79
Personality of the sales person with the parameter of brand name of the company	0.59

The values of the correlation coefficients reveal that brand name of a company is a very well connected parameter with the attributes of the sales person, that is the sales person has major role in brand development.

4. Willingness of the customers to switch to a new service provider in the genomics service industry.

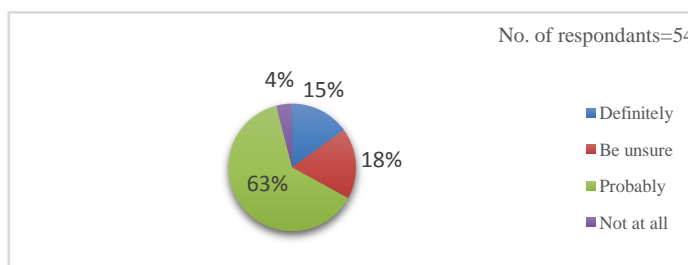


Figure 4.1: Willingness to switch to a new company

As this is a competitive market and customers are willing to experiment so the new players have a greater chance to jump into the market. Majority of the customers are probably willing to switch to a newer company. But from the above graph brand loyalty can also be seen with some of the customers. 6% of the customers can be the target customers as they are definitely willing to switch to a new company. Seeing this opportunity of the suspects and prospects, the market share can be expanded and the new players can benefit themselves.

Customer relationship management in the service industry is far more important and difficult as the most important thing is customer retention which can be achieved by keeping regular contacts and proving updates to the customers along with a consistency in the services provided and results.

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10. Marketing management by Kotler.

**Appendix**

Questionnaire used for the research.

1. What are the genomic services you outsource(that is you send your sample to other company for processing).Multiple ticks.  Sanger sequencing  Microbial identification  Primer walk  Shotgun sequencing  SNP genotyping  Gene expression  Whole genome and whole transcriptome sequencing  Metagenomics  chip sequencing
2. A. How important do you think are the following parameters while outsourcing genomic services to a service provider?( Pre Test)  
 B. How would you rate your current service provider based on following parameters? (Post Test)

Parameters	Poor	Fair	Good	Very good	Excellent
Brand name of the company					
Reliability of service					
Speed/ timeliness of the service					
Integrity of the sample					
Pricing					
Convenience					
Service orientation					

3. How would you rate the sales person based on following attributes?

Attributes	Poor	Fair	Good	Very good	Excellent
Technical knowledge					
Regularity in visits					
Query satisfaction					
Communication skills					
Personality					

4. If a new company wants to enter in the genomic services area , are you willing to switch to a new service provider ?

- Definitely     Be unsure     Probably     Not at all

\* \* \*



# Principles of Cardiorespiratory Endurance Training and Exercise Programme

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## INTRODUCTION

Cardiorespiratory fitness continues to receive high acclaim as a centerpiece of physical fitness and cardiovascular health. For health and fitness applications, the terms Cardiorespiratory fitness, cardiovascular fitness and aerobic endurance are synonymous. Cardiorespiratory fitness best describes the health and function of the heart, lungs and circulatory system, and is related to Cardiorespiratory endurance, which is the ability to persist or sustain activity for prolonged periods. Cardiorespiratory fitness also describes the capacity of the lungs to exchange oxygen and carbon dioxide with the blood, and the circulatory system's ability to transport blood and nutrients to metabolically active tissues for sustained periods without undue fatigue.

Development of a systematic, individualized exercise prescription depends on the thoughtful, scientific integration of five essential components into a structured exercise program: mode, frequency, intensity, duration, and progression. These essential components are applied regardless of the participant's age, health status, or fitness level. Consideration of limitations, needs, and goals of each individual will result in a more individualized, safer, and effective exercise program.

The following data obtained from a graded exercise test provide the basis for the exercise prescription;

### Purposes of Exercise Programs

- Enhancement of physical fitness for daily activities, recreation, or competitive athletic endeavors
- Primary or secondary disease prevention

### Components of an Exercise Prescription

#### ▪ Mode

Mode is a particular form or type of exercise. Selection of mode should be based on the desired outcomes, focusing on exercises that are most likely to sustain participation (adherence and compliance) and enjoyment. **Cardiovascular endurance** exercise requires the involvement of large muscle group activity performed in rhythmic fashion over prolonged duration. **Resistance training** (e.g., circuit training) should be part of a comprehensive exercise program. Mode improves muscular strength and endurance. Some techniques can also be used to provide cardiovascular benefits.

#### ▪ Intensity

Intensity is the relative physiologic difficulty of the exercise. Intensity and duration of exercise interact and are inversely related. Improvements in aerobic fitness from low intensity, longer duration exercises are similar to those with higher intensity, short duration exercise. This is an important consideration when developing an exercise prescription for individuals who do not enjoy high intensity physical activity. Risk of orthopedic and perhaps cardiovascular complications increases with higher intensity activity.

#### **Factors to consider when determining intensity for a particular client include:**

- Level of fitness
- Medications that may influence exercise performance
- Risk of cardiovascular or orthopedic injury

- Individual preference
- Program objectives

▪ **Duration**

Duration is the length of an exercise session. High-intensity/short-duration exercise programs are associated with increased potential for injury. Programs of excessive duration are associated with decreased compliance. Increases in exercise duration should be instituted as adaptation occurs without signs of intolerance.

▪ **Frequency**

Frequency refers to the number of exercise sessions per day and per week. Frequency interacts with both intensity and duration. Deconditioned persons with low functional capacity benefit from multiple daily bouts of short-duration/low-intensity exercise. Individual goals, preferences, limitations, and time constraints may affect frequency.

▪ **Progression**

Progression (overload) is the increase in activity during exercise training, which, over time, stimulates adaptation. The rate of progression depends on the participant's health/fitness status, age, goals, and compliance. Improvement depends upon systematic progression of frequency, intensity, and/or duration. Increasing the frequency and duration of an activity before increasing the intensity is preferred.

▪ **Adaptation**

Adaptation occurs when an individual's physiology can adequately respond to the demands of a particular exercise stress. Depends on health/fitness status and the relative mix of frequency, intensity, duration, and the mode of exercise.

- a. Most participants adapt more easily and comfortably to smaller increases in the volume or intensity of exercise.
- b. There are few objective markers for short-term adaptation (1-3 weeks); some indications may be:
  - Improvements in motor patterns,
  - Lower RPE.
  - Subjective evaluation by communication between the exercise professional and the individual.
- c. The rate of adaptation is affected by the participant's compliance with the exercise program.

**Principles of Cardiorespiratory Endurance Exercise**

The ability to take in, deliver, and utilize oxygen is dependent on the function of the circulatory systems and cellular metabolic capacities. The degree of improvement that may be expected in cardiorespiratory fitness is directly related to the frequency, intensity, duration, and mode. Maximal oxygen uptake ( $\text{Vo}_2\text{max}$ ) may increase between 5% and 30% with training.

**Cardiorespiratory Fitness Goals**

The following are areas that can be addressed in the formulation of cardiorespiratory exercise and activity goals:

1. **Overall acquisition and maintenance of cardiorespiratory fitness** (e.g., kcal/day energy expenditure, mastery of jogging, 20 pound weight loss)
2. **Cardiovascular risk factor modification**

- Body composition
- Blood pressure reduction
- Cholesterol control
- Stress and anxiety reduction

### 3. Performance objectives

- Personal accomplishment (e.g., 10Km run, 1-mile swim, or 6-mile hike)
- Increase physical stamina

#### *Exercise prescription*

##### *Mode*

*The best improvements in cardiorespiratory endurance occur when large muscle groups are engaged in rhythmic, aerobic activity. Various activities may be incorporated into an exercise plan to increase enjoyment and improve compliance. Appropriate activities include walking, jogging, cycling, rowing, stair climbing, aerobic dance ("aerobics"), water exercise, and cross-country skiing.*

- **Cycling** This non-weight-bearing activity has a low potential for musculoskeletal injury. An ergometer is recommended for accurate exercise testing and training so that workload can be quantified, The major limiting factor to cycling is local muscle fatigue of the upper leg.
- **Stair climbing** Stair-climbing machines, including chain-driven machines, step-treadmills, and "steppers," are commonly found in fitness centers. An upright posture is important to avoid low back trauma. Weak quadriceps and gluteals may cause dependence on handrails for support, reducing the intensity of the exercise.
- **Aerobics is typically offered as a group activity**, Intensity is usually controlled by music and choreographed movement patterns. HR is not a valid indicator of exercise intensity when excessive arm movements are used. The use of RPE should be considered an adjunct form of intensity monitoring,
  - **High-impact aerobics** Refers to movements where both feet leave the ground simultaneously. May require significant energy expenditure. Increase the potential for musculoskeletal injury.
  - **Low-impact aerobics** Refers to movement patterns where one foot remains in contact with the floor at all times. Produce low impact forces and low injury potential Are appropriate for even highly fit individuals. Exercise intensity can be increased by using greater horizontal displacement during movement.
- **Step aerobics** involves the use of choreographed movement patterns **performed on and off bench steps** varying in heights from 4 to 12 inches. Energy cost ranges from 6-11 metabolic equivalents (METs). Cadence must be reduced for less fit individuals (< 8 METs functional capacity). Organizations such as the American College of Sports Medicine, the American Council on Exercise (ACE), and the Aerobics and Fitness Association of America (AFAA) are excellent resources for more detailed aerobics information and continuing education.
- **Water exercise:** Water exercise allows the buoyancy properties of water to help reduce the potential for musculoskeletal injury and may even allow an injured person an opportunity to exercise without further injury, **Activities** Include walking, jogging, and dance activity. Typically combine the benefits of the buoyancy and resistive properties of water, providing an aerobic stimulus as well as enhancing muscular strength and endurance. **Special population** groups such as the obese, pregnant, arthritic, and elderly may benefit from water exercise. **Intensity** may be altered by changing the speed of movement or the depth of the water, or by using resistive devices such as fins and hand paddles.

**Intensity**

The exercise intensity be prescribed within a range of:

HR max %	Vo2 or HRR %	RPE	Classification
<35	<20	<10	Very Light
35 – 54	20 – 39	10 – 11	Light
55 – 65	40 – 59	12 - 13	Moderate
70 - 89	60 – 84	14 - 16	Hard
90 - 99	85 - 99	17 - 19	Very Hard
90 - 99	100	20	Maximal

Lower intensities (40%-50% of Vo<sub>2max</sub>) elicit a favorable response in individuals with very low fitness levels. Due to the variability in estimating maximal HR from age, whenever possible use an actual maximal HR from a graded exercise test.

**Target Heart Calculation**

**Target Heart rate (HR max)**

	220	220
<b>Age</b>	- 20	-20
	-----	-----
<b>Max Heart Rate</b>	200	200
<b>60%-80%</b>	x .6	x .8
	-----	-----
<b>Target Heart Rate</b>	<b>120 (60%)HRM</b>	<b>160 (80%)HRM</b>
<b>Heart Rate Reserve (HRR)</b>		
	220	220
<b>Age</b>	-25	-25
	-----	-----
<b>Max Heart Rate</b>	195	
<b>Resting Heart Rate</b>	-75	-75
	-----	-----
<b>Heart Rate Reserve</b>	120	120
<b>60%-80%</b>	x .6	x .8
	-----	-----
	72	96
<b>Resting Heart Rate</b>	+75	+75
	-----	-----
<b>Target Heart Rate</b>	<b>147 (60%)HRR</b>	<b>171 (80%)HRR</b>

**Ratings of Perceived Exertion (RPE)** may be used with HR for regulating intensity. An intensity that will elicit an RPE within a range of 12-16 on the original 6-20 Borg scale. RPE is considered a reliable indicator of exercise intensity, though some learning is required on the part of the participant. RPE is particularly useful when a participant (particularly the elderly) is unable to monitor his/her pulse accurately or when HR response to exercise is altered by medications.

**Borg Scale**

**Ratings of Perceived Exertion (RPE)**

6	
7	Very, very, light
8	
9	Very light
10	
11	Fairly light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Very, very hard
20	

**An abnormal response to a graded exercise test or individual exercise** limitations must be considered when prescribing intensity.

Exercise at intensities where the following problems occur should be avoided:

1. Exercise-induced anginal pain
2. Inappropriate BP changes
3. Musculoskeletal discomfort
4. Leg pain
5. Any sign or symptom that caused premature termination of the exercise test.

For any of the problems mentioned above, the training HR may be 10 bpm lower than the HR where a problem was evidenced.

**Training Programme Guideline**

Stage	Intensity (HRR)	Duration (Min)	Goal
Initiation	40-60%	12-30	Habituation

**Role of Exercise Leader or Personal Trainer**

- Minimize muscle soreness, discomfort, and injury
- Establish individual and realistic goals
- System of reward including intrinsic and extrinsic

Stage	Intensity (HRR)	Duration (min)	Goal
Improvement	70-85%	25-40	Increase Fitness/Self Esteem

**Role of Exercise Leader or Personal Trainer**

- Variety to avoid boredom or injury
- Measurements to show progress
- Encouragement and socialization

Stage	Intensity (HRR)	Duration (min)	Goal
<b>Maintenance</b>	70-85%	30-45	Make applicable

**Role of Exercise Leader or Personal Trainer**

- Reevaluate progress
- Set new long consistent with long-term goals
- Specificity of training for recreational Activities

**Duration**

20-60 minutes of continuous aerobic activity. Caloric expenditure and cardiorespiratory conditioning goals may be met with exercise sessions of moderate duration (20-30 min). Deconditioned individuals may benefit from multiple, short-duration exercise sessions (< 10 minutes) with frequent interspersed rest periods. An inverse relationship exists between the intensity and duration of training. There may be greater musculoskeletal and cardiovascular risk with exercise performed at high intensities for short durations as compared with lower intensity exercise for a longer duration.

Interval training programs that use bouts of higher intensity exercise with bouts of lower intensity exercise can be effective for improving cardiorespiratory fitness.

- Intermittent exercise may allow increased caloric expenditure and interest level compared with continuous aerobic activity and may be particularly useful for beginning or deconditioned exercisers. Intervals programmed for health/fitness purposes should be aerobic in nature and not exceed an intensity of 85% HRR.

**Frequency**

Aerobic exercise be performed 3-5 days per week for most individuals. Although frequency, intensity, and duration of exercise are interrelated, frequency is also influenced by lifestyle and convenience. Less conditioned people may benefit from lower intensity, shorter duration exercise performed at higher frequencies per day and/or per week.

**Progression (Overload)**

A written progression plan with periodic reevaluation is crucial. This plan must provide details for a graduated progression in the frequency, duration and intensity of exercise. There must be sufficient flexibility in the rate of progression so that the plan comfortably adjusts to the client's cardiorespiratory and musculoskeletal response.

**The rate of progression depends upon a number of factors:**

- Individual level of fitness (aerobic capacity)
- Age
- Health status
- Individual preferences and goals
- Social and family support
- Level of exercise initiative and motivation
- Access to appropriate facilities and equipment

Three stages of progression for the cardiorespiratory endurance exercise plan are identified below: the initial conditioning stage, the improvement conditioning stage and the maintenance conditioning stage.

### **Warm-up**

Warm-up consists of large muscle group activity performed rhythmically at a relatively low intensity.

- Physiological changes induced by appropriate warm-up exercises include:
  1. Increase in muscle temperature, -increase in muscle blood flow.
  2. Increased dissociation of oxygen from hemoglobin.
  3. Enhancement of enzyme activity, -increase in nerve conduction velocity
  4. Increases in elasticity of muscle and connective tissue.
  5. Decrease in muscle viscosity.
- Benefits include possible prevention of musculoskeletal and cardiovascular injury.
- Five to ten minutes should be allotted for the warm-up.

### **Cool – Down**

Consists of large muscle activity performed at a low to moderate intensity for approximately 5-10 minutes.

1. Facilitates venous return.
2. Facilitates removal of metabolic by-products.
3. Promotes a gradual return of HR and BP to pre-exercise values.
4. Because the musculature and connective tissue are less viscous and more pliable after the exercise stimulus, the cool-down period is an appropriate time to enhance flexibility through stretching.

### **Training Methods**

Understanding the physiological response to various training methods. There are five major training methods:

1. Continuous training
  - a) Intermediate slow distance
  - b) Long slow distance
2. Interval training
  - a) Aerobic interval training
  - b) Anaerobic interval training
3. Fartlek training
4. Circuit training
5. Aerobic cross training

### **Continuous Training**

Continuous training involves conditioning stage exercise, such as walking, jogging, cycling, swimming and aerobic dancing. The prescribed intensity is maintained continuously between 50 percent and 85 percent of functional capacity (maximal oxygen uptake). For those with initially low functional capacities, continuous training may be initiated at 40 percent of functional capacity and is usually preceded by four to six weeks of interval training in the initial conditioning stage. In practice, continuous training is divided into two types:

- **Intermediate slow distance:** Generally from 20 to 60 minutes of continuous aerobic exercise the most common type of sustained aerobic exercise for fitness improvement. Body-fat reduction, improvement in cardiorespiratory fitness and cardiovascular risk factor management all are responsive to this type of continuous training.

- **Long slow distance (LSD):** 60 or more minutes of continuous aerobic exercise, usually employed for athletic training in such sports as cycling and long-distance running. Cardiorespiratory and metabolic demands are great for LSD training.

### **Interval Training**

Interval training involves the alternating of relatively more intense bouts of cardiovascular exercise with those that are relatively less intense.

- **Aerobic Interval Training.** Aerobic interval training is best suited for those beginning in the poor- or low-cardiorespiratory fitness classifications because it is less intense.
  - Generally, aerobic interval training uses exercise bouts of two to 15 minutes at intensity between 60 percent and 80 percent of functional capacity.
  - Those with poor- or low-functional capacity should start with two- to three-minute exercise intervals at 60 percent to 70 percent of functional capacity.

Rest intervals should take approximately the same time as a complete exercise interval. Intervals can be repeated five to 10 times depending on the client's response and program goals; for example, stationary bicycling for three minutes at a work load intensity of 60 percent to 70 percent of functional capacity with a two-minute "rest period" of cycling at zero resistance or load.

- **Anaerobic Interval Training,** Anaerobic interval training is primarily reserved for those in the higher cardiorespiratory fitness classifications who desire to increase speed, lactate threshold and overall aerobic power because of the relatively high metabolic and cardio respiratory demands. The training stimulus is usually between 30 seconds and four minutes at an intensity of 85 percent to greater than 100 percent of functional capacity (maximal oxygen uptake). The probability of musculoskeletal injury is greater because of high muscle contraction velocities and forces. The client, frequently an athlete, should engage in substantial low-level aerobic warm-up and stretching before vigorous activity.

### **Fartlek Training**

Fartlek training is similar to interval training; however, the work-rest intervals are not systematically or accurately measured. Work-rest intervals and intensity are usually determined by how the participant feels. Over the years, Fartlek training used primarily to prevent boredom and to enhance aerobic endurance. One of its most useful applications is in running, where the warm up consists of running for 10 to 20 minutes, then the pace is significantly varied every five to 10 minutes. Like long, slow distance aerobic training; this form should be reserved for those in the average or above-average cardio-respiratory fitness levels because of the relatively high demand on the cardiorespiratory system.

### **Circuit Training**

Circuit training takes the participant through a series of exercise stations, with relatively brief rest intervals between each station. The number of stations may range from four to 10. Circuit training is designed for enhancing muscular endurance and incorporated mostly muscular endurance exercises such as sit-ups, the bench press and the leg press. A circuit of four to 10 stations with a low-level aerobic warm-up and cool-down station (for example, the stationary bicycle) could be followed by exercise stations using either free weights and/or single-station weight machines.



### **Aerobic Cross Training**

Aerobic cross training is an individualized combination or composite of all aerobic-training methods, and is characterized by a variety of intensities and modes.

- A good example is a 50-minute workout where the client warms up by jogging 15 minutes to a nearby pool, then swims for 20 minutes, and then jogs 15 minutes back home.
- Another example is bicycling 20 minutes to a track or running course and, after 20 minutes of running, cycling back home.

Combining a group of aerobic activities into one workout at steady or various intensities is an excellent method of cross training.

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## A Review of Microarray Data Normalisation Techniques

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### Abstract

In this paper we have taken a brief review of microarray data normalisation technique used in microarray procedure. The focus of the paper is to only review the technique as to discuss the procedure, advantages and disadvantages of different normalisation methods. Normalisation is one of the important steps in the microarray data analysis procedure. Removing systematic bias from the data which has occurred due to different technical steps of carried out in microarray experiment is the challenge before researcher for identifying sensible data.

### Introduction:

Schena in 1995 came out with the first official publication on microarray. Thereafter many people worked on the topic with different approaches. Microarray research considered to be one of the important methods for comparison of thousands of genes simultaneously. This facilitated researcher to look into complete genome or some specific group of genes as a whole. Gene microarray emerged as one of the important tool in studying changes in gene expression. Microarray is widely used for gene discovery, disease diagnosis, pharmacogenomics and toxicogenomics etc. Microarray is generating huge data because of which not only geneticist but statisticians even started taking interest in the many quantitative and data analysis related issues with microarray technology.

Huard et. al. [6] reported that “statistical approach does not start once the results of an experiment have been obtained, but at the very first step of the conception of experiment” and also suggested biologist “do not wait till you get your data to go and discuss with statistician”. The following advice from pioneering British geneticist and statistician Ronald Fisher sounds true today than uttered it in 1938. According to him, “To call in the statistician after the experiment is done may be no more than asking him to perform a post-mortem examination: he may be able to say what the experiment died of . [1]” Advises like this are very common from many persons working with statistics and data analysis emphasized the need of planned research. This also cited the importance design and analysis of experiment. As like in all other experiment, Designing and analysis is important aspect of microarray experiment.

Data generated in microarray is considered to be noisy data and therefore like all other data sets microarray data also has to pass through the basic data cleaning procedures. The data has to pass through many stages before its analysis stage. Of all these stages data normalisation is considered to be one of the important stages.

### Data Normalization:

Microarray experiments are aimed at comparing two different samples and identify differentially expressed genes. Data so generated in microarray experiments shows high variability. Variability may be due to differentially expressed genes or may be because of different technical steps introduced during microarray experiment. These systematic biases are broadly classified as within array bias and between array biases.

Once segmentation is done, data is normalized to reduce systematic biases due to microarray experiments. According to Smyth et.al. [10], ‘Normalization means, to adjust microarray data for effects which arise from variation in the technology rather than from biological differences between the RNA samples or between the printed probes’. Procedure of normalisation is aimed at identifying true data for further analysis.

Different procedures are applied for normalisation of within array bias and between array biases. The following normalisation methods are discussed in [3, 10].

The methods discussed below are based on assumption that the majority of the genes on the microarray are not differentially expressed. The normalization methods discussed below gives

efficient results under this assumption only. If this assumption is not true, then these methods may not be reliable. In this situation different experimental design and normalisation methods can be used [4, 8, 9].

Some of the very frequently used normalization methods are discussed in the section followed:  
**Linear Regression of Cy5 dye against Cy3 dye based method:**

This is the simplest of the all normalization methods. This method starts with the scatter plot of Cy3 and Cy5. Using this scatterplot one can determine whether the channels behave comparably or not. If the channels behaves appropriately then the points should be denser around approximate straight line, and the linear regression line through the data should have a gradient of 1 and an intercept of 0. Variations from these values represent different responses of the Cy3 and Cy5 channel. A non-zero intercept of the regression represents that one of the channels brighter than the other if slope is not equal to 1 then one of the channels is responding strongly to high intensities and any kind of deviation from a straight line represent non-linearities in the intensity responses. This is as said is the simplest method even to discuss. The procedure is as below:

- Obtain scatterplot of Cy3 vs. Cy5.
- Fit a regression line through the scatterplot.
- Identify the gradient and intercept of the regression line fitted in the above step.
- Replace the Cy3 values with the fitted values on the regression line.

This normalisation method works well for the data in which linear fit is an appropriate fit. Though the method is simple but has some disadvantages even some of the disadvantages like since the plot is diagonal and some time it non-linearities might not be observed with human eye.

#### **Linear Regression of Log Ratio Against Average Intensity ( MA plots ) :**

The method is discussed in [6, 3, 10, 9, 5]. The method is considered as more reliable than that of the one discussed earlier for data normalisation. The MA plot is obtained by plotting average log intensities of Cy3 and Cy5 taking on X axis denoted by A against Log intensity ratio of Cy5 and Cy3 denoted by M. MA plot can also be obtained from scatterplot of log intensities by rotating it by 45° and then scaling the axis appropriately. This method has many advantages. The very important of these advantages are that the MA plots can be used with linear as well as non-linear differential responses and the channels are treated equally. The method can be summarised in following steps:

- Compute average log intensity of Cy3 and Cy5 and log ratio.
- Obtain MA plot of by taking A on X axis and M on Y axis.
- Perform linear regression of the log ratio (dependent variable) on the average log intensities (independent variable).
- For each feature, calculate the normalised log ratio by subtracting the fitted value on the regression from the raw log ratio.

Both the methods discussed above are very good if used with the data set showing linear trend. But most of the microarray data sets show non-linear relationship between Cy3 and Cy5, all such type of data set linear regression do not provide appropriate results. Thus for such data set non-linear methods are more appropriate. Nonlinear regression analysis method is most commonly practised in such a situation.

#### **Nonlinear Regression of Log Ratio against Average Intensity**

If the relationship between Cy3 and Cy5 channels is nonlinear, nonlinear regression approach is used for normalisation of data. The most commonly used non-linear regression method with microarray is called as Loess regression. The word Loess sometime known as Lowess stands for locally weighted polynomial regression. This method is considered to be relatively advanced statistical technique. Loess normalisation consists of following steps:

- Obtain the A and M values for the given data set.

- Obtain MA plot.
- Obtain Loess regression to the data.
- For each feature, calculate the normalised log ratio by subtracting the fitted value on the Loess regression from the raw log ratio.

**Spatial bias normalisation:**

The spatial bias is the result of some technical problems with scanner and array. Sometimes arrays are not completely flat or horizontal. In this situation spatial biases occur. Two methods are used very commonly for normalisation of spatial biases. The first of which is based on Loess regression. Method is known as two dimensional Loess method. The major difference between 2D Loess and 1D Loess is that in 2D surface is fitted instead of curve to the data. The second method used for spatial bias normalisation is **Block-by-Block Loess Regression**. In this method one dimensional Loess regression is used. Loess regression on the log ratio as a function of average log intensity, but instead of applying this method to the whole array (as done earlier), apply the method to each grid on the array separately.

**Between Array Normalisation:**

As the name suggest, in this section we will discuss normalisation methods used when data from two different arrays is to be normalised that is to make comparisons between samples hybridised to different arrays, which could be either two-colour arrays or affymetrix arrays.

Box plot method is widely used for normalisation of between arrays. The box plot allows you to compare the distributions of the log ratios in the different patients. Once the Box plots are obtain and distributions are studied then it needs to be adjusted.

**1. Scaling**

In this method the scaled value is obtained by subtracting the mean log ratio (or log intensity) of all of the data on the array from each log ratio (or log intensity) measurement on the array. The mean of the measurements on each array will be zero after scale normalisation. Median can also be used in place of mean to give more robust measure of the average intensity on an array in situations where there are outliers or the intensities are not normally distributed.

**2. Centring**

Centring method is used to ensure that the means and the standard deviations of all of the distributions are equal. In this method, for each measurement on the array subtract the mean measurement of the array and divide by the standard deviation. After centring, the mean of the measurements on each array will be zero, and the standard deviation will be 1. This method is commonly practised with multiple arrays. It is particularly useful when calculating the Pearson correlation coefficient of a large number of data sets prior to cluster analysis, because it ensures that the correlation coefficient can define a distance metric on the data. Sometime median and median absolute deviation from the median (MAD) is also used in place of Mean and standard deviation. This has the advantage with outliers than using the mean and standard deviation. It also has some disadvantage when used with Pearson correlation.

**3. Distribution Normalisation**

Distribution normalisation is important step in the between array normalisation method. In the distribution normalisation procedure the data from all the arrays are normalised in such a way that the distributions of the data on each of the arrays are identical. In this method first of all data is centred then this centred data is arranged from lowest to highest for each array. After this we Compute a new distribution whose lowest value is the average of the values of the lowest expressed gene on each of the arrays; whose second-lowest value is the average of the second-lowest values from each of the arrays; and so on until the highest value is the average value of the highest values from each of the arrays. Once this is achieved then replace each measurement on each array with the corresponding average in the new distribution. For example, if a particular measurement is the 100<sup>th</sup> largest value on the array, replace it with the 100th largest value in the new distribution.

While concluding the Normalisation part of this report, it can be noted that it needs more attention because when data is normalised using methods discussed above there is chance of loss of information. Since most of the normalisation procedures are based on averaging out the data sets. Though it is essential to normalise to reduce biases but also has the problem of loss of information.

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## Effect of Asana on Health Related Fitness of School Children

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### Abstract

Every individual needs health and fitness to lead a happy and enjoyable life. To achieve this diet and exercise plays a vital role & it helps the body to build healthy cells, tissues, glands and organs. For assessing the role of yoga in improving Health related Physical Fitness an experiment was conducted on the students belonging to different economic class/society i.e. Elite class having income above Rs. 1 lakh and the colour of ration-card is White, Middle Class – Income below Rs. 1 lakh and the colour of ration card is Orange, and Slum Area – Income below Rs. 15000/- and rationing card is Yellow. Specially prepared yoga program was administered on the subjects having age between 13-15 years. All the subject of experimental group underwent six weeks training of Yoga practices for 1 hour daily in the morning except Sunday and holidays. Simultaneously, the subjects of the control group were engaged in some recreational activities, library reading etc. for 1 hour daily. The result shows that the subjects' benefited by the yoga program in improve Height ( $F=73.67$ ,  $p=0.001$ ), Muscular Endurance ( $F=137.15$ ,  $p=0.001$ ) and Flexibility ( $F=69.25$ ,  $p=0.001$ ) while it was helpful in reducing the weight ( $F=18.04$ ,  $p=0.001$ ). It was also confirmed that the yoga program has superior effect on slum class students than elite class in case of muscular endurance.

Key Words: Economic Class, Yoga Program.

### INTRODUCTION

Every individual needs health and fitness to lead a happy and enjoyable life. Individual may be young or old, men or women, ill or handicapped, rich or poor, but they need physical, mental, social and emotional health. To achieve this diet plays a vital role & it helps the body to build healthy cells, tissues, glands and organs. The body can't perform any of its functions be they metabolic, hormonal physical, mental or chemical without proper diet.

Physical fitness, participation in physical activity, fundamental motor skills and body composition are important contributors to the health and the development of a healthy lifestyle among children and youth. It has been seen through many scientific research studies that significant health problems encountered in adulthood often have their roots in health behaviours initiated during childhood and adolescence (Grund, Dilba, Forberger, Krause, Siewers, Rieckert, and Müller, 2000; Heath, Pratt, Warren, and Kann, 1994). In order to reverse this trend, school authority, health personnel, and parents need to understand the growth, nutrition and health related fitness status of the teenagers belonging to slum, middle class and elite society.

In this context, Indian educational institutions consider Yoga in the curriculum of Physical Education with a view to encourage value education, personality development and mental growth. In reality, impact of yoga on children's growth, nutrition, health related fitness and performance related fitness is unexplored. Thus, the present study on yoga, fitness and nutrition for school children has social significance.

### METHODOLOGY

#### Experimental Study

On the basis of survey study ninety subjects were randomly selected and assigned six equal groups as shown in table 1.

The experimental Groups received specially designed Yoga training while remaining three Groups were treated as control. The design of the experiment has been planned in three phases.

**Pre – Test (phase – I)**

As the purpose of this part of the study was to see the efficacy of yogic practices on growth, nutrition, health related fitness and sports talent components, all the subjects of experimental and control groups were exposed to related standard tests to record the pre test data.

**Treatment stimuli (phase – II)**

After the pre test was over, all the subject of experimental group underwent six weeks training of Yoga practices for 1 hour daily in the morning except Sunday and holidays. Simultaneously, the subjects of the control group were engaged in some recreational activities, library reading etc. for 1 hour daily. In the mean while, all the parents of the students of experimental groups were given ideas about yogic diet to be given to their respective child.

For total period of six weeks, one yoga teacher was appointed to organize daily training programmes (yoga) under the over all supervision of the present investigator.

Table 1  
Subjects of the Study

Class	Experimental	Control	Total
Low income-Slum	15	15	30
Middle class	15	15	30
Elite	15	15	30
Total	45	45	90

**Post test (phase III)**

Finally, when the treatment or training period of six weeks was over, all the subjects of experimental and control groups were assessed with the standard tests which were already performed in pretest.

**Variables, Tools Used & Criterion Measures**

Before and after experiment following tests for the subjects of both the experimental and control groups were assessed with the help of some standard tests (Table 2).

**Yoga Intervention**

Yoga intervention was prepared with some of the asanas and pranayamas. This also includes Omkar recitation. All these contents were selected on the basis of various reports on Yoga and Physical fitness and also based on suggestions on *full course* cited by Swami Kuvalayananda (1982) and opinion also from the experts of Kaivalyadhama Yoga Research Institution, Kaivalyadhama, Lonavla. The yoga training imparted to the experimental groups for total of six weeks (Table 3).

Table 2  
Variables and Criterion Measures of the Study

Variables	Tools Used	Criterion Measures (Nearest to)
<b>Growth variable:</b> Height Weight	Stadiometer Weighing machine	Cm. (0.05 Cm) Kg. (0.5 Kg.)
<b>Health related physical fitness variable:</b> Abdominal muscles strength Flexibility Body fat Cardiovascular endurance	Sit ups test Sit & Reach test Fat O Monitor 1400 M run	No./min (1.0 No.) Cm. (0.05 Cm.) % (0.5%) Min:Sec (0.05 Sec)

Table 3  
Specialy Prepared Yoga Program

Sr. No.	Name of Yoga Practice	Sr. No.	Name of Yoga Practice
1	Shavasana	12	Chakrasana
2	Pawanmuktasana	13	Parvatasana
3	Naukasana	14	Tadasana
4	Viparitkarani	15	Halasana
5	Bhujangasana	16	Brahma Mudra
6	Shalabhasana	17	Ujjayi Pranayama
7	Vajrasana	18	Anuloma-Viloma
8	Vakrasana	19	Kapalabhati
9	Paschimottanasana	20	Om Recitation
10	Mayurasana		
11	Janushirasana		

Results of the Study

Table 4  
Discriptive Statistics: Change in Mean Performance

Economic Class	Group	Height	Weight	Muscular Endurance	Flexibility	C.V. Endurance	Fat %
Elite Class	Experiment	0.45	-0.17	2.53	3.47	-0.03	0.10
	Control	0.03	0.47	-0.40	0.20	-0.01	0.01
	Total	0.24	0.15	1.07	1.83	-0.02	0.06
Middle Class	Experiment	0.29	0.17	3.13	3.33	-0.03	-0.01
	Control	0.03	0.71	0.53	0.40	0.00	-0.07
	Total	0.16	0.44	1.83	1.87	-0.01	-0.04
Slum Class	Experiment	0.35	-0.17	3.67	4.53	0.62	-0.25
	Control	0.00	0.43	0.21	0.93	-0.72	0.00
	Total	0.18	0.12	2.00	2.79	-0.03	-0.13
Total	Experiment	0.37	-0.06	3.11	3.78	0.19	-0.05
	Control	0.02	0.54	0.11	0.50	-0.23	-0.02
	Total	0.19	0.24	1.63	2.16	-0.02	-0.04

Table 5  
Consolidated Inferential Statistics of Change in Performance

Source	Change in Height		Change in Weight		Change in Muscular Endurance	
	F	Sig.	F	Sig.	F	Sig.
Economic Class	1.44	0.243	1.78	0.174	<b>4.29*</b>	0.017
Group	<b>73.67*</b>	0.001	<b>18.04*</b>	0.001	<b>137.15*</b>	0.001
Economic Class * Group	1.29	0.280	0.05	0.950	1.12	0.331



Table 3A  
Consolidated Inferential Statistics of Change in Performance

Dependent Variable	Change in Flexibility		Change in C.V. Endurance		Change in Body Fat %	
	F	Sig.	F	Sig.	F	Sig.
Economic_type	1.87	0.160	0.001	0.999	1.83	0.167
Group	<b>69.25*</b>	0.001	1.716	0.194	0.16	0.686
Economic_type * Group	0.34	0.713	1.969	0.146	1.96	0.148

Table 6  
Multiple Comparison : Muscular Strength

(I) Economic_type	(J) Economic_type	Mean Difference (I-J)	Std. Error	Sig.
Elite Class	Middle Class	-.77	.316	.058
	Slum Class	<b>-.83*</b>	.316	.035
Middle Class	Elite Class	.77	.316	.058
	Slum Class	-.07	.316	.978
Slum Class	Elite Class	.83*	.316	.035
	Middle Class	.07	.316	.978

#### Results on Yoga for Health related fitness Variables

- Economic Class wise results shows that “**Slum class**” showed significant **improvement in Abdominal muscles strength** than elite class ( $p=0.035$ ). However, students of “**Middle class**” and “**Elite Class**” did not show significant change ( $p=0.058$ ). In case of other variables there was no significant difference in the change in mean performance.
- Group Wise it was found that experimental group showed significant improvement in Height ( $F=73.67$ ,  $p=0.001$ ), Weight ( $F=18.04$ ,  $p=0.001$ ), Muscular Endurance ( $F=137.15$ ,  $p=0.001$ ) and Flexibility ( $F=69.25$ ,  $p=0.001$ ). Remaining Variables like C.V. Endurance and Body Fat, group wise, there was no significant difference.

#### CONCLUSION

This study warrants following conclusions:

- Status of abdominal muscular strength is different among the children belong to elite, middle class and slum areas. The children of slum class had superior status than elite and middle class.
- Yoga training helps to improve Height, Muscular Endurance and Flexibility while it was helpful in reducing weight.

#### RECOMMENDATIONS

*On the basis of the results and findings, this study presents the following recommendations:*

- Excessive body weight and higher level of fat deposition are evident among the children of higher economic group of families (elite families), which needs special attention.

- Implementation of specific yoga practices, as suggested by Swami Kuvalayananda, is recommended for school children to record better growth, health related physical fitness and sports talent ability.

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## Properties of d-th power residue symbol

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**Abstract:** In the last century Dedekind proved an analogue of quadratic reciprocity law for  $A = F[T]$  where  $F$  is a finite field. Carlitz has given several different proofs for the general reciprocity law for  $A$ .

For given  $m$ , suppose we have to find all primes  $P$  such that  $m$  is a  $d$ -th power modulo  $P$ . It turns out that there are infinitely many primes, so that it is not possible to answer the question by making a list. One has to characterise the primes with these properties in some natural way. That is what the reciprocity law of  $A$  allows us to do.

As an analogue of legendre symbol,  $d$ -th power residue symbol is defined where  $d$  is a divisor of  $q-1$  and  $q$  is cardinality of  $F$ . In this exposition we will prove some properties of this  $d$ -th power residue symbol which are essential in the proof of reciprocity law for  $A$ .

**Main text:** We recall that  $q$  is the cardinality of  $F$  and characteristic of  $F$  is  $p$ . Let  $P \in A$  be an irreducible polynomial. Let  $a \in A, P \nmid a$  and  $d \mid q-1$ . Recall that  $|P| = |A/PA| = q^{\deg(P)}$ . Now

$$|P|-1 = q^{\deg(P)} - 1 = (q-1)(q^{\deg(P)-1} + \dots + 1). \text{ Hence } d \parallel |P|-1 \text{ and}$$

$$\left( a \frac{|P|-1}{d} \right)^d = a^{|P|-1} \equiv 1 \pmod{P}, \text{ The element } \left( a \frac{|P|-1}{d} \right) + PA \text{ is of order dividing } d \text{ in}$$

$(A/PA)^*$ . We recall that in a cyclic group  $G$  of order  $n$ , for every divisor  $d$  of  $n$  there exists a unique subgroup of order  $d$ . Of course converse is also true i.e. if for every divisor  $d$  of order  $n$  of a group  $G$ , there exists a unique subgroup of order  $d$  then  $G$  is cyclic.

Consider the natural map  $\eta: F^* \rightarrow (A/PA)^*$ . This map is 1-1.  $F^*$  is a cyclic group of order  $q-1$  and also  $(A/PA)^*$  is a cyclic group of order  $|P|-1$ . Hence for any divisor  $d \mid q-1$ ,  $F^*$  has a unique subgroup of that order. Also for any divisor of  $|P|-1$ ,  $(A/PA)^*$  has a unique subgroup of that order. Now  $d$  divides  $q-1$  and  $|P|-1$ . The element  $\left( a \frac{|P|-1}{d} \right) + PA$  is of order dividing  $d$  in

$(A/PA)^*$  implies that there exists a unique  $\alpha \in F^*$  such that  $\eta(\alpha) = \left( a \frac{|P|-1}{d} \right) + PA$ . That is,

$$a \frac{|P|-1}{d} \equiv \alpha \pmod{P}.$$

Using this we define  $d$ -th residue symbol as follows,

**Definition : [d-th residue symbol]** Let  $P$  be an irreducible polynomial in  $A$  and  $a \in A$ . Suppose  $d \mid q-1$ . If  $P \nmid a$ , we denote by  $\left( \frac{a}{P} \right)_d$  the unique element of  $F^*$  such that

$a^{\frac{|P|-1}{d}} \equiv \left(\frac{a}{P}\right)_d \pmod{P}$ . If  $P|a$ , we put  $a^{\frac{|P|-1}{d}} = 0$ . The symbol  $\left(\frac{a}{P}\right)_d$  is called d-th residue symbol.

2.2.2 **Note:**  $\left(\frac{a}{P}\right)_d = 1$  if and only if  $x^d \equiv a \pmod{P}$  is solvable. (Refer [3]).

2.2.3 **Proposition :** Suppose  $a \equiv b \pmod{P}$ . Then  $\left(\frac{a}{P}\right)_d = \left(\frac{b}{P}\right)_d$ .

**Proof :** If  $a \equiv b \pmod{P}$ , then  $a^{\frac{|P|-1}{d}} \equiv b^{\frac{|P|-1}{d}} \pmod{P}$ . But  $\left(\frac{b}{P}\right)_d$  is the unique element of  $F^*$  such that  $b^{\frac{|P|-1}{d}} \equiv \left(\frac{b}{P}\right)_d \pmod{P}$ . So  $a^{\frac{|P|-1}{d}} \equiv \left(\frac{b}{P}\right)_d \pmod{P}$ . But  $\left(\frac{a}{P}\right)_d$  is the unique element of  $F^*$  such that  $a^{\frac{|P|-1}{d}} \equiv \left(\frac{a}{P}\right)_d \pmod{P}$ . Hence  $\left(\frac{a}{P}\right)_d = \left(\frac{b}{P}\right)_d$ .

2.2.4 **Proposition :**  $\left(\frac{ab}{P}\right)_d = \left(\frac{a}{P}\right)_d \left(\frac{b}{P}\right)_d$ .

**Proof :** By definition  $a^{\frac{|P|-1}{d}} \equiv \left(\frac{a}{P}\right)_d \pmod{P}$  and  $b^{\frac{|P|-1}{d}} \equiv \left(\frac{b}{P}\right)_d \pmod{P}$ . Hence  $(ab)^{\frac{|P|-1}{d}} \equiv \left(\frac{a}{P}\right)_d \left(\frac{b}{P}\right)_d \pmod{P}$ . But  $\left(\frac{ab}{P}\right)_d$  is the unique element of  $F^*$  such that  $(ab)^{\frac{|P|-1}{d}} \equiv \left(\frac{ab}{P}\right)_d \pmod{P}$ . Therefore  $\left(\frac{ab}{P}\right)_d \equiv \left(\frac{a}{P}\right)_d \left(\frac{b}{P}\right)_d$ .

2.2.5 **Proposition :** Let  $\tau \in F^*$  be an element of order dividing d. Then  $\exists a \in A$  such that  $\left(\frac{a}{P}\right)_d = \tau$ .

**Proof :** Consider the homomorphism  $\eta : (A/PA)^* \rightarrow F^*$  given by  $\eta(a+PA) = \alpha$  where  $\alpha = \left(\frac{a}{P}\right)_d$ . This is uniquely defined by Proposition 2.2.3. By Note 2.2.2,  $\ker \eta$  is the set of all d<sup>th</sup> powers in  $(A/PA)^*$ .  $(A/PA)^*$  is a cyclic group of order  $|P|-1$  and order of  $\ker \eta$  is  $\frac{|P|-1}{d}$  (for reference see [3]). So,  $\text{Im } \eta$  has order d. Since  $F^*$  is cyclic,  $\text{Im } \eta$  is also cyclic of order d. Thus all elements of order dividing d belong to  $\text{Im } \eta$ . Therefore by definition of  $\eta$ ,  $\exists a \in A$  such that  $\left(\frac{a}{P}\right)_d = \tau$ .

2.2.6 **Proposition :** Let  $\alpha \in F$ . Then  $\left(\frac{\alpha}{P}\right)_d = \alpha^{\frac{(q-1)\text{deg}(P)}{d}}$

Proof : Let  $\delta = \deg(P)$ . Then  $\frac{|P|-1}{d} = \frac{q^\delta - 1}{d} = (1 + q + \dots + q^{\delta-1}) \left( \frac{q-1}{d} \right)$

Now by definition  $\alpha^{\frac{|P|-1}{d}} \equiv \left( \frac{\alpha}{P} \right)_d \pmod{P}$ . For all  $\alpha \in F$  we have  $\alpha^q = \alpha$ . Hence

$$\alpha^{\frac{|P|-1}{d}} \equiv (\alpha^\delta)^{\frac{q-1}{d}} = \alpha^{\frac{(q-1)\deg(P)}{d}}. \quad \text{Thus, } \left( \frac{\alpha}{P} \right)_d = \alpha^{\frac{(q-1)\deg(P)}{d}}.$$

2.2.7 Note : Assume  $d$  also divides  $\deg(P)$  and  $\alpha \in F^*$ , then by Proposition 2.2.6,

$$\left( \frac{\alpha}{P} \right)_d = \alpha^{\frac{(q-1)\deg(P)}{d}} = \alpha^{(q-1)m}, \text{ Where } \deg(P) = md. \text{ Since } \alpha \in F^*, \alpha^{(q-1)} = 1. \text{ Hence}$$

$\left( \frac{\alpha}{P} \right)_d = 1$ . Thus if  $d \mid \deg(P)$ , then by Note 2.2.2 automatically every constant is a  $d$ -th power residue modulo  $P$ .

**Extension of  $d$ -th reciprocity Symbol :** The definition of  $d$ -th reciprocity symbol is extended to the case where the prime  $P$  is replaced by a nonzero element  $b \in A$ .

**2.2.9 Definition [Extension of  $d$ -th reciprocity Symbol]** Let  $b \in A, b \neq 0$ . Suppose

$b = \beta Q_1^{f_1} Q_2^{f_2} \dots Q_s^{f_s}$  is the prime decomposition of  $b$ . If  $a \in A$ , we define  $\left( \frac{a}{b} \right)_d = \prod_{j=1}^s \left( \frac{a}{Q_j} \right)_d^{f_j}$

We give below some basic properties of  $\left( \frac{a}{b} \right)_d$  which are derived from those of the  $d$ -

$th$  power residue symbol. In the following we assume  $a_1, a_2, a \in A$  and  $b_1, b_2, b \in A$  are nonzero elements. We suppose  $b = \beta Q_1^{f_1} Q_2^{f_2} \dots Q_s^{f_s}$  is the prime decomposition of  $b$ .

2.2.10 Proposition : If  $a_1 \equiv a_2 \pmod{b}$ , then  $\left( \frac{a_1}{b} \right)_d = \left( \frac{a_2}{b} \right)_d$ .

Proof :  $a_1 \equiv a_2 \pmod{b}$  implies  $a_1 \equiv a_2 \pmod{Q_j}, \forall j$ . So by Proposition 2.2.3 we get,

$$\left( \frac{a_1}{Q_j} \right)_d = \left( \frac{a_2}{Q_j} \right)_d. \text{ Therefore } \left( \frac{a_1}{b} \right)_d = \prod_{j=1}^s \left( \frac{a_1}{Q_j} \right)_d^{f_j} = \prod_{j=1}^s \left( \frac{a_2}{Q_j} \right)_d^{f_j} = \left( \frac{a_2}{b} \right)_d.$$

2.2.11 Proposition :  $\left( \frac{a_1 a_2}{b} \right)_d = \left( \frac{a_1}{b} \right)_d \left( \frac{a_2}{b} \right)_d$

Proof : Now  $\left( \frac{a_1 a_2}{b} \right)_d = \prod_{j=1}^s \left( \frac{a_1 a_2}{Q_j} \right)_d^{f_j} = \prod_{j=1}^s \left( \frac{a_1}{Q_j} \right)_d^{f_j} \prod_{j=1}^s \left( \frac{a_2}{Q_j} \right)_d^{f_j}$

, by Proposition 2.2.4. So 
$$\left(\frac{a_1 a_2}{b}\right)_d = \left(\frac{a_1}{b}\right)_d \left(\frac{a_2}{b}\right)_d$$

2.2.12 Proposition : 
$$\left(\frac{a}{b_1 b_2}\right)_d = \left(\frac{a}{b_1}\right)_d \left(\frac{a}{b_2}\right)_d .$$

Proof : We can assume  $b_1 = \beta_1 Q_1^{f_1} \dots Q_s^{f_s}$  and  $b_2 = \beta_2 Q_1^{g_1} \dots Q_s^{g_s}$ , where the  $Q_i$ 's are monic irreducible polynomials in  $A$ ,  $f_i \geq 0$  and  $g_i \geq 0$  for  $1 \leq i \leq s$ . Hence  $b_1 b_2 = \beta_1 \beta_2 \prod_{j=1}^s Q_j^{f_j + g_j}$ .

Proof : 
$$\left(\frac{a}{b_1 b_2}\right)_d = \prod_{j=1}^s \left(\frac{a}{Q_j}\right)_d^{f_j + g_j} = \prod_{j=1}^s \left(\frac{a}{Q_j}\right)_d^{f_j} \prod_{j=1}^s \left(\frac{a}{Q_j}\right)_d^{g_j} = \left(\frac{a}{b_1}\right)_d \left(\frac{a}{b_2}\right)_d$$

2.2.13 Proposition :  $\left(\frac{a}{b}\right)_d \neq 0$  if and only if  $(a, b) = 1$ .

Proof: let  $(a, b) = 1$ . This implies  $(a, Q_j) = 1$  for every  $j$ . i.e.  $Q_j$  does not divide  $a$ . By definition  $\left(\frac{a}{Q_j}\right)_d, \left(\frac{a}{Q_j}\right)_d \neq 0$  for every  $j$ . So by Proposition 2.2.12,  $\left(\frac{a}{b}\right)_d \neq 0$ .

Conversely,  $\left(\frac{a}{b}\right)_d \neq 0$  implies 
$$\left(\frac{a}{b}\right)_d = \prod_{j=1}^s \left(\frac{a}{Q_j}\right)_d^{f_j} \neq 0$$

which in turn implies  $\left(\frac{a}{Q_j}\right)_d \neq 0, \forall j = 1, 2, \dots, s$ . So  $Q_j$  does not divide  $a$ . Hence  $(a, Q_j) = 1$ .

So we get  $(a, b) = 1$ .

2.2.14 Proposition : If  $x^d \equiv a \pmod{b}$  is solvable in  $A$ , then  $\left(\frac{a}{b}\right)_d = 1$ .

Proof : Suppose  $c^d \equiv a \pmod{b}$  where  $c \in A$ . Let  $b = \beta Q_1^{f_1} Q_2^{f_2} \dots Q_s^{f_s}$  be prime decomposition of  $b$  in  $A$ . we have  $c^d \equiv a \pmod{b}$  if and only if  $c^d \equiv a \pmod{Q_j}, \forall j = 1, \dots, t$

We note that  $(a, b) = 1$  implies  $(a, Q_j) = 1 \forall j$ . By Proposition 2.2.2,  $\left(\frac{a}{Q_j}\right)_d = 1$  for every  $j$ .

By definition,  $\left(\frac{a}{b}\right)_d = \prod_{j=1}^t \left(\frac{a}{Q_j}\right)_d^{f_j}$ . Hence  $\left(\frac{a}{b}\right)_d = 1$ .

2.2.15 Note : In general,  $(a, b) = 1$  and  $\left(\frac{a}{b}\right)_d = 1$  need not imply  $x^d \equiv a \pmod{b}$  is solvable. Hence Proposition 2.2.2 does not hold for generalized symbol.

**Finding:** As an application of these properties d-th power reciprocity law for  $A$  is proved

which states that: If P and Q be monic irreducible polynomials of degree  $\delta$  and  $\nu$  respectively, then

$$\left(\frac{Q}{P}\right)_d = (-1)^{\frac{(q-1)\delta\nu}{d}} \left(\frac{P}{Q}\right)_d.$$

Further using this

the general reciprocity law for A is proved which states that

$$\text{If } a, b \in A, \text{ Then } \left(\frac{a}{b}\right)_d \left(\frac{b}{a}\right)_d^{-1} = (-1)^{\frac{(q-1)\deg(a)\deg(b)}{d}} \text{sgn}_d(a)^{\deg(b)} \text{sgn}_d(b)^{-\deg(a)}$$

where for

$f \in A, f \neq 0$ ,  $\text{sgn}_d(f)$  is defined to be the leading coefficient of  $f$  raised to  $\frac{q-1}{d}$  power and  $a, b$  are relatively prime, non zero elements.

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## Comparative Effect of Creatine Supplementation Blood Lactate and Intermittent Running Performance on Vegetarian and Non-Vegetarian Active Males

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### ABSTRACT

The purpose of the study was to compare the changes in blood lactate, blood creatinine, and intermittent running performance between vegetarians and non-vegetarians with short-term creatine supplementation. This study carried out among 60 male physical education students of University of Pune. Thirty vegetarian and thirty non-vegetarian subjects (20-30 years) were randomly assigned to four groups: vegetarian creatine (VGCr,  $N = 15$ ), vegetarian placebo (VGPI,  $N = 15$ ), non-vegetarian creatine (NVCr,  $N = 15$ ), and non-vegetarian placebo (NVPI,  $N = 15$ ). To control experimenter expectations, a double blind study is used. Creatine and placebo dosage were 20 grams per day for six days for short-term supplementation. In this study glucose was used as a placebo. The ANCOVA were used for statistical treatment of the data. The result of this study revealed that there was significant improvement in the average time of four times 50m run with 30s rest interval after short-term creatine supplementation in vegetarian and non-vegetarian creatine groups comparing to their placebo groups ( $P < 0.05$ ). The average time of four times 50m run was found not to differ significantly in vegetarian creatine versus non-vegetarian creatine groups ( $P < 0.05$ ). Also the blood lactate level in vegetarian creatine and non-vegetarian creatine groups in comparison with their placebo was not significantly reduced after short-term creatine supplementation ( $P < 0.05$ ). Blood lactate level was found not to differ significantly in vegetarian creatine group in comparison with non-vegetarian creatine group ( $P < 0.05$ ). After short-term creatine supplementation, significant increase were found (at the normal range of 0.6 to 1.2 mg/dL) in blood creatinine level in vegetarian and non-vegetarian creatine groups comparing to their placebo groups ( $P < 0.05$ ). There was no significant difference between vegetarian experimental versus non-vegetarian experimental groups ( $P < 0.05$ ). It was concluded that creatine supplementation may prevent extra accumulation of blood lactate because the subjects could perform the speed test significantly faster than pre-test in vegetarian and non-vegetarian creatine groups in comparison with their placebo groups, but the rate of blood lactate was not significantly increased. And also, there was no significant difference between dietary habits.

**Key Words:** Short-Term Creatine Supplementation, Blood Lactate, Creatinine, Vegetarian, Non-Vegetarian

### INTRODUCTION

The metabolism of lactate is one of the dominant topics in research study today. At low intensities exercise, lactic acid is quickly and without difficulty removed from the blood via the liver, but at higher intensities exercise, lactic acid accumulates at high levels in the blood. The rate of lactic acid accumulation depends on the need placed on ATP to generate energy for muscular contraction during exercise, and the capability of creatine phosphate and aerobic system metabolism to meet that need. Lactic acid must be changed to lactate before it can go away from the muscles because the membranes of muscle fibers will not permit lactic acid to move through or be pumped from them. When lactic acid is changed to lactate, its  $H^+$  ion will be remained. The  $H^+$  ions are extremely acidic and it is  $H^+$  ions, and not lactic acid, that reduce muscle pH. The rate and amount of  $H^+$  accumulation depends upon the interaction between three elements. (a) the amount of lactic acid generation in the active muscles, (b) the amount of clearance of lactic acid from those same muscles as lactate and (c) the buffering capability of those muscles. Apparently, muscle pH will become acidic when the amount



of generation exceeds the clearance and buffering rates, a condition that takes place in all sport events except the extremely the shortest and the longest. The formation of metabolic acidosis during high intensity non-steady-state exercise has been revealed to occur when the rate of ATP hydrolysis exceeds the rate of ATP production by the mitochondria. Some studies suggested that fatigue causes from creatine phosphate depletion and, exactly, the accumulation of inorganic phosphate and ADP that happen when the muscle supply of creatine phosphate is decreased. The measures of blood lactate throughout and immediately following exercise are yet considered reasonable correlates of changes in Intracellular fluid pH for total-body exercise (Fitts, 1994; Robergs, 2001; Robergs, et al, 2004; Cairn, 2006;). On the other hand, Athletes have different eating habits, some of them are vegetarian and some of them are non-vegetarian. In vegetarians daily creatine consumption is almost zero, and endogenous synthesis from arginine, glycine and S-methylmethionine, is their only source of creatine. Following creatine supplementation the total creatine and phosphocreatine levels would be increased and therefore greater potential energy would be available; that is to state, more ATP concentration through anaerobic exercise of short-duration.

Most of the studies examined the effect of creatine supplementation irrespective of the dietary type. It is in this regard that such a study needs to be conducted highlighting the effect of creatine supplementation on blood lactate and intermittent running performance with different dietary types. In this study as the subjects of this study were human beings and considering ethical issues, the rate of creatinine and phosphocreatine were not measured directly. But blood creatinine is measured as an index, which shows the increase of muscle creatine levels.

#### Methodology

Sixty male subjects (30 vegetarians, 30 non-vegetarians) volunteered for the study and had a blood test. All of the subjects agreed to take part in creatine monohydrate supplementation and were randomly assigned (double blind method) to receive creatine or placebo. In this study creatine monohydrate supplementation which was produced by Venkey's India (LTD) was used. No subject had supplemented with creatine (and also other supplements) within the previous six months. Subjects were self-described as vegetarian or non-vegetarian. The study was an experimental study which was carried out by using the pre-test and post-tests. The post-test was performed after short-term creatine supplementation (20 grams per day for 6 days). Subjects were randomly assigned to four groups: vegetarian creatine (VGCr, N 15), vegetarian placebo (VGPI, N 15), non-vegetarian creatine (NVCr, N 15), and non-vegetarian placebo (NVPI, N 15). This study was approved by the University of Pune for physical education research involving human subjects, and written informed consent was obtained from each subject. Subject characteristics are presented in Table 1.

**TABLE 1 SUBJECT CHARACTERISTICS FOR THOSE VEGETARIAN AND NONVEGETARIAN WHO PARTICIPATED IN SIX DAYS OF CONSUMING SUPPLEMENTEITHER CREATINE OR PLACEBO**

Group	N	Age	Height(cm)	Weight (kg)
VGCr	15	24 ± 3.8	170.3 ± 3.4	63.2 ± 3.3
VGPI	15	24 ± 3.6	170.4 ± 3.8	63.8 ± 3.8
NVCr	15	24 ± 3.2	170.6 ± 3.6	64.1 ± 3.2
NVPI	15	24 ± 2.6	170.1 ± 3.9	64.5 ± 3.5

#### SUPPLEMENTATION PROTOCOL

The subjects began consuming supplement the day following the pre-test. For the short-term supplementation participants consumed four 5 gram packages in four meals over the course of six days. Directions were given to them about dissolving the contents of each package in 250cc lukewarm water and how to consume it along with breakfast, lunch, dinner and before going to bed. On the seventh day, the post-test is performed similarly to the pre-test.

During supplementation their normal diet is kept, however, they were requested not to

consume anything containing caffeine. To control this, forms were distributed among the subjects to guide them not to eat any kind of food containing caffeine which may have an effect on the results of the experiment. All rules, which were supposed to be followed during the study, were given in written form to the subjects. They were asked to study the form and to follow the instructions before proceeding with consumption of the creatine supplements.

**BLOOD TEST AND RUNNING EXERCISE PERFORMANCE TEST**

On the nights before all tests, the participants were on fast for 12 hours. On the day of the pre-test and post-test each participant was weighed and blood sample was also taken from each participant (at resting heart rate) to test creatinine levels. After these initial procedures, each participant did warm up (only stretches) for 5 minutes. They were then performed 4 times 50 meters dash runs with 30 seconds rest interval between each event. Immediately after the fourth 50 m running test, another blood test was performed to test levels of blood lactate. Enzymatic method is used for measuring the level of blood lactate and alkaline picrate method is used for measuring the level of blood creatinine on a Simens Dimension RXL Max machine in the Golwilkar Metropolice health service.

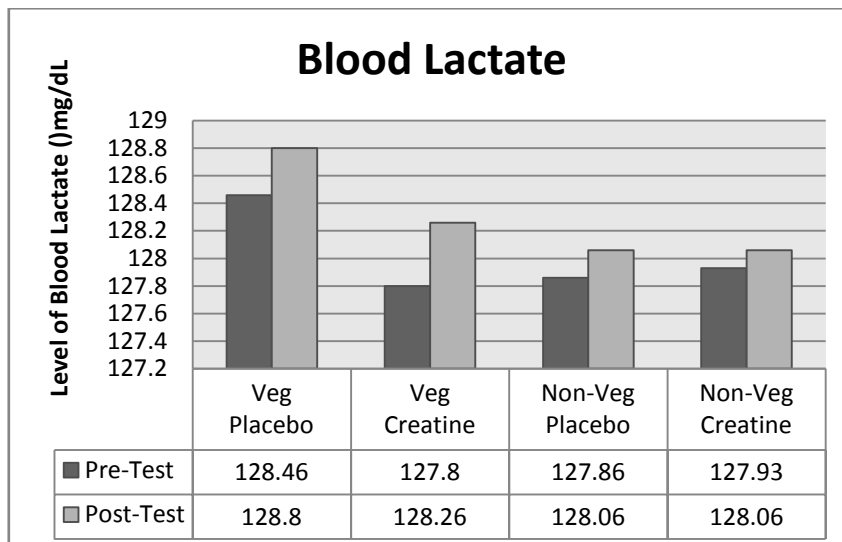
**STATISTICAL ANALYSIS**

Parametric statistical tools were employed for descriptive and inferential analysis. The effect of the different treatment procedure and comparison between them was determined by applying standard statistical procedures. Blood lactate, blood creatinine and intermittent running performance are analyzed by two-way analysis of covariance (ANCOVA) at the .05 probability level (P=.05) to find out the differences between groups (vegetarian vs. non-vegetarian).

**RESULTS**

The results revealed that the blood lactate Mean and SD at pre-test for vegetarian placebo, vegetarian creatine, non-vegetarian placebo and non-vegetarian creatine groups (before supplementation) was 128.46 (SD=21.41), 127.80 (SD=21.80), 127.86 (SD=23.62) and 127.93 (SD=23.25) respectively. Similarly, the post-test Mean of vegetarian placebo group was found to be 128.80 (SD=22.76), the post-test Mean of vegetarian creatine group was 128.26 (SD=21.54), the post-test Mean of non-vegetarian placebo group was 128.06 (SD=22.61) and the post-test of non-vegetarian creatine group was 128.06 (SD= 21.93). From the graphical representation values of Mean and SD for blood lactate at pre-test and post-test for all the four groups, It is clearly seen that after creatine supplementation the blood ammonia in both vegetarian and non-vegetarian creatine groups is not changed greatly as compared to placebo groups.

**Graphical Representation of Mean Blood Lactate (mg/dL) Immediately After Intermittent Running**



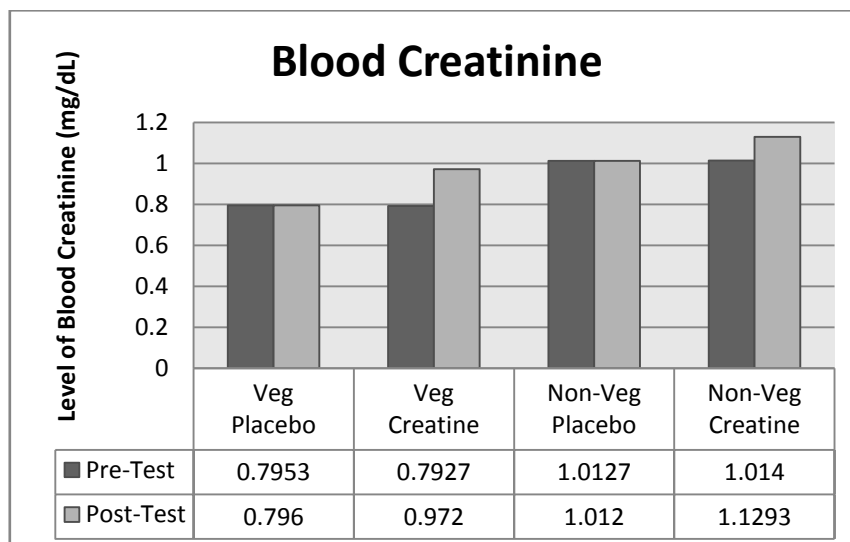
As it is shown in table 2, the serum lactate monitoring in this study revealed that there was no significant difference on serum lactate between vegetarian and non-vegetarian creatine groups after short-term creatine supplementation ( $p=1.000$ ). It means that immediately after performing four times 50m run dash there was no significant difference on blood lactate in vegetarian creatine versus non-vegetarian creatine group. Also, the rate of serum lactate was not found significantly reduced (immediately after performing four times 50m run dash with 30 second rest interval) in vegetarian and non-vegetarian creatine groups as comparing to placebo groups after short-term creatine supplementation ( $p=1.000$ ).

**TABLE 2 PAIR WISE COMPARISON OF ESTIMATED MARGINAL MEANS (BLOOD LACTATE IN POST-TEST) THROUGH ANCOVA**

(I) Group	(J) Group	a			95% Confidence Interval for Difference <sup>a</sup>	
		MD (I-J)	Std. Error	Sig. <sup>a</sup>	Lower Bound	Upper Bound
VGCr	VGPI	-.439	8.103	1.000	-22.618	21.740
NVCr	NVPI	.209	8.103	1.000	-21.968	22.387
NVCr	VCr	-.219	8.103	1.000	-22.396	21.958
Based on estimated marginal means						
*. The MD is significant at the .05 level.						
a. Adjustment for multiple comparisons: Bonferroni.						

The results revealed that the blood creatinine Mean and SD at pre-test for vegetarian placebo, vegetarian creatine, non-vegetarian placebo and non-vegetarian creatine groups was .7953 (SD=.071), .7927 (SD=.078), 1.01 (SD=.089) and 1.01 (SD=0.93) respectively. Similarly, the post-test Mean of vegetarian placebo group was found to be .7960 (SD=.077), the post-test Mean of vegetarian creatine group was .9720 (SD=.083), the post-test Mean of non-vegetarian placebo group was 1.01(SD=.084) and the post-test of non-vegetarian creatine group was 1.12(SD= .054). From the graphical representation values of Mean for blood creatinine at pre-test and post tests for all the four groups, it is clearly seen that after short-term creatine supplementation the blood creatinine in both vegetarian and non-vegetarian creatine groups is risen dramatically as compared to placebo groups.

**Graphical Representation of Mean for Blood Creatinine (mg/dL)**



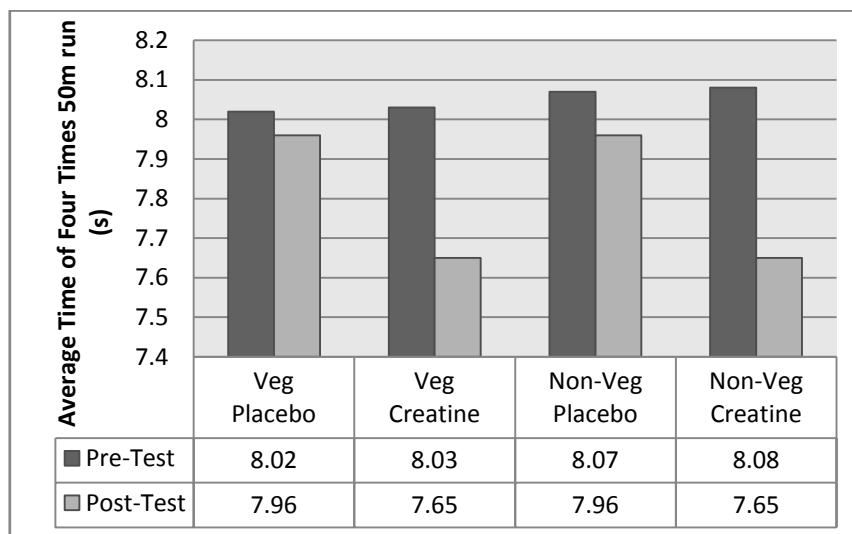
As it is demonstrated in table 3, the statistical analyzing creatinine data revealed that at the rest level after short-term creatine supplementation in vegetarian and non-vegetarian creatine group the level of serum creatinine is significantly increased at the normal range of 0.6 to 1.2 mg/dL in comparison with their placebo groups (p=.000). There was not a significant difference in serum creatinine level after short-term creatine supplementation on vegetarian creatine group as compared to non-vegetarian creatine group (p=1.000).

**TABLE 3 PAIR WISE COMPARISON OF ESTIMATED MARGINAL MEANS (BLOOD CREATININE IN POST-TEST) THROUGH ANCOVA**

(I) Group	(J) Group	a			95% Confidence Interval for Difference <sup>a</sup>	
		MD (I-J)	Std. Error	Sig. <sup>a</sup>	Lower Bound	Upper Bound
VGCr	VGPI	.178*	.015	.000	.136	.220
NVCr	NVPI	.116*	.015	.000	.074	.159
NVCr	VCr	-.010	.021	1.000	-.069	.048
Based on estimated marginal means						
*. The MD is significant at the .05 level.						
a. Adjustment for multiple comparisons: Bonferroni.						

The results revealed that the Average Time of Four Times 50m Run Mean and SD at pre-test for vegetarian placebo, vegetarian creatine, non-vegetarian placebo and non-vegetarian creatine groups (before supplementation) was 8.02 (SD=.59), 8.03 (SD=.55), 8.07 (SD=.50) and 8.08 (SD=.50) respectively. Similarly, the post-test Mean of vegetarian placebo group was found to be 7.96 (SD=.58), the post-test Mean of vegetarian creatine group was 7.65 (SD=.47), the post-test Mean of non-vegetarian placebo group was 7.96 (SD=.56) and the post-test of non-vegetarian creatine group was 7.65 (SD=.47). From the graphical representation values of Mean for the average time of four times 50m run at pre-test and post-tests for all the four groups, It is clearly seen that after creatine supplementation the average time of four times 50m run in both vegetarian and non-vegetarian creatine groups is decreased markedly as compared to placebo groups.

**Graphical Representation of Mean for the Average Time of Four Times 50m Run**



As it is shown in tabale 4, The average time of four times 50m run was found not to reduce

significantly after short-term creatine supplementation in vegetarian creatine versus non-vegetarian creatine groups ( $p=1.000$ ). But the average time of four times 50m run was found to reduce significantly after short-term creatine supplementation in vegetarian creatine ( $p=.032$ ) and non-vegetarian creatine ( $p=.046$ ) after creatine supplementation as comparing to their placebo groups. These results demonstrate that creatine supplementation was effective for improving intermittent running performance in vegetarian and non-vegetarian creatine groups but there was not seen a significant difference concerning creatine supplementation related to the type of diet habit (vegetarian vs non-vegetarian) on the average of intermittent running timing.

**TABLE 4 PAIR WISE COMPARISON OF ESTIMATED MARGINAL MEANS (AVERAGE TIME OF FOUR TIMES 50M RUN IN POST-TEST) THROUGH ANCOVA**

(I) Group	(J) Group	a			95% Confidence Interval for Difference <sup>a</sup>	
		MD (I-J)	Std. Error	Sig. <sup>a</sup>	Lower Bound	Upper Bound
VGCr	VGPI	-.324*	.112	.032	-.629	-.019
NVCr	NVPI	-.309*	.112	.046	-.614	-.004
NVCr	VCr	-.027	.112	1.000	-.333	.278
Based on estimated marginal means						
*. The MD is significant at the .05 level.						
a. Adjustment for multiple comparisons: Bonferroni.						

#### DISSCUTION

The findings of this study revealed that after short-term creatine supplementation and performing intermittent running, the rate of serum lactate accumulation was not significantly changed in vegetarian and non-vegetarian creatine groups comparing to their placebo groups and also there was no significant difference between vegetarian and non-vegetarian creatine groups after supplementation ( $P<0.05$ ). The average time of performing four times 50m dash run after short-term creatine supplementation in vegetarian and non-vegetarian creatine groups comparing to vegetarian and non-vegetarian placebo groups was significantly reduced and also the timing of performing four times 50m run was not significantly changed in vegetarian and non-vegetarian placebo (control) groups ( $P<0.05$ ). It means that the average time of performing four times 50m run was significantly reduced in vegetarian and non-vegetarian creatine groups but the rate of their serum lactate were not changed as compared to their performance. The results of this study exposed that creatine supplementation may prevent extra accumulation of blood lactate because the subjects could perform the speed test significantly faster than pre-test in vegetarian and non-vegetarian creatine groups in comparison with their placebo groups, but the rate of blood lactate was not significantly increased. These results of effect of short-term creatine supplementation on vegetarian and non-vegetarian active males demonstrate that creatine supplementation was effective for improving intermittent running performance in vegetarian and non-vegetarian creatine groups but there was not seen a significant difference concerning creatine supplementation related to the type of diet habit (vegetarian vs non-vegetarian) on intermittent running performance.

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## **Demanding Innovations In Teacher Education - What We Know And Need To Know**

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### **Abstract**

Innovations are the significant pathways of growth and development. Teacher education in India also has witnessed significant innovations in the last few decades in the form of numerous innovative schemes, programmes, approaches and practices. Yet, the scenario of teacher education still possess immense scope for innovations. Current teacher education in India is well inspired from significant educational experiments, well aware of the educational expectations and significantly influenced by the technological advancements. Yet, there exists many ideological, personal, institutional, social and political lacunae in its path towards innovation.

In the present article, the author has made attempts to address the various hidden issues behind the slow pace of innovations in the current teacher education of the country.

### **Introduction- Concept of innovation in teacher education**

Education is the basis for creating a future generation of ignited resources. Teacher education is all about developing the prospective teachers into reform -oriented, humane professionals. The concept of innovation in teacher education is not new. From the time of its emergence as a distinct activity, teacher education has been continuously evolving and transforming. These transformations and evolutions are the constituent units of innovative thinking. It has been a ruling tradition in the teacher education scenario since time immemorial to call, discuss, debate, incubate, experiment, criticize and ultimately formulate and accept a “change” endorsed by the majority. This 'majority' class is often a few committees or commissions. There has not been a complete consensus on the content of the concept of innovation in teacher education. Hence, there is an urgent need to reflect upon our knowledge base on the concept, process and themes of innovation in teacher education.

Teacher educators lay predominant emphasis on preparation of future teachers who are pedagogically competent and responsive to the social, economic and political changes of the prevailing context. These goals and visions of teacher educators are themselves transitory in nature. Hence, designing a vision for innovation is in itself a challenging task. Design is a key element in the innovation process and crucial for promoting innovation in the present knowledge economy. Design thinking envisages processes like repeatedly re framing the problems, engaging with stakeholders, testing solutions, exploring alternatives, visioning scenarios and so on to arrive at a need- based solution. Design thinking inculcates a vision that is merged with the contemporary realities rather than building a vision that is mere restructuring of the present realities. Innovation in teacher education is unavoidably a social and political enterprise as they influence and are influenced by the social, cultural, economic and political milieu of the society in which they exist.

In the present paper, the author has made an attempt to instill a reflection on the concept of innovating teacher education in India, a few prominent questions that drive innovation and the need for understanding the real problem in creating an innovated teacher education.

### **Questions that drive innovation?**

Teacher education is a vast discipline that envisages indefinite elements of the process, products and skills/ competencies related to teaching. Curriculum, syllabus, pedagogy, instructional strategies, learning strategies, instructional approaches, evaluation, thinking models, quality education etc are the popular terminologies of any teacher education programme. Hence innovations have been directed towards bringing reforms in these areas. Yet, thinking on innovations instills a few

fundamental questions that has an immense potential to build a precise framework for innovation in the present teacher education scenario. The questions are:

- 14.1 Do we teacher educators possess adequate and authentic knowledge of the status, strengths, limitations and prospects of the teacher education scenario in India?
- 14.2 Who should innovate?- Teachers, policy makers, administration or government?
- 14.3 Are our present educational frameworks, policies and strategies outdated?
- 14.4 What are the essential elements of a innovative teacher education?
- 14.5 Don't we have the necessary research evidences that have the potential to direct innovations?
- 14.6 Have we already explored and utilized the present resources of innovation?
- 14.7 Do we have the ability to design a comprehensive and feasible blue print of the innovation-design for our present teacher education context?
- 14.8 How motivated and efficacious we are to engage in creative academic discussions and most important, arrive at strategies to implement the actions taken?

#### **Innovative approaches and programmes in Indian teacher education scenario**

Teacher education in India has achieved significant milestones and progressed in midst of deteriorating social and political challenges. Teacher education since its origin has strengthened significantly extending its vistas and imbibed new reformations. These innovative programmes and approaches are the results of a collective efficacy and dedication along with intelligent and creative personal and institutional outputs. Discussed below are the major innovative approaches and programmes ( Goel, D.R& Goel,C; 2010) designed, institutionalized and infused by the teacher education at various institutional level in India.

#### ***Innovative Approaches***

Integration of Micro-Teaching Skills.  
 Integration of Life-Skills.  
 Integration of Techno-Pedagogic Skills.  
 Problem Solving Through Participatory Approach.  
 Personalized Teacher Education.  
 Integrated Teacher Education.  
 Specialized Teacher Education.  
 ICT Mediated Education.  
 Bridging the gaps between Teaching Styles & Learning Styles.  
 Developing Integrated Thinking Styles.  
 Training Thinking.  
 Choice Based Credit System.  
 Electronic Distribution of Examination Papers (EDEP).  
 Double Valuation.  
 Total internal Continuous Comprehensive Evaluation.  
 Constructivist Approach.  
 Research through novel approaches.  
 Holistic Approach.

#### ***Innovative programmes***

M Tech Engineering Education by NITTTR, Chandigarh.  
 M Tech HRD by NITTTR, Chennai.  
 B.C Ed.(1989) And M.C.Ed (1991) by DAVV, Indore.  
 Master of Educational Technology (Computer Applications) by SNDT, University, Mumbai.  
 M. Tech. (Educational Technology) by Kurekshetra University, Kurekshetra.  
 B.Sc. in Teaching Technology by Sikkim Manipal University.  
 HSTP, Training Teachers, Eklavya, MP(1982).  
 Activity Based Teacher Education Program, DAVV, Indore(1991).

Personalized Teacher Education Program, Lucknow University, Lucknow (1996).  
 Comprehensive Teacher Education Program, Gandhi Shikshan Bhavan College of Education, Mumbai University, Mumbai (2000).  
 Four Year Integrated Program of Teacher Education, Kurekshetra University, Kurekshetra (1955).  
 Four Year Integrated Program of Teacher Education, RIE, NCERT (1963).  
 B. Ed. (Educational Technology), AEC Teacher Training College, Pachmadi, MP.  
 Early Faculty Induction Programme (EFIP) under QIP by AICTE, New Delhi.  
 Induction Training Programme (ITP) under QIP by AICTE, New Delhi.  
 IGNOU Institute of Professional Competency Advancement of Teachers (IIPCAT, 2009), IGNOU, India.

### **Where is the problem?**

Glorious achievements have been made in innovating and uplifting the status of teacher education in our country. Teacher educators are convinced of the need for innovative practices and policies in teacher education. Affirmative actions also have been taken. Then, why these voices for innovations are being raised by teachers and teacher educators alike? Where is the gamut of the real problem? The section below discusses a few probable concerns of the teacher education in the country that needs to be effectively alleviated in order to enhance the productivity of the ongoing innovations and the implementation of the future reforms.

2. Valuable experiences, comprehensive understanding of the expectations from education and prospects of further growth are evident before us. But, the gap between these expectations and the probability of their accomplishments are enhanced by the poor management of limited resources, reduced level of commitment and poor collective efficacy and motivation of institutions. Hence, the success of any innovation depends upon its feasibility value in actual practice.
3. Mere appreciation and demand for creating a relevant knowledge society is not adequate. Individual commitment towards achieving these broader aims is significantly negligible.
4. Exceptionally low tolerance for failures and genuine mistakes made during innovative experiments.
5. Pace of modernization in teacher education is comparatively slower than other disciplines.
6. Regional and national priorities are the bases for innovation, yet there are comparatively no matching research trends to address these problems.
7. Empirical evidences demonstrating the positive influences and efficacy of the present research policies governing teacher education are comparatively less.
8. No complete consensus over the specific concerns and questions that needs to be reformed.
9. Educational priorities have become stagnant. The questions at a particular period are not resolved during that time. Instead these priorities are periodically revisited, reformulated, rethreaded into current intersections of research, practice and policy. Contextual Transfer of priorities results in solutions of reduced implementation value.
10. No consensus on how the research outcomes needs to be operationally defined, measured and utilized in policy and practice decisions.
11. The collective vision of teacher educators on the meaning, significance and purpose of teacher education varies significantly.

### **Emerging Themes**

Calling for innovations in teacher education, there emerges a need to introspect the current practices and policies. The discussion has highlighted the following themes in innovation that warrants creative attention so as to enhance the effectiveness of all the innovative approaches, actions and programmes in the realm of teacher education.

2. Continuous and comprehensive innovation



3. Holistic innovation
4. Relevant innovation
5. Need-based innovation
6. Research -based innovation
7. Feasible innovation
8. Sustainable innovation
9. Upgrading information infrastructure
10. Learning to innovate

### **Conclusion**

Teacher education in India has vitalized significantly during the past few decades. There are still immense resources and potentials for enhancing its vitality through innovations directed towards excellence. Creating the essential pathways for these innovations is the crucial responsibility of the teacher educators and all the stakeholders of education. Major pathways of innovative approaches broadly include creating the most conducive environment for the germination of innovative thoughts accompanied by social, political and institutional support for the transformation of these innovative thoughts into innovative practices. Due appreciation and encouragement needs to be provided to the innovator and most crucial is the development of unconditional institutional tolerance for failures and mistakes during innovative experiments.

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## **Development of Short-Catching Skill Test for Under 19 Cricket Players of Pune District**

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### **ABSTRACT**

The purpose of the study was to develop short-catching skill test for under-19 cricket players of Pune district. This is a descriptive survey study. The study was conducted on 120 players of 12 different clubs, academies and gymkhana. To determine the reliability Test-Retest Method was employed. Validity was established through face validity. To decide the objectivity of all constructed skill tests, researcher took the help of experts from cricket field. The main instrument used to conduct all these items was Bowling Machine. For the analysis of data descriptive statistics, Pearson's product moment correlation method and Percentile was used. After analysis of data it is seen that Short-catching skill test is Valid, Reliable and Objective and the norms of the test are gradable and can be useful to distinguish cricket players having a good level of skill performance.

### **Introduction**

Physical education had lost its relevance in the last few decades due to various reasons. But now the scenario is changing, due to the scholarly efforts of many Physical Educations professionals, physical education has obtained a status now. The education boards have made it mandatory for the physical education teachers to conduct the physical education programmed by keeping theory as well as practical exams. An allotment of 50 marks to Physical education subject has brought great relevance to physical education as a subject. The school authorities and physical education teacher, who were taking Physical Education for granted, have understood the importance and need of physical education due to the change in the syllabus and curriculum of physical education. Various new activities are being included in physical education.

In cricket there are four skills i.e. batting, bowling, fielding, and wicket keeping. To be a cricketer of elite level one need to be a very skillful and professional in Batting, Bowling or Wicket keeping but besides being a professional in either of these skills he needs to be a very good fielder which gives him the advantage to cement his place in the team. In fielding, ground fielding as well as catching plays an important role. Besides bowler a fielder also can be the reason to make batsman out. A good fielder can make batsman run out of his crease or take a brilliant catch and turn the match around in his team's favor. A sometimes fielder stops so many runs that boost the confidence of the bowler and frustrates the batsman. Every fielder has its own characteristics. Some fielders may have good reflexes and agility where as some may have good strength and speed. The captain should recognize the potentials of the fielders and should allot the places accordingly. The fielders may be categorized as close in fielders and deep fielders. It is very difficult to recognize who can be the close in fielders or deep fielders so the researcher intends to develop a test for catching. They can place good fielders on those places where batsman is hitting more shots. There are more chances that they will take the catch easily. Apart from taking catches a good fielder can also save lots of runs or look for a run out. It becomes handy in crunch situations. By saving runs, you can create a pressure and force the batsman to hit more shots in the air. They can make mistakes and lose their concentration. At that time, you have more scope to take the wicket and win the match. It has, therefore, been considered appropriate by the present investigator to construct the "Cricket skill test" for U-19 district level players. The main objective of this research was to develop short-catching skill test for under-19 cricket players of Pune district.

## MATERIAL AND METHOD

For this study the researcher tried to develop short catching skill test and also to prepare the Norms of catching skill test for under-19 cricket players of Pune district. Hence he used *descriptive survey study* for solving his problem. The study was conducted on different clubs, academy and gymkhana those who had qualified teams participating in the Invitation Tournament conducted by MCA (Maharashtra Cricket Association) in the year 2013 season (N=120). The main instrument used to conduct test items was Bowling Machine (Liverage). Test re-tests reliability and total item coefficients were determined by employing Pearson's product moment correlation method. Normality of the scores of each event was tested on basis of the characteristics (skewness, kurtosis, and their critical raiton and standards error, percentage of distribution of scores) of normal probability curve. Percentile norms of test were calculated by using standard formula. Statistical Package for social Sciences (SPSS) MS windows Release 11.5 was used for statistical analysis. Detail of the skill test is given following

### Short-Catching Skill Test

#### Purpose:

To test the Hand Eye Coordination and Reaction Time of the player.

#### Equipment:

Bowling machine, marking cones, measurement tape, score sheet, balls.

#### Play field area

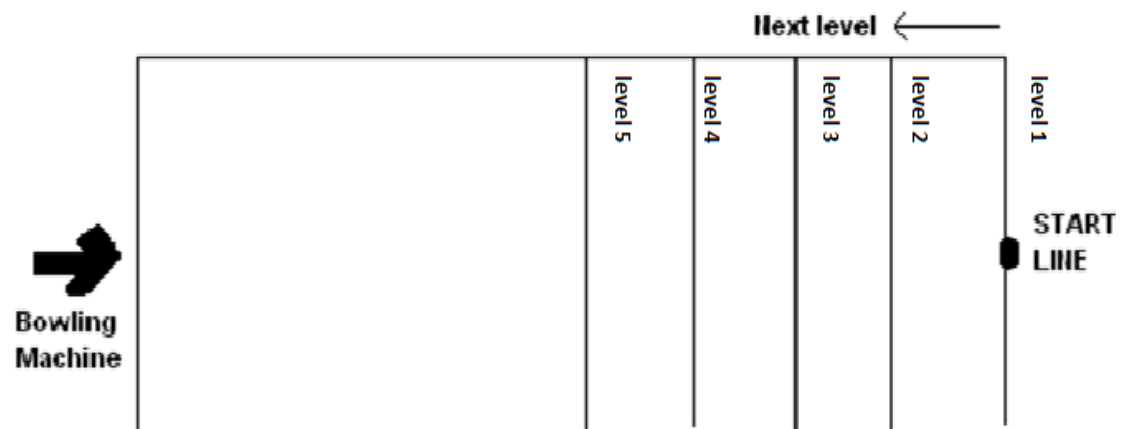


Fig 3.1 Short-Catching test

#### Description or test and procedure

1. The subject should stand at the start line which is level one.
2. Once the player is ready three catches will be sent one by one from the bowling machine.
3. After the three catches player will come forward to the second level to take another three sets of catches.
4. And likewise the player will come forward to the third, fourth and fifth level to take the remaining set of catches in each level.
5. Player will have to take three catches in each level, fifteen in total.

#### Rules

- All the catching must be taken clean.
- Catches must be taken from behind the line of the level.

#### Scoring:

Points system will be at 1<sup>st</sup> level subject will get 1 points for each catch, in 2<sup>nd</sup> level 2 points for each catch, in 3<sup>rd</sup> level 3 points for each catch, in 4<sup>th</sup> level 4 points for each catch, and in 5<sup>th</sup> level

5 points for each catch there will be total 4m5 points. Number of catches taken with respect to the point allotted will be the score.

### RESULTS AND DISCUSSION

The Short-catching skill test was conducted on 120 subjects. The scoring of the skill test is presented in the table 4.1. The data was initially analysed for descriptive statistics. Mean, median, standard error of mean, Standard Deviation, was calculated to find out the normality of the data.

**Table 4.1**

**Descriptive statistics for testing Reliability and Objectivity of Short-catching skill test (N=20)**

	Mean	Median	Mode	Std. Deviation	Minimum	Maximum
<b>Test</b>	36	36.5	36	5.265578	23	45
<b>Re-Test</b>	37	37	34	4.243881	25	44
<b>Tester 1</b>	36	36.5	36	5.265578	23	45
<b>Tester 2</b>	36	36.5	36	5.265578	23	45

**Table 4.2**

**Reliability, Objectivity coefficients of Short-catching Skill Test**

	Pearson Correlation
Reliability (N=20)	0.921(**)
Objectivity(N=20)	1.000(**)
Validity	Face Validity

(\*\*)Significant level 0.01

**Table 4.3**

**Percentile Norms of Short-Catching skill Test**

Percentiles	Score in Numbers
<b>100</b>	45
<b>90</b>	43
<b>80</b>	41
<b>70</b>	40
<b>60</b>	39
<b>50</b>	38
<b>40</b>	37
<b>30</b>	36
<b>20</b>	34
<b>10</b>	32

The reliability of the test items has been computed by calculating coefficient of correlation with test retest method. The objectivity of the constructed skill test is resolute by finding out the correlation between the scores of two observers who have evaluated the players at the same time. From the above table 4.2 it is seen that the correlation coefficient for Reliability between the score test & retest is 0.921, which is high correlation and significant at 0.01 level of significance. The correlation coefficient for Objectivity between the test scores of two observes is 1.000, which is very high

correlation or very dependable correlation and significant at 0.01 level of significance. And the Validity was Face Validity which was good as per the experts.

### **Discussion**

The test is good when its validity, reliability and objectivity are significant. The results of standard test will also be good. Various researchers had constructed and developed various skill and fitness test for the improvement of sports. Like this Kangane,S.E (2000) developed and standardized test battery for junior hand ball players of Maharashtra. Kashid,A.P.(2010) studied the construction of the jump and service test in volleyball for boys under-21 and test has good validity, reliability and objectivity. Nirmala (1985) constructed an objective skill test in hockey for higher secondary school girls and the reliability was 0.68, 0.95 and 0.86 for three test items namely “Shooting accuracy, hitting and stopping accuracy” respectively. The validity was obtained by comparing the test result with the expert’s opinion while playing situation and was found 0.92 of all three test items. Like this with the help of this test the coaches and the captain can select good players to improve the standard of the game.

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## **Differentials on Surface of Volleyball Practice Such as Indoor and Outdoor on Selected Psychological Variable-Sports Achievement Motivation**

**Dr. D. Suresh Kumar:** Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu.

### **Abstract**

The purpose of the study was to find out the differentials on surface of volleyball practice such as indoor and outdoor on selected psychological variable-Sports Achievement Motivation. To achieve this purpose forty five male volleyball players who were studying in the Department of Physical Education and sports sciences, Annamalai University, Tamilnadu, were selected as subjects and their age are ranged from 18 to 25 years. For the present study sports achievement motivation is selected as criterion variable. The collected data from the indoor practice, outdoor practice and control groups during pre and post test on selected criterion variable such as sports achievement motivation used for statistical treatment to find out significant difference between the adjusted post means by computing analysis of covariance (ANCOVA) for each criterion variable separately. In all cases 05 level of confidence was fixed to test the significance which was considered as an appropriate. Since, three groups were compared, whenever the obtained 'F' ratio for the adjusted post test was found to be significant.

**Keywords:** Volleyball Practice, Indoor, Outdoor, Sports Achievement Motivation, ANCOVA

### **INTRODUCTION**

Psychology is a science of behavior of living organism whereas sports psychology is the study of athletes' behavior in the sport environment. It aims at understanding of highly skilful competitive. According to Bucher, "Psychology of sports means applying psychological theories and concepts to aspects of sports such as coaching". It is concerned with analysing human behavior in various types of sports situations performances. Some of its objectives are to predict the performance and identify the growth and development patterns which are essential for the athletic efficiency and that of personality make up which really is a vital force in one's achievement.

### **METHODOLOGY**

The purpose of the study was to find out the differentials on surface of volleyball practice such as indoor and outdoor on selected psychological variable-Sports Achievement Motivation. To achieve this purpose forty five male volleyball players who were studying in the Department of Physical Education and sports sciences, Annamalai University were selected as subjects and their age are ranged from 18 to 25 years. For the present study sports achievement motivation is selected as criterion variable. The collected data from the indoor practice, outdoor practice and control groups during pre and post test on selected criterion variable such as sports achievement motivation is used for statistical treatment to find out significant difference between the adjusted post means by computing analysis of covariance (ANCOVA) for each criterion variable separately. In all cases 05 level of confidence was fixed to test the significance which was considered as an appropriate. Since, three groups were compared, whenever the obtained 'F' ratio for the adjusted post test was found to be significant.

### **ANALYSIS OF THE DATA**

Analysis of covariance on Sports Achievement Motivation

**SPORTS ACHIEVEMENT MOTIVATION**

The analysis of covariance on Sports Achievement Motivation of the pre and post test scores of indoor practice, outdoor practice and control groups have been analyzed and presented in Table I.

**TABLE-I**  
**ANALYSIS OF COVARIANCE OF THE DATA ON SPORTS ACHIEVEMENT**  
**MOTIVATION OF PRE AND POST TESTS SCORES OF INDOOR**  
**PRACTICE GROUP, OUTDOOR PRACTICE GROUP AND CONTROL GROUP**

Test	Indoor Practices Group	Outdoor Practices Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
<b>Pre Test</b>								
Mean	27.87	27.53	27.67	Between	0.84	2	0.42	0.41
S.D.	0.96	0.96	1.01	Within	42.80	42	1.02	
<b>Post Test</b>								
Mean	36.13	31.00	27.80	Between	530.18	2	265.09	241.34*
S.D.	0.96	0.89	1.17	Within	46.13	42	1.10	
<b>Adjusted Post Test</b>								
Mean	36.00	31.11	27.82	Between	504.49	2	252.24	444.01*
				Within	23.29	41	0.57	

\* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The table I show that the pre-test mean values on sports achievement motivation of indoor practices group, outdoor practices group and control group are 27.87, 27.53 and 27.67 respectively. The obtained "F" ratio of 0.41 for pre-test scores is less than the table value of 3.222 for df 2 and 42 required for significance at .05 level of confidence on sports achievement motivation. The post-test mean values on sports achievement motivation of indoor practices group, outdoor practices group and control group are 36.13, 31.00 and 27.80 respectively. The obtained "F" ratio of 241.34 for post test scores is greater than the table value of 3.222 for df 2 and 42 required for significance at .05 level of confidence on sports achievement motivation.

The adjusted post-test means of indoor practices group, outdoor practices group and control group are 36.00, 31.11 and 27.82 respectively. The obtained "F" ratio of 444.01 for adjusted post test scores is greater than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on sports achievement motivation. To determine the significance difference among the three paired means, the Scheffe's test was applied as post-hoc test and the results are presented in Table II.

**Table II**  
**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED**  
**MEANS ON SPORTS ACHIEVEMENT MOTIVATION**

Indoor practices Group	Outdoor Practices Group	Control Group	Mean Differences	Confidence Interval Value
36.00	31.11	-	4.89*	0.70
36.00	-	27.82	8.19*	0.70
-	31.11	27.82	3.30*	0.70

\* Significant at .05 level of confidence.

The table II shows that the mean difference values between indoor practices and outdoor practices groups, indoor practices and control groups and outdoor practices and control groups 4.89, 8.19 and 3.30 respectively on sports achievement motivation which were greater than the required confidence interval value 0.70 at .05 level of confidence.

#### **RESULTS**

The results of the study showed that indoor practice group has significantly improved on sports achievement motivation when compared to outdoor practice and control group. Outdoor practices group also significantly improved on sports achievement motivation when compared to control group.

Both indoor practices and outdoor practices were improved sports achievement motivation. Among the experimental groups, indoor practice group improved much better than outdoor practice group.

Indoor practices group has significantly changed on achievement motivation when compared to outdoor practices and control group. Outdoor practices group also significantly changed on achievement motivation when compared to control group.

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## A Study of Cardiovascular Endurance between Post Graduate Level Students

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### Abstract

The primary objective of the study is to find out the cardiovascular endurance level between physical education and other post graduate level students. Fifty physical education students studied from M.P. Ed. at dept. of physical education and Fifty other student studied from various P. G. department of Swami RamanandTeerthMarathwada University campus Nanded, Exclusion criteria were the presence of chronic medical conditions such as asthma, injuries, heart disease or any other condition that would put the subjects at risk when performing the Health tests. The data was collected by age, height, weight, and cardiovascular endurance of all subjects were measured in physical education department laboratory and Field. Cardiovascular endurance was assessed using Harvard step test and 12 minute run & walk test. The result reveals a statistically significant difference of cardiovascular endurance through Harvard step test ( $t=22.25 < .05$ ) between post graduate level students. However the result reveals a statistically significant difference of cardiovascular endurance through 12 min. Run & walk test. ( $t=9.91, p < .05$ ) was found between Master of physical education and other post graduate students. The results of present study showed that cardiovascular endurance fitness performance was better in master of physical educational students.

### Introduction

Cardiovascular Endurance is the ability of the heart to provide oxygen to muscles during physical activity for a prolonged period of time. Cardiovascular endurance is the most important aspect of fitness. The cardiovascular endurance involves moderate contraction of large muscle group for long periods of time during which maximum adjustments of circulatory respiratory system are necessary as in continuous running, swimming, climbing, hiking, aerobics bicycling and the like. (Clarke and Clarke, 1987) The importance of cardiovascular fitness to health for all individuals has been well documented. Physical fitness is a required element for all the activities in our life. (Jourkesh et.al.2012). Cardiovascular endurance various elements involved include the heart lungs, major blood vessels, the capillary system and the oxygen-nutrient carrying capacity of blood. The measurements of individual elements may be done by testing heart rate, stroke volume of the heart, systolic and diastolic blood pressure, oxygen utilization during resting, exercise and recovery, and their numerous combinations. (Devinder Kansal 1996) The primary objective of the study is to find out the cardiovascular endurance and Blood Pressure between Master of physical education students and other P. G. Level students.

### Material and Methods

Fifty physical education students studied from M.P. Ed. at dept. of physical education and Fifty other student studied from various P. G. department of Swami Ramanand Teerth Marathwada University campus Nanded. Exclusion criteria were the presence of chronic medical conditions such as asthma, injuries, heart disease or any other condition that would put the subjects at risk when performing the Health tests. The subjects were free of smoking, alcohol and caffeine consumption, antioxidant supplementation and drugs during the programmes. The age, height, weight, and cardiovascular endurance among the groups Harvard Step Test of Brouha, 1943 and 12 min. Run & walk test was used. It was conducted on physical education department sports Field.

### Data Analysis

Statistical Analysis: For data analysis responses were expressed as mean, standard deviation and t-test was performed for comparison among between two groups. The level of significant set up at 0.5 level.

### Results

The data have been systematically analyzed in the form of Mean Scores, Standard Deviations and t-ratios. Findings are given below.

**Table 1, Shows Mean Scores and Standard Deviations of Morphological Characteristics**

Sr. No.	Parameters	M. P. Ed. Students		Post graduate students	
		Mean	S.D.	Mean	S.D.
	Age	24.5	1.32	25.42	2.27
	Weight	66.27	5.52	65.1	6.94
	Height	171.27	5.31	171.25	6.23

Table -1, shows that Mean and S.D. of morphological characteristics of Master of physical education and Other Post graduate student.

**Table -2, illustrates the mean scores and standard deviations and t-ratio of between M.P. Ed and other P.G. students of cardiovascular Endurance with respect using through Harvard step test.**

Test	Variable	Number	Mean	S.D.	T-ratio
Harvard Step Test	M.P.Ed. students	50	86.09	7.54	22.25*
	Other P.G. Students	50	74.69	3.59	

**\*Significant at 0.05 level**

Table-2, illustrates the mean scores obtained from Table 2, the mean score of M. P. Ed students was 86.09 and other P.G. Students was 74.69 respectively, the result reveals a statistically significant difference of Harvard step test ( $t=22.25 < .05$ ) was found between M. P. Ed students and other P.G. Students.

**Table- 3, illustrates the mean scores and standard deviations and t-ratio of between M.P. Ed. and other P.G. students of cardiovascular endurance Fitness with respect using through 12 min. Run & walk test.**

Test	Variable	Number	Mean(Mts.)	S.D.	T-ratio
12Meter Run& walk test	M.P.ED Students	50	2130.8	176.63	9.91*
	Other P.G. Students	50	1810.6	139.47	

**\* Significant at 0.05 level**

Table -3, illustrates the mean scores obtained from Table 2, the mean score of M.P.Ed students was 2127.8 and other P.G. Students was 1811.6 respectively, the result reveals a statistically significant difference of 12 min. Run& walk test ( $t=9.91 < .05$ ) was found between m.p.ed students and other P.G. Students.

### **Discussion of findings**

The results of present study showed that cardiovascular endurance performance was better in M.P.ED. Students, The results of this study suggest that Other Post graduate level students have lower levels of cardiovascular endurance & fitness as compared with Master of physical educational students. The research has provided early information to help the students understand their health related physical fitness. It will motivate them to be involved in sports. The information can be applied as criteria in selecting or choosing athletes. It is also a source to assist physical education teachers, sports directors, physical educationist and sports trainer to be proactive and change their perspective in order to improve the cardiovascular endurance & fitness.

### **CONCLUSION**

Results of this study are consistent with previous research that has demonstrated

cardiovascular endurance of Physical Education Students is better than other P. G. Educational students. These results may assist the Educational policy makers, Universities and other State and Centre educational bodies to include must be a compulsory subject for college students of Maharashtra in their curriculum to improve cardiovascular endurance and other health related fitness components to keep away various diseases and enjoy a quality of life.

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## **Aero Yoga: An Analogy between Yoga and Aerobic Exercise**

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### **Abstract:**

The present article tries to focus on the similarities between yoga and aerobics which could be helpful in utilizing the best possible means to keep oneself fit in the simplest manner. Both have their own strengths and weakness. At a time when the modern man is thriving hard to maintain his physical fitness, the analogy that has been found out between aerobic exercise and yoga comes as a blessing in disguise. People who find it hard to perform aerobics, especially the elder people and ladies, can have the same benefits by performing yoga. Although yogic exercise burns less calories than aerobics, it gains in other disciplines. It is time for us to ponder over a combination of the two for better health of the mankind.

**Key words:** Aerobics, yoga, strength, cardiovascular exercise, flexibility, fat loss, mental outlook.

### **Introduction:**

Aerobic exercise and yoga both offer significant health benefits including improved muscle tone, decreased body fat and improved mental outlook, but in different ways. Aerobic exercise such as swimming, biking and running has little effect on strength and flexibility. However, it burns significant calories and conditions the heart muscle, so that the heart works more efficiently to pump blood throughout the body. Yoga helps to build strength, increases flexibility and improves balance. However, it does not provide a cardiovascular workout. So each form of exercise has its strengths and weaknesses and should be selected according to one's fitness goals.

### **Strength:**

Cardiovascular exercise will help develop muscular endurance, however as a rule, aerobic exercise does not encourage the development of muscular strength to the same extent that yoga does. Yoga does tend to boost muscular strength and muscular endurance, particularly in the chest, triceps and abdominal regions. Yoga also helps to develop strength and endurance in many of the core muscles, especially the obliques and the erector spinae.

In 2011, researchers followed a group of 79 male and female volunteers as they engaged in sun salutations – a basic yoga sequence – six days a week for 24 weeks. The 'Asian journal of sports medicine' published the study, which found a significant increase in strength and endurance among both men and women whose bench press one rep maximum increased by 15 and 6 pounds, respectively.

### **Cardiovascular exercise:**

Cardiovascular exercises such as running and swimming elicit intense demands on the large muscles of the body, which require more oxygen to perform exercises. The increased need for oxygen causes the heart muscle to work harder, and as the heart adapts to the stress, it becomes more efficient. The main difference between yoga and aerobic exercise occurs in the effect each exercise has on the heart muscle. The slower pace of yoga does not require as much oxygen. Therefore, it does have the same conditioning effect on the heart that aerobic exercises do.

Another key difference between yoga and aerobic exercise lies in caloric expenditure. The average 50 minute hatha yoga burns approximately 144 calories. A 50 minute ashtanga class, the more vigorous style of yoga burns slightly more at 237 calories. Compare this to 50 minutes of running or swimming at 355 and 507 calories, respectively. Aerobic exercise burns considerably more calories than yoga.

A study published in the 'Indian journal of physiology and pharmacology' in 2004

evaluated energy costs and cardiovascular changes during a sequence of eight yoga poses. The highest recorded heart rate among study participants was 101 beats per minute, which is only 50 percent of maximum heart rate for a 30 year old. Although yoga involves systematic breathing that improves respiratory fitness, ultimately aerobic exercise outperforms yoga in the cardiovascular arena because it involves elevation of the heart rate for sustained periods of time or for distinct intervals. This improves the efficiency of the heart muscle, allowing it to do more work with less effort during rest times.

**Flexibility:**

Aerobic exercise has little impact on the development of flexibility, whereas yoga significantly improves the flexibility. In a study, 108 physically fit fire fighters took yoga classes over six weeks. None of the participants had practiced yoga prior to the study. Researchers marked significant improvements in trunk flexibility, and the study participants also reported less musculoskeletal pain overall.

**Fat loss:**

Fat loss occurs when more calories are expended than consumed. Aerobic exercise – specially running at 7 kms per hour – burns about 600 calories in one hour. A yoga class of moderate intensity – as practiced in ashtanga yoga – burns about 350 calories. However, calories burned do not tell the whole story. The gain in lean muscle from yoga practice yields a slight improvement in basal metabolic rate. Nevertheless, when exercising five days a week for one hour, running has the potential to burn off three pounds more than yoga over the course of eight weeks.

**Mental outlook:**

Aerobic exercise and yoga both produce immediate and sustained changes in mental outlook, including reduced anxiety and depression, improved self-esteem and a greater overall sense of well being. Some of the changes seen with both forms of exercise can be attributed to improvements in body composition, suggesting that the exercise itself improves mental outlook.

**Conclusion:**

It is true that aerobic was developed in the west while yoga is an eastern concept. In this era of globalization, when the east is being merged with the west, yoga too has transgressed the barriers of nation. The analogy made in the paper has not only proved that yoga is easier to perform, but also equally beneficial as aerobics. Yoga leads not only to physical fitness, but also peace of mind which is the ultimate goal of all human beings.

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## The Effect of Complex and Contrast Resistance and Plyometric Training on Selected Strength Parameters

**Dr. G. Rajamohan:** Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu.

### Abstract

The purpose of the study was to find out the effects of complex and contrast resistance and plyometric training on selected strength parameters-leg strength. To achieve this purpose, forty five men students studying Bachelor's degree in the Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu, India, were randomly selected as subjects. The age, height and weight of the selected subjects were ranged from 18 to 21 years, 167 to 173 cm and 58 to 65 kilogram respectively. The collected data from the complex resistance and plyometric training, contrast resistance and plyometric training and control groups during pre and post test on selected criterion variables such as leg strength, used for statistical treatment to find out significant difference between the adjusted post means by computing analysis of covariance (ANCOVA) for each criterion variable separately. In all cases, .05 level of confidence was fixed to test the significance which was considered as an appropriate. Since, three groups were compared, whenever the obtained 'F' ratio for the adjusted post test was found to be significant, the Scheffe's test was applied as post hoc test to find out paired mean differences, if any.

**Keywords:** Complex Resistance and Plyometric Training, Contrast Resistance and Plyometric Training, Leg Strength, ANCOVA.

### THE EFFECT OF COMPLEX AND CONTRAST RESISTANCE AND PLYOMETRIC TRAINING ON SELECTED STRENGTH PARAMETERS

**Dr.G.RAJAMOHAN**

Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Tamilnadu.

### INTRODUCTION

According to Hooks<sup>1</sup> strength is the key to success in sports and games. The value of strength in athletics is not a new idea. There is a vast need for everyone involved in sports for a better understanding of strength.

### METHODOLOGY

The purpose of the study was to find out the effects of complex and contrast resistance and plyometric training on selected strength parameters-leg strength. To achieve this purpose, forty five men students studying Bachelor's degree in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects. The age, height and weight of the selected subjects were ranged from 18 to 21 years, 167 to 173 cm and 58 to 65 kilogram respectively. The collected data from the complex resistance and plyometric training, contrast resistance and plyometric training and control groups during pre and post test on selected criterion variables such as leg strength, used for statistical treatment to find out significant difference between the adjusted post means by computing analysis of covariance (ANCOVA) for each criterion variable separately. In all cases, .05 level of confidence was

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<sup>1</sup> Gene Hooks, *Weight Training in Athletics and Physical Education*, (New Jersey : The Prentice Hall Inc., 1996),p.45.

fixed to test the significance which was considered as an appropriate. Since, three groups were compared, whenever the obtained 'F' ratio for the adjusted post test was found to be significant, the Scheffe's test was applied as post hoc test to find out paired mean differences, if any.

#### ANALYSIS OF THE DATA

The influence of complex and contrast resistance and plyometric trainings on selected strength parameters were analyzed separately for leg strength variable and presented below.

#### LEG STRENGTH

The analysis of covariance on leg strength of the pre and post test scores of complex resistance and plyometric training, contrast resistance and plyometric training and control groups have been analyzed and presented in Table I.

**Table I**  
**ANCOVA OF COMPLEX, CONTRAST RESISTANCE AND PLYOMETRIC TRAININGS AND CONTROL GROUPS ON LEG STRENGTH**

Test	Complex Training Group	Contrast Training Group	Contr ol Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtaine d 'F' Ratio
<b>Pre Test</b>								
Mean	92.27	92.27	92.13	Between	0.18	2	0.09	0.41
S.D.	0.77	0.85	0.72	Within	27.60	42	0.66	
<b>Post Test</b>								
Mean	97.00	94.80	92.20	Between	173.20	2	86.60	159.53*
S.D.	0.52	0.83	0.75	Within	22.80	42	0.54	
<b>Adjusted Post Test</b>								
Mean	96.97	94.77	92.26	Between	165.52	2	82.76	370.28*
				Within	9.16	41	0.22	

\* Significant at 0.05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The table I show that the pre-test mean values on leg strength of complex training, contrast training and control groups are 92.27, 92.27 and 92.13 respectively. The obtained "F" ratio of 0.41 for pre-test scores is less than the table value of 3.222 for df 2 and 42 required for significance at .05 level of confidence on leg strength. The post-test mean values on leg strength of complex training, contrast training and control groups are 97.00, 94.80 and 92.20 respectively. The obtained "F" ratio of 159.53 for post test scores is greater than the table value of 3.222 for df 2 and 42 required for significance at .05 level of confidence on leg strength.

The adjusted post-test means of complex training, contrast training and control groups are 96.97, 94.77 and 92.26 respectively. The obtained "F" ratio of 370.28 for adjusted post test scores is greater than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on leg strength. To determine the significance difference among the three paired means, the Scheffe's test was applied as post-hoc test and the results are presented in Table II.

**Table II**  
**THE SCHEFFE’S TEST FOR THE DIFFERENCES BETWEEN PAIRED**  
**MEANS ON LEG STRENGTH**

<b>Complex Training Group</b>	<b>Contrast Training Group</b>	<b>Control Group</b>	<b>Mean Differences</b>	<b>Confidence Interval Value</b>
96.97	94.77	-	2.20*	0.44
96.97	-	92.26	4.71*	0.44
-	94.77	92.26	2.51*	0.44

\* Significant at .05 level of confidence.

The table II shows that the mean difference values between complex training group and contrast training group, complex training group and control group and contrast training group and control group 2.20, 4.71 and 2.51 respectively on leg strength which were greater than the required confidence interval value 0.44 at .05 level of confidence.

**RESULTS**

The results of the study indicated that there was a significant difference among the adjusted post-test means of complex training, contrast training and control groups on leg strength.

The results of the study showed that there was a significant difference between complex training group and contrast training group, complex training group and control group and contrast training group and control group on leg strength.

In further, the results of the study showed that complex training group and contrast training group have significantly improved leg strength when compared to control group. Among the training, complex training improved leg strength much better than contrast training programme.

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## **Effect of Plyometric Training on Selected Strength Parameter**

**Dr. G. Santosh Kumar:** Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University.

The purpose of the study was to find out the effect of plyometric training on selected strength parameters such as leg strength. To achieve this purpose of the study, thirty boys from various games and sports, studying in the Jawahar Matriculation Higher Secondary School, Neyveli were randomly selected as subjects and they were divided into two equal groups. Each group consisted of the fifteen subjects. Group -1 underwent plyometric training for three days per week for eight weeks, group -2 acted as control who did not participate in any special training programme. The subjects were tested on selected criterion variable such as leg strength at prior to and immediately after the training period. The selected criterion variable such as leg strength was measured by using leg dynamometer. The analysis of covariance (ANCOVA) was used to find out significant difference if any, between groups on each selected criterion variable separately. In all cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate.

### **EFFECT OF PLYOMETRIC TRAINING ON SELECTED STRENGTH PARAMETERS**

**Dr. G. Santosh Kumar :** Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University.

#### **INTRODUCTION**

Evolution of human life starts in the movement. Human beings are very active and creative by nature and physical activity is the part of their life all along since evolution for primitive man, search for food and shelter was the first activity. This first physical activity was the first mode of communication and also a means of expression. Human beings are evolved culturally, emotionally and socially including physical activity.

#### **METHODOLOGY**

The purpose of the study was to find out the effect of plyometric training on selected strength parameters such as leg strength. To achieve this purpose of the study, thirty boys from various games and sports, studying in the Jawahar Matriculation Higher Secondary School, Neyveli were randomly selected as subjects and they were divided into two equal groups. Each group consisted of the fifteen subjects. Group -1 underwent plyometric training for three days per week for eight weeks, group -2 acted as control who did not participate in any special training programme. The subjects were tested on selected criterion variable such as leg strength at prior to and immediately after the training period. The selected criterion variable such as leg strength was measured by using leg dynamometer. The analysis of covariance (ANCOVA) was used to find out significant difference if any, between groups on each selected criterion variable separately. In all cases, .05 level of confidence was fixed to test the significance, which was considered as appropriate.

#### **ANALYSIS OF THE DATA**

The influence of plyometric training on each criterion variable were analysed separately presented below

##### **Leg Strength**

The analysis of covariance on leg strength of experimental group and control group are analysed and presented in Table-1

**Table-1**  
**ANALYSIS OF COVARIANCE ON LEG STRENGTH OF PLYOMETRIC TRAINING GROUP AND CONTROL GROUP**

	<b>Plyometric Training Group</b>	<b>Control Group</b>	<b>SOV</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>'F'ratio</b>
<b>Pre-test Mean</b>	75.88	76.29	B:	0.22	1	0.22	0.50
<b>S.D</b>	2.15	1.28	W	12.31	28	0.44	
<b>Post-test Mean</b>	78.29	76.22	B	28.26	1	28.26	35.19*
<b>S.D</b>	1.89	2.81	W	22.47	28	0.803	
<b>Adjusted Post-test Mean</b>	78.97	76.90	B	51.69	1	144.50	64.61*
			W	21.63	27	0.86	

\*Significant at .05 level of confidence

(The table value for significance at 0.05 level of confidence for 1 and 28 and 1 and 27 are 3.37 and 3.36)

Table-1 shows that the adjust post-test mean values of plyometric training group and control group were 78.97 and 76.90 respectively. The obtain 'f' ratio value of 64.61 for adjust post-test scores of plyometric training group and control group was more than the required table value of 3.28 for significance with df 1 and 27 at .05 level confidence.

### **RESULT AND DISCUSSION**

1. There was a significance difference between plyometric training group and control group on leg strength.
2. And also it was found there was a significant improvement on leg strength due to plyometric training group compare than control group.

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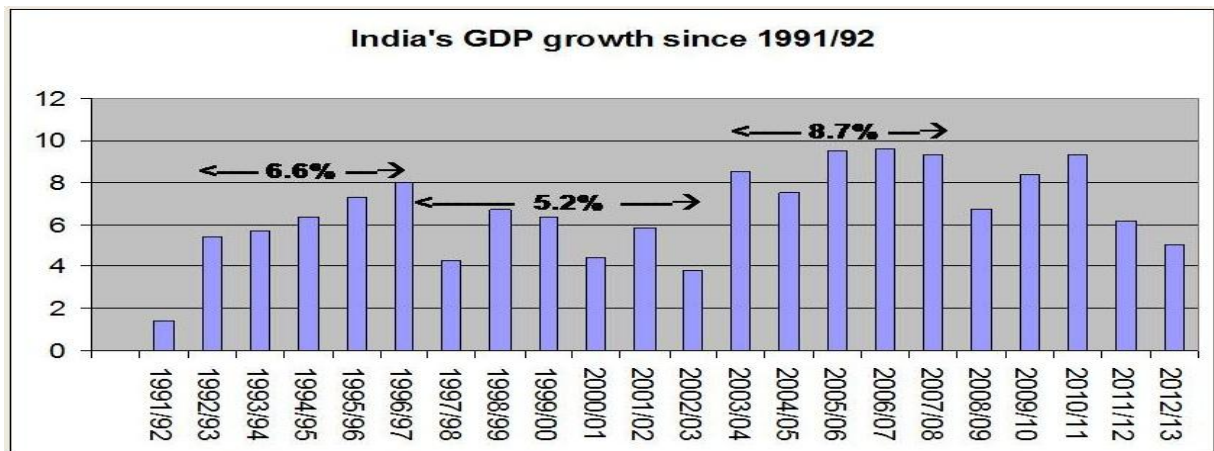
## India's Growth Story & is it Sustainability

**Dr. Adarsh Mishra:** Director, VIVA Institute of Management & Research

### 1. Overview of the Current Economic Scenario of India

The slowdown in the Indian economy persisted, with growth hobbled by structural bottlenecks and adverse global conditions. While demand-side inflation pressures reduced, high consumer price inflation along with the current account deficit (CAD) well above sustainable levels limits the space for monetary policy to support growth. Surveys show that business confidence remains subdued despite reforms and policy initiatives since September 2012. Against this backdrop, a recovery in 2013-14 is likely to be slow-paced. It would require further all-round efforts that include initiatives to remove structural impediments and improve governance. Resolving outstanding issues that constrain infrastructure investment and a public investment stimulus rebalanced by revenue spending cuts holds the key to the economy's revival.

### 2. Comparison of Indian Economy Since 1991



(Figure 1: Sources - Report prepared by the Society for Policy Studies Team)

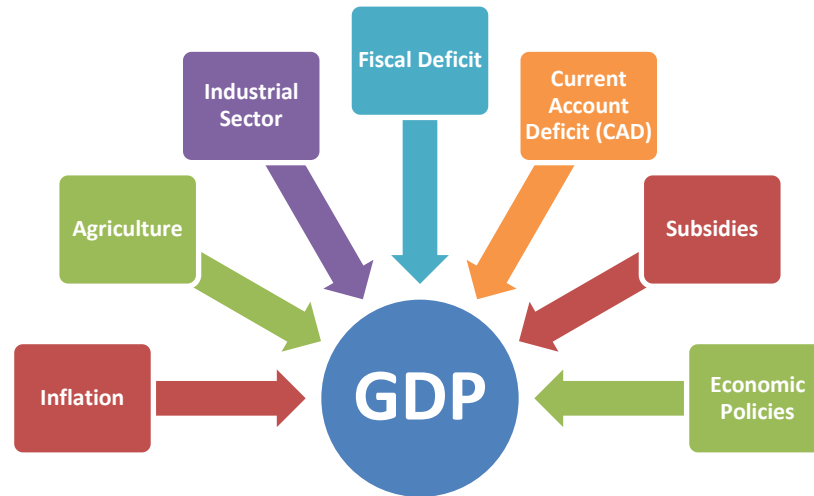
Indicators	2008/09-2012/13	2003/04-2007/08	1992/93-1996/97
India's Real GDP Growth Rate (at Factor Cost 2004-05)	7.16	8.68	6.6
Inflation (GDP Deflator, % per year)	7.7	5.5	9.1
Current Account Deficit (% of GDP)	-3.1	-0.3	-1.1
Combined Fiscal Deficit (% of GDP)	-8.28	-6.2	-7.1
Gross Domestic Investment (% of GDP)	35.34	33.8	24.2

(Sources: RBI, Central Statistical Organization, Finance Ministry, etc)

- After liberalization in 1991, India's rapid integration with the global economy; rise of entrepreneurship; and increase in productivity leads to the GDP growth.

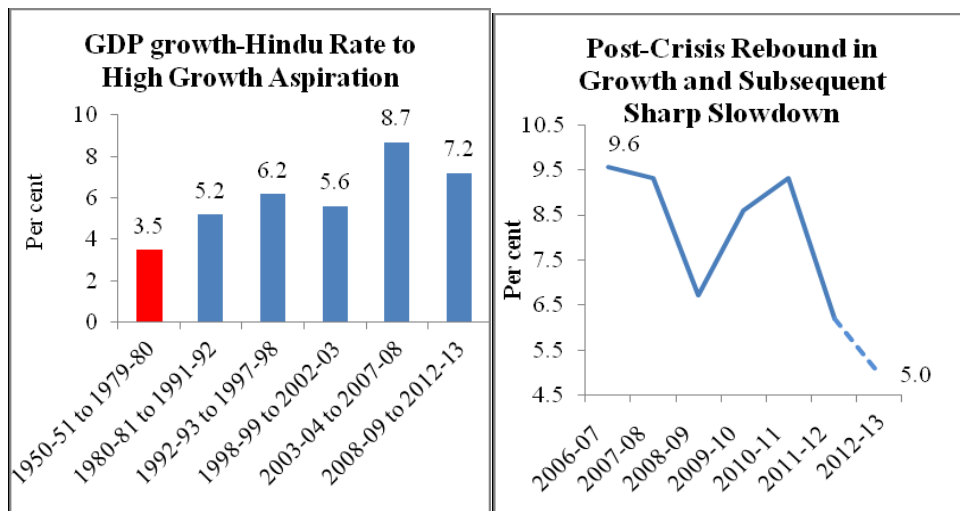
- The global financial crisis in 2008 affected virtually every economy in the world, and India was no exception. But we recovered from the crisis much sooner than even other emerging economies.
- Today, there is a sharp reversal. Growth has decelerated, inflation is still high and stubborn, the investment rate has declined sharply and the external sector is beset with a record high current account deficit.
- Gross Domestic Investment is showing a continuous improvement which is a positive for us.

**3. Macroeconomic Problems Of Indian Economy in 2013**



**I. GDP**

- In the crisis year of 2008/09, growth dropped to 6.7%, but it recovered smartly thereafter. In fact, in the 2 years after the crisis, 2008/09 and 2009/10, growth averaged 9% which compares favorably with the average growth of 9.5% in the 3 years before the crisis. However, in 2011/12, growth moderated to 6.2%, and during 2012-13 the growth was dropped to 5%. It was further lowered to 4.3% in Q1 of FY 2013-14 the lowest in a decade & recovered in a Q2 to be finished at 4.4%. It is expected to grow at 4.8% for next 2 quarters of this Financial Year.



**(Sources: Mr. DuvvuriSubbarao Speech at London School of Economics)**

- To understand the latest downtrend, it is important first to understand the pre-crisis growth surge. Several explanations are offered for India's growth acceleration in the pre-crisis period: the impact of economic reforms of the 1990s; India's rapid integration with the global economy; rise of entrepreneurship; and increase in productivity.
- Underlying all these factors was the massive increase in capacity as investment jumped from 26.9% of GDP in 2003-04 to 38.1% in 2007-08.
- This increase in investment was financed by growing domestic saving, and was accompanied by an increase in productivity driven by improvements in technology, organization, financial intermediation and external and domestic competitiveness.

**II. Inflation**

- Just as India recovered from the crisis sooner than other countries, inflation too caught up with us sooner than elsewhere.
- Inflation, as measured by the wholesale price index (WPI), went briefly into negative territory for a few months in 2009 but started rising sharply thereafter, clocking a peak rate of 10.9% in April 2010. Average WPI inflation was 9.6% in fiscal year 2010-11, 8.9% in 2011-12 and 7.5% in 2012-13. In Q2 of 2013-14 the inflation rate was 7%.
- The story therefore is that at 8.7%, the average inflation over the last 3 years has been higher than the average inflation of 5.4% during the previous decade.

**➤ What is Driving Inflation?**

- A major driver from the supply side has been food inflation, which has both structural and cyclical components. The structural component arises from rising incomes, especially in rural areas, which is leading to a shift in dietary habits from cereals to protein foods. The cyclical component of food inflation arises from the monsoon related spike in prices of food items such as vegetables.
- The second major factor driving the current episode of inflation has been global commodity prices, especially the price of crude oil. India imports 80% of its oil demand.
- The third major factor fuelling inflation has been wage pressures. Nominal rural wages increased at double digit rates over the last 5 years.

**III. Agriculture Sector Growth**

- Growth in agriculture and allied sectors as per national account data is placed at 7.9% in 2010-11, and is declined to 3.65% in 2011-12 and 1.8% in 2012-13.
- The reason for Slowdown in agriculture sector growth is due to shortage of rainfall. But this year it is expected to increase due to good monsoon season this year.

**IV. Industrial Sector Growth**

- The contraction in the current year was largely because of decline in capital goods, natural gas, crude petroleum, and fertilizers output. Overall industrial performance, as reflected by the IIP continued to moderate from Q1 of 2011-12 with growth turning negative in Q1 of 2012-13, before improving to 2.1% in Q3 of 2012-13.
- Reasons for slowdown in industrial sector growth are due to weak global demand, weak supply linkages, high import costs, and sluggish investment activities.

**V. Fiscal Deficit**

- The large fiscal deficit of the government remains one of India's biggest macroeconomic challenges.

- A reason for high fiscal deficit is due to overshooting of government expenditures over its revenue collection.

#### VI. Current Account Deficit

- Over the last two years, India's balance of payments has come under growing pressure as evidenced most clearly by a large and increasing current account deficit (CAD). The CAD last year (2011/12) was 4.2% of GDP, historically the highest; the CAD during the current year is expected to be even higher.
- A Reason for high CAD, Rising crude oil prices, along with increase in gold and silver prices have contributed significantly to the import bill.
- But, after India's current account deficit (CAD) fell to 1.2% of gross domestic product (GDP) in the quarter ended September; CAD for this financial year is expected to move closer to the Reserve Bank of India (RBI)'s comfort level of 2.5% of GDP.
- There are mainly three concerns about the CAD in the balance of payments: (i) the quantum of CAD; (ii) the quality of CAD; and (iii) the financing of CAD.
- Quantum of CAD
- Reserve Bank's estimates show that the sustainable CAD for India is 2.5% of GDP. A CAD above the sustainable level, year after year, is a clear macroeconomic risk as it raises concerns about our ability to meet our external payment obligations and erodes the confidence of potential lenders and investors.
- Quality of CAD
- The concern about the quality of CAD arises from the composition of imports. If we were importing capital goods, we can maybe countenance a higher CAD because investment in capital goods implies building production capacity for tomorrow. On the other hand, import of gold, largely as a hedge against inflation, is a deadweight burden, especially at a time when the CAD is beyond the sustainable level.
- Financing of CAD
- Even as the CAD has been high, we have been able to finance it because of a combination of 'push' and 'pull' factors. On the push side is the amount of surplus liquidity in the global system consequent upon the extraordinary monetary stimulus provided by advanced economy central banks. On the pull side are the measures taken by us to attract capital flows such as liberalizing FDI, expanding the limits for foreign investment in corporate and government debt and easing restrictions on external commercial borrowing by corporate.

#### VII. Subsidies

- If the domestic petroleum sector was a free market and if global prices passed through to domestic prices, demand would arguably have declined in response to rising prices. But such a demand adjustment was blocked by the administered (subsidized) pricing regime of petroleum products.
- Subsidization did not, however, protect us from inflation pressures - the cost of subsidies raised the fiscal deficit which fuelled inflation.
- There is a debate in India about the macroeconomic and welfare dimensions of subsidies financed, not by government surpluses, but by government borrowing.
- An argument against de-subsidization is that it will be inflationary. Sure, it will be inflationary in the short-term, but price pressures will even out over the medium term.
- Also, the inflation impact should not be overstated. To the extent lower subsidies result in a lower fiscal deficit, there would be some disinflationary impact even in the short-term. Finally, reduction in subsidies will remove price distortions, improve efficiency and provide a much better investment environment.

➤ **Food Bill**

- The Food Security bill which has been recently approved in Parliament will also increase the subsidy burden. However, its impact may be felt only in upcoming fiscal years,
- It will guarantee 5 kg of rice, wheat and coarse cereals per month per person at a fixed price of Rs 3, Rs 2 and Rs 1 respectively.
- The Bill seeks to provide cheap food grains to 82 crore people in the country, ushering in the biggest program in the world to fight hunger.
- The annual financial burden after its implementation is estimated to be about Rs 1.30 lakh crore at current cost.
- Due to which it may be difficult to achieve the fiscal deficit target of 4.8% in the current fiscal year.

**VIII. Economic Policies (Monetary Policy)**

- Monetary policy is known to work with lags, and as a consequence of the tight monetary policy, WPI inflation which peaked at 10.9% in April 2010, has come down to 6.6% in January 2013.
- As of 31<sup>st</sup> October 2013, the key indicators are

Indicator	Current rate
Inflation	7%
Bank rate	10.25%
CRR	4.00%
SLR	23%
Repo rate	7.75%
Reverse repo rate	6.75%
Marginal standing Facility	8.75%

(Sources: RBI website)

**4. Blended Solutions**

**1. Inflation**

- Adopt an inflation target, and make it the center of a new macroeconomic policy framework
- Ease supply constraints by removing APMC Act - The Agriculture Produce Marketing Committee Act, designed to protect farmers from the vagaries of the market, has been turned on its head to enrich traders & politicians and harm farmers.
- Open up all sector to FDI –We had included this solution in inflation because It will increase the no. of suppliers in the market which will result in revenue generation & employment generation therefore purchasing power will increase which may help to curb inflation.

**2. Agriculture**

- Increase the investment in bio-technology and bring in agricultural land reforms that will help farmers with small holdings get greater access to credit while allowing them to consolidate their holdings through mechanisms like Producer Companies and Self-Help Groups (SHGs). This will push up rural demand and purchasing power.
- Innovate in farming. Gujarat isn't a traditional agricultural producer, but it has improved productivity with initiatives like its "white revolution" in milk production. The whole nation, still greatly dependent on farming, needs enormous improvements. Basically India needs second green revolution.

**3. Industry**

- Privatize the Oil companies government should only concentrate on infrastructure projects and do nothing else. Once the oil companies are privatized, allow as many companies to sell fuel and the competition will immediately bring the petrol and other fuel prices down. Keep a control on the margins of petroleum companies. Allow them to make maximum 10% profit. This should be tax free. Reduce the taxation on the fuel; allow airline companies to import their own fuel from their own foreign currency Reduce federal taxes and state taxes on fuel. Automatic you will see industrial growth and currency will stabilize.
- Implement the integrated manufacturing policy proposed by the Ministry of Commerce in a mission-mode approach. India needs more factories to generate employment. Revive the concept of Special Economic Zone SEZs and promote them with incentives. Such a focus will increase employment, while generating consumer demand

**4. Fiscal Deficit**

- Introduce a medium to long-term fiscal-policy framework, perhaps with ceilings as in the Maastricht Treaty -- a deficit of less than 3% of GDP and debt of less than 60% of GDP.

**5. CAD**

- Controlling fiscal deficit will curtail current account deficit. Restore distribution margins on financial saving products, to curb demand for gold.
- Increase import duties on all non-essentials - that would force the local manufacturer to wake up which would force them to produce world class products to meet the domestic demand.
- Issuance of Overseas bonds - are an option. For e.g. Quasi Sovereign Bonds.

**6. Subsidies**

- Scrap diesel & urea subsidies, decontrol diesel. Stop implementing various bills like food security bill which will increase the fiscal deficit of the nation.

**7. GDP**

- Combined effort of all the above mentioned factors will contribute to overall growth of GDP. Some of the other Factors which can help to improve the economic condition of India are as follows.

**1. Governance**

- Improve its governance. This is probably the hardest and most important task. Whoever leads the next government in 2014, India needs maximum governance and minimum government. There is no point having the world's largest democracy unless it leads to effective government.
- Digitize all government records and drastically reduce all physical contact for government services. This will bring in greater transparency, reduce corruption and will rationalize the size of the bureaucracy. Digital governance will reduce delays and corruption in decision-making.

**2. Infrastructure**

- Allow both foreign and domestic investment in infrastructure projects - Increase the time-to-market cycle for these projects by allowing foreign companies to enter the tender process.
- Interlinking major rivers - Large parts of country are either water-deficient or water-surplus. So by Interlinking major rivers will create provision for adequate drinking water as well as for agricultural and industrial purposes.
- Establish a High-speed rail network - For an economy to prosper people need to move quickly from one city to another. A high-speed rail network will not only integrate Indian cities, but will also improve the logistics by which supply chain will become organized.

**3. Education**

- Improve colleges and universities. India has too few excellent institutions. Its share of places in the "Shanghai Ranking" of the world's top universities should be proportional to its share



of global gross domestic product -- meaning 10 universities in the top 500 (it currently has just one). Make that an official goal.

- Focus on higher education is critical if India needs to keep up its supply of good quality graduates, post-graduates and doctorates in order to provide for a rapidly growing economy. Indian youth need to be exposed to global standards and private sector should be allowed to tie-up with established foreign universities to provision high quality education.
- 4. Environmental**
- Protect the environment – India need to takes steps to safeguard environmental quality and use energy and other resources more efficiently which will help to get us carbon credit facility from World Bank.
  - There should be a Nation-wide policy on achieving energy security - The country is energy and electricity deficient. Without adequate energy and electricity, factories, industries and services-based economy cannot take off.
  - Cycle lane - Cycling is probably the best way to obtain a sustainable transportation system, especially in urban areas. Cycling must be promoted like EUROPEAN countries and policies must provide the safe conditions to do so. There are numerous advantages associated with cycling, 1. Money savings. (Fuel, maintenance & Parking.), 2. Healthy exercise, 3. Well for the environment.
- 5. Encourage Entrepreneurs**
- Give special focus to entrepreneurs who bring in innovative high-end technology and generate Intellectual Property Rights (IPRs). Entrepreneurship will not only generate jobs, but will create drivers of growth.

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## The Effect of Pranayama on Physiological Aspects

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### Abstract

Yoga is an old system essentially a way of life that integrates the means of harmonizing the body, mind, and spirit. It is all about a series of postures, breathing exercises and meditation. There are different types Pranayama and it has been found that these techniques influence cardio-respiratory and autonomic functions.

The purpose of this study was to evaluate effect of pranayama on physiological aspects among adolescents Sixty male adolescents (n=60) aged 18 to 22 years, who are thoroughly screened through an eminent physician of Faizpur and are with no known medical complications, were pooled for this controlled experiment. The subjects were matched into two groups viz., Pranayama group (Gr. I) and Control group (Gr. II). The participants who were willing to participate and medically fit were included in this experiment.

The experiment was conducted in considering three phases i.e. Phase – I: Pretest, Phase – II: Training or Treatment, and Phase – III: Post test. All the subjects of experimental and control groups were exposed to different physiological and biochemical tests viz., Pulse Rate, Breath holding capacity, Vital Capacity, Body fat % and Lipid profile to record the pre test and post test data.

The report of analysis (2 x 2 x 11 Factorial ANOVA) as revealed that the achievement scores in the selected dependent variables of the Pranayama and Control group were significantly different (F=32.60, p<0.01). The impact of such statistical difference has been evidenced in the case of their group comparison (F=25.56, p<0.01). This indicates, the interaction was also statistically significant (F=11.48, p<0.05). However, employing Scheffe's Post Hoc techniques, the specific variables were identified, which showed significant changes as a result of pranayama training intervention.

**Key word:** - The Effect of Pranayama on Physiological Aspects

### Introduction: -

Yoga is an old system essentially a way of life that integrates the means of harmonizing the body, mind, and spirit. It is all about a series of postures, breathing exercises and meditation. With an increase in awareness and interest in health and alternative therapies, various yoga techniques are gaining importance and becoming acceptable in scientific community.

Pranayama is a type of yogic practice which produces many systemic physical effects in the body, besides its specific effects on the respiratory functions. The beneficial effects of different *Pranayama* are well reported and have sound scientific basis. There are different types Pranayama and it has been found that these techniques influence cardio-respiratory and autonomic functions.

With the increase in psychosomatic disorders due to sedentary or altered lifestyle, the time has come to avert youths towards yoga. In fact, research studies revealed that due to lifestyle changes the most common causes of morbidity and mortality are coronary heart disease, stroke, obesity, hypertension, type-2 diabetes, allergies and several cancers. Evidence suggests that sedentary behavior, low levels of physical activity, and cardio respiratory fitness in youth track into adulthood. Similarly, metabolic risk factors also appear to track over time, and may predispose young people to disease later in life.

Therefore, if one has to reduce the risk of various diseases and to improve work capacity one must improve the cardiovascular and respiratory function. Therefore, it has been a longstanding effort from various researchers to identify the cardio-vascular efficiency and lung function ability of adolescents. A number of approaches have been made through various faculties of medicine, in this quest; one of the significant approaches seems to be the traditional Yoga's Pranayama techniques. Various aspects that improve the cardio-respiratory endurance need to be studied and evaluated, so as

to form a comprehensive program of yoga exercise for enriching one's heart and lungs function. Being a non-invasive, drugless and non-expensive technique, Pranayama methods can be promoted to the adolescents at gross levels for enhancing their cardio respiratory fitness. Therefore, the main objective of this study was to see the effect of pranayama on the psychological functions, biochemical variables and personality.

### **Origin of Research Problem**

Normally individuals realize the importance of breath yogic statement of prana, shusumna and pingala etc. deem strange to one who hardly observes his breathing. There are several beliefs and misbeliefs regarding pranayama. But no scientific data is made authentically available. Due to change in lifestyle the total capacity of few human organs is not completely utilized.

Today human movement is largely restricted to pushing buttons and keyboards clicking switches, walking a few steps to a car or public transport. Human body is hardly used and as a result suffers from many disorders and health problems. Everyone needs some physical activity to maintain physiological health.

### **Interdisciplinary Relevance**

Sports and physical activities are associated with mental as well as physical health of an individual. In yoga, mudra, asana or pranayama the effects are omnifarious and touching to every discipline associated with human life. Such as psychology, physiology, anatomy, physiotherapy, medical, pharmaceutical etc.

The importance of yoga, pranayama and Ayurveda along with regular physical mental, respiratory exercise is increasing rapidly. Certain NGO's, health organizations and certain institutions are working in direction to popularize yogic and pranayama practices. But the things are propagated by the support of ancient scriptures and mythologies. It is the need of time to support such activities on the basis of firm scientific data.

Patanjali yoga peeth horidwar and Kaivalyadhama Lonavala yoga research center is doing lot of research in this field. Swami Ramadev Baba and and Shri Shri Ravshankar along with other saints are restlessly working to spread the importance of pranayama. All over the India, activities are being preferred, practiced and popularized with the assistance of NGO's and other organization working in the field of human health.

### **Objectives**

- To assess physiological function especially pulmonary function, and status of biochemical variables and personality of healthy collegiate students.
- To design a schedule of "Pranayama" considering the physiological and biochemical aspects leading to good health.
- To record the efficacy of the Pranayama schedule on the physiological functions, biochemical status.

### **METHODOLOGY**

The purpose of this study was to evaluate effect of pranayama on physiological aspects among adolescents Sixty male adolescents (n=60) aged 18 to 22 years, who are thoroughly screened through an eminent physician of Faizpur and are with no known medical complications, were pooled for this controlled experiment. The subjects were matched into two groups viz., *Pranayama group* (Gr. I) and *Control group* (Gr. II). The participants who were willing to participate and medically fit were included in this experiment. Further, known smokers or chronic alcoholics were excluded due to complex nature of their problem and expected poor compliance.

Informed consent (of all the participants prior to the experiment was taken with standard format (as per the Declaration of Helsinki). The training stimulus for this experiment was of low to medium intensity, which was constructed on the basis of scientific principles of Yoga. Moreover, as the period of actual training was for eight weeks, the consequences of the same are not expected to be detrimental in any way. Nevertheless, the study protocol had been approved by the institutional ethical committee.

The experiment was conducted in considering three phases i.e. Phase – I: Pretest, Phase – II: Training or Treatment, and Phase – III: Post test. All the subjects of experimental and control groups were exposed to different physiological and biochemical tests viz., Pulse Rate, Breath holding capacity, Vital Capacity, Body fat %, personality and Lipid profile to record the pre test or baseline data.

After the completion of pre test, all the subject of experimental group were exposed to a two months (8 week) training of selected pranayama techniques for one hour daily in the morning from 6.30 to 7.30 except Sunday and holidays under expert yoga teacher. During this period control group subjects were engaged in recreational activities. In general, asanas are practiced prior to the practice of pranayama, because they are complimentary to each other. However, as this project has specially designed to record the effect of pranayama, some of the basic asanas were introduced. They were – **1<sup>st</sup> – 2<sup>nd</sup> Week** Shavasana, Crocodile (4), Ardhalasana, Niralambasana, Naukasana, Sarpasana, and Paschimottanasana, Vrikshasana, Deep Breathing (10), Anuloma-Viloma (2-10), Kapalabhati (5-10), Bhastrika (5) 1 Om Recitation (5-10), Sit silently (breathing awareness for 5 mins.) **3<sup>rd</sup> – 4<sup>th</sup> Week** Shavasana, Pawanmuktasana, Naukasana, Viparitarani, Matsyasana, Ujjayi, Anuloma-Viloma (10), Kapalabhati (10-30), Bhastrika (5-25) 2 Om recitation (10), Sit silently (breathing awareness for 5 mins.). **5<sup>th</sup> -6<sup>th</sup> Week** Shavasana, Sarvangasana, Matsyasana, Yogmudra, Ujjayi, Bhastrika (25-40) 2 Om recitation (3), Sit silently (breathing awareness for 5 mins.). **7<sup>th</sup> – 8<sup>th</sup> Week** Shavasana, Sarvangasana, Matsyasana, Yogmudra, Ujjayi, Bhastrika (40) 2 Om recitation (3) Sit silently (breathing awareness for 5 mins.).

After completion of training period of 8 week posttest on selected physiological variables was assessed for all the subject of both the groups.

#### **Statistical Analysis**

Descriptive statistics have been applied to process the data prior to employing inferential statistics. Since there are two testing programmes (i.e., pre-test and post-test) conducted for two different groups on twelve variables, the inferential statistics applied was 2 x 2 x 11 Factorial ANOVA. Further, Scheffe's post hoc test was employed to record comparative effects of yoga on the selected variables.

#### **RESULTS**

The report of analysis (2 x 2 x 11 Factorial ANOVA) as revealed that the achievement scores in the selected dependent variables of the Pranayama and Control group were significantly different ( $F=32.60$ ,  $p<0.01$ ). The impact of such statistical difference has been evidenced in the case of their group comparison ( $F=25.56$ ,  $p<0.01$ ). This indicates, the interaction was also statistically significant ( $F=11.48$ ,  $p<0.05$ ). However, employing Scheffe's Post Hoc techniques, the specific variables were identified, which showed significant changes as a result of pranayama training intervention.

#### **Result on Pulse Rate**

In pulse rate control group did not show significant change ( $CD=0.13$ ,  $p>0.05$ ). Pranayama group showed significant reduction ( $CD=0.27$ ,  $p<0.05$ ) in Resting Pulse Rate. Further, Pranayama group showed significant superiority over the Control group in reducing Resting Pulse Rate ( $CD=0.22$ ,  $p<0.05$ ).

#### **Result on Breath Holding Capacity**

In breath holding capacity Control group did not show significant change ( $CD=0.15$ ,  $p>0.05$ ). Pranayama group showed significant improvement ( $CD=0.41$ ,  $p<0.01$ ) in Breath holding capacity. Pranayama group showed significant superiority over the Control group in improving Breath holding capacity ( $CD=0.30$ ,  $p<0.05$ ).

#### **Result on Vital Capacity**

Control group did not show significant change in Vital capacity ( $CD=0.10$ ,  $p>0.05$ ). Pranayama group showed significant improvement ( $CD=0.45$ ,  $p<0.01$ ) in Vital capacity. Pranayama group showed significant superiority over the Control group in improving Vital capacity ( $CD=0.37$ ,  $p<0.05$ ).

**Result on Cholesterol**

Control group did not show significant change in Cholesterol (CD=0.11,  $p>0.05$ ). Pranayama group showed significant reduction (CD=0.25,  $p<0.05$ ) in Cholesterol. Pranayama group showed significant superiority over the Control group in improving Cholesterol (CD=0.29,  $p<0.05$ ).

**Result on Triglyceride**

Control group did not show significant change in Triglyceride (CD=0.08,  $p>0.05$ ). Pranayama group showed significant reduction (CD=0.27,  $p<0.05$ ) in Triglyceride. Pranayama group showed significant superiority over the Control group in improving Triglyceride (CD=0.23,  $p<0.05$ ).

**Result on HDL**

Control group did not show significant change in HDL Cholesterol (CD=0.13,  $p>0.05$ ). Pranayama group also could not show significant reduction (CD=0.10,  $p<0.05$ ) in HDL Cholesterol. Pranayama group showed similar result like the Control group in maintaining HDL Cholesterol (CD=0.11,  $p>0.05$ ).

**Result on LDL**

Control group did not show significant change in LDL Cholesterol (CD=0.16,  $p>0.05$ ). Pranayama group showed significant reduction (CD=0.36,  $p<0.05$ ) in LDL Cholesterol.

Pranayama group showed significant superiority over the Control group in reducing LDL Cholesterol (CD=0.30,  $p<0.05$ ).

**Result on VLDL**

Control group did not show significant change in VLDL Cholesterol (CD=0.14,  $p>0.05$ ). Pranayama group showed significant reduction (CD=0.28,  $p<0.05$ ) in VLDL Cholesterol. Pranayama group showed significant superiority over the Control group in reducing VLDL Cholesterol (CD=0.22,  $p<0.05$ ).

**Result on Cholesterol to HDL Ratio**

Control group did not show significant change in Cholesterol-HDL ratio (CD=0.12,  $p>0.05$ ). Pranayama group also could not show significant reduction (CD=0.09,  $p<0.05$ ) in Cholesterol-HDL ratio. Pranayama group showed similar result like the Control group in maintaining Cholesterol-HDL ratio (CD=0.08,  $p>0.05$ ).

**Result on LDL to HDL Ratio**

Control group did not show significant change in LDL-HDL ratio (CD=0.13,  $p>0.05$ ). Pranayama group also could show significant reduction (CD=0.26,  $p<0.05$ ) in LDL-HDL ratio. Pranayama group showed significant reduction than the Control group in reducing LDL-HDL ratio (CD=0.20,  $p<0.05$ ).

**Result on Body Fat**

Control group did not show significant change in Body fat (CD=0.15,  $p>0.05$ ). Pranayama group also could show significant reduction (CD=0.33,  $p<0.05$ ) in Body fat. Pranayama group showed significant reduction than the Control group in reducing Body fat (CD=0.27,  $p<0.05$ ).

**DISCUSSION OF RESULTS**

Human, in general, became sedentary due to change in modern lifestyle. In this age of automation, human takes help from machines for almost every work. Therefore, they become sedentary and more dependent on machines. The collegiate students are not the exception. Such a state of physically inactive life affects blood circulation, reduces muscles function, declines range of motion in joints and puts on excessive body fat (Anderson *et al.*, 1998; Twisk *et al.*, 2000). This indicates that collegiate students might be akin to poor physiological and biochemical functions, which may affect personality too.

To overcome such a poor state of physiological as well as biochemical functions and to reinstate good health, various strategies (viz., daily walking, participation in games, sports, or doing regular gym exercises, control of diet etc) are available today. Since many of these strategies are very costly and need handful of facilities (sports equipments, play ground, gym, space etc.) which are rarely available in urban areas; the researcher, therefore, thought yoga in general and pranayama in particular

might be useful. As pranayama is easy to practice and does not need much facilities, and cost effective, it was thought appropriate to include pranayama for the collegiate students.

The result on physiological variables revealed that selected pranayama practices were found useful to reduce pulse rate. In fact, *pulse rate is one of the attributes that represent heart functions*. The reduction in pulse rate among the healthy individuals signifies lower workload on heart. Moreover, improvement in breath holding capacity and vital capacity suggests that pranayama practices could help to improve the functional ability of the lungs. Since the function of lungs and heart are complementary to each other, the appearance of such results infers that pranayama is useful to regulate cardio-respiratory functions. Thus, pranayama training improves overall physiological functions and therefore the hypothesis- “H<sub>1</sub>: Pranayama practices would improve physiological attributes especially pulmonary functions” as formulated in this study has been retained statistically.

The result on biochemical variables revealed that selected pranayama practices were found useful to reduce cholesterol, triglycerides, LDL, VLDL, Cholesterol-HDL ratio, and LDL-HDL ratio. In fact, all these variables are detrimental to heart functions. Reduction trend of these lipids to the normal range in the blood plays a significant role to keep the heart healthy and enhance the process of circulation. As the lipid profiles in the blood are well regulated by pranayama, obviously physiological functions are enhanced. It seems there is a possibility to improve HDL by pranayama practices and in reality such result appears. In fact, HDL is known as good cholesterol and pranayama helps to improve HDL in blood of collegiate students. It is commonly known that reduction in bad cholesterol (LDL) and improvement in good cholesterol (HDL) is a sign of good health and pranayama plays a key role for appearance of such result. Moreover, many of the earlier researches revealed that reduction of detrimental lipid profiles in blood reduces body fat to the normal range. In fact, pranayama could help to bring the same result and thus body fat is controlled to normal range. Thus, the hypothesis-“H<sub>2</sub>: Pranayama practices would lead to improvement in lipid profiles” has been sustained.

### CONCLUSION

The present study warrants following conclusions:

- Pranayama training for 8 weeks is found effective in improving physiological attributes especially pulmonary functions.
- The Pranayama training helps to reduce lipid profiles, which in turn controls obesity.

### CONTRIBUTION TO THE KNOWLEDGE

Ample of research reports on yoga support health benefits in human. Majority of these experiments could focus on overall yoga training intervention that includes *asanas, pranayamas, bandhas, kriyas, mudras etc.* However, the present investigation contributes the efficacy of only *pranayamas on physiological and biochemical attributes of human of average health*, which in fact could add a quantum of knowledge to the literature of tertiary system of Indian education.

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## **Influence of Environmental Attitude and Awareness among Teacher Trainees**

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### **ABSTRACT**

As we all know, the societies of the world are at a dreadful impasse. Teacher education, an integral component of the educational system, is intimately connected with the society and conditioned by the ethos, culture and character of a nation. The effectiveness of EE is based on knowledge, skills and attitude of the teacher trainee. The present study was taken to know about the environmental attitude and awareness of teacher trainees. Normative survey method was used in the present study. The sample was taken from teacher trainees of B.Ed. course. The results showed that 68% of female and 54% of male were having attitude towards environmental conservation while 36% of female and 52% male have favourable awareness about environment. No relationship was observed between environmental awareness and attitude among teacher trainees. Hence there is a need to organise educational programmes and group discussions about environment in teacher education institution.

**Keywords:** Environmental awareness, attitude and teacher trainees.

### **Introduction**

As we all know, the societies of the world are at a dreadful impasse. The only things that are moving forward are human suffering, rampant materialism and fear for the future. Money is God. Everyone is afraid to have it and not to have it. Nations and Governments are paranoid about money — not education, not good teachers. Surprisingly, good education and good teachers will give us not only the prosperity we need but also happiness and peace. A good teacher is the most valuable asset of a nation. The teacher's place in a community is the most important one. Teachers can be the redeemers of a void-filled society. To build a civilisation of caring and thoughtful people we need good teachers.

Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action

Environmental Education is a new focus for education. It is a way of helping individuals and societies to resolve fundamental issues relating to the current and future use of the world's resources. However, simply raising awareness of these issues is insufficient to bring about change. Environmental Education must strongly promote the need for personal initiatives and social participation to achieve sustainability.

Environmental education is the study of developing a code of human behaviour that is environment values to protect and improve our environment.

### **Principles of Environmental Education**

1. Environmental Education must involve everyone.
2. Environmental Education must be lifelong.
3. Environmental Education must be holistic and about connections.
4. Environmental Education must be practical.
5. Environmental Education must be in harmony with social and economic goals and accorded equal priority.

### **Significance**

Teacher education, an important part of educational system, is closely associated with the society, since it is conditioned by the ethos, culture and character of a nation. Similarly EE is also intimately linked with Teacher Education and education system and the effectiveness of EE depend



primarily on the knowledge, skills and attitudes of the teacher trainee. The present day concern is that how best the integration of EE into teachers' training curriculum and educational system is effectively done. The study about the level of teacher trainees' awareness and attitude towards environment will enlighten the status of EE integration into the teacher trainee's curriculum.

### Objective

The objectives of the study are to find out the status of environmental awareness and attitude of male and female teacher trainees and relationship between environmental awareness and environmental attitude of B.Ed. students.

### Research Design

Normative survey method of was adopted for sampling among male and female B. Ed. Students from Teacher Training College, Mumbai. For the collection of data, two environmental tools, Environmental Attitude Scale for Teacher Trainees (EASTT) and Environmental Awareness Test for Teacher Trainees (EASTT) were developed and validated for use.

### Findings

Table 1 indicates that the majority of the teacher trainees fall in the category of high attitude level. It is interesting to note that 68% of female and 54% of male fall in this category.

**Table 1 : Frequency and percentage of respondents on environmental attitude**

Attitude Level	Range of Scores	Female (N=50)	Response (%)	Male (N=50)	Response (%)
High	37-51	34	68	27	54
Average	16-36	13	26	13	26
Low	0-15	03	06	10	20

Table 2 clearly shows that majority of male and female had intermediary awareness towards environment. It was found that 36% female and 52% male had favourable awareness while equal percentage of male and female had unfavourable awareness towards environment. Since value of correlation (r) is insignificant between environmental awareness and attitude, it is found in the present study that there is no relationship between the environmental awareness and attitude.

**TABLE 2. Frequency and percentage of awareness of teachers trainees towards environment**

Range of scores (Male)	Male (N=50) Frequency Attitude	%	Classification of environmental Awareness	Female(N=50) Fequency	%	Range of scores (Female)
59 and above	12	24	Most favorable	13	26	59 and
52-58	14	28	Favourable	5	10	above 49-55
45-51	18	36	Intermediary	26	52	42-48
38-44	4	8	Unfavourable	4	8	35-41
37 and less	2	4	Most Unfavourable	2	4	34 and less

**Educational Implications**

In the recent scenario the teacher's role increases tremendously since the environmental concern and problems are manifold. So, there is a need of preparing teachers to become EE facilitators. EE is not only meant for a change in 'what' is being 'how' (the approaches and attitude) it is taught. To protect the environment, the essential personal commitment and action are associated with the knowledge, skills and attitudes of teacher trainees. These criteria are to be developed among teacher trainees through organizing educational programmes, focused group discussions in teacher education in all grades. Parents and teachers should try to inculcate knowledge about environment and develop positive and healthy attitude towards environment from the very beginning of life. The environmental issues, problem and attitude, which would have significant impact on intentional ecological behaviour must be emphasized for directing people towards conservation of environment.

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## **A Study of Importance of Agro-Tourism in Maharashtra W.R.T. Konkan Region**

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### **ABSTRACT:**

Tourism is now well recognised as an engine of growth in the various economies in the world. Several countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large-scale employment and additional income sources to the skilled and unskilled. Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people.

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions. Moreover, this activity brings visitors closer to nature and rural activities in which they can participate, be entertained and feel the pleasure of touring. Agro-Tourism is helpful to the both farmers and urban peoples. It has provided an additional income source to the farmers and employment opportunity to the family members and rural youth. But, there are some problems in the process of the development of such centers. Hence, the government and other related authorities should try to support these activities in Maharashtra for the rural development and increase income level of the farmers. The farmers should also try to establish their co-operative society for the development of agro-tourism centers. The agro-tourism may become a cash crop for the farmers in Maharashtra and also an instrument of the rural employment generation.

### **INTRODUCTION:**

Tourism is now well recognised as an engine of growth in the various economies in the world. Several countries have transformed their economies by developing their tourism potential. Tourism has great capacity to generate large-scale employment and additional income sources to the skilled and unskilled. Today the concept of traditional tourism has been changed. Some new areas of the tourism have been emerged like Agro-Tourism. Promotion of tourism would bring many direct and indirect benefits to the people.

Agro-tourism is an innovative agricultural activity related to tourism and agriculture both. It has a great capacity to create additional source of income and employment opportunities to the farmers. Maharashtra is one of the major tourist centers in the India and there is large scope and great potential to develop agro-tourism.

### **OBJECTIVES OF STUDY:**

The objectives of this paper are follows:

- To examine the importance of agro-tourism development in Maharashtra.
- To define a suitable framework for the of agro- tourism centres in the view of marginal and small farmers.
- To identify the problems of the agro-tourism and make suggestions to establishment and operations of agro-tourism.

**IMPORTANCE OF STUDY:**

Agriculture is the most important occupation in the India including in the Maharashtra. But, today it becomes unprofitable due the irregular monsoon, prices fluctuations of Agro-products and some internal weaknesses of the agriculture sector. Hence, there is need to do some innovative activities in the agriculture, which will help to farmers, rural people.

Urban population is increasing day by day in the Maharashtra, today the urban people's world is restricted in the closed door flats, offices, clubs, television, video games, spicy fast food, computer, internet, and so on. They can see nature only on television or screen of the computers. More over some people living in the cities do not have relatives in villages and they never visited or stayed in village. These people want to enjoy rural life but there is problem of such type of facilities. Hence, it is opportunity to the farmers for the development of the agro-tourism centres and it serves him and create additional income source.

**RESEARCH METHODOLOGY:**

The scope of the study is limited to examine the benefits and applicability of agro-tourism business in Maharashtra. The study includes their benefits and problems. As well as it includes appropriate framework regarding to establish the agro-tourism centers in the Maharashtra. The present study was conducted on the agro-tourism is based on secondary data. The data has been furnished from the related articles, research papers, reports and 11th plan document of the government of India. Some data has been furnished from the websites of the government of India and Maharashtra, as well as ministry of agriculture. Some ideas have been taken from the Tourism Development Corporation of Maharashtra.

**REVIEW OF LITERATURE:**

A term 'Agro-Tourism' is a new face of tourism. An agro-tourism is farm based business that is open to the public. These specialized agro-tourism destinations generally offer things to see, things to do, and produce or gifts to buy, and are open to the public. Agritourism is defined as "Travel that combines agricultural or rural settings with products of agricultural operations – all within a tourism experience". According to Mr. Pandurang Tavare (ATDC, Pune) - "Agro-Tourism is that Agri-Business activity, when a native farmers or person of the area offers tours to their agriculture farm to allow a person to view them growing, harvesting, and processing locally grown foods, such as coconuts, pineapple, sugar cane, corn, or any agriculture produce the person would not encounter in their city or home country. Often the farmers would provide a home-stay opportunity and education". Agro-Tourism and Eco-Tourism are closely related to each other. Eco-Tourism provided by the tour companies but, in the agro-tourism farmers offer tours to their agriculture farm and providing entertainment, education and fun-filled experiences for the urban people.

Agro-tourism is a way of sustainable tourist development and multi-activity in rural areas through which the visitor has the opportunity to get aware with agricultural areas, agricultural occupations, local products, traditional food and the daily life of the rural people, as well as the cultural elements and traditions. Moreover, this activity brings visitors closer to nature and rural activities in which they can participate, be entertained and feel the pleasure of touring.

**WHO CAN START AGRO-TOURISM CENTERS?**

The individual farmer can start agro-tourism who have minimum two hector land, farm house, and water resource and is interested to entertain the tourists. Apart from the individual farmer, agricultural co-operatives institute, Non-Government organisations, Agricultural Universities, and agricultural colleges may start their centers. Even Grampanchayats can start such centers in their operational areas with the help of villagers and farmers.

**REQUIREMENTS FOR AGRO-TOURISM CENTERS**

Researcher has identified the minimum requirements for the agro-tourism centre. To develop an agro-tourism in their farm, the farmer / farmers must have basic infrastructure and facilities in their farm as follows:

**INFRASTRUCTURE FACILITIES:**

- Accommodation facilities at same place or alliance with nearest hotels.
- Farmhouse, which has the rural look and feel comfortable along with all minimum required facilities.
- Rich resources in agriculture namely water and plants at the place.
- Cooking equipments for cooking food, if tourists have interested.
- Emergency medical cares with first aid box.
- The well or lake or swimming tank for fishing, swimming
- Bullock cart, cattle shade, telephone facilities etc
- Goat farm, Emu (Ostrich bird) farm, sericulture farm, green house, etc.

**FACILITIES BE PROVIDED**

1. Offer authentic rural Indian / Maharashtrian food for breakfast, lunch and dinner.
2. Farmers should offer to see and participate in the agricultural activities.
3. Offer an opportunity to participate in the rural games to the tourist
4. Provide information them about the culture, dress, arts, crafts, festivals, rural traditions and also give possible demonstration of some arts.
5. Offer bullock cart for riding and horse riding, buffalo ride in the water, fishing facility in your pounds or nearest lake.
6. Offer fruits, corns, groundnuts, sugarcane and other agro-products as per availability.
7. Show local birds, animals and waterfalls etc and give authentic information about them.
8. Must provide safety to tourists with the support of alliance hospitals.
9. Arrange folk dance programme, Shekoti folk songs bhajan, kirtana, lezim dance, dhangari gaja, etc.
10. Make available some agro-product to purchase to the tourist

**LOCATION FOR THE AGRO-TOURISM CENTRE**

Location is most the important factor for success in the agro-tourism. The location of the centre must easy to arrive and have a good natural background. Urban tourists are interested into enjoying the nature and rural life. So, farmers should develop their centre in the rural areas only which have a beautiful natural background to attract urban tourist in your farm.

The place of agro-tourism centre must be easy accessible by roads and railways. Tourists want to enjoy some historical and natural tourist places along with the agro-tourism. Hence, the centre should be developed near of these tourist places. It is more beneficial to both tourist and farmers. The places which are already tourist centres like Mahabaleswara, Panchgani, Nashik, Jotiba, Narshinghvasi, Pandharpur, Akkalkot, Konkan etc. These are the better places for the development of agro-tourism. Other than these places farmer can develop their centres in any affordable places.

**BENEFITS OF AGRO-TOURISM CENTERS**

Agro-Tourism has the potential to change the economic face of traditional agriculture. The benefits of agro-tourism development are manifold. It would bring many direct and indirect benefits to the farmers and rural people. Some of the benefits are following:-

- Employment opportunities to the farmers including farm family members and youth
- Additional income source for the farmers to protect against income fluctuation.
- Cultural transformation between urban and rural people including social moral values

- Farmers can improve their standard of living due to the contacts with urban people.
- Benefits to the urban people, they can understand about the rural life and know about the agricultural activities.
- It support for rural and agricultural development process.
- Help to the reduce burden on the other traditional tourist centers.

### **SUPPORTS TO THE AGRO-TOURISM IN MAHARASHTRA**

Promotion of Agro-Tourism involves some more important stakeholders namely Ministry of Agriculture and rural development ministry of the state and central governments. To promote domestic tourism, thrust areas identified by the government of India for the development of infrastructure, product development and diversification, development of eco-adventure sports, cultural presentations, providing inexpensive accommodation etc. The government has also realized the importance of agro-tourism. The Planning Commission of India had constituted a Working Group for the formulation of Tenth Five Year Plan on Tourism. It has accorded high priority to tourism as an instrument of employment generation and poverty alleviation in rural and backward areas by developing the potential of agro tourism to supplement farm incomes, and heritage tourism to promote village development.

AGRICULTURE TOURISM DEVELOPMENT CORPORATION –ATDC is the main promoter of this activity in the Maharashtra. ATDC is promoting agriculture tourism for achieving income, employment and economic stability in rural areas. It help to boosting a range of activities, services and amenities, provided by farmers and rural people to attract urban tourists to their area thus providing opportunity to urban people to get back to the rural roots”.

### **KEY TECHNIQUES FOR SUCCESS IN AGRO-TOURISM**

Agro-Tourism is a one of the business activities. So, farmers must have commercial mindset and some marketing techniques for the success. For the better success in the agro-tourism farmers should follow the following things;

- Give a wide publicity of your tourism centre by new papers, television etc Use all possible advertisement means.
- Develop contacts with the schools, colleges, NGOs, clubs, unions, organisations etc.
- Train your staff or family members for reception and hospitality
- Understand about the customers wants and their expectations and serve
- Charge optimum rent and charges for the facilities/services on the commercial base
- Do the artificially use local resources for the entertain / serve to tourist
- Develop your website and update time to time for attract foreign tourist
- Take their feedback and comments about the service and suggestions to more development and modification
- Develop a good relationship with the tourist for future business and chain publicity
- Develop different agro-tour packages of for different type of tourist and their expectations.
- Preserve an address book and comments of the visited tourists for future tourism business
- Behave sincerely with the tourists and participate with them / him
- Small farmers can develop their agro-tourism centres on the basis of cooperative society.

### **CONCLUSIONS AND POLICY IMPLICATIONS**

Maharashtra has a great potential to the development of agro-tourism, because of natural conditions and different types of agri products as well as variety of rural traditions, festivals. More than 45 percent of population live in the urban areas and they want enjoy rural life and to know about the rural life. It is a good opportunity to develop an agro-tourism business in Maharashtra. But there is a problem of low awareness about this business in the farmer and problem of the finance and proper view in the farmers of the Maharashtra.

Hence, the agriculture departments of the districts, Agriculture Universities should try to give orientation about it and provide some innovative ideas regarding to the Agro-Tourism. The government should try to provide optimum financial aids to the agro-tourism activities in Maharashtra by the grants and institutional finance. Bank should provide optimum financial help for the agro-tourism activities in the Maharashtra. Union of the agro-tourism service providers is also another need of these farmers which helps the agricultural tourism network in the India including Maharashtra.

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## **Teachers' Awareness of the Causes and Consequences of Climate Change and their Classroom Strategies**

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### **ABSTRACT**

The research study investigated teachers' awareness of the causes and effects of climate change and their classroom management strategies in climate change era. Since the teacher is the eyes and ear of any nation, the study will find out how hopeful we should be in the education of the leaders of tomorrow of Mumbai on the issues and problems of climate change. The findings of the study hopefully will be beneficial to education managers, curriculum developers, education ministry and future researchers.

The study was guided by three research questions and three null hypotheses. The researcher adopted a descriptive survey design. The study was carried out in two schools of Mumbai. A sample of 98 teachers was covered.

Data was collected using a 27 item researcher developed questionnaire titled teachers' awareness of causes and effects of climate change and their classroom management strategies (TACECCMS). Statistical mean and 't' test was used for the analysis. The findings revealed among others that teachers are not quite aware of the causes and effects of climate change. Based on the findings, recommendations were made.

**KEYWORDS:** Teachers, Awareness, Climate Change, Classroom Management, Strategy

### **INTRODUCTION**

It is a popular claim that climate change will result in increase in problem of flooding, loss of biodiversity, and changes in agricultural production among others. The above in simple language implies that climate change would result to increase in the level of poverty. Education is seen as the key that unlocks the door to development and thus breaks the pangs of poverty. The student teacher is indispensable in the education system as the extent of her awareness determines the degree of learning that can take place. It therefore follows that the teacher and classroom management cannot be over emphasized in the era of climate change. This is greatly so because the era requires a knowledgeable society in the area of issues connected to climate change.

The Indian education system relies heavily on its teachers who are central to the process of teaching and learning. The country has more than five million teachers working at different levels of school education and an equally huge network of teacher education institutions to meet the needs of teacher preparation for the country. Consequently, it spells out certain competencies, commitments, and awareness areas for the teachers to develop climate change awareness in their students. But are the teachers aware of the causes and consequences of climate change? Are they adopting appropriate strategies in this climate change era?

Climate change is one of the greatest public policy issues in our time. It has a lot of implications to humanity and the environment with its effects often linked to the collapse of various civilizations.



Climate change is a change in the statistical distribution of weather elements and which is sustained for up to a decade or more. For the United Nations Framework Convention on Climate Change (2004), climate change is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. From the above definitions, one can deduce that changes in climate can only be regarded as climate change if such changes are observed over comparable time periods of up to a decade. There is also the implication that climate change is caused by a number of factors.

The factors responsible for climate change are classified into two; namely: the climatic forcings and natural factors: such as solar radiation, mountain building and continental drift and b) The human factors which include: activities of man that increase the emission of greenhouse gases e.g. methane emitted during production of gas and transport of natural gas, oil, coal etc.; nitrous oxide emitted during the combustion of fossil fuels persistent deforestation land use animal agriculture .These actions pose a lot of challenges to mankind.

To respond effectively to these challenges, education has a key role to play in promoting, understanding and assisting individuals, the society and the government to make informed choices in relation to activities they take up. The classroom is said to be the most important unit of the educational system, as it is in the classroom that all the policies of education are finally implemented (Emeh, 1990). There is therefore every need to manage the classroom properly as this has serious consequences for the achievement of the school's set goals. Management is a generic term and subject to many interpretations. According to Drucker (1960) and Daft (2004), management is a function as well as the people who discharge it, a social position and authority and also a discipline and field of study. Arguing along this line, Babalola (2006) stated that management is being in charge or being in control. In relation to the education system,

Babalola asserted that educational management is being able to handle (carefully and not wastefully) what goes on in the process of educating people so that nothing goes out of hand. This definition agrees with the earlier contention of Amos (1996), that not only do managers monitor and inspect things but it is also usually their job to make predictions, to plan ahead and to decide how things will change and develop. Following from the above conception of the classroom and management, is the view of Emeh (1990) who contended that classroom management is, a process which includes the teacher deciding to do or not to do something, to plan and execute instruction, to make choices over a range of alternative teaching strategies, to monitor performance, and to collaborate with other people in the process of achieving educational goals and objectives. This implies that classroom management involves clear communication of behavioural and academic expectation as well as co-operative learning environment. It can therefore be agreed that classroom management is a general process of ensuring that lessons run smooth disruptions of any kind notwithstanding. The purpose of effective classroom management is therefore to create a community of pupils who will freely and willingly learn the norms and principles of the school and that of the society (Alexander 1971). It therefore follows that the most important factor in moulding character of students in the education process is the teacher who interacts with them in the classroom.

Classroom climate is the type of environment that is created for students by the school, the teachers and their peers in the school. Effective classroom climate demands four basic

mental needs: love, power (to be in control of our own lives) fun and freedom.

Freedom in this context demands giving students the chance to make choices about assignments and other lesson planning as well as to help make decisions about the classroom (Crothy 2002). Good classroom climate enables the students to meet their full learning potentials and thus imbibe the desired norms and culture of the society. As already established the teacher is in charge of the classroom and is a major factor in determining activities including those of learning that takes place in the classroom. The teacher thus commands a great influence on learners.

Supporting this argument Omenyi (2007) asserted that teachers are in charge in the classroom and are the clinic managers because they command and possess authority in the classroom. Continuing Omenyi observed that the teachers need to establish a climate of trust and respect to create a positive community for learning. It is true that the issue and problem of climate change have been on air and are seriously viewed by the West, Asia and Europe, but most Indians see climate change as white man's problem. Serious work has to be done in the education of our students in the area of climate change and its problems. It will be better to educate the adolescents through the school system for more impact and understanding to be made.

The major problems are the extent the teachers are aware of climate change and possible causes and effects, and the strategies they could apply in the classrooms to be able to educate the students effectively on that. The student teachers of today are tomorrow's teachers.

There are also serious flooding India. In all, human and material losses are incurred seriously. There is then an urgent need for Indians to be educated on the issues and problems of climate change with particular emphasis on how to prevent it or mitigate its adverse effects.

### **RESEARCH QUESTIONS AND HYPOTHESES**

The study was guided by the following research questions and hypotheses.

1. How far are teachers aware of the causes of climate change?
2. How far are teachers aware of the effects of climate change in the society?
3. What classroom management strategies teachers employ in view of the climate change?

On the null hypotheses, the following were tested at .05 level of significance:

1. The mean awareness scores of male and female teachers on the causes of climate change do not differ significantly.
2. There is no significant difference in the mean awareness scores of male and female teachers on the effects of climate change.
3. The male and female teachers do not differ in their classroom management strategies in view of climate change

### **METHOD OF STUDY**

The study adopted a survey design and was carried out in two schools of Mumbai. A total of 98 teachers were used in the study. There were 30 male and 68 female student teachers.

Convenient sampling technique was employed

The instrument used for data collection was researchers structured questionnaire titled Teachers Awareness OF Causes and Effects of Climate Change and their Classroom Management Strategies (IACECCMS). It is a closed type and was in form of check list. There are two parts in the instrument, viz Parts 1 and 2. Part 1 is on personal data of the

subjects while Part 2, which has three Sections, is on Causes and Effects of Climate Change and the teachers' Classroom Management Strategies.

#### ANALYSIS OF DATA

Mean scores were used for answering the research questions and t-test was employed in testing the null hypotheses.

#### RESULTS

The data collected were analyzed and the summaries of the analyses were presented in tables to highlight the findings.

The data collected were analyzed and the summaries of the analyses were presented in tables to highlight the findings.

**Table I: Mean Scores on Teachers Awareness of Climate Change on basis of Gender**

Variable	N	Causes of CC	Consequences of CC	Strategies
female	68	9.43	6.94	5.46
male	30	10.03	7.07	5.9

**Interpretation-** the mean value for the awareness of causes, consequences of climate change and classroom strategies of male teachers is higher than female teachers.

**Table II: Mean Scores on Teachers Awareness of Climate Change on basis of Educational background**

Variable	N	Causes of CC	Consequences of CC	Strategies
Arts	37	9.51	6.94	5.37
Commerce	32	9.47	6.78	5.63
Science	29	10.03	7.23	5.89

**Interpretation** – the mean value for the awareness of causes, consequences of climate change and classroom strategies of science teachers is higher than commerce and arts teachers.

#### TABLE III

**Hypothesis 1.** The mean awareness scores of male and female teachers on the causes of climate change do not differ significantly.

**Relevant Statistics for Significance of Difference between Means of School Teachers on the basis of gender**

Awareness of causes of climate change	N	M	SD	t	Table Value (0.05)	S/NS
female	68	9.43	3.53	1.69	1.98	NS
male	30	10.03	2.31			

**df=96**

**Interpretation-** The obtained 't' value is less than the table 't' value at 0.05 level of significance, that means it is not significant, therefore, the null hypothesis is retained.

**Conclusion-** There is no significant difference in awareness about causes of climate change among school teachers on basis of gender.

**Hypothesis 2.** There is no significant difference in the mean awareness scores of male and female teachers on the effects of climate change.

#### TABLE IV

**Relevant Statistics for Significance of Difference between Means of School**

**Teachers on the basis of gender**

Awareness of consequences climate change	N	M	SD	t	Table Value (0.05)	S/NS
female	68	6.94	1.28	0.58	1.98	NS
male	30	7.01	1.68			

**Df=96**

**Interpretation-** The obtained 't' value is less than the table 't' value at 0.05 level of significance, that means it is not significant, therefore, the null hypothesis is retained

**Conclusion-** There is no significant difference in awareness about effects of climate change among school teachers on basis of gender

**Hypothesis 3.** There is no significant difference in the mean awareness scores of male and female teachers on the classroom management strategies used for climate change

**TABLE V****Relevant Statistics for Significance of Difference between Means of School Teachers on the basis of gender**

Awareness of causes of climate change	N	M	SD	t	Table Value (0.05)	S/NS
female	68	5.46	1.27	2.86	1.98	S
male	30	5.9	0.16			

**df=96**

**Interpretation-** The obtained 't' value is greater than the table 't' value at 0.05 level of significance, that means it is significant, therefore, the null hypothesis is accepted.

**Conclusion-** There is a significant difference in mean awareness scores of male and female teachers on the classroom management strategies used for climate change

**DISCUSSION**

The findings of this study show majority of the teachers are not adequately aware of the causes and effects of climate change. These issues have been on air since 2004 when United Nations Framework Convention on Climate Change started emphasizing on the causes and dangers associated with climate change. One then wonders what then the fate of the future of India. Who will teach these students about this climate change if future teachers are not fully aware? Hence nobody can give out what he does not have.

Furthermore, the findings revealed that teachers are not adequately aware of classroom management strategies needed in this era of climate change. With this condition existing, how can we achieve the educational goals and objectives?

Also, the above finding negates the view of Crothy (2002) who stressed that good classroom management enables the students to meet their full learning potentials and thus imbibe the desired norms and culture of the society. This means that the students will not be able to imbibe the precautions spelt out by the United Nations on Climate Change. Since teachers according to Omenyi (2007) are in charge in the classroom, they are the clinic managers. Because they command and possess authority in the classroom there is serious need for government intervention for teachers cannot give out what he/she has not.

**CONCLUSION**

In conclusion, the study has revealed that teachers do not have enough of the required

knowledge of the causes and effects of climate change and that of the necessary strategies for classroom management in the climate change era. The study has contributed to knowledge in the following ways:

1. It has established statistically that the teachers lack the required knowledge in the area of climate change.
2. The findings serve as baseline data and source of inspiration for further research
3. It will inform the stakeholder in education the need for serious intervention.

#### **RECOMMENDATIONS**

The findings of this study call for number of recommendations among them are:

1. The curriculum needs to be revamped at B.Ed level.
2. Climate change and environmental issues to be made a part of the core study.
3. Institutions should without delay start organizing workshops and conferences on issues of climate change.
4. As a member of United Nations, Indian government should start carrying out radio and television campaigns on the causes and effects of climate change.
5. Government should start working on the schools by providing infrastructural facilities that could enable the teachers meet the demand of this era of climate change.

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## Reoccurrence of Injuries in Football at Three Level of Achievement

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### Abstract

The present study deals with identification and comparison of reoccurrence of injuries among three groups of competitive footballers. The investigator has made an attempt to classify the footballers based on the class of the games. Accordingly three groups of footballers were targeted. international, national and state groups footballers aged between 14 to 30 years. The data was collected with the help of questionnaires prepared by Cromwell, F.J. Walsh Gromley for Elite Gaelic footballers (2000) and it was modified by the investigator and utilized. The subjects were required to fill out a questionnaire for injury in the duration of last one year. In this study total 300 players were selected; out of 100 footballers of each groups. Total 300 questionnaires were administered out of 300 questionnaires 100 belongs to international, 100 belongs to national and 100 belongs to state groups s footballers.

The mean (S.Ds) age of International groups national group and State groups footballers were 21.25 (7.08), 23.33 (7.78) and 19.91 (6.29) in years respectively. Their weight were 58.35 (18.45), 58.23 (19.01), and 53.99 (17.33) kg. respectively, their height were 167.33 (55.33), 166.09 (55.10) and 164.87 (54.66) cm. respectively, their training were 4.61 (1.47), 4.31 (1.43), and 4.10 (1.33) days in a week respectively, their training durations were 2.74 (.58), 2.34 (.78), and 1.99 (.66) hours respectively, their warm-up were 28.53 (9.33), 36.05 (11.05) and 22.8 (7.8) minutes respectively, and competition was 8.67 (2.81), 8.68 (2.78), and 6.58 (2.11) in one year respectively. The Results of the study reveals that there were no significant deference of Injuries among three group football players.

### Introduction

Injury results in the loss of the opportunity to participate in a high valued activity and is a threat to continued success at sports. This is most problematic where injury is severe, or the process of rehabilitation is long or complicated. Serious injury can mean instant death to an athletic career cultivated by years of hardwork. Even relatively mild injury may have a significant impact on the athlete when its timing is such that is undermines competitive success, for example, if it occurs immediately prior to a key competition. (Jhell, d.a.1994). Many studies have investigated reoccurrence injuries in football (Ekstrand and Gillquist 1983a; Ekstrand and Gillquist 1983b; Tropp et al. 1984; Taimela et al. 1990b; Inklaar et al. 1996; Dvorak et al. 2000; Delaney et al. 2001; Soderman et al. 2001b; Delaney et al. 2002). Ekstrand and Gillquist (Ekstrand and Gillquist 1983a; Ekstrand and Gillquist 1983b) found an increased risk of ankle and knee sprains in players with a history of previous sprains or clinical instability in ankles and knees. Delaney et al. found in retrospective studies that football players had increased risk of incurring a concussion if they had a previously recognized concussion during football. Studies indicate that recurrent injuries represent 22- 42% of total number of injuries in football (Ekstrand et al. 1983a; Nielsen and Yde 1989; Hawkins and Fuller 1999; Chomiak et al. 2000). Reoccurrence muscle strains account for 26-61% of all strains (Nielsen and Yde 1989; Inklaar 1994b; Hawkins and Fuller 1999), and recurrent ligament sprains for 30% of all sprains (Hawkins and Fuller 1999). Studies have also shown that recurrent ankle sprains represent 32-56% of all ankle sprains occurring in football (Ekstrand and Gillquist 1983a; Nielsen and Yde 1989; Hawkins and Fuller 1999). However, Tropp et al. (Tropp et al. 1984) found no correlation between previous ankle

sprains and new sprains in football players. Ekstrand and Gillquist (Ekstrand and Gillquist

1983a) also indicated that even minor injuries could predispose for more severe injuries of same or other type and location (Ekstrand and Gillquist 1983a).This injuries

**Target population**

Total 300 male competitive footballers; 100 out of International players, 100 National players and 100 State groups football players from different Clubs, Academy, State and University were selected as a subject for the present study. Inter-varsity footballers have been considered as national players. Their age ranged from 14 to 30 years.

**Administration of the test :-**

Some questionnaires were sent to different Club, Academy, State and University who had participated in International, National, State and Inter-varsity tournament and some cases contacting footballer at the venue of State, University, and National tournament held at different places. Instructions were given to the footballers before filling these questionnaires by the researcher, football coach and football experts.

**Tools of the study :-**

For the present study, modified questionnaires prepared by Cromwell, F.J. Walsh Gromely (2000) for Elite gaelic footballers was utilized after the modification of these questionnaires and the test -retest reliability was found out 0.94 by the researcher.

**Colletion of data :-**

Data was collected individually through a questionnaire from 300 competitive footballers of different Academy, Clubs, State and University separately, Some questionnaire were received to the researcher by the post and some by contacting footballers at the venue of Inter-varsity, State and National tournaments.

**Statistical technique :-**

Statistical techniques play very significant role in the interpretation of numerical data obtained from individuals by giving numerical expressions to the relationships and the variations with respect to different aspects. Keeping in view the aim of the study, following statistical tools have used for interpretation of the data (Garett, 1981). The statistical computation of data of the present study is used by using SPSS package in the computer. The result computed also cross checked by using following statistical variables.

**Table – I**

Mean Scores and Standard Deviations of reoccurrence of injuries among three groups of competitive footballers.

<b>Footballers</b>	<b>Number</b>	<b>Mean scores</b>	<b>Standard Deviations</b>
International (INT)	24	1.87	.72
National (NA)	14	1.28	.51
State (ST)	18	1.33	.61

As per Table-5.30, shows that the mean scores and standard deviations of incidence of injuries reoccurrence of old among three groups of competitive footballers.

The mean scores and the standard deviations obtained from Table 5.30, the highest mean score is in international groups footballers (1.87) and the lowest mean score is in national groups footballers (1.28) and the mean scores of the rest falls between these two groups competitive footballers.

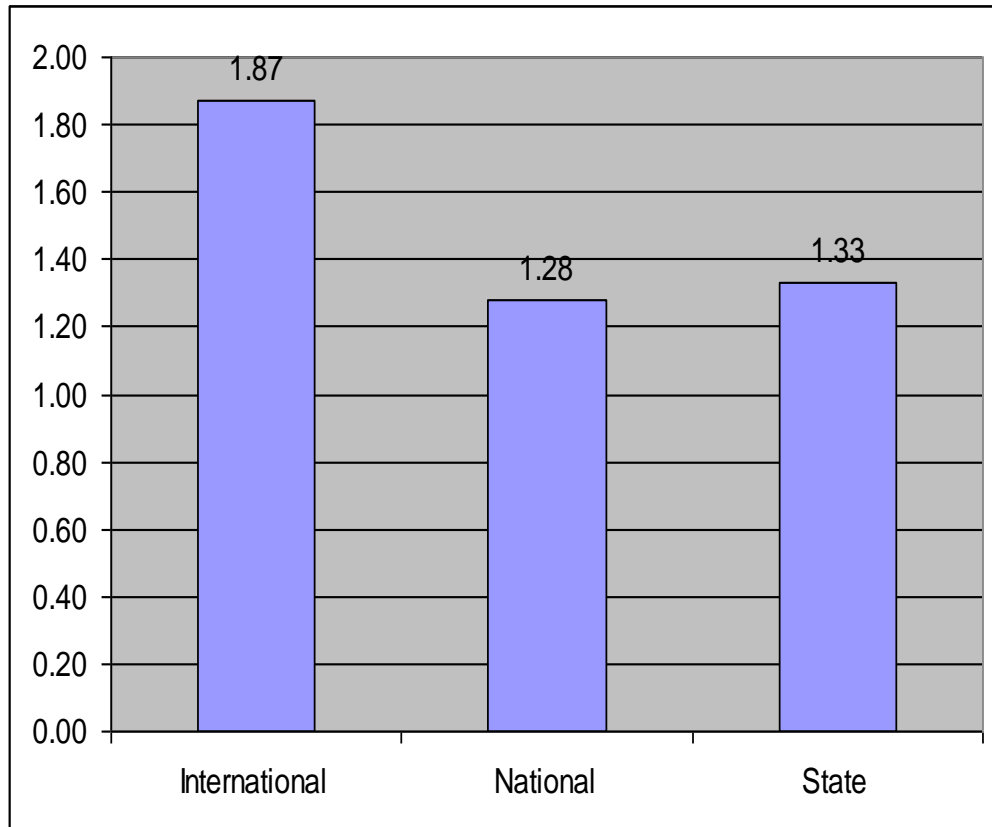
The sample of footballers indicated by the standard deviation which is not higher than (.72) in case of international groups footballers and not lower than (.51) in case of national groups footballers. In other words, the mean scores and standard deviations of reoccurrence of old injuries among three groups of competitive footballers are decreasing from international to national groups.

Mean scores of incidence of reoccurrence of old injuries for three groups of competitive

footballers have been depicted graphically in figure-I.



Figure I showing Mean Scores of Reoccurrence of Injuries among three groups of competitive footballers



In order to find out the statistically significant difference of reoccurrence of old injuries among three groups of competitive footballers; one way analysis of variance was used to compare the reoccurrence of old injuries.

The results of Analysis of variance of reoccurrence of old injuries among three groups of competitive footballers formed on the basis of reoccurrence of old injuries is presented in Table 5.31

Table – 2.

Analysis of variance of Reoccurrence of old injuries among three groups of competitive footballers.

Source of Variance	SS	df	MSS	F- ratio
Between Groups	4.35	2	2.17	2.15 <sup>NS</sup>
Within Groups	53.51	53	1.009	

NS = Not Significant

Table-2 reveals no statistically significant difference of reoccurrence of old injuries was found among three groups of competitive footballers as above observed in F-ratio was 2.15 which is required to be 3.17 at 2,53 df. at .05 level of significance.

## Discussion

State groups footballer are more younger to international and national groups footballers, while international groups footballers are more weighted to their counterparts. However, state groups footballers are more shorter to their counterparts. Meanwhile, international groups footballers more time spend in training. Not with understanding national groups footballers has given more time in warm-up. National groups footballers also have been playing more competition in one year as compared to international and state groups footballers. The mean (S.Ds) age of International groups national group and State groups footballers were 21.25 (7.08), 23.33 (7.78) and 19.91 (6.29) in years respectively. Their weight were 58.35 (18.45), 58.23 (19.01), and 53.99 (17.33) kg. respectively, their height were 167.33 (55.33), 166.09 (55.10) and 164.87 (54.66) cm. respectively, their training were 4.61 (1.47), 4.31 (1.43), and 4.10 (1.33) days in a week respectively, their training durations were 2.74 (.58), 2.34 (.78), and 1.99 (.66) hours respectively, their warm-up were 28.53 (9.33), 36.05 (11.05) and 22.8 (7.8) minutes respectively, and competition was 8.67 (2.81), 8.68 (2.78), and 6.58 (2.11) in one year respectively. Football is a high risk sport dominated by overuse injuries while recovery time from injuries is relatively long, but only a few working days are lost by the players to return back to play, thus leading to abuse of the injured sites. In football only a few studies have been made in the literature regarding incidents of injury and pattern, possible risk factors and injury prevention ( Winter Griffith, 1989; waskan. 1993; Junge, 2004 ). In football overuse injuries are the most frequent incidences of injury; and injuries are traditionally divided into contact and non contact causes in which case contact refers to players contact. Some of the forces involved in a non contact injury are transmitted from the playing surface to the injured body part. (Orchard et.al. ,2001)

Injuries in football normally occur due to physical contacts. Even though injuries in football are driven by several factors, factors such as the physical and the lack and/or improper physical preparation, the violence and harsh playing style of the opponents, Injuries in sport activities can occur for many reasons such as stumble, tackle, running, foul play and collision. (Cromwell ,2000) No matter how safe the environment or how well conditioned the athlete is will sometimes inevitably produce some injuries, whether it is by contact with other bodies or by psychological factors as discussed before in this study Soccer entails physical contact in the course of tackling or contesting possession of the ball with opponents and this inevitably leads to injury of varying severity (Reilly & Howe, 1996). A majority of injuries are unintentional, resulting from an error may lead to an accident and some of these accidents lead to injuries.

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## New Trend to Participation in Adventure sports

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### Introduction:-

Sports play a vital role in everybody's life in one or another. Someone is playing, someone is watching. Sports are played for fun or for money or for both. Sports bring people together and also set apart. Sports play a pivotal role in the making of a youth, especially students and corporate sector. It offers several health benefits and the career opportunities too.

In the world many types of sports activities are played. And the impact of participation in those activities matters a lot.

E.g. - According to researchers at the Institute for the Study of youth sports at Michigan State University, those who participate in sports do better in academics, have better interpersonal skills and are generally healthier.

As a human being we are posed in the world in such a manner that we are compulsive adventurous. Adventure sports gives you thrill, excitement and extraordinary experiences. It helps to identify your strengths and weakness and accept you as a person.

### Importance of Adventure sports:-

Take a look at some of the ways adventure sports can positively influence a person, especially youth, because in this sports activity, the youth are participating in huge number.

1. To develop strong team building bounding and utilize the sy-energy to achieve bigger goal & targets.
2. To develop true leadership skill and qualities of our kids and youth.
3. To face and overcome any emergencies created by Natural/Human disturbances at all times.
4. To know our Natures/Mother earth very well and to preserve/ protect the Natural wealth.
5. To know our Religion/Culture and heritage very well through proper training, try out best to preserve/protect it.

### Objectives:-

1. To study what is adventure sports.
2. To study the benefits of Adventure sports.
3. To study the role of organization, institutions and adventure sports in Maharashtra.
4. To study about equipments.
5. To study safety paramount.

### Review of Literature:-

1. Various types of journal and review of research.
2. Books in adventure sports and mountaineering.
3. News papers.

### Methodology:-

Methodology means a system of methods and rules applicable to research. There are survey method and field research method.

### Sampling:-

1. 200 organization, institutions in Maharashtra.
2. 4000 Members from various organizations, Institutions.
3. 25 experts in adventure sports.
4. 50 parents of participants.(adventure sports)

**Sources of Information:-**

1. Primary Source: The information which are collected through questionnaire and interview.
2. Secondary Source: Information which are collected from libraries, Handbooks, Reports, Reviews and gazetteers still remain the principal source of data.

**Limitations of study:**

The scope of this study of Adventure sports in Maharashtra need is limited to the survey of Maharashtra. It is representative survey. Due to the time constraints study of Maharashtra.

**Recreation and Adventure sports:-**

Adventure is state of mind. There is plenty of adventure events divided into three major parts according to their nature.

**➤ Terrestrial Adventure:**

1. Trekking/Hiking/Nights Treks.
2. Camping
3. Rock Climbing – Basic & Advance levels.
4. Rope Management.
5. Rappelling/Valley crossing/Flying fox/Jummaring.
6. Himalayan Treks & Exploration Tours.
7. Wildlife Study tours & visits.
8. Nature trails.
9. Heritage: Fort/Caves study treks.
10. Caving
11. Bungee jumping.
12. Moto sports.

**➤ Aqua Adventure:**

1. Swimming/Boating.
2. River Rafting.
3. Canonnering (Water fall rappelling).
4. Yachting.
5. Sea Kayaking & Surfing.

**➤ Aero Adventure**

1. Aero Modeling.
2. Para Sailing-land/Beaches/Power Boat.
3. Para Gliding.
4. Power Hang Gliding.
5. Para Motoring.
6. Hot air Ballooning.
7. Sky Diving,
8. Cave Diving.
9. Scuba Diving.

**Benefits of Participating in Adventure sports:-**

When we talk about benefits we have to divide all benefits.

**1. Physical Benefits:-**

- Fitness.
- Constructive expenditure of energy.
- Healthy habits.
- Adrenaline rush.

**2. Personal Benefits:-**

- Valuing preparation.
- Resilience.

- Leadership opportunities.
- Identity and balance.
- Time Management.

### 3. Social Benefits:-

- Relationship with others.
- Teamwork.
- Diversity.
- Relationship with adults.
- Love for nature.

### 4. Psychological Benefits:-

- Stress Relief.
- Attitude Control.
- Emotion Control.

### Future Prospect:-

Many courses provide you opportunities as adventure sports professional in following type of organizations:

1. Excursion Agencies.
2. Holiday Resorts.
3. Commercial recreation centers.
4. Sports centers & clubs.
5. Adventure sports photographer.
6. An instructor.
7. Set up an adventure sports centre.
8. Work as a liaison officer in travel & tourism agencies.

### Adventure sports as a career:-

Every one likes the career which brings name, fame and money for lifelong. A career with a life long enjoyment is a priority of all. Adventure sports definitely provide you that career. Adventure tourism is a booming sector due to the involvement of the media like National Geographic, Discovery, AXN, etc. People are becoming more aware and want to plan adventure holiday instead of routine vacation.

The demand of trained professionals in this field is much more than their availability. A qualified graduate in adventure sports can get a job of executive guide or a trainer in Adventure Sports Institutes, Travel Agencies or Adventure Clubs & Sites.

### Conclusion:-

1. Commercial organizations are arising.
2. Lack of shortage world class equipments and gear.
3. Safety and Security of Adventure sports persons are not properly run by the institution and Club.

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## Communal Harmony in Mahesh Dattani's *Final Solutions*

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Contemporary Indian Drama Shows a Special Penchant for the study of man where playwright like Mahesh Dattani set his microscopes to study man's social and family relationships. Man's social, emotional, economic and physical needs have driven him to form association with his fellow beings resulting in the emergence of the institutions like family and society. In personal and social relationships man has moved no doubt but perhaps in a zigzag motion that the threads of love and affection or even betrayal have got tangled and solving the puzzle of these threads has become a hard nut to crack.

Mahesh Dattani is the first Indian playwright to be awarded the prestigious Sahitya Akademi Award for his unique contribution to theatre. His endeavor is different from earlier attempts at staging Indian Drama in English as he chooses to entertain his spectators, at the same time making them feel at home with the incidents on the stage from their life itself and making them reflect a bit on their own lives. Thematically, Dattani's plays belong to the existing times dealing with sexuality, gender issues, religious tension, class conflicts, homosexuality etc. Dattani makes an abundant use of the Indian mythology, rituals, Traditions, contemporary problems and elevates these themes to higher level touching the human chords that emanate love, happiness, sexual fulfillment and the problem of identity. The plays of Mahesh Dattani emerged as 'fresh arrival' in the domain of Indian English Drama in the last decade of the twentieth century. John Mc Rae in his Introduction to Dattani's plays writes, "They are plays of today, Sometimes as actual as to cause controversy, but at the same time they are plays which embody many of the classic concerns of world drama" (Qtd in Dhawan 20)

Dattani's dramatic art is inspired by the mission to communicate profound meaning through his plays and therefore he exhibits keen awareness for the direction and stage performance of his own plays. Most of the issues taken up by Dattani in his plays are radical, unconventional, contemporary and free from the taboos. In the present paper, I am going to discuss communal harmony in *Final Solutions*, the major issue handled by Mahesh Dattani.

Dattani's '*Final Solutions*' is a prize-winning play as a brave attempt at portraying to feel in the primitive way and is sadly lacking in human understandings. To quote Alyque Padamsee's note on the play in this context, "Is life a forward journey or do we travel round in circle returning to our starting point? Can we shake off our prejudices or are they in our psyche like our genes? Will we ever be free or ever locked in combat... Arabs against Jews, white against blacks, Hindus against Muslims? Are they any final Solutions?" (161)

The present drama projects two Muslim intruders in a traditional Hindu family during a communal Hindu-Muslim riot. Much to the surprise of the other characters, Smita, the young daughter of Ramnik and Aruna Gandhi, reveals that she has been acquainted with the two Muslim youngmen. The old grandmother Hardika recalls the Hindu-Muslim riot after Independence and appears panicky because of the intrusion of the two Muslim young men inside the house. Hardika's husband and father-in-law exploited a Muslim shopkeeper (burning his shop in the name of communal hatred) to enhance their own business, a fact that was known to Hardika's son Ramnik. His anger at his father's shameful act led him to analyze the causes behind the Hindu-Muslim riot from an unbiased viewpoint. A mob of individuals outside the Gandhi house, who alternatively put on Hindu and Muslim masks to give out violent hatred for the other community. Daksha's diary introduces the theme of Hindu-Muslim riot as an integral part of Indian Independence. Daksha recorded the incident as a most terrible thing she wrote,

My father has fought for that hour. And he was happy when it came. He said he was happy we were rid of the Britishers. He also said that something I did not understand then. He said that before

leaving, they had let loose the dogs. I hated to think that he was talking about my friends' fathers---- But that night in Hussainabad in our ancestral house-when I heard them outside- I knew that they were thinking the same of us. And I knew that I was thinking the same, like my father. (167)

After forty years of independence, Hardika again witnesses a Hindu-Muslim riot, but the two Muslim young men who have entered her house for safety, reveal that the table is turned this time. Through Hardika's analysis Dattani highlights how the wounded pride of the minority community in India breeds hatred and stands in the way of peace. Hardika's biased view that they don't want equality but want to be superior, is prompted by her lack of knowledge in regard to what actually happened to the family of her friend Zarine who owned the record of Noor Jehan, the most favourite collection of Daksha that she had lost during the riot. Daksha only knew that the shop owned by Zarine's father was burnt during riot and that shop was purchased by Daksha's father -in- law. She also knew that Zarine's father did not accept the job in the same shop offered by her father -in- law , the new owner of the shop, and hence she explained the matter of pride of the minority community. Zarine's family had enough reason to suspect Daksha's father-in-law though there was hardly any legal proof, therefore, just the result of their wounded pride.

Dattani has made a realistic analysis of the cause of friction between the two communities in Post -Independence India. To quote a critic, Rina Mitra,

"Dattani's *Final Solutions*, first stage in Bangalore in 1993 focuses on the problem of communal disharmony between the Hindus and Muslims in India, especially during the period of the post -Partition riot. The analysis of the cause of friction between the two communities offered by Dattani carries conviction as it is endorsed by a study of human psychology offering valid explanations of the proclivities and susceptibilities of individuals under circumstantial pressure."129

Dattani searches for the root causes behind Hindu-Muslim riot is best revealed through Javed and Bobby who are introduced as two Muslim young men trying in vain to suppress their identity while they are chased by some Hindu fanatics. It is made clear that failure of understanding between man and man creates communal tension. Infuriated by the notion that a chariot carrying the Hindu God was destroyed by some Muslim men. The Hindu fanatics started searching for Muslim men because the equated the breakers of chariot with the Muslim community. When the prayer cap of Javed and the knotted handkerchief of Bobby were found in their pockets the mob became furious.

CHORAS ALL: You pray to a god you do not know! You pray to a nothing. You do not know this form. And you seek to destroy our gods! Drive them out! Kill the sons swine! Kill the sons of swine! (178)

Dattani shows how fear & seclusion creates frenzy leading to riots. And all this is caused by the tendency to create the persons belonging to a separate community as the other. He elaborates the theme of Hindu-Muslim riot through projecting the incapacity of the recognition of "other man's otherness." When Ramnik chooses to give shelter to the two Muslim young men, the Hindu chorus outside becomes frenzied.

RAMNIK: What harm have they done to you?

CHORAS 1. Set an example.

CHORAS ALL : Stop them.

CHORAS 1. Before they do harm.....

CHORAS ALL: Tame them.

CHORAS 1. Before their passions inflame.

CHORAS ALL. Thwart them, So we may live in peace.

RAMNIK. We?

CHORAS ALL. We, who are right.

RAMNIK. And they?

CHORAS ALL . They who are wrong. Since we are right.And they oppose us.

RAMNIK. If we are right.

CHORAS ALL. Do you doubt us? Your own people? (181)



The fanatics are so biased that they don't bother to verify if the people belonging to other community have actually done any harm to them. They don't care for any logic; nor do they have rational mindset. The Hindus are often at loggerheads with the lower class people within their own community is also focused. Thus, *Final Solution* serves the dramatist's purpose well through a life-like portrayal & Indian society. He wants to use the theatre as a powerful tool for bringing about the necessary social change. Mahaesh Dattani in an interview says, "Theatre to me is a reflection of what you observe..... I write plays for the sheer pleasure of communicating through this dynamic medium." (Qtd in Pant 33)

At the end of the play, Hardika asks to Ramnik why he has not yet gone to his shop and he answers much to her surprise, that he cannot enter the shop any more. The secret is now revealed by Ramnik. The shop was the same burnt-up shop. They purchased from Zarine's father at half its price and it had been burnt up by Hari and his father in the name of communal hatred. They needed a shop and used communal violence to satisfy their selfishness. It was not their arrogance then, but their anger. Hardika is crushed and wants to know why Ramnik has not disclose the fact to her earlier. Ramnik replies that he did not just want her to put in shame. Hardika wants to know if the two boys will ever come back. He says that they may come if she calls them. But soon he says that they may not come back as it is too late. The play ends with the light fading out slowly on the mob. We may come to the conclusion that the play mocks at the politicians who use people as their puppets. These puppeteers are the real culprits. The playwright, attacks on this game of hatred and communal tension. Ramnik accepts that his father has done the black deed. To conclude, the Play ends with Ramnik's statement, "We should forgive the offenders and forget the past. This can be the final solution"

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## पुरुष प्रौढ नागरिकांच्या रक्तदाब व मधुमेहावर निवडक प्राणायाम व आसनांचा होणाऱ्या परिणामांचे अध्ययन

संदिपराज श. औताडे: सहा. प्राध्यापक, भारती विद्यापीठ विश्वविद्यालय, शारीरिक शिक्षण महाविद्यालय, धनकवडी, पुणे.

बी. आर. हिमालयन: क्रीडा संचालक, भारती विद्यापीठ विश्वविद्यालय, पुणे.

संशोधन करण्यामागचा उद्देश प्रौढ नागरिकांच्या रक्तदाब व मधुमेहावर होणाऱ्या आसन आणि प्राणायाम उपचारांच्या परिणामांचा कार्यक्रम तयार करून त्यांच्या परिणामांचे अध्ययन करणे हा आहे. हे संशोधन पुणे शहरातील कर्वेनगरमधील ४० ते ५९+ वर्षे वय असलेल्या प्रौढ पुरुष नागरिकांशी संबंधित आहे. यासाठी ८४ रक्तदाब व ७८ मधुमेही अशा एकूण १६२ रुग्णांची विभागणी दोन प्रायोगिक गट व एक नियंत्रित गटात करण्यात आली. आसन व प्राणायाम गट व स्वयंअध्ययन गटास आठवड्यातील सहा दिवस प्रत्येकी एक तास रोज सायंकाळी याप्रमाणे एकूण चार महिने प्रतिसादकांना योगा प्रशिक्षण देण्यात आले. तीनही गटातील प्रौढ नागरिकांची तीन वेळा चाचणी घेण्यात आल्या. यातील पूर्व चाचणी सराव सुरु करण्यापूर्वी, मध्य चाचणी ६० दिवसानंतर तर पश्चात चाचणी १२० दिवसानंतर घेण्यात आल्या. अॅनकोव्हाचा (सहप्रसरण विश्लेषण) निष्कर्ष शेफिजच्या पोस्ट हॉक टेस्टचा वापर करून स्पष्टपणे ह्या संशोधनात सादर केला गेला आहे. या संशोधनावरून असे दिसून आले की योगा प्रशिक्षणाचा योगा गटावर उच्च रक्तदाब व मधुमेह नियंत्रित करण्यासाठी स्वयंअध्ययन व नियंत्रित गटाच्या तुलनेत जास्त परिणाम झालेला आढळून येतो.

**प्रास्ताविक:** आधुनिक युग हे यांत्रिक युग असल्याने दिवसेंदिवस माणूस परिश्रमापासून दूर होत आहे. सोबतच अलीकडच्या काळातील अव्यवस्थित दिनचर्या, अनियमित खान-पान, अति महत्वाकांक्षा, वेळेचा अभाव आदी कारणांनी माणसाला रोगग्रस्त केलेले आहे. याशिवाय व्यायाम न करणे यामुळे माणूस अनेक शारीरिक व मानसिक रोगांनी ग्रस्त होत आहे. काही प्रमाणात व्यक्तीचे आरोग्य हे अनुवंशिक, कौटुंबिक, सामाजिक इ. बाह्य घटकांवर अवलंबून असले तरी ते संपादन करणे आपल्या हाती असते. आज हृदयरोग, रक्तदाब, मधुमेह, वातरोग इ. आजार बऱ्याच प्रमाणात आढळून येतात. सोबतच वर्तमान युगात मानसिक तणावाने मनुष्यास सर्वाधिक उध्वस्त केले आहे. मानसिक तणाव बरेचदा रोगाचे प्रमुख कारण असल्याचे दिसून येते. अशावेळी ज्यामुळे रोग दूर होईल व ज्याच्या नियमांचे पालन केल्याने रोग होणार नाही अशा शास्त्राची गरज भासते. योगासन व प्राणायामांमुळे शरीर व मनावर नियंत्रण होवून शरीर आरोग्यसंपन्न व मन प्रसन्न राहते. यासाठी संशोधकाने पुरुष प्रौढ नागरिकांच्या रक्तदाब व मधुमेहावर निवडक प्राणायाम व आसनांचा होणाऱ्या बदलांचा अभ्यास करण्याचे ठरविले आहे.

**संशोधनाचा उद्देश:** संशोधनाचा उद्देश प्रौढ नागरिकांच्या रक्तदाब व मधुमेहावर होणाऱ्या आसन आणि प्राणायाम उपचारांच्या परिणामांचा कार्यक्रम तयार करून त्यांच्या परिणामांचे अध्ययन करणे हा आहे.

### संशोधनपध्दती:

प्रस्तुत संशोधनाचे क्षेत्र पुणे शहरातील कर्वेनगरमधील ४० ते ५९+ वर्षे वय असलेल्या प्रौढ पुरुष नागरिकांशी संबंधित आहे. या संशोधनाच्या आराखड्याचे स्वरूप प्रायोगिक संशोधन पध्दतीचे आहे. या संशोधनासाठी उच्च रक्तदाब व मधुमेह (टाईप-२) असलेल्या मध्यमवर्गीय प्रतिसादकांची निवड करण्यात आली होती. या

संशोधनाकरीता असंभाव्य न्यादर्श पध्दतीतील (तज्ज्ञ डॉक्टरांच्या सल्ल्यानुसार) सहेतुक पध्दतीचा अवलंब करून प्रथम ८४ रक्तदाब व ७८ मधुमेही असा एकुण १६२ रुग्णांची निवड करण्यात आली होती. याचे मुख्य दोन प्रायोगिक गट करण्यात आले, तर एक नियंत्रित गट निवडण्यात आला होता असे प्रत्येकी २८ रक्तदाब असलेल्या रुग्णांचे तीन गट व प्रत्येकी २६ मधुमेह असलेल्या रुग्णांचे तीन गट असे एकुण सहा गट करण्यात आले होते. आसन व प्राणायाम गट व स्वयंअध्ययन गटास आठवड्यातील सहा दिवस प्रत्येकी एक तास रोज सायंकाळी याप्रमाणे चार महिने योगा सराव देण्यात आला, आसन व प्राणायाम गटाकडून संशोधकाने स्वतः योगासन व प्राणायाम करवून घेतले. स्वयंअध्ययन गट हा स्वतः प्रशिक्षण घेणारा गट आहे. तिसरा गट हा नियंत्रित गट असून तो कोणत्याही प्रकारे योगासन व प्राणायाम या विषयाशी संबंधित असा गट नाही. या गटांवरील प्रयोगाचा आराखडा एकुण पाच प्रगतीच्या अवस्थेत विभागण्यात आले (पूर्व चाचणी – उपचार प्रशिक्षण – मध्य चाचणी – उपचार प्रशिक्षण – उत्तर चाचणी) सरावा अंतर्गत तीनही गटातील प्रौढ नागरिकांचे तीन वेळा चाचणी घेण्यात आल्या. यातील पूर्व चाचणी सराव सुरु करण्यापूर्वी, मध्य चाचणी ६० दिवसानंतर तर पश्चात चाचणी १२० दिवसानंतर घेण्यात आल्या.

रक्तदाबासाठी योगमुद्रा, मस्त्यासन, सिध्दासन, पद्मासन, पश्चिमोत्तानासन, सर्वांगासन, वज्रासन, पवनमुक्तासन, धनुरासन, भुजंगासन, धनुरासन या आसनांची निवड करण्यात आली. तर मधुमेहासाठी ताडासन, त्रिकोणासन, सुखासन, पद्मासन, वज्रासन, पश्चिमोत्तानासन, अर्धमस्त्येंद्रासन, पवनमुक्तासन, नौकासन, भुजंगासन, धनुरासन या आसनांची निवड करण्यात आली. तसेच रक्तदाबासाठी व मधुमेहासाठी भस्त्रिका प्राणायाम, कपालभाती, अनुलोम-विलोम, भ्रामरी ही प्राणायाम निवडण्यात आली. संशोधनासाठी आवश्यक असणारी माहिती गोळा करण्यासाठी, संकलित करण्यासाठी संशोधकाने प्रमाणित कसोटीचा वापर केला.

#### सांख्यिकी विश्लेषण व अर्थनिर्वचण :

संशोधकाने संशोधनात संख्याशास्त्रीय विश्लेषणावरून योग्य अर्थनिर्वचण करून निष्कर्ष काढले. त्यासाठी अॅनकोव्हा (ANCOVA) आणि शेफिजची पोस्ट हॉक टेस्ट्स यांचा वापर केला

अ.क्र.		चाचणी	गट			
			योग	स्वयंअध्ययन	नियंत्रित	
१.	रक्तदाब	सिस्टॉलिक	पूर्व	१३९.०३	१४०.१४	१४१.०८
			मध्य	१२६.३६	१३५.३०	१३९.५४
			उत्तर	१२२.१८	१३२.३६	१३९.९२
२.	रक्तदाब	डायस्टॉलिक	पूर्व	८९.७६	९०.७९	८८.१८
			मध्य	८४.१२	८७.०५	८७.५४
			उत्तर	८१.१२	८७.१३	८८.४९
३.	रक्तदाब	फास्टिंगची	पूर्व	१७८.९६	१७२.६३	१७०.८८
			मध्य	१४७.६२	१५८.२०	१६६.८५
			उत्तर	१३०.४८	१५०.३३	१५९.२९
४.	रक्तशर्करा	पोस्ट प्रेडिअलची	पूर्व	२४६.१८	२६५.६४	२७०.४३
			मध्य	२३१.४६	२५७.८०	२६६.३२

			उत्तर	२१६.३०	२५१.५४	२६८.१५
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१. हेतु पुरस्कर देण्यात आलेल्या प्रशिक्षणातील मध्य चाचणीपर्यंत सिस्टॉलिक रक्तदाब कमी झाला. तसेच उत्तर चाचणीमध्ये हाच रक्तदाब कमी होण्याचा क्रम विशेषतः योगा गटाच्या प्रतिसादकांमध्ये परिणामकारक आढळला. परंतु स्वयंअध्ययन व नियंत्रित गटांच्या प्रतिसादकांच्या सिस्टॉलिक रक्तदाबामध्ये कोणताही फरक आढळला नाही. शेवटी उत्तर चाचणीपर्यंत योगा (आसन व प्राणायाम) प्रशिक्षणामुळे सिस्टॉलिक रक्तदाब कमी होऊन तो सर्वसामान्य व्यक्तींइतका झाला.
२. हेतु पुरस्कर देण्यात आलेल्या प्रशिक्षणातील मध्य चाचणीपर्यंत डायस्टॉलिक रक्तदाब कमी झाला. तसेच उत्तर चाचणीमध्ये हाच रक्तदाब कमी होण्याचा क्रम विशेषतः योगा गटाच्या प्रतिसादकांमध्ये परिणामकारक आढळला. परंतु स्वयंअध्ययन व नियंत्रित गटांच्या प्रतिसादकांच्या डायस्टॉलिक रक्तदाबामध्ये कोणताही फरक आढळला नाही. शेवटी उत्तर चाचणीपर्यंत योगा (आसन व प्राणायाम) प्रशिक्षणामुळे डायस्टॉलिक रक्तदाब कमी होऊन तो सर्वसामान्य व्यक्तींइतका झाला.
३. हेतु पुरस्कर देण्यात आलेल्या प्रशिक्षणातील मध्य चाचणीपर्यंत फास्टिंगमधील रक्तशर्करा नियंत्रित झाली. तसेच उत्तर चाचणीमध्ये हीच रक्तशर्करा कमी होण्याचा क्रम विशेषतः योगा गटाच्या प्रतिसादकांमध्ये परिणामकारक आढळला. परंतु स्वयंअध्ययन व नियंत्रित गटांच्या प्रतिसादकांच्या फास्टिंगच्या रक्तशर्करेमध्ये कोणताही फरक आढळला नाही. शेवटी उत्तर चाचणीपर्यंत योगा (आसन व प्राणायाम) प्रशिक्षणामुळे फास्टिंगची रक्तशर्करा कमी होऊन तो सर्वसामान्य व्यक्तींइतकी झाली.
४. हेतु पुरस्कर देण्यात आलेल्या प्रशिक्षणातील मध्य चाचणीपर्यंत पोस्ट प्रेंडिअलमधील रक्तशर्करा नियंत्रित झाली तसेच उत्तर चाचणीमध्ये हीच रक्तशर्करा कमी होण्याचा क्रम विशेषतः योगा गटाच्या प्रतिसादकांमध्ये परिणामकारक आढळला. परंतु स्वयंअध्ययन व नियंत्रित गटांच्या प्रतिसादकांच्या पोस्ट प्रेंडिअलच्या रक्तशर्करेमध्ये कोणताही फरक आढळला नाही. शेवटी उत्तर चाचणीपर्यंत योगा (आसन व प्राणायाम) प्रशिक्षण असे दर्शविते की पोस्ट प्रेंडिअलची रक्तशर्करा कमी होऊन तो सर्वसामान्य व्यक्तींइतकी झाली.

#### निष्कर्ष :

- योगा प्रशिक्षणाचा योगा गटावर, स्वयंअध्ययन व नियंत्रित गटापेक्षा उच्चरक्तदाब नियंत्रित करण्यासाठी चांगला उपयोग झालेला दिसून आले.
- योगा प्रशिक्षणाचा योगा गटावर, स्वयंअध्ययन व नियंत्रित गटापेक्षा फास्टिंग तसेच पोस्ट प्रेंडिअल रक्तशर्करा नियंत्रित करण्यासाठी चांगला उपयोग झालेला दिसून आले.

#### शिफारशी :

- सदर संशोधन ४० – ५९ वर्षे वयोगट असलेल्या प्रौढ नागरिकांसाठी केलेले आहे, अशाप्रकारे इतरही प्रौढ नागरिकांसाठी केलेले आहे. अशाप्रकारे इतरही प्रौढ नागरिकांच्या गटासाठी संशोधन करता येईल.
- प्रस्तुत संशोधन प्रौढ नागरिकांच्या रक्तदाब व मधुमेह या व्याधींशी संबंधित आहे, अशाचप्रकारे इतरही व्याधींबाबत याच वयोगटासाठी किंवा इतर वयोगटासाठी अशाप्रकारे संशोधन करता येईल.

- शालेय विद्यार्थी तसेच स्त्रियांची शारीरिक क्षमता सुधारण्यासाठी तसेच आरोग्य चांगले राहण्यासाठी योगासन हा व्यायामप्रकार म्हणून अवलंब करता येईल. तसेच महाविद्यालयीन स्तरावर अभ्यासक्रमात आसने व प्राणायाम यांचा समावेश करण्यात यावा.

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## ताला उद्योग में औद्योगिक विवाद – एक विश्लेषण

**कृत्तिका सिंह:** शोध छात्रा, श्री. जे.जे.टी विश्वविद्यालय, राजस्थान

प्रस्तुत शोध प्रपत्र ताला उद्योग में औद्योगिक विवाद के अध्ययन पर केन्द्रित है। यह अध्ययन अलीगढ़ नगर (उ.प्र.) के ताला उद्योग के 100 श्रमिकों पर आधारित है। प्राथमिक तथ्यों का संकलन 'साक्षात्कार-अनुसूची' के माध्यम से किया गया है। संकलित प्राथमिक तथ्य परिलक्षित करते हैं कि औद्योगिक विवाद का प्रमुख स्वरूप हड़ताल है। वह औद्योगिक विवाद के प्रमुख कारणों में श्रम संगठन के पदाधिकारी, वेतन, वेतनवृद्धि, बोनस का समय पर भुगतान न होना एवं कार्यदशाओं का अच्छान होना आदि को उत्तरदायी मानते हैं। औद्योगिक विवादों के निस्तारण में "सामूहिक सौदेबाजी" की महत्वपूर्ण भूमिका है।

भारतवर्ष एक विकासशील देश है। जहां औद्योगिकीकरण की प्रक्रिया तीव्रगति से चल रही है। औद्योगिकीकरण की प्रक्रिया ने जहां देश में अनेक सकारात्मक परिवर्तन किये हैं, वहीं उसके कुछ नकारात्मक प्रभाव की दृष्टिगोचर हुए हैं। उस नकारात्मक प्रभावों में औद्योगिक विवाद महत्वपूर्ण हैं। सामान्यतः औद्योगिक विवाद से तात्पर्य सेवायोजकों और श्रमिकों के बीच होने वाले मतभेदों से है, जिनके परिणाम स्वरूप हड़तालें, तालाबन्दी, काम की धीमीगति, घेराव तथा इस प्रकार की अन्य समस्याएं उठ खड़ी होती है।<sup>1</sup> शोधार्थी, मास्टर ऑफ बिजनेस एडमिनिस्ट्रेशन विभाग, जे.जे.टी. विश्वविद्यालय, झुनझुनू (राज.)

**वी.पी.आर्य<sup>2</sup>** का मत है कि, "औद्योगिक विवाद शुद्ध साधारण श्रमिकों व नियोक्ता उसके मध्य श्रमिकों को रोजगार या उनकी बेरोजगारी की दशाओं से सम्बन्धित असहमति को निर्देशित करता है। अधिकांश रूप से उत्पन्न होने वाले विवाद महंगाई भत्ता, बोनस, श्रमिकों की पदच्युति या सेवामुक्ति, अवकाश एवं छुट्टियाँ, सेवानिवृत्ति लाभों और मकान किराया एवं अन्य भत्तों से सम्बन्ध होते हैं। विभिन्न समाजिक वैज्ञानिकों ने समय-समय पर औद्योगिक विवाद के विविध पक्षों का अध्ययन किया है। उन अध्ययनों के कुछ प्रमुख संदर्भ निम्नवत् हैं।

**डनलप<sup>3</sup>** ने कार्यस्थल के परिवेश का औद्योगिक श्रमिकों के कार्यक्षमता, औद्योगिक सम्बन्ध, औद्योगिक विवादों पर पड़ने वाले प्रभावों का अध्ययन किया है। **मार्जरिसन<sup>4</sup>** ने श्रमिक एवं प्रबन्धकों के सम्बन्धों का विश्लेषण किया है तथा उद्योगों में औद्योगिक विवाद के कारणों का विश्लेषण कर सुलह के प्रारूप को प्रस्तुत किया है। **रस्तौगी<sup>5</sup>** ने सूती कपड़ा उद्योग में कार्यरत श्रमिकों से हड़ताल एवं ताला बन्दियों के कारणों की जानकारी प्राप्त की है। **देसाई<sup>6</sup>** ने भारतीय औद्योगिक समाज की प्रमुख मानवीय समस्याओं, प्रशिक्षण, पदोन्नति, प्रोत्साहन आदि का अध्ययन किया है।

**महरोत्रा<sup>7</sup>** ने सहकारी श्रम प्रबन्ध के माध्यम से औद्योगिक क्षेत्र की समस्याओं के निराकरण एवं औद्योगिक कार्यकुशलता की रूपरेखा प्रस्तुत की है। अलीगढ़ का ताला उद्योग विश्व में प्रसिद्ध है। ताला उद्योग में औद्योगिक विवाद का क्या स्वरूप है। जानने का प्रयास प्रस्तुत शोध प्रपत्र में किया गया है। इस शोध प्रपत्र के प्रमुख उद्देश्य

निम्नवत् है—

1. ताला उद्योग में औद्योगिक विवाद के स्वरूप एवं कारण क्या हैं?
2. ताला उद्योग में औद्योगिक विवादों के निष्पादन हेतु क्या नीति अपनायी जाती है?
3. क्या औद्योगिक विवादों के परिणाम स्वरूप ताला उद्योग श्रमिकों के वेतनमान, पदोन्नति, कार्यदशाओं आदि में सुधार होता है?
4. ताला उद्योग श्रमिकों के औद्योगिक विवादों के निस्तारण हेतु क्या सुझाव है?

प्रस्तुत शोध प्रपत्र अलीगढ़ नगर (उ.प्र.) के ताला उद्योग में कार्यरत 100 पुरुष श्रमिकों पर आधारित है। सूचनादाताओं का चयन उद्देश्य पूर्ण निदर्शन पद्धति के आधार पर किया गया है। प्राथमिक तथ्योंका संकलन साक्षात्कार अनुसूची के माध्यम से किया गया है। इस साक्षात्कार सम्बन्धित विभिन्न 'मुक्त' तथा 'उमुक्त' प्रश्नों को सम्मिलित किया गया है।

अध्ययन से प्राप्त प्राथमिक तथ्यों का विवरण एवं विश्लेषण निम्नवत् है—

औद्योगिक विवाद प्रायः प्रत्येक औद्योगिक संगठन में पाया जाता है, जब कोई औद्योगिक विवाद व्यापक रूप धारण कर लेता है तो उसका प्रतिकूल प्रभाव प्रतिष्ठान की कार्य प्रणाली पर पड़ता है। अलीगढ़ नगर के ताला उद्योग में औद्योगिक विवाद के क्या स्वरूप हैं के सन्दर्भ में तथ्यों को संकलित किया गया है? संकलित तथ्यों की विवेचना से स्पष्ट होता है कि 22 (22.00 प्रतिशत) सूचनादाताओं के प्रतिष्ठानों में घेराव करना, 67 (67.00 प्रतिशत) के प्रतिष्ठानों हड़ताल करना, 11 (11.00 प्रतिशत) के प्रतिष्ठानों में ताला बन्दी औद्योगिक विवाद के स्वरूप में होता है। अतः निष्कर्ष रूप में कहा जा सकता है कि अधिकांश (67.00 प्रतिशत) ताला उद्योगों में श्रमिक अपनी मांगों को मनवाने के लिए हड़ताल करते हैं। उनकी मान्यता है कि हड़ताल करने से श्रमिकों को प्रबन्धकों के दुर्व्यवहार एवं शोषण से आंशिक मुक्ति मिल जाती है। साथ ही श्रमिकों में पारस्परिक समानता एवं सहयोग की भावना भी विकसित होती है।

किसी भी औद्योगिक प्रतिष्ठान में औद्योगिक विवाद के लिए अनेक कारण उत्तरदायी होते हैं, उनमें से कुछ कारण आर्थिक, राजनीतिक, मनोवैज्ञानिक एवं प्रबन्धकीय आदि होते हैं। रघुराज गुप्त एवं एस.एन.मुंशी<sup>8</sup> ने किसी भी औद्योगिक प्रतिष्ठान में हड़ताल के लिए प्रशासनिक प्रणाली, सामाजिक टेक्नीकल प्रणाली, आर्थिक प्रणाली को मुख्य रूप से उत्तरदायी कारण माना है। ताला उद्योग में औद्योगिक विवाद के लिए कौन-कौन से कारण उत्तरदायी हैं का अध्ययन किया गया है। संकलित तथ्य परिलक्षित करते हैं कि 27 (27.00 प्रतिशत) सूचनादाता औद्योगिक संवाद के लिए मालिक संवाद के लिए मालिक / प्रबन्धक को उत्तरदायी मानते हैं, 58 (58.00 प्रतिशत) श्रम संगठनों को उत्तरदायी मानते हैं तथा शेष 15 (15.00 प्रतिशत) श्रमिकों को उत्तरदायी मानते हैं। अतः स्पष्ट होता है कि अधिकांश (58.00 प्रतिशत) सूचनादाता औद्योगिक विवाद का मुख्य कारण श्रम संगठनों को मानते हैं। श्रम संगठन के पदाधिकारी श्रमिकों में दलबन्दी पैदाकर विवाद उत्पन्न कराते है। साथ ही श्रमिक नेताओं की पदलोलुपता एवं स्वार्थसिद्धि की भावना औद्योगिक विवादों को सकारात्मक रूप से प्रोत्साहित करती है।

औद्योगिक विवादों का एक प्रमुख कारण आर्थिक है। उद्योगों में श्रमिकों का आर्थिक शोषण होना सामान्यतः प्रचलित है। श्रमिकों को कम मजदूरी देना बोनस की समुचित व्यवस्था न करना, वेतन समय पर न देना, आदि अनेक आर्थिक पक्ष हैं, जिस कारण औद्योगिक विवाद होते रहते हैं। ताला उद्योग में यह आर्थिक पक्ष औद्योगिक विवादों के लिए किस सीमा तक उत्तरदायी है, जानने कि चेष्टा की गयी है? संकलित तथ्यों से स्पष्ट होता है कि 81 (81.00

प्रतिशत) सूचनादाता औद्योगिक विवादों के लिए वेतन, वेतनवृद्धि, बोनस आदि का समय पर भुगतान न होना उत्तरदायी कारण मानते हैं तथा शेष 19 (19.00 प्रतिशत) का ऐसा मानना नहीं है। अतः निष्कर्ष रूप में कहा जा सकता है कि अधिकांश (81.00 प्रतिशत) सूचनादाता औद्योगिक विवादों के लिए आर्थिक कारणों यथा वेतन, वेतनवृद्धि, बोनस आदि का समय पर न मिलना, को उत्तरदायी कारक मानते हैं। यह तथ्य 'शाही श्रम आयोग' द्वारा उल्लिखित निष्कर्ष कारणों की भूमिका का पूर्णतः समर्थन करते हैं।

औद्योगिक प्रतिष्ठानों में श्रमिकों के लिए समुचित कार्यस्थल प्रदान किया जाये, यह औद्योगिक प्रतिष्ठान के मालिक का दायित्व होता है। इस उद्देश्य की पूर्ति हेतु सरकार ने अनेक वैधानिक प्राविधान भी किये हैं। जिससे कि औद्योगिक प्रतिष्ठानों में विवाद न हो। क्या अध्ययन में सम्मिलित ताला उद्योग श्रमिक कार्यस्थल पर वांछित सुविधायें न होने को औद्योगिक विवाद का कारण मानते हैं। संकलित तथ्य स्पष्ट करते हैं कि 66 (66.00 प्रतिशत) सूचनादाता औद्योगिक स्थल पर वांछित सुविधाएँ न होने को औद्योगिक विवाद का कारण मानते हैं तथा शेष 34 (34.00 प्रतिशत) सूचनादाता ऐसा नहीं मानते हैं। अतः स्पष्ट होता है कि अधिकांश 66 (66.00 प्रतिशत) सूचनादाता कार्यस्थल पर वांछित सुविधाओं का न होना औद्योगिक विवाद का एक महत्वपूर्ण कारण मानते हैं। इन का मानना है कि अधिकांश औद्योगिक प्रतिष्ठानों में अस्वस्थ वातावरण, दोषपूर्ण संयंत्र आदि होते हैं तो वह श्रमिक की कार्यक्षमता पर प्रतिकूल प्रभाव डालते हैं। जिससे उनमें आक्रोश की भावना पैदा हो जाती है। इसी के परिणाम स्वरूप वह औद्योगिक विवादों के माध्यम से अपने वांछित अधिकारों को प्राप्त करने का प्रयास करते हैं।

देश के आर्थिक विकास एवं सामाजिक व्यवस्था को बनाने के लिए औद्योगिक विवादों को समाप्त करने की दिशा में सकारात्मक प्रयास करना आवश्यक है। अध्ययन में सम्मिलित सूचनादाताओं से ज्ञात किया गया है कि ताला उद्योग में औद्योगिक विवादों के निष्पादन हेतु किन-किन तरीकों का प्रयोग किया जाता है। संकलित तथ्यों की विवेचना से स्पष्ट होता है कि 68 (68.00 प्रतिशत) सूचनादाताओं के उद्योगों में औद्योगिक विवादों के निष्पादन में सामूहिक सौदेबाजी को अपनाया जाता है। 28 (28.00 प्रतिशत) के यहाँ समझौता बोर्ड का गठन किया जाता है तथा 11 (11.00 प्रतिशत) के यहाँ आचार संहिता का निर्माण करके औद्योगिक विवादों का निष्पादन किया जाता है। अतः निष्कर्ष रूप में कहा जा सकता है कि अधिकांश 68 (68.00 प्रतिशत) सूचनादाताओं के यहाँ औद्योगिक विवादों के निष्पादन में 'सामूहिक सौदेबाजी' को अपनाया जाता है। इनकी मान्यता है कि सामूहिक सौदेबाजी के अन्तर्गत दोनों पक्षकार सेवायोजन और श्रमिक बिना किसी तीसरे पक्षकार के हस्तक्षेप के आपसी विचार विमर्श द्वारा अपने मतभेदों को सुलझाने में बहुत अधिक सीमा तक सफल हो जाते हैं, जिसके परिणाम स्वरूप सेवायोजक एवं श्रमिकों के मध्य अच्छे सम्बन्धों की शुरुआत भी होती है।

औद्योगिक विवाद के परिणाम स्वरूप यहाँ औद्योगिक संगठन पर विपरीत प्रभाव पड़ता है, वहीं कुछ सन्दर्भों में उसका अनुकूल प्रभाव भी देखा जा सकता है। क्या ताला उद्योग श्रमिकों के प्रतिष्ठानों में औद्योगिक विवाद के फलस्वरूप उनके वेतनमान, पदोन्नति तथा कार्य की दशाओं में सुधार पदोन्नति तथा कार्य की रक्षा उनमें सुधार हुआ है? संकलित तथ्य स्पष्ट करते हैं कि 78 (78.00 प्रतिशत) सूचनादाताओं का मानना है कि औद्योगिक विवाद के फलस्वरूप उनके वेतनमान पदोन्नति तथा कार्यदशाओं में सुधार हुआ है तथा शेष 22 (22.00 प्रतिशत) का ऐसा मानना नहीं है। अतः निष्कर्ष रूप में कहा जा सकता है कि अधिकांश 78 (78.00 प्रतिशत) सूचनादाता औद्योगिक विवाद को लाभकारी मानते हैं। उनका मानना है कि औद्योगिक विवाद होने पर उनका वेतनमान, बढ़ता है पदोन्नति होती है तथा कार्य की दशाओं में भी सुधार होता है। यही नहीं औद्योगिक विवाद होने पर उन्हें प्रबन्धकों के दुर्व्यवहार एवं शोषण से कुछ समय

के लिए मुक्ति भी मिल जाती है।

औद्योगिक विवादों के निष्पादन हेतु सूचनादाता के सुझावों को भी आमंत्रित किया गया है। संकलित तथा स्पष्ट करते हैं कि 71 (71.00 प्रतिशत) सूचनादाताओं ने कार्य समितियों की स्थापना के द्वारा औद्योगिक विवादों का निष्पादन करने का सुझाव दिया है। 19 (19.00 प्रतिशत) ने मजदूर परिषदों की स्थापना का सुझाव दिया है तथा 10 (10.00 प्रतिशत) ने शिकायत निवारण क्रिया विधि की स्थापना का सुझाव दिया है। अतः निष्कर्ष रूप में कहा जा सकता है कि अधिकांश 71 (71.00 प्रतिशत) सूचनादाता औद्योगिक विवादों के निस्तारण हेतु 'मालिक-मजदूर समितियों' की स्थापना के पक्षधर हैं। उनकी मान्यता है कि इस प्रकार की समितियों ने देश के विभिन्न औद्योगिक क्षेत्रों में व्याप्त औद्योगिक विवादों के निस्तारण में महत्वपूर्ण भूमिका निभाई है। इसी कारण 'शाही श्रमिक आयोग' ने भी इस प्रकार कार्य समितियों को औद्योगिक विवादों को समाप्त करने में उपयोगी माना है।

यद्यपि इन सीमित आंकड़ों के आधार पर व्यापक सामन्तीकरण करना कठिन होगा तथापि प्रस्तुत शोध प्रपत्र के आधार पर कहा जा सकता है कि ताला उद्योग में औद्योगिक विवाद का प्रमुख स्वरूप हड़ताल है। औद्योगिक विवाद का प्रमुख कारण श्रम संगठन है, श्रम संगठन के पदाधिकारी श्रमिकों में दलबन्दी पैदाकर विवाद-उत्पन्न कराते हैं। औद्योगिक विवाद के लिए वेतन, वेतनवृद्धि, बोनस का समय पर भुगतान न होना, कार्यदशाओं का अच्छा न होना प्रमुख रूप से उत्तरदायी कारण हैं।

औद्योगिक विवाद के परिणाम स्वरूप जहां औद्योगिक संगठन पर विपरीत प्रभाव पड़ता है, वहीं इसके सकारात्मक प्रभाव भी देखे जा सकते हैं। इससे श्रमिकों का वेतनमान बढ़ता है, पदोन्नति होती है तथा कार्यदिशाओं में भी सुधार होता है। औद्योगिक विवादों के निष्पादन में 'सामूहिक सौदेबाजी' की अहम भूमिका होती है। औद्योगिक विवादों के निस्तारण हेतु 'शाही श्रम आयोग' की सिफारिशों के अनुरूप ही श्रमिकों ने भी 'मालिक-मजदूर कार्य समितियों' की स्थापना का सुझाव दिया है।

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## महात्मा गांधीचे आर्थिक व सामाजिक विचार

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### सारांश –

महात्मा गांधीजींनी भारताच्या संदर्भात जे काही विचार मांडले ते एखाद्या अर्थशास्त्रज्ञांच्या विचारापेक्षा कमी नव्हते. भारतातील आर्थिक समस्या सोडविण्यासाठी त्यांनी ज्या व्यावाहारिक उपाययोजना केल्या त्यामुळे देशातीलच नव्हे तर विदेशातील अर्थतज्ञही प्रभावित झाले. गांधीजी समाजवादी असूनसुद्धा वैयक्तिक स्वातंत्र्याचे प्रबळ समर्थक होते. आज आपल्या दुर्दैवामुळे समाजात अनेक प्रकारच्या वाईट विकृती निर्माण झालेल्या असून आदर्श सामाजिक संघटनांद्वारे सर्वोदयाची कल्पना साकारण्याची गरज आहे. भौतिकवादी प्रवृत्तींनी लोकांना साध्या जीवन पद्धतीपासून बरेच दूर नेले आहे. 'गरज' अविष्काराची जननी मानली जात आहे. परिणामी अत्योत्पादन, बेकारी यासारख्या समस्या उद्भवून त्या सोडविण्यासाठी आंतरराष्ट्रीय व्यापाराचा आधार घेतला जात आहे. आजचे युग हे श्रमविभाजनाचे युग असून त्यामुळे परस्परावलंबन वाढत आहे. ते आर्थिक गुलामगिरीला जन्म देत आहे. या गुलामगिरीतून देशाला बाहेर काढण्यासाठी प्रत्येक देशाने आपल्या गरजेच्या वस्तूंचे उत्पादन स्वतः करायला हवे. गांधीजींचे सत्य व अहिंसेचे अस्त्र आजही आपल्याला दिशाहीन होण्यापासून वाचवत आहे. भौतिकवादाच्या सीमेवर पोहोचलेले देशही आज गांधीवादाला शरण येऊन आरामात श्वास घेऊ लागले आहेत.

### महात्मा गांधींचे आर्थिक व सामाजिक विचार –

महात्मा गांधींचे नाव केवळ भारताच्या इतिहासातच अमर राहिले नाही तर संपूर्ण जगाच्या राजकीय इतिहासात अमर राहिले. त्यांना अहिंसात्मक स्वतंत्रता चळवळीचे जनक म्हटले जाते. गांधीजी हे महान व्यक्ती आणि पुढारी असून महान विचारवंतही होते. गांधीजींचे नितिशास्त्र, धर्मशास्त्र, अर्थशास्त्र, राज्यशास्त्र सर्वच क्षेत्रात निःसंशयपणाचे विचार दिसून येतात. ते एक महान समाजसुधारक, स्वातंत्र्य लढ्याचे सेनानी होते तसेच ते अहिंसा आणि सत्याचे पुजारी होते. त्यांना उद्दिष्टांबरोबरच ध्येय प्राप्त करण्याच्या साधनांचे महत्वही वाटत होते. एखादे ध्येय / उद्दिष्ट प्राप्त करण्यासाठी अयोग्य साधनांचा वापर केल्यास ते ध्येय योग्य राहत नाही असा गांधीजींचा विश्वास होता.

गांधीजींनी आपले आर्थिक विचार मांडतांना त्यावर वेगवेगळ्या विचारांचा प्रभाव पडला. त्यात त्यांची आई, श्रावणबाळ, हरिश्चंद्र, भारतीय धार्मिक ग्रंथ – तुलसीरामायण, महाभारत, भगवत-गिता, बायबल, संत कबीर व मिराबाई यांचे दोहे आणि विदेशी विचारवंत टॉलस्टॉय, रस्कीन, प्रिन्स फ्रापोटकिंन यांच्या ही विचारांचा प्रभाव त्यांच्यावर पडला.

सर्व प्राणीमात्र समान असतात या टॉलस्टॉयच्या तात्विक समान सिध्दांताचा प्रभाव गांधीजींवर पडला होता आणि त्यानुसार गांधीजींनी साधेपणा आणि गरजा यासंबंधीचे विचार मांडले आणि त्यांचे हे विचार मुलभूत विचार मानले जाऊ लागले.

रस्कीनचे पुस्तक “Unto The Last John Rustin” याचाही प्रभाव गांधीजींवर पडला होता. रस्कीनच्या पुस्तकाच्या प्रभावाने राष्ट्राच्या कल्याणासाठी अर्थशास्त्र हे नितिशास्त्रापासून अलग पडता कामा नये असे मत त्यांनी मांडले.

गांधीजी भारतीय विचारवंतांतील एक महत्वपूर्ण विचारवंत असून त्यांचे विचार भारतीय संस्कृती, रुढी, परंपरा यावर मूलतः आधारित आहे. त्यांचे विचार हे त्यांनी जीवनात घेतलेला अनुभव आणि भारतीयांना वेळोवेळी गरिबी / दारिद्र्य यांना द्यावे लागणारे तोंड यावर आधारित आहेत.

पाश्चात्य / आधुनिक आर्थिक विचारांपेक्षा गांधीजींचे अर्थव्यवस्थे संबंधीचे विचार मूलतः पूर्णपणे भिन्न आहेत. मानव आणि त्यांच्या अनंत गरजा ह्या व्यक्तीला बेचैन करतात. असमाधानाची जाणीव करून देतात. आणि त्या अमर्याद गरजा पूर्ण करण्याचा मानव प्रयत्न करतो, त्या पूर्ण करण्यासाठीच मानव एक दुसऱ्यांचे शोषण करू लागतात. आणि समाजातील श्रीमंत हे गरिबांचे शोषण करू लागतो. वर्गसंघर्ष व हिंसा हे शोषणामुळेच घडते. आणि म्हणून गांधीजींचे म्हणणे असे होते की, प्रत्येकाने आपल्या गरजा मर्यादित केल्या पाहिजे, म्हणजे व्यक्तीला सुख समाधानाचे जीवन जगता येईल. असमाधानाची जाणीव वाटणार नाही. गांधीजींना शहरांपेक्षा ग्रामीण खेडीच अधिक आवडत होती. ते उद्योगांच्या विकेंद्रीकरणाचे पुरस्कर्ते होते. कारण त्यामुळे ग्रामीण भागात रोजगार निर्माण होऊन नैसर्गिक व मानवी साधन सामुग्रीही पूर्णपणे वापरता येईल. गांधीजींनी अर्थशास्त्र, संपत्ती, श्रम, समाजवाद, यांत्रिकीकरण, उद्योग, ग्रामीण अर्थव्यवस्था, सामाजिक समता याबाबत त्यांनी आपले विचार मांडलेले आहेत.

#### महात्मा गांधीजींचे अर्थशास्त्राविषयक विचार –

गांधीजींचे अर्थशास्त्रासंबंधीचे विचार पाश्चिमात्य विद्वानांपेक्षा पूर्णपणे भिन्न आहेत. पाश्चात्य अर्थशास्त्रज्ञांनी अर्थशास्त्राचा संबंध भौतिकतेशी जोडला आहे. उदा. अर्थशास्त्राचे जनक अँडम स्मिथने तर अर्थशास्त्राला संपत्तीचे शास्त्र म्हटले आहे. नंतर त्यांच्या सर्व अनुयायांनी त्यांच्या विचारांचे समर्थन केले; परंतु गांधीजींनी अर्थशास्त्राचा संबंध नैतिकतेशी जोडला. त्यांच्या मते, अर्थशास्त्र एक नैतिक शास्त्र (Moral) आहे. याउलट पाश्चात्य विद्वानांनी अर्थशास्त्राला सकारात्मक शास्त्र (Positive Science) मानले. गांधीजींच्या मते, अर्थशास्त्राचा मुख्य उद्देश मानवाच्या सभ्यतेचे अध्ययन करणे, त्यांची गरिबी मिटविणे, त्यांच्यात सदाचाराची भावना रूजविणे होय, या विचारांवरून गांधीजी भौतिकवादापेक्षा (Materialism) अध्यात्मवादाला (Spiritualism) अधिक महत्व देत होते.

#### संपत्तीसंबंधी विचार –

गांधीजींनी व्यक्तीच्या जीवनात संपत्तीला महत्वाचे स्थान दिले. तसेच संपत्तीला उपयुक्तही मानले; परंतु संपत्तीला साध्य (End) न समजता साधन (Means) मानले आहे. गांधीजींच्या मते, 'जगण्यासाठी खा, खाण्यासाठी जगू नका' तसेच त्यांच्या मते, व्यक्तिचा उद्देश जीवनात केवळ संपत्ती कमविणेच नसून इतरही बरेच उद्देश आहे. या अनेक उद्देशांपैकी एक उद्देश संपत्ती / पैसा कमविणे हा आहे. व्यक्तीने धन / संपत्ती कमविण्यासाठी स्वतःला वाहून देऊ नये.

#### उपभोगविषयक विचार –

गांधीजींवर भारतीय दर्शनाची छाप होती, आणि त्यानुसार त्यांनी उपभोगापेक्षा त्यागाला अधिक महत्व दिले आहे. गांधीजींनी गरजा कमीत – कमी करून त्याग अधिक करण्याचे सांगितले. त्यांच्यानुसार, त्यागातच सुख आहे. आणि त्याग तेव्हाच शक्य आहे जेव्हा व्यक्तींच्या गरजा कमी असतील. गरजा वाढल्याने त्यांची पूर्तता करण्याच्या साधनांत वाढ करता येत नाही. परिणामी व्यक्तीला अनावश्यक खर्च करावा लागतो; की जो त्यांच्या दुःखाचे कारण बनतो. गांधीजींचा लोकांना असला संदेश होता की, त्यांनी आपल्या उत्पन्नानुसारच आपल्या गरजा वाढवायला पाहिजे. तरच उत्पादन व उपभोग यातील दरी कमी राहिल व व्यापारचक्रे निर्माण होणार नाहीत. परिणामी जगात सुख-शांतीची स्थापना होईल. अशा प्रकारे गांधीजी त्यागाद्वारे शांतीची स्थापना करू इच्छित होते.

गांधीजी जीवनावश्यक गरजांना कमी करण्याच्या पक्षात नव्हते. त्यांच्या अर्थशास्त्रात आरामाला कोणतेही स्थान दिले गेले नाही. 'साधी राहणी आणि उच्च विचारसरणी' हाच त्यांच्या जीवनाचा आदर्श होता. आणि याच आदर्शाला ते समाजात लागू करू पाहत होते. उच्च राहणीमानाची झलक ते सर्वोदयात पाहतात.

#### श्रमाच्या प्रतिष्ठेसंबंधी विचार –

गांधीजी श्रमाकडे सन्मानित दृष्टीने बघत असून त्यांनी कोणतेही काम घृणास्पद मानले नाही. त्यांच्या जीवनाचे ध्येय काम करणे हेच होते. कामाचे महत्त्व केव्हाही त्यांच्या मते, पैशापेक्षा कमी नव्हते, गांधीजी 'काम हीच पूजा' मानीत असत. शरीर स्वस्थ, उत्तम, निरोगी राखण्यासाठी तसेच व्यक्तीची मानसिक शक्ती उत्तेजित होण्यासाठी एकमात्र उपाय म्हणजे श्रम होय. ते श्रमाला एक नैसर्गिक नियम समजत असत. जी व्यक्ती नैसर्गिक नियमांचे उल्लंघन करते ती स्वयं आपत्तींना आमंत्रण देते. त्यांच्या मते, 'श्रम करणे पाप नसून ते एक पवित्र कर्तव्य आहे', प्रत्येक व्यक्तीने आपल्या गरजेच्या थोड्याफार वस्तूंचे उत्पादन स्वतःच केले पाहिजे. कोणतेही श्रम न करणाऱ्या व्यक्तीला जेवण करण्याचा अधिकार नसावा. गांधीजींनी रोज चरखा चालवून आपल्या या आदर्शाला प्रत्यक्ष जीवनात उतरविले होते.

#### यंत्रांसंबंधी विचार –

गांधीजींचे यांत्रिकीकरणासंबंधीचे विचार सिसमांडी यांच्या विचारांशी मिळते जुळते होते. गांधीजींना यांत्रिकीकरणापासून मानवी समाजास वाचवायचे होते. त्यांच्या मते, "यंत्र हे सभ्यतेचे प्रमुख चिन्ह आहे. तथापि ते एका महान पापाचे प्रतीक आहे." यंत्रांच्या अविष्कारामुळे स्पर्धा वाढून मोठमोठे उद्योजक आपापसात गळेकापू स्पर्धा करतात, यामुळे हस्तोद्योगांचा न्हास होतो. यंत्रामुळे बेकारी, उपासमार यात वाढ होते. त्यांना यांत्रिकीकरणाच्या जागी हस्तोद्योगांचा न्हास होतो. यंत्रामुळे बेकारी, उपासमार यात वाढ होते. त्यांना यांत्रिकीकरणाच्या जागी हस्तोद्योग व मोठ्या प्रमाणावरील उद्योगांच्या जागी लघु व कुटीरउद्योगांची स्थापना करायची होती. तसेच गांधीजी अर्थव्यवस्थेच्या विकेंद्रीकरणाचे पुरस्कर्ते होते. कारण यामुळे एकाधिकारी प्रवृत्तीला आळा घालता येते.

#### समाजवादासंबंधी / विश्वस्तांसंबंधी विचार –

गांधीजींच्या 'विश्वस्तवादाच्या सिध्दांतावरून' हे स्पष्ट होते की त्यांनी वर्गसंघर्ष मिटविण्यासाठी उद्योजकांना 'ट्रस्टी' बनण्याचे सांगितले. त्यांच्या मते, उद्योजकांनी स्वतःला धन-संपत्ती व कारखान्याचे मालक न समजता 'संरक्षक' समजायला पाहिजे. त्यांच्या जवळील धन / संपत्ती ही समाजाच्या मालकीची असून तिचा वापर त्यांनी समाजाच्या हितासाठी करावा, त्यांचे हे विचार त्यांना समाजवादाच्या जवळ आणतात. तसेच त्यांनी उत्पन्नातील असमानता दूर करण्याचेही सूचविले.

#### वैयक्तीक स्वातंत्र्यासंबंधी विचार –

गांधीजी समाजवादी विचारक असल्याने वैयक्तिक स्वातंत्र्य त्यांना कोणत्याही किंमतीवर टिकवून ठेवायचे होते. त्यांच्या मते, राजाने व्यक्तीच्या स्वातंत्र्यावर कमीत – कमी नियंत्रण ठेवायला पाहिजे. तसेच ते अराजकतेच्या पक्षातही नव्हते. यादृष्टीने त्यांनी लोकशाही व्यवस्थेद्वारे अशा एका राज्याची कल्पना केली की, ज्यात व्यक्तीच्या प्राधान्याबरोबरच राज्याचीही सत्ता टिकून राहील, ते वाढत्या राजशक्तीला व्यक्तीच्या विकासासाठी हानीकारक मानतात. याच कारणामुळे ते उच्च समाजवादी राज्याकडे घृणेच्या दृष्टीने पाहत असत.

#### साधेपणा आणि गरजांसंबंधी विचार –

गांधीजींच्या विचारसरणीत साधेपणाला एक आगळेवेगळे वैशिष्ट्य होते. त्यांच्या मते, प्रत्येक व्यक्तीच्या जीवनाचे ध्येय साधेपणा असायला हवे. जीवनाचा हेतू साधी राहणी व उच्च विचारसरणी असली पाहिजे. जीवनामध्ये कल्याण, समाधान, सुखाचा अनुभव येण्यासाठी गरजा मर्यादित असल्या पाहिजे. वास्तवतेत जितक्या कमी गरजा असतील तितक्याच प्रमाणात असंतोष, अकल्याण व दुःखाचा अनुभव कमी येतो. गांधीजी केवळ भौतिक कल्याणालाच सुख-समाधानाचे साधन मानत नव्हते; तर अभौतिक कल्याणाचेही त्यांना तितकेच महत्त्व वाटत होते. खरे सुख समाधान प्राप्त करण्यासाठी शरीर तसेच बुद्धी दोन्हींवर नियंत्रण ठेवणे आवश्यक आहे. गांधीजींचा असा दृढ विश्वास होता की, सामाजिक व आर्थिक संघटनांचे उद्दिष्ट गरजा वाढविणे असू नये. परंतु याचा अर्थ असा नाही की गांधीजी विकास / प्रगतीच्या विरोधी होते तर त्यांचे म्हणणे असे होते की, देशातील प्रत्येक व्यक्तीला एक योग्य स्तरावरील जीवन जगण्यासाठी वस्तू उपलब्ध व्हायला पाहिजे. परंतु ही जीवनावश्यक राहणीमानाची पातळी गाठली गेल्यानंतर व्यक्तीने आपला मोह टाळला पाहिजे.

#### आर्थिक आत्मनिर्भरतेसंबंधी विचार –

गांधीजी आर्थिक आत्मनिर्भरता तसेच स्वावलंबनाचे प्रबळ समर्थक होते. त्यांच्या मते, विदेशी व्यापार कमीत – कमी असावा. कारण ते संघर्ष वाढविण्याचे साधन आहे. स्वावलंबनासाठी अनेक प्रयोग केले. उदा. चरखा चालविणे, चक्की चालविणे, सूत कापणे, कापड विणणे आणि लहान मोठे काम स्वतः करून त्यांनी लोकांसमोर एक आदर्श ठेवला होता. ह्या प्रयोगांद्वारे त्यांना हे दाखवायचे होते की, जर संपूर्ण देशातील लोक अशा प्रकारचे कार्य स्वतः करू लागले तर देश आर्थिक गुलामगिरीतून मुक्त होईल.

#### ग्रामीण अर्थव्यवस्थेसंबंधी विचार –

गांधीजींचे अर्थशास्त्र ग्रामीण प्रधान आहे. त्यांनी गावांची स्थिती पाहून लघु व कुटिरउद्योगांना महत्त्व दिले आहे. भारत एक शेतीप्रधान देश असून येथे शेतीची कामे वर्षभर चालू शकते. तसेच देशातील कोट्यावधी लोकांना काम देण्यासाठी हस्तोद्योग सुरू करण्याचे गांधीजींनी सांगितले. आर्थिक स्वावलंबन, साधी राहणी उच्च विचार, पंचायत राज्य, भूस्वामित्व सर्वोदयाशी संबंधित जे काही विचार गांधीजींनी सांगितले त्याचे मूळ खेड्यातच आहे. ह्या अनेक समस्यांच्या निराकरणासाठी गांधीजींनी जे विचार सूचविले ते सर्व व्यावहारिक आहे. त्यांच्या मते, जोपर्यंत गावांची स्थिती सुधारत नाही तो पर्यंत देश शक्तिशाली होणार नाही व तोपर्यंत लोकांची स्थितीही सुधारणार नाही. त्यांचा हा प्रयत्न परिस्थितीनुरूप होता.

#### निष्कर्षात्मक अभिप्राय –

महात्मा गांधींच्या आर्थिक विचारांचा आढावा घेतल्यानंतर असे निष्कर्ष काढता येतात की, त्यांच्या आर्थिक विचारांमध्ये सामाजिक, आर्थिक व नैतिकतेला महत्त्वाचे स्थान आहे. कोणत्याही आर्थिक प्रश्नांचा विचार करतांना सामान्य गरिब माणसाचे हित त्यांच्या मनात केंद्रस्थानी आहे. लोकशाहीप्रणीत समाजाची निर्मिती हे गांधीजींच्या आर्थिक विचारांचे एक उद्दिष्ट मानले जाते. शेतमजुरांचे प्रश्न, औद्योगिकीकरण, रोजगारनिर्मिती, कामगारांचे प्रश्न, लोकसंख्या नियंत्रण, शिक्षण, आर्थिक नियोजन व नियंत्रण, सहकारी संस्था, अस्पृश्यता निवारण, सर्वोदय, स्वदेशी बहिष्कार यासंबंधी मांडलेले विचार मोलाचे आहेत. गांधीजी आधुनिक विज्ञानाचे प्रशंसक होते. पण त्यांच्या प्रकाशात पुन्हा जुन्या गोष्टींचेच संशोधन व नवीनीकरण करायला पाहिजे असे त्यांचे मत होते. त्यांचा विरोध यांत्रिक उत्पादनाला नसून औद्योगिक केंद्रीकरणाला आणि कारखानदारी पध्दतीतून निर्माण होणाऱ्या आर्थिक विषमतेला आणि दास्याला आहे. यंत्राला वार्डट मानत कारण त्यामुळे बेकारी निर्माण होते. जेथे भांडवल विपुल प्रमाणात असून श्रमाची टंचाई आहे त्या

देशात यंत्र उपयुक्त आहे. परंतु भारतासारख्या देशात अतिरिक्त श्रमसंख्या व भांडवलाची टंचाई असतांना यंत्र येथे वाईटच आहे. बेकारी निवारणासाठी त्यांनी विकेंद्रीकरण महत्वाचे मानले. व त्यासाठी त्यांनी चरख्याला प्राधान्य दिले. त्यांच्या मते, चरखा हा हिंदुस्थानातील सनातन दारिद्र्याचा प्रश्न सोडवितो आणि दुष्काळातील संकटांविरुद्ध हमी देतो. गांधीजी समाजसुधारक असल्यामुळे देशातील राष्ट्रीय उत्पन्नाचे वाटप सर्व देशबांधवांना मिळावे असे त्यांना वाटत होते.

आजच्या जागतिकीकरणाच्या युगात मुक्त अर्थव्यवस्थेचा प्रसार मोठ्या प्रमाणावर झालेला असून भांडवलशाहीचे धोके पुन्हा संभवतात. बहुराष्ट्रीय कंपन्यांचे प्रस्थ वाढत असल्याने व ते उद्योगधंद्यात अत्याधुनिक भांडवलप्रधान तंत्रज्ञान वापरत असल्याने बेकारी मोठ्या प्रमाणात वाढत आहे. शेतीचेही काही प्रमाणात यांत्रिकीकरण होत असल्याने व पर्यायी उद्योगांचा अभाव असल्याने बेकारीत आणखीनच भर पडत आहे. त्यामुळे आजही गांधीजींच्या विचारांची गरज निर्माण झालेली आहे.

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## अंधश्रद्धा निर्मुलन ही सामाजिक चळवळ व्हावी

श्री. सतीश गंगाराम ससाणे : विभाग प्रमुख, समाजशास्त्र, महात्मा फुले महाविद्यालय, अहमदपूर, लातूर

“अज्ञानी हा समाज सगळा दैव हाती माणुस दुबळा” अशीच भारतीय समाज जीवनाची स्थिती अंधश्रद्धेमुळे निर्माण झालेली आहे. प्राचीन काळापासून भारतीय समाजात धर्माच्या नावाखाली वर्ण प्रधान, जातीय प्रधान, समाज व्यवस्था निर्माण करून या समाज व्यवस्थेत स्वार्थापोटी कांही परंपरावादी अंधश्रद्धेच्या प्रथा निर्माण केलेल्या आहेत.

भारत हा जगाच्या पाठीवर जसा गरीब लोकांचा श्रीमंत देश म्हणून ओळखला जातो त्याच प्रमाणे अज्ञानी, दळभद्री, दारिद्र्य आणि अंधश्रद्धेचा देशही म्हणून ओळखला जातो. त्याचे कारण आजच्या विज्ञान युगात ही फुले, शाहु, आंबेडकर यांच्या पुरोगामी विचारसरणीच्या देशातही कर्मकांडाला, दैववादाला, उपवास-तपवासाला, सण, यात्रा, अन महोत्सवातील पशु हत्येला कंदोरीसारख्या प्रथेला भोंदू बाबाच्या तंत्र मंत्राला, त्यांच्या अवैज्ञानिक उपचाराला, त्यांनी दिलेल्या गंडे दोरे यांना अवास्तव महत्त्व निर्माण झाल्याचे चित्र दिसून येत आहे. भारतीय समाजात अंधश्रद्धा नावाचा बीनभांडवलाचा तेजीत चालणारा धंदा येथील भोंदुगीरी करणाऱ्या लोकांनी मोठ्या थाटामाटात सुरू केलेला आहे. आणि या धंद्यांचे भांडवल म्हणजे निव्वळ लोकांची अंधश्रद्धा होय. लोकांच्या बुद्धीचे अपहरण करून त्यांना मानसिक गुलाम बनवून स्वतःचे उद्योग धंदे येथे निर्माण केले आहेत. आणि विनाकष्ट विना सायास ऐशोआरामात जीवन जगण्याचा नविन फंडा येथे निर्माण केला गेलेला आहे. आणि असे धंदे देशात सर्वत्र तेजीने चालतात. यामुळे लोकांना गंडवून फसवून समाजात अंधश्रद्धेला खतपाणी घालून मृत लोकांच्या टाळु वरील मलई खाणाऱ्यांचे प्रमाणही दिवसेंदिवस वाढत आहे. मग या विकृत अंधश्रद्धेला जबाबदार कोण असा प्रश्न आपण स्वतःला विचारला तर या भोंदूबाबा बरोबर आपणही त्यास तेवढेच जबाबदार आहोत असे निर्दर्शनास येते.

जगाच्या पाठीवर भारत हा गुलामांचा देश म्हणून ओळखला जातो. प्राचीन काळात धर्माच्या नावाखाली उच्चवर्णीयांनी बहुजन समाजाला वर्णाच्या आणि जातीच्या नावाखाली गुलाम बनवून ठेवले होते तर ब्रिटीशांनीही आपणास १५० वर्षे गुलाम बनविले होते. मात्र आपणास स्वातंत्र्य क्रांतीकारकांनी आपल्या बलिदानातून मिळवून दिले आणि पारतंत्र्यातून मुक्त केले.

परंतु भारतीय समाजातील लोक अंधश्रद्धेच्या आहारी जावून, अंधश्रद्धेचे गुलाम म्हणून जीवन जगण्याची नव्याने विचार सरणी जोपासत आहेत. आणि बिनतक्रार करणाऱ्या मेंदुच्या पिढ्या जन्मास घालत आहेत. त्यामुळे भारत देशात अंधश्रद्धेची अघोरी प्रथा हळु हळु समाज विनाशकारी ठरू लागलेली आहे.

इतिहासाचे अवलोकन केले तर प्रत्येक कालखंडातील त्या त्या महापुरुषांनी समाज सुधारकांनी तत्कालीन असलेल्या समाज व्यवस्थेत पुरोगामी विचारसरणी रुजवण्याचा प्रयत्न केला. जगाला प्रथमतः वैज्ञानिक दृष्टीकोन देणारे तथागत महामानव गौतम बुद्ध यांनी कोणत्याही घटनेच्या पाठीमागे कांही तरी कारणे असतात म्हणून तृष्णा हे दुःखाचे मुळ कारण आहे हे सांगितले. यासाठी बहुजन हिताय बहुजन सुखाय हा नैतिकतेचा मुलमंत्र दिला आणि त्यासाठी

प्रत्येक व्यक्तीने अत् दीप भव्, प्रज्ञा शिल करुणा, पंचशील तत्त्वे, आर्य अष्टांगीक मार्ग व चार आर्यसत्ये संबंध जगाला व विश्वातील प्रत्येक मानवाला सुखी समाधानाने जीवन जगण्यासाठी एक वैज्ञानिक दृष्टीकोन दिला. त्याचप्रमाणे पुढच्या कालखंडात सम्राट अशोक, संत तुकाराम, संत कबीर, फुले, शाहु, आंबेडकर या राष्ट्रसंत व समाजसुधारकांनी आपले संपुर्ण आयुष्य समाजातील अज्ञान अंधश्रद्धा, सामाजिक विषमता, धर्मभोळेपणा, धार्मीक विषमता, आर्थीक विषमता, कर्मकांडपणा, थोंटांडपणा, दैववादीपणा या गोष्टी समाजातुन हद्दपार करण्यासाठी कृतीशील स्वरुपाचे कार्य केलेले आहे. आणि त्याऐवजी समाजात स्वातंत्र्य, समता, न्याय, आणि बंधुत्वाचा पुरस्कार करुन खऱ्या अर्थाने समाजात वैज्ञानीकता, बूध्दीप्रामान्यवादी दृष्टीकोन निर्माण करुन सामाजिक प्रगती व सामाजिक परिवर्तन घडवुन आणण्याचा त्यांनी यशस्वी प्रयोग केला आहे.

सामाजिक उचनिचता ही ईश्वरीय संकेतानुसार व पुर्व जन्मीच्या संचीतामुळे लाभते या अद्य अंधश्रद्धेवर म.जोतीराव फुले यांनी कठोर हल्ले केले. स्त्री शुद्राच्या मानगुटीवर स्वार झालेल्या भ्रम मुलक मिथीकांचे वाभाडे काढले. दैववादी कल्पना, फलजोतिष, ज्वारण-मारण, भूतबाधा, सोहळेपणा, विविध संस्कार, बुवाबाजी, भोंदुगीरी, फसवेगीरी, हात चालाखी हे अंधश्रद्धेचे अविष्कार करते. ते तर्कदुष्ट व खुळचट आहेत. लोकांना फसविणाऱ्या आहेत. दारीद्रय आणि अंधश्रद्धेच्या खाईत टाकणारे आहेत हे त्यांनी त्याकाळातील जनसामान्यांना पटवुन दिले. प्रतिगामी विचारसरणी नाकारुन पुरोगामी विचारसरणीच्या बळावरच आपले जीवन सुखी होईल असे आवाहन त्यांनी सामाजिक शोषितांना केले. पारंपारीक पध्दतीने धर्माच्या नावाखाली अवास्तव महत्त्व देवून निर्माण केलेल्या विविध कर्मकांड करण्याऐवजी विवाह प्रसंगी वधु वरांचे अनुरूप गुण त्यांची वैचारीकता, त्यांचे विशिष्ट वय सर्रास तपासुन पहावेत हा वैज्ञानिक दृष्टीकोन त्यांनी दिला. तसेच वास्तुशांती ऐवजी गृहप्रवेशाच्या वेळी तेथे राबलेल्या श्रमीकांचा सन्मान करावा. मृत्यु नंतर कर्मकांड, जोडेदान, अन्नदान न करता मृत व्यक्तींची आठवण ठेवून शाळेतील निराश्रीत मुला-मुलींच्या शिक्षणाला मदत करावी. अशा डोळस पणाच्या व्यवहारीक सुचना म. फुलेंनी केल्या. जो पर्यंत या अज्ञानाचा विनाश होणार नाही. आणि त्यातील अंधश्रद्धेचा नाश होणार नाही तो पर्यंत बहुजन समाजाचा विकास होणार नाही म्हणूनच म. फुले असे म्हणतात.

“विद्येविणा मती गेली

मती विणा निती गेली

निती विणा गती गेली

गती विणा वित्त गेले

वित्त विणा शुद्र खचले

आणि इतके अनर्थ एका अविद्येने केले.”

या महात्मा फुलेंच्या विचार धारेतुन ते किती दुरदुष्टीचे होते आणि कृती सुधारक होते हे आपल्या लक्षात येते. म.फुले यांच्या बरोबरच अज्ञान आणि अंधश्रद्धेवर भाष्य करताना डॉ.बाबासाहेब आंबेडकर असे म्हणतात, “खुळचट, दैववादी, आणि धर्म कल्पनांनी देश भिकेस लागतो.” ज्या धर्मात मानवता आणि समानता नाही तो धर्म एक क्रूर प्रकारची अंधश्रद्धा होय. यावरुन फुले आणि डॉ. आंबेडकर यांच्या विचार आणि कृतीत किती मोठया प्रमाणात साम्य होते याचा प्रत्यय येतो. अंधश्रद्धेवर आणि अज्ञानावर प्रहार करताना आपणास राष्ट्रसंत गाडगेमहाराज यांचाही विचार करावा लागतो. राष्ट्रसंत गाडगे महाराजांनी आपल्या किर्तनातुन, प्रबोधनातुन, पशु हत्या, सत्यनारायण, दैववादी कल्पना, कर्मकांड कल्पना, अशा गोष्टीचा कडाडुन विरोध केला आणि सांगितले ‘माय बापांनो तुम्हाला डॉक्टर,

प्राध्यापक, वकील, बनता आले नाही तरी चालेल तरी त्यांचे बाप बना' मुलांना शिकवा त्यासाठी प्रसंगी घरातील भांडीकुंडी विका, कर्ज काढा पण मुलांना चांगले शिक्षण द्या. शिक्षणामुळे जीवनात स्वच्छता, साधेपणा स्वावलंबन व वैज्ञानिक दृष्टीकोण निर्माण होवुन आपले जीवन सुखी होईल, त्यांच्या काळात बुवाबाजी भोंदूगीरी करणाऱ्या फसव्या लोकांना प्रसंगी त्यांनी त्यांच्या झाडुनी समाचार घेतला. यावरून राष्ट्रसंत गाडगेमहाराज यांचे अंधश्रद्धा निर्मुलनासाठी किती महत्वाचे योगदान होते हे निर्दर्शनास येते. छत्रपती शाहु महाराजांचेही अज्ञान आणि अंधश्रद्धा निर्मुलनाबाबतचे कार्य महत्त्व स्वरूपाचे आहे, ते पुढील उदाहरणावरून आपणास सांगता येते.

शाहु महाराजांच्या दरबारामध्ये एकदा एक ज्योतिषी आलेला आहे असे त्यांना कळविले तो अतिशय निष्णात आहे. अचुक भविष्य सांगतो असे महाराजांना सांगण्यात आले. शाहु महाराजांचा त्यावर विश्वास नव्हता पण शाहु महाराज म्हणाले 'ठीक आहे त्याला बोलवा.' तो आत आला त्याने महाराजाला मुजरा केला महाराज त्याच्याकडे न बघता म्हणाले, याला काढण्या घाला आणि तुरुंगामध्ये पाठवा त्या महाराजाची आज्ञा यापुढे कोणाची काय प्रज्ञा ? कोण काय करणार म्हणुन त्याची तुरुंगात रवानगी झाली. दुसऱ्या दिवशी दरबार भरला आणि महाराजांनी ज्योतिषाला बोलाविले त्याला उच्च आसनावर बसविले त्याचा सन्मान केला तो बिचारा अगदीच भांबावुन गेला आणि म्हणाला की, महाराज मला काय समजत नाही, काल मी या ठिकाणी आलो, त्यावेळी तुम्ही मला तुरुंगात टाकले आणि आज माझी मुक्तता करुन माझा सन्मान केलात हे मला समजत नाही महाराज म्हणाले हे सगळ एवढयासाठीच केले की, तुला काही समजत नाही, एवढतरी तुला समजाव, तुला तुझ भविष्य कळत नाही तर उगीच सगळया जगाचे भविष्य सांगत फिरण्याचा धंदा कशाला पत्करावा ? यावरून छत्रपती शाहु महाराजांनी आपल्या रयतेमध्ये, संस्थानिकामध्ये ज्योतिषाचे थोतांड आणि अज्ञान आणि अंधश्रद्धेवरील लोकांचा विश्वास किती तकलादु असतो हे त्यांनी दाखवून दिले, यावरून छत्रपती शाहु महाराजांनी देखील त्यांच्या काळात अज्ञान अंधश्रद्धेवर कठोर निर्णय घेऊन रयतेमध्ये डोळस विचार रुजवण्याचा यशस्वी विचार केला.

आपल्या देशाचा संपूर्ण इतिहास जर त्याग, बलिदान, आणि पूरोगामी विचारसरणीचा असून मग भारतीय समाजातील लोक मोठया प्रमाणात अज्ञान आणि अंधश्रद्धेला कवटाळुन घेण्याचा का प्रयत्न करीत आहेत याच्या पाठी मागच्या कारणांचा समाजशास्त्रीय विश्लेषणातून आढावा घ्यावा लागतो. त्यामध्ये दिसुन येत असलेले सामाजिक कारणे उदा: व्यक्तींचे मानसिक आजार धर्माच्या नावाखाली अनेक प्रथा परंपरा लोकांच्या मानसिक गुलामगीरी लोकांचे विविध प्रकारचे ढोंग, भुताने झपाटल्याने देवीचे अंगात येणे, एखादयाने करणी करणे, भुतबाधा होणे मनात भुताची भिती निर्माण होणे, समाजाचा अज्ञानीपणा, समाजातील भ्रामक खुळचटपणा, सद्दोष केले जाणारे संस्कार, धर्मादता, धर्मभोळेपणा, प्रचंड सामाजिक विषमता, आर्थिक विषमता, शुभ अशुभ कल्पित मनोकल्पना, जादुटोना भुतप्रेत अशा गोष्टींवर असलेला अंधविश्वास पशु व प्राण्यांना मानल्या जाणाऱ्या शुभ अशुभ कल्पना आणि अशा गोष्टींना समाजांची मिळणारी मान्यता आणि त्यातुनच आजच्या आधुनिक समाजात भोंदू बाबांचे वाढणारे वर्चस्व, त्यांचे चमत्कारीक स्वरूपाचे कृत्य, त्यांच्या हात चालाकी, व त्यातुन व्यक्तींच्या बुद्धीची केली जाणारी हत्या आणि त्यात स्त्रियांचा मोठया प्रमाणात असणारा सहभाग म्हणुनच "बुवा तिथे बया आणि गेले सारे जण वाया" असे समीकरण भारतीय समाजात निर्माण झाल्याचे दिसुन येते. अंधश्रद्धेच्या निर्मितीमध्ये या लोकांबरोबरच विविध खाजगी वाहिन्या आणि प्रसारमाध्यमांची भुमिका महत्वाची निर्माण झाल्याचे दिसुन येते. अशा वेळी अंधश्रद्धा निर्मितीत दोष कुणाचा ? हा ही प्रश्न सामाजिक विचारवंतांना पडतो. आणि त्यामुळे अंधश्रद्धा निर्मुलन चळवळींच्या कार्यकर्त्यांना हा एक चिंता आणि चिंतनाचा विषय बनलेला आहे. याचे कारण अनेक लोक विविध शाररीक, बौद्धीक, मानसिक आजाराने ग्रस्त होतात



अशा वेळी ते वैद्यकिय उपचार न घेता भोंदु बाबांच्या नादी लागुन अंधश्रध्देला कवठाळून त्यांच्या उपचाराकडे वळतात. त्यामुळे अंधश्रध्देच्या निर्मितीला चालना देण्यासाठी देशातील लोकांची प्रतिगामी विचार सरणी तसेच लाचारवृत्ती, भ्रष्टाचारवृत्ती, अविवेकीय वृत्ती अंधश्रध्देला बळकट करीत आहेत. यामध्ये या वृत्तीबरोबरच समाजातील लोकांचे असलेले ढोंगी अथवा संशयखोर वृत्ती देखील चालना देणारी कशी ठरते या संदर्भात भाष्य करताना डॉ. नरेंद्र दाभोळकर यांनी आपल्या श्रध्दा आणि अंधश्रध्दा या पुस्तकातुन समाजशास्त्रीय विश्लेषणातुन आणि त्यांनी अनुभवलेल्या कांही सामाजिक घटना प्रसंगातील गमतीदार उदाहरणांचा परामर्श घेतलेला आहे.

सातारा शहरात लग्न होऊन दहा वर्षे झालेली बाई, तीन मुलांची आई, नवरा मुंबईला नोकरीला, बाई मूलांना घेवुन गावाकडे राहणारी, कोणीतरी नवऱ्याचे कान भरवले नवऱ्याला बायकोच्या चारीत्र्या बद्दल संशय निर्माण झाला. तो गावाकडे आला व बायकोला म्हणाला “तु जर चारीत्र्याने शुध्द असशील तर गावच्या देवळासमोर उकळत्या तेलातील नाणं काढुन दाखव” आता उकळत्या तेलात कोणीही हात घातला तर तो भाजणारच ही सत्यता आहे. मग चारीत्र्याचा अन् उकळत्या तेलाचा कसलाही संबंध येत नाही. परंतु अशा तकलादु, अज्ञानी अंधश्रध्देच्या विचार धारेतून लाखो युवक संशयखोरवृत्तीने आपल्या संसाराची राखरांगोळी करताना दिसुन येतात. यावरुन अंध श्रध्देच्या निर्मितीला सामाजिक संशयखोरवृत्ती, अज्ञानी प्रवृत्ती कशी जबाबदार ठरते हे त्यांनी दाखवुन दिलेले आहे. तसेच अंधश्रध्देच्या निर्मितीला कारणीभूत ठरणारे ढोंगीपणाचे कारण डॉ. नरेंद्र दाभोळकर यांनी अतिशय मार्मीक उदाहरणाव्दारे स्पष्ट केलेले आहे.

सातारा जवळची एक गोष्ट सातारच्या एम.आय.डी.सी. मधील रात्रीची कामगारांची पाळी सुटली. एक तारीख होती. पगार घेतलेले कामगार आपल्या गावाकडे निघालेले होते. हा रस्ता एका विहीरीवरुन जात होता. ज्या विहीरीमध्ये १५ दिवसापुर्वी एका नवविवाहित तरुणीने आत्महत्या केलेली होती. हे सगळे जन बोलत त्या विहीरीजवळून पुढे जात होते. त्यातला एक वामन नावाचा कामगार लघुशंकेसाठी मागे थांबला. थोड्या वेळाने आपला मित्र येत नाही म्हणून त्याचे अन्य मित्र ही थांबले. आणि एवढ्यात धावाधावा मेलो मेलो आता मी कांही जगत नाही असा त्या वामनचा आवाज मोठयाने आला. त्यांचा मित्र विहीरीमध्ये पडलेला होता, भिजलेला होता आणि थंडीने कुडकुडत होता. त्या मित्राने त्याला बाहेर काढले आणि विचारले काय झालं? तो म्हणाला मी लघुशंका करुन उठलो आणि माझी कॉलर कोणीतरी पकडली. मी कसं बसं मागं वळुन बघतो ती आपली पुष्पी जीने आत्महत्या केलेली होती ती नखशिखांत शुभ्र कपडयांमध्ये होती आणि तिचा एक हात मात्र चांगला १५ फुट लांब होता त्या हाताने तिने मला विहीरीत टाकले असे म्हणून तो बरळु लागला. झपाटले रे बाबा आता मी कांही वाचत नाही रे बाबा. दुसऱ्या दिवशी गावात एकच गोंधळ उडाला पुष्पीची लागीर वामन्याला झाली. अशी चर्चा सुरु झाली आणि असंख्य मानसे त्याच्या घराकडे येऊ लागली. परंतु याचा पर्दाफाश अंधश्रध्दा निर्मुलन समितीच्या एका संजय देशमुख नावाच्या कार्यकर्त्याने केला. त्याने सर्व किस्सा ऐकुन घेतला. आणि वामनच्या ढोंगीपणाचे सत्य बाहेर काढले. वामन्याला पिण्याची सवय होती. एक तारखेला पगार झालेला होता सकाळपासून देणेकरी आपल्या दारामध्ये येणार या कल्पनेमुळे त्याने ही ढोंगीपणाची कल्पना काढलेली होती. ज्यामुळे आपल्या देणे करापासुन आपल्याला एक महिन्याची सुट मिळेल. म्हणून त्याने पगाराच्या पैश्याचे पाकिट पुरले आणि स्वतःच विहीरीमध्ये उडी टाकली. ज्यामुळे आपल्याला लोकांची सहानुभुती मिळेल आणि देणेकऱ्यांची कट कट ही मिटेल. अशा प्रकारे अंधश्रध्देचा विळखा हा व्यक्तीच्या ढोंगीपणातुन समाज जीवनात निर्माण होत असतो. हे डॉ. नरेंद्र दाभोळकर यांनी आपल्या चळवळीच्या आणि कार्यकर्त्यांच्या कर्तुत्वशील कार्यातुन श्रध्दा आणि अंधश्रध्दा या त्यांच्या ग्रंथातुन समाजासमोर सत्य उघडकीस आणलेले आहे.

अंधश्रद्धेच्या निर्मीतीची ही कारणे आपणास वरील प्रमाणे निदर्शनास येतात. परंतु त्याचे सामाजिक दुष्परीणाम ही आपणास जाणुन घ्यावे लागतात. अंधश्रद्धा ही एक अघोरी प्रथा आहे. अंधश्रद्धा म्हणजे चिकित्सक बुद्धी गुंडाळून ठेवुन वर्तन घडवुन आणणारी प्रक्रिया होय, वैज्ञानिक दृष्टीकोनाचा नाश करणे म्हणजे अंधश्रद्धा होय. डोक्यात मेंदूला चालणा न देता इतरांचे विचार स्विकारणारी पध्दत म्हणजे अंधश्रद्धा होय. अशा या अघोरी प्रथेतुन आजच्या समाजातील भोळ्या भाबड्या स्त्री पुरुष, बालक बालिका व सर्व सामान्य लोकांचे मोठया प्रमाणात लैंगिक, सामाजिक, आर्थिक, मानसिक, शारीरिक शोषण मोठया प्रमाणात केले जाते. अंधश्रद्धेला शासनाकडुनही अघोरी प्रथा म्हणून संबोधित केले जात आहे. मात्र या अघोरी प्रथेत पुढील बाबींचा समावेश केलेला आहे. उदा: जादुटोणा, भूतपिशाच्य बाधा, या पध्दतीद्वारे सामान्य लोकांचे मानसिक शारीरिक शोषण करणे तसेच एखादया व्यक्तीला मानसिक इजा करणे, एखादी व्यक्ती गावावर करणी करत आहे म्हणून तिच्यावर आरोप लावणे, अशा व्यक्तीची गावात नग्न धिंड काढणे, सार्वजनिक ठिकाणी अशा व्यक्तीला बांधुन मारहाण करणे तसेच एखादया व्यक्तीला बांधुन ठेवणे, काठीचे किंवा चाबकाने मारहाण करणे, पादत्राने भिजवलेले पाणी पाजणे. मिरचीचा धुर देणे, छताला टांगणे, केसांना बांधणे किंवा केस उपटणे, व्यक्तीच्या शरीरावर किंवा अवयवावर तापलेल्या वस्तुचे चटके देणे, तसेच तोंडात मल मुत्र घालणे अशा अनेक प्रकारच्या वर्तनाला अंधश्रद्धेतील अघोरी प्रथा म्हणून समाज आणि कायदयाची मान्यता ही मिळत आहे. आणि या प्रथेतून वरील प्रमाणे व्यक्ती आणि सामाजिक जीवनातील दुष्परीणाम दिसून येत आहेत.

आजच्या एकविसाव्या शतकात एकीकडे डॉ. ए.पी.जे.अब्दुल कलाम २०२० मध्ये भारताला महासत्ताक बनवण्याचे स्वप्न पहात आहेत. आणि दुसरीकडे भारतीय समाजातील असंख्य लोक आजही अंधश्रद्धेला कवटाळून बसलेले आहेत. तेंव्हा आपण महासत्ताक बनणार आहात काय ?

डॉ. ए.पी.जे. अब्दुल कलाम यांच्या स्वप्नांना साकार करण्यासाठी आपणास फुले, शाहु, आंबेडकर यांच्या वाटेवरून जावे लागणार आहे. तसेच ज्यांनी चार दशकाहुन अधिक काळ अंधश्रद्धा निर्मुलन चळवळीत आपले संपुर्ण जीवनकार्यात वाहुन घेतले इतकेच नव्हे तर या चळवळीत त्यांना स्वतःच्या प्राणाची आहुतीच दयावी लागली असे डॉ. नरेंद्र दाभोळकर यांना खऱ्या अर्थाने श्रद्धांजली अर्पण करायची असेल तर आम्ही सगळे दाभोळकर, आम्ही सर्व पुरोगामी आणि दाभोळकर कुटुंबीयाप्रमाणे “संकट असु दे निर्दय पण आमचा मार्ग मात्र निर्भय” या त्यांच्या विचार कार्यप्रणालीतूनच आपणासही सामोरे जावे लागणार आहे. तरच आपण अंधाराकडुन प्रकाशाकडे, तिमीराकडुन तेजाकडे, अज्ञाना कडुन ज्ञानाकडे खऱ्या अर्थाने वाटचाल करू शकतो. ज्ञान दिप लावू जगी किंवा अंधार खुप झाला पणती जपुन ठेवा या विचाराने जर आपण दिपावली साजरी करू शकलो तरच खऱ्या अर्थाने अंधश्रद्धा निर्मुलन चळवळही सामाजिक चळवळ अथवा लोक चळवळ म्हणून पुढील काळात आपणास प्रत्ययास येईल. आणि प्रत्येकाने हे कार्य स्वतःपासून सुरु करुया असा संकल्प करुया. कारण अंधश्रद्धा निर्मुलन ही आता काळाची गरज बनलेली आहे.

**संदर्भ :**

१) श्रद्धा अंधश्रद्धा - डॉ. नरेंद्र दाभोळकर

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## महाराष्ट्राच्या जडणघडणीत यशवंतराव चव्हाणांचे योगदान

डॉ. शरद मधुकर कुलकर्णी : गं.ए.ट्र.चे कला, वाणिज्य व विज्ञान महाविद्यालय, नगांव जि. धुळे

**प्रस्तावना :-** महाराष्ट्राच्या जडणघडणीत लोकनेते राज्याचे माजी मुख्यमंत्री मा. यशवंतराव चव्हाण यांचे योगदान फार मोठे आहे. महाराष्ट्र राज्याच्या निर्मितीपूर्वी चार वर्ष आणि महाराष्ट्र राज्याच्या निर्मितीनंतरची दोन वर्षे असे जवळ जवळ सहा वर्षे ते राज्याचे मुख्यमंत्री होते. या काळात त्यांनी आधुनिक प्रगत अशा मराठी भाषीकांच्या महाराष्ट्र राज्याच्या विकासाचा पाया घातला. लोकशाही व्यवस्थेला बळकटी देऊन राष्ट्रीय एकात्मतेला महत्व देऊन राज्याच्या प्रगतीचा पाया त्यांनी तयार केला. तसेच महाराष्ट्रातील काँग्रेस पक्षाची संघटनात्मक बांधणी त्यांनी चांगल्या प्रकारे केली. त्यांना राजकारणाप्रमाणेच समाजसेवा, साहित्य, कला इ. क्षेत्रातही रस होता. शिक्षण, सहकार, औद्योगिक विकास, सामाजिक, आर्थिक, कृषी अशा विविध क्षेत्रांच्या विकासात त्यांचे योगदान महत्वाचे आहे. त्यांनी महाराष्ट्र राज्य शिक्षणाच्या दृष्टीने प्रगतशील व्हावे म्हणून प्रयत्नांची पराकाष्ठा केली. तसेच महाराष्ट्रातील काँग्रेस पक्षाची संघटनात्मक बांधणी त्यांनी चांगल्या प्रकारे केली. आजच्या काळात यशवंतराव चव्हाण यांच्या विचारांचा अभ्यास केला पाहिजे. यशवंतराव चव्हाण यांचे विचार, तत्वज्ञान आजच्या समस्यांना उत्तर आहे.

**उद्देश :-**

- १) यशवंतराव चव्हाण यांच्या विचारांचा अभ्यास करणे.
- २) वर्तमान काळात यशवंतराव चव्हाण यांच्या विचारांची आवश्यकता समजून घेणे.
- ३) यशवंतराव चव्हाण यांच्या तत्वज्ञानाचे महत्व समाजासमोर मांडणे.

**गृहीतके :-**

- १) यशवंतराव चव्हाण यांचे विचार, तत्वज्ञान आजच्या समस्यांना उत्तर आहे.
- २) शिक्षण, सामाजिक, आर्थिक, कृषी - क्षेत्रांच्या विकासात त्यांचे योगदान महत्वाचे आहे.

**पद्धती :-** या शोध निबंधासाठी वर्णनात्मक विश्लेषण पद्धतीचा वापर केला असून स्रोत म्हणून विविध ग्रंथ, पुस्तके, मासिके, वृत्तपत्रे यांचा वापर केला आहे.

महाराष्ट्राच्या जडणघडणीत लोकनेते राज्याचे माजी मुख्यमंत्री मा. यशवंतराव चव्हाण यांचे योगदान फार मोठे आहे. महाराष्ट्र राज्याच्या निर्मितीपूर्वी चार वर्ष आणि महाराष्ट्र राज्याच्या निर्मितीनंतरची दोन वर्षे असे जवळ जवळ सहा वर्षे ते राज्याचे मुख्यमंत्री होते. या काळात त्यांनी आधुनिक प्रगत अशा मराठी भाषीकांच्या महाराष्ट्र राज्याच्या विकासाचा पाया घातला. लोकशाही व्यवस्थेला बळकटी देऊन राष्ट्रीय एकात्मतेला महत्व देऊन राज्याच्या प्रगतीचा पाया त्यांनी तयार केला. शिक्षण, सहकार, औद्योगिक विकास, सामाजिक, आर्थिक, कृषी अशा विविध क्षेत्रांच्या विकासात त्यांचे योगदान महत्वाचे आहे. सामाजिक आर्थिक क्षेत्रात सर्व संपन्न असा महाराष्ट्र निर्माण करण्यासाठी त्यांनी शासकीय धोरणांची योग्य अशी आखणी करून सर्व जाती, जमाती, सर्व प्रादेशीक विभाग, उपविभाग यांच्या प्रगतीचा

मार्ग आखून दिला. ग्रामिण भाग, ग्रामिण जनता त्यांचे विकासाचे प्रश्न इ. बाबीवर त्यांनी विशेष भर दिला. यशवंतराव चव्हाण एक कर्तबगार उत्तुंग व्यक्तीमत्त्व होते. केवळ राजकारणाच्या परिघातच न वावरता प्रचंड समाज परिवर्तनाची उर्मी घेवून त्यांनी महाराष्ट्र राज्याचा कारभार अधिकाधिक समाजाभिमुख आणि विकासाभिमुख करण्यासाठी अथक परीश्रम घेतले. त्यांचे देशप्रेम आणि समाजाप्रती असलेले प्रेम त्यांना कार्याची प्रेरणा देत असायचीच त्यामुळेच प्रशासनाच्या बरोबरीने विकासाला चालना द्यायची अधिकाऱ्यांशी भांडत बसायचे नाही, चांगल्या अधिकाऱ्यांना त्रास द्यायचा नाही. अशी शिकवण त्यांनी आपल्या कार्यकर्त्यांना दिलेली होती. महाराष्ट्र राज्याची निर्मिती झाल्यावर यशवंतराव चव्हाण यांच्या नेतृत्वाखाली प्रशासनात सुध्दा एक विश्वासाचे आणि भारावलेले, प्रेरित वातावरण होते की आपल्या महाराष्ट्र राज्याला देशातले सर्वात प्रगत क्रमांकाचे राज्य बनवायचे. त्याच्या नेतृत्वाखाली प्रशासनाने चांगले कार्य केले. त्यामुळेच एक उत्कृष्ट प्रशासक असा नावलौकीक त्यांना मिळाला. महाराष्ट्राच्या राजकारणाला एक पुरोगामी वळण लावण्यात त्यांचा प्रमुख वाटा होता. तसेच महाराष्ट्रातील काँग्रेस पक्षाची संघटनात्मक बांधणी त्यांनी चांगल्या प्रकारे केली. त्यांना राजकारणाप्रमाणेच समाजसेवा, साहित्य, कला इ. क्षेत्रातही रस होता. त्यामुळेच त्यांनी महाराष्ट्र राज्य साहित्य संस्कृती मंडळाची निर्मिती केली.

संयुक्त महाराष्ट्राच्या संदर्भात त्यांची भूमिका त्यांच्या पुढील भाषणातून दिसते. संयुक्त महाराष्ट्र चळवळीच्या काळात काँग्रेसविरोधी जनमत तयार होत असतांनाच लोकसभेच्या निवडणूका जवळ आल्या होत्या. अशा परिस्थितीत सातारा येथे झालेल्या काँग्रेसच्या बैठकीत यशवंतराव चव्हाण म्हणाले की आज पराभव झाला तरी त्यातून विजयाकडे कसे जाऊ याचा विचार करतांना आपली तात्विक भूमिका व कार्यक्रम ठाम पाहिजे. आज सर्वत्र लढा, बंड व असहकाराची हवा सुटलेली आहे. पण असहकाराची कल्पना चुकीची आहे. संयुक्त महाराष्ट्रासाठी आज रक्तापेक्षा घाम गाळण्याची तयारी पाहिजे. महाराष्ट्राचे राज्य नेकीने व कुशलतेने चालवून यशस्वी करणे हाच मुंबई मिळविण्याचा मार्ग आहे. मोर्चे निघाले तर गडबडून जाऊ नका. त्याला एकदा तोंड दिलेच पाहिजे. येत्या निवडणूकीत काँग्रेस सरकारच अधिकारावर येणार आहे. मुंबई मागण्याचा आमचा हक्क आम्ही गमविला नाही. अजूनही ते आमचे ध्येय आहे. पण त्यासाठी नवा उपक्रम राबवीला आहे.

संयुक्त महाराष्ट्र निर्मिती बद्दल त्यांची भूमिका किती विकासाभिमुख होती हे त्यांच्या पुढील वक्तव्यावरून स्पष्ट होते. राष्ट्रीय प्रवाहापासून महाराष्ट्र वेगळा राहिला तर आपल्या राज्याची प्रगती खुंटेले १९५२ ते १९५६ या चार वर्षात मोरारजी प्रशासनाने संयुक्त महाराष्ट्राचे आंदोलन अगदी निर्दयपणे दडपून टाकण्याचा प्रयत्न केला होता. त्यात १०५ हुतात्मे झाले होते. मुंबई राज्यात मराठी भाषीकांचा प्रचंड असंतोष होता व या पार्श्वभूमीवर यशवंतरावांनी व्दिभाषिक मुंबई राज्याचे मुख्यमंत्रीपद स्विकारतांना म्हटले होते की मी बंदुकीची एकही गोळी न वापरता हे राज्य चालविणार आहे. महाराष्ट्र राज्याच्या निर्मितीसाठी त्यांनी पंडीत जवाहरलाल नेहरू यांचे मन वळवून यश खेचून आणले. त्यांनी महाराष्ट्र राज्य शिक्षणाच्या दृष्टीने प्रगतशील व्हावे म्हणून प्रयत्नांची पराकाष्ठा केली. २५ ऑगस्ट १९६० रोजी विधानसभेत लोकशाही नियोजन या विषयावर महत्वपूर्ण विचार मांडतांना त्यांनी शिक्षणाबाबत आपले विचार स्पष्ट केले. पुढे त्याप्रमाणे त्यांनी कार्य करण्यावर भर दिल्याचे दिसून येते. त्यांनी हुशार विद्यार्थ्यांना शिक्षणाच्या बाबतीत कोणत्याही प्रकारच्या अडचणी येवू नयेत म्हणून शिष्यवृत्ती देण्याची भूमिका घेतली. मागासवर्गीयांना आणि आर्थिक दृष्ट्या मागासलेल्यांना शिष्यवृत्ती देण्याचे धोरण ठरविले. खाजगी संस्थाना तंत्रनिकेतन व अभियांत्रिकी महाविद्यालये काढण्यासाठी महाराष्ट्र शासनाची परवानगी देण्याचे ठरविले. अकोला येथील कृषी महाविद्यालयाची स्थापना त्यांच्याच पुढाकाराने झाली होती. पुढे त्यांचेच रूपांतर पंजाबाराव कृषी विद्यापीठात झाले. औरंगाबाद येथील डॉ. बाबासाहेब

आंबेडकर मराठवाडा विद्यापीठ (त्यावेळचे नाव मराठवाडा विद्यापीठ) स्थापन व्हावे यासाठी त्यांनी पुढाकार घेतला. त्यावेळचे शिक्षणमंत्री श्री. शाह यांनी विद्यापीठ स्थापनेस नकार दिलेला असतांना सुध्दा यशवंतरावांनी वास्तव परिस्थिती जाणून घेवून विद्यापीठ स्थापनेस हिरवा कंदील दाखविला.

या विद्यापीठा प्रमाणेच सातारा येथील सैनिक स्कूलची निर्मिती औरंगाबाद येथील वैद्यकीय आणि अभियांत्रिकी महाविद्यालयाची स्थापना करण्यासाठी त्यांनी मदत केली. ही महाविद्यालये स्थापन करण्यामागे मा. यशवंतराव चव्हाण यांचीच प्रेरणा होती. कोल्हापूर येथील शिवाजी विद्यापीठाची स्थापना यशवंतरावांच्याच कारकीर्दीत तत्कालीन राष्ट्रपती राधाकृष्णन यांच्या हस्ते झाली होती. आज समाजात जातीयवाद हा छुप्या उघड पद्धतीने आणि प्रतिष्ठीतपणे जोपासला जात आहे. वास्तविक पहाता शैक्षणिक प्रसारानंतर जातीय वादाचे प्रमाण कमी होणे अपेक्षित होते. कारण शिक्षणातून विचार परिपक्वच होतील व पर्यायाने जातीयव्यवस्था निखळून पडेल असे यशवंतरावजींना वाटले होते. परंतु समाजातील वाढत्या जातीयवादाचे स्वरूप पाहून ते एका ठिकाणी म्हणतात कि महाराष्ट्राला एवढी थोर परंपरा असतांना आजची तरुण पिढी ठिकठिकाणी जातीयवाद करते याचा मला खेद वाटतो. यामुळेच त्यांनी आपल्या वगार्याकाळात सामाजिक आर्थिक समतेला पूरक ठरणारे कायदे केले होते.

उद्योग धंद्यांच्या विस्तारासाठी त्यांनी भर दिला. आजारी उद्योगात पैसा ओतण्यापेक्षा प्रथम कमी क्षमतेचा उद्योग सुरु करावा आणि नंतर हळू हळू त्या उद्योगाचा विचार करावा असे धोरण त्यांनी ठरविल्याचे दिसते. उद्योगांमुळे रोजगार निर्मितीवर चांगला परिणाम होत असतो. त्यासाठी उद्योगांना तात्काळ मदत करण्याचे त्यांचे धोरण होते.

**निष्कर्ष :-** यशवंतराव चव्हाण एक कर्तबगार व्यक्तीमत्व होते. महाराष्ट्र राज्याच्या निर्मितीसाठी त्यांनी पंडित जवाहरलाल नेहरू यांचे मन वळवून यश खेचून आणले. केवळ राजकारणाच्या परिघातच न वावरता समाज परिवर्तनाची उर्मी घेवून त्यांनी महाराष्ट्र राज्याचा कारभार अधिकाधिक समाजाभिमुख आणि विकासाभिमुख करण्यासाठी अथक परिश्रम घेतले. आजच्या काळात यशवंतराव चव्हाण यांच्या विचारांचा अभ्यास तरुण राजकीय नेत्यांनी केला पाहिजे. महाराष्ट्र राज्य उद्योगधंद्यात गुजरातपेक्षा मागे पडत असल्याची टिका होत आहे. अशा वेळी यशवंतरावांची आठवण येते. विकासाभिमुख प्रशासकीय यंत्रणा, उच्च शिक्षणातील गळती, वाढती जातीयता, गरीब – श्रीमंतातील वाढलेली दरी इ. संदर्भात यशवंतराव चव्हाण यांचे विचार आजही दिशा दाखवू शकतात. सामाजिक, आर्थिक, कृषी, शिक्षण अशा विविध क्षेत्रांच्या विकासात त्यांचे योगदान महत्वाचे आहे. यशवंतराव चव्हाण यांचे सामाजिक आर्थिक, राजकीय, शैक्षणिक कार्य समाजाला सतत प्रेरणा देत राहिल.

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## सौ. नेहा नलिन पावसकर-एक नवज्योती (व्यक्ती अभ्यास)

डॉ. मनोहर महादेव माने : (सहायक प्राध्यापक) शारीरिक शिक्षण विभाग, मुंबई विद्यापीठ, मुंबई-९८श्री. सचिन सिताराम पिसाळ : (क्रिडा शिक्षक) रायन इंटरनॅशनल स्कूल, सानपाडा.

### सारांश :

प्रस्तुत संशोधन पुस्तकामध्ये सौ. नेहा पावसकर यांचे गिर्यारोहण व त्याचबरोबर इतर खेळातील (अॅथलेटिक्स, जलतरण, बुद्धीबळ) कामगिरी चा अभ्यास करण्याचा थोडक्यात प्रयत्न केला गेला आहे.

सौ. नेहा पावसकर यांनी आपल्या अपंगत्वावर मात करून कशाप्रकारे खेळामध्ये आपले पदार्पण केले आहे याची माहिती या प्रस्तुत संशोधन पुस्तकामध्ये देण्यात आली. या संशोधन प्रबंधात सौ. नेहा पावसकर यांनी अपंग व्यक्तीसाठी विशेषकरून अंध महिलांसाठी वेगवेगळ्या साहसी खेळांचे प्रशिक्षण कशा प्रकारे दिले, त्याचा आढावा मांडण्यात आला.

संशोधकाने प्रस्तुत शोध पुस्तकामध्ये व्यक्ती अभ्यास संशोधन पद्धतीचा उपयोग केला आहे. सौ. नेहा पावसकर यांचा खेळातील आढावा घेण्याचे कार्य संशोधकाने येथे केले आहे. याचा उपयोग अपंग व्यक्ती, खेळाडू, मार्गदर्शक, प्रशिक्षक त्याचप्रमाणे सर्वसामान्य व्यक्तींनाही प्रेरणादायी ठरणार आहे. हे प्रस्तुत संशोधन पुस्तक विशेषकरून अपंग व्यक्तीसाठी मोठ्या प्रमाणावर प्रेरणादायी ठरणार आहे व त्या व्यक्तींना खेळामध्ये पुढे जाण्यास एक शक्ती मिळेल.

उत्कृष्ट व्यक्तीमत्त्व असलेली आणि शिवछत्रपती विशेष पुरस्कार विजेती सौ. नेहा पावसकर यांची खेळाडू, प्रशिक्षक व खेळातील जिद्दीपणा याचा अभ्यास येथे करायचा आहे.

म्हणून या समस्येची मांडणी करताना या प्रकल्पाला खालील शीर्षक दिले आहे.

### सौ. नेहा नलिन पावसकर-एक नवज्योती (व्यक्ती अभ्यास)

संशोधकाने प्रस्तुत शोध पुस्तकामध्ये व्यक्ती अभ्यास संशोधन पद्धतीचा उपयोग केला आहे. व्यक्ती अध्ययनाची काही तंत्रे आणि तथ्यांचे स्रोत आहेत.

द्वितीय किंवा प्रलेखित तथ्यांचे संकलन संशोधकाने सौ. नेहा पावसकर यांचे साहित्य, लेखन, विचार, मत त्यांची आवडती पुस्तके, शासकीय फाईलमधील भाग, फोटोचा अल्बम, शाळा व कार्यालयामधील रेकॉर्ड, त्यांना प्रदान करण्यात आलेले प्रमाणपत्र व भेटवस्तू तसेच सौ. नेहा पावसकर यांचे मित्र, शिष्य, नातेवाईक आणि माहिती असणाऱ्यांपासून माहिती संकलित करण्यात आली.

प्रस्तुत संशोधन पुस्तकामध्ये सौ. नेहा पावसकर यांची वैयक्तिक जीवनाची माहिती खेळातील श्रीगणेशा, अपंगत्वावर मात करून खेळामध्ये केलेली उत्तम कामगिरी, घेतलेले परिश्रम आणि पुरस्काराची यशोगाथा यांचा मागोवा घेण्यात आला आहे. त्याचप्रमाणे त्यांनी अपंग व्यक्तीसाठी खासकरून अंध व्यक्तींवर घेतलेले परिश्रम यांचा

आढावा घेण्यात आला आहे. त्याचप्रमाणे त्यांनी अपंग व्यक्तीसाठी खासकरून अंध व्यक्तींवर घेतलेले परिश्रम यांचा आढावा घेण्यात आला.

सौ. नेहा पावसकर यांनी खेळामध्ये घेतलेल्या मेहनतीची ओळख सर्व क्रीडा खेळाडूंना तसेच सर्व व्यक्तींना होण्यासाठी या अभ्यासाची गरज आहे.

सौ. नेहा पावसकर यांच्या जीवनकार्याचा अभ्यास करून अपंग, अंध व्यक्तीसाठी जे अथक परिश्रम घेतले आहे, जे बहुमोल कार्य केले आहे ते परिश्रम व कार्य खेळाडूंना, संघटकांना मार्गदर्शन मिळावे व तरूण पिढीला प्रेरणादायी ठरावे यासाठी सदर प्रबंध संशोधन करण्यात आला आहे.

खेळातील या जिद्दी, कष्टाळू, प्रत्येक संकटातून वाट काढत जी काही खेळामध्ये वाटचाल केली आहे व त्याचबरोबर खेळामध्ये विविध रेकॉर्ड केले आहे अशा सौ. नेहा पावसकर-एक नवज्योती यांना आपणा सर्वांकडून सलाम!

### प्रस्तावना

खेळाचे मानवाच्या जीवनात फार महत्वाचे स्थान आहे. कारण जीवनाचा आरंभ हा खेळामुळेच होत असतो. मनुष्य जन्माला येताक्षणी तो हात पाय हालवण्यास सुरुवात करतो. कारण “जीवन हा एक क्रिडांगणाचा भाग आहे.”

मानवाच्या शारीरिक, मानसिक, भावनिक, सामाजिक, शैक्षणिकदृष्ट्या विकास हा खेळातूनच होत असतो. खेळामुळे मानवाच्या जीवनामध्ये आत्मविश्वास निरोगी स्वास्थ्य, चिकाटी, जिद्दीपणा, इत्यादी बाबी निर्माण होतात. भारतीय संस्कृती ही प्राचीन संस्कृती असल्याने वेगवेगळ्या पद्धतीने वेगवेगळे खेळ खेळले जातात. त्यामध्ये दोन पद्धती असतात. एक सांघिक खेळ व दुसरे वैयक्तिक खेळ. सांघिक खेळामध्ये क्रिकेट, व्हॉलीबॉल, फुटबॉल, हॅन्डबॉल, बास्केटबॉल, हॉकी, कबड्डी, खो-खो इत्यादी खेळ आहेत व वैयक्तिक खेळांमध्ये जलतरण, जिम्नॅस्टिक, बॅडमिंटन, बॉक्सिंग, कुस्ती, शरीरसौष्ठव, अॅथलॅटिक्स इत्यादी खेळ आहेत. ज्यांना निसर्गात सहवासात फिरण्याची खुप आवड आहे, असाच एक वैयक्तिक खेळ म्हणजे गिर्यारोहण. हा खेळ सर्वात कठीण आहे. या खेळात शारीरिकदृष्ट्या तंदुरूस्त असणे खुप गरजेचे आहे. गिर्यारोहण हा खेळ जितका मजेशीर आहे, तितकाच धोकादायक सुद्धा आहे. त्यामुळे या खेळात स्वतःची काळजी घेणे खुप गरजेचे आहे.

एखादी व्यक्ती तिच्या अपंगत्वावर मात करून ती कशी खेळामध्ये वाटचाल करते व जिद्दीने मेहनत करून शारीरिक अपंगत्वावर मात करून ती विविध खेळामध्ये आपला ठसा उमटविते, ज्याप्रमाणे साधारण व्यक्ती खेळामध्ये प्रदर्शन करतात, सहभागी होतात, तर आपण का नाही सहभागी होऊ शकत? हा प्रश्न सतत मनामध्ये असतो व त्यामुळे आपणही त्या व्यक्तीप्रमाणे स्पर्धामध्ये सहभागी होऊ शकतो ही जिद्द ठेवून ते मोठ्या प्रमाणावर खेळाचा सराव करतात. अपंग व्यक्ती ही स्वतःला कमी न समजता तिही साधारण व्यक्तीप्रमाणे खेळामध्ये सराव करतात व त्याचा खेळामध्ये ठसा उमटवितात. आपल्या देशाचे काही अपंग खेळाडूंनी राष्ट्रीय स्तरावर उत्तम कामगिरी केली आहे. उदा. प्रसन्ना कर्माकर या जलतरण पटु, असे अनेक अपंग खेळाडू आहेत.

### शीर्षक:

एक जिद्दीपणा असलेली, पहिली अंध गिर्यारोहक व्यक्ती विशेष पुरस्कार विजेती सौ. नेहा नलिन पावसकर या व्यक्तींची खेळातील कामगिरीचा अभ्यास करायचा आहे म्हणून या समस्येची मांडणी करताना खालील शीर्षक दिले आहे.

सौ. नेहा नलिन पावसकर – एक नवज्योती (व्यक्ती अभ्यास)

**संशोधनाची गरज व महत्त्व :**

सौ. नेहा नलिन पावसकर यांनी अपंगत्वावर मात करून गिर्यारोहण, जलतरण, बुद्धिबळ व त्याचबरोबर अॅथलेटिक्स या सर्व खेळासाठी घेतलेल्या मेहनतीची ओळख सर्व क्रीडा क्षेत्रातील खेळाडूंना त्याचप्रमाणे सामान्य व्यक्तींना होण्यासाठी या अभ्यासाची गरज आहे.

वरील सर्व खेळासाठी विशिष्टकरून गिर्यारोहण या खेळासाठी जे अथक परिश्रम घेतले व सर्व खेळाडूंना त्याच प्रमाणे मार्गदर्शकांना यामुळे प्रेरणा व मार्गदर्शन मिळावे यासाठी सदर प्रबंध संशोधन करण्यात आला आहे. तसेच गिर्यारोहण या क्षेत्राची सर्वांना जास्तीत जास्त मार्गदर्शन व्हावे व विकासाची दिशा मिळावी म्हणून संशोधनासाठी हा विषय निवडण्यात आला आहे.

सौ. नेहा नलिन पावसकर यांचे गिर्यारोहण मधील कामगिरी सर्वक्षेत्रातील व्यक्तींना किंवा खेळाडूंना होण्यासाठी या अभ्यासाची गरज आहे. तसेच या क्षेत्रातील सर्व व्यक्तींना व नवीन पिढीच्या विकासाला नवीन दिशा मिळावी म्हणून संशोधनासाठी हा विषय निवडण्यात आला आहे.

त्याचप्रमाणे जास्तीत जास्त सामान्य लोकांना व अपंग लोकांना सौ. नेहा पावसकर यांनी केलेल्या कामगिरीची माहिती व्हावी आणि त्याचबरोबर सामान्य व अंध व्यक्तींना प्रोत्साहन मिळावे यासाठी हा विषय महत्त्वाचा आहे.

**संशोधनाची उद्दिष्टे :**

- ❖ सौ. नेहा पावसकर यांची वैयक्तिक माहिती जाणून घेणे. उदा. जन्मस्थान व बालपण अवस्थेतील दिवस इत्यादी.
- ❖ सौ. नेहा पावसकर यांची शिक्षणाविषयी माहिती जाणून घेणे.
- ❖ सौ. नेहा पावसकर यांची शिक्षणाविषयी माहिती जाणून घेणे.
- ❖ सौ. नेहा पावसकर यांची शारीरिक शिक्षणाविषयी असलेली आवड जाणून घेणे.
- ❖ सौ. नेहा पावसकर यांची आर्थिक परिस्थिती जाणून घेणे.
- ❖ सौ. नेहा पावसकर यांची एक प्रशिक्षक म्हणून केलेली कामगिरी समजून घेणे.
- ❖ गिर्यारोहण, अॅथलेटिक्स, बुद्धिबळ व जलतरण या खेळासाठी घेतलेल्या अथक परिश्रमाचा आढावा घेणे.
- ❖ सौ. नेहा पावसकर यांचे वर्तमान सामाजिक स्थानाचे अध्ययन करणे.
- ❖ त्यांनी तळागाळातील खेळाडू कसे घडवले हे जाणून घेणे.
- ❖ सौ. नेहा पावसकर यांना विविध क्षेत्रात आलेल्या अडचणीचा अभ्यास करणे.

**परिक्ल्पना :**

- ❖ सौ. नेहा पावसकर गिर्यारोहण खेळासाठी केलेल्या योगदानाबद्दल त्यांना कौटुंबिक प्रोत्साहन मिळाले असेल.
- ❖ सौ. नेहा पावसकर यांच्या गिर्यारोहण खेळातील चांगल्या कामगिरीसाठी शिवछत्रपती विशेष पुरस्कार प्राप्त झाला असेल.

**संशोधनाची मर्यादा :**

व्यक्ती अद्ययन पद्धतीत काही विशिष्ट एककाचे सुक्ष्म अध्ययन करून त्या आधारावर निष्कर्ष काढले जातात.

- ❖ प्रकाशित संशोधनाचा अभ्यास हा व्यक्तीशी मर्यादित आहे.



- ❖ संशोधनासाठी आवश्यक माहिती साहित्यातील सर्व लिखित तसेच मौखिक स्रोतातून उपलब्ध झाली आहे.
- ❖ स्वतः त्या व्यक्तीकडून आणि त्यांच्याशी संबंधित लोकांकडून संशोधकाने माहिती गोळा केली आहे.

#### संशोधनाची व्याप्ती :

- ❖ सौ. नेहा नलिन पावसकर यांनी दिलेल्या स्वतःच्या माहितीवरून कौटुंबिक तसेच मित्र परिवारातून माहितीनुसार संशोधन केले जाईल.
- ❖ तसेच घटना व प्रसंग घडलेले असतील त्याक्षणी टिपून ठेवलेली माहिती प्रकाशित केल्यामुळे त्यातून देखील अभ्यास करता येईल.

#### संशोधन अभ्यास पद्धती

व्यक्ती अध्ययन म्हणजे सखोल व सुक्ष्म अध्ययन पद्धत होय. या अध्ययनात अनेक विषयांच्या संबंधात माहिती न मिळवता एका विषयांच्या संबंधात अधिक जाणून घेण्याचा प्रयत्न केला जातो.

व्यक्ती अध्ययनाची कार्यपद्धती :

खऱ्या अर्थाने पाहिले तर व्यक्ती अध्ययन हे भूतकाळ आणि वर्तमान काळाशी संबंधीत उपलब्ध माहिती किंवा तथ्यावर आधारीत असते. अध्ययन करण्यात येणाऱ्या एकाविषयी केवळ प्रश्नावली, मुलाखती निरीक्षण इत्यादी तंत्राच्या माध्यमातून तथ्यांचे संकलन केले जाते असे नाही. या प्राथमिक स्रोतांप्रमाणे द्वितीय स्रोतांद्वारेदेखील तथ्ये मिळविली जातात.

व्यक्ती अध्ययनाची तंत्रे व तथ्यांचे स्रोत :

प्रत्येक शास्त्रीय अध्ययनाची काही तंत्रे आणि तथ्यांचे स्रोत असतात. त्याचप्रमाणे व्यक्ती अध्ययनाची काही तंत्रे आणि तथ्यांचे स्रोत आहेत. व्यक्ती अध्ययनात मुलाखत आणि निरीक्षण या तंत्राचा प्रामुख्याने उपयोग केला जातो. या तंत्राच्या माध्यमातून संशोधनकर्ता आपल्या अध्ययन विषयासंबंधीत तथ्यांचे संकलन करतो. या तंत्राबरोबरच पुस्तक, पत्रे, दैनंदिनी आणि शासकीय रेकॉर्ड या द्वितीय अशा दोन्ही स्रोतांद्वारे व्यक्ती अध्ययनात तथ्यांचे संकलन करण्यात येते. व्यक्ती अध्ययनात तथ्यांच्या संकलनासाठी पुढील प्रकारच्या स्रोतांचा उपयोग केला जातो.

#### अ) प्राथमिक किंवा स्वतः संकलित केलेल्या तथ्यांचे स्रोत :

प्राथमिक तथ्यांचे संकलन हे स्वतः संशोधनकर्त्याने केले आहे. व्यक्ती अध्ययनात या तथ्यांचे संकलन करण्यात येते. व्यक्ती अध्ययनात या तथ्यांचे संकलन संबंधित दीर्घकाळ मुलाखत घेऊन केले आहे.

मुलाखतीच्या वेळापत्रकाप्रमाणे प्रश्नावली मार्फत पुढील कुटुंबाबाबत माहिती येथे मिळणार आहे.

- ❖ सौ. नेहा नलिन पावसकर यांचा जन्म व बालपण
- ❖ त्यांचा शैक्षणिक आढावा
- ❖ कौटुंबिक जीवन
- ❖ व्यावसायिक आढावा
- ❖ वैवाहिक जीवन
- ❖ सन्मान
- ❖ आलेल्या अडचणी
- ❖ त्याचा स्वभाव व वागणुक

- ❖ गिर्यारोहणमधील कामगिरी
- ❖ त्यांच्या कल्पना व विचार
- ❖ खेळामध्ये अंध व्यक्तींना मोठ्या प्रमाणावर सहभागी होण्यासाठी केलेले प्रयत्न.
- ❖ ऑल इंडिया अंध स्त्री हित असोसिएशन संस्थेची सचिव म्हणून पाहिलेली स्वप्ने

#### ब) द्वितीय किंवा प्रेलखीत स्रोत :

- ❖ सौ. नेहा पावसकर यांचे विचार व मत
- ❖ सौ. नेहा पावसकर यांचा शासकीय फाईलमधील भाग
- ❖ फोटोचा अल्बम
- ❖ सौ. नेहा पावसकर यांना महत्त्वपूर्ण व्यक्तींद्वारे दिलेले प्रमाणपत्र, सन्मानचिन्ह, मानपत्र व भेटवस्तू इत्यादीवरील माहितीच्या आधारे सौ. नेहा नलिन पावसकर यांच्या जीवनातील विविध पैलूंचा अभ्यास केला आहे.

सौ. नेहा पावसकर म्हणजेच एक नवज्योती म्हटले तर वावगे ठरणार नाही. ज्या प्रकारे त्यांनी अनेक गोष्टींवर मात करून जी काही खेळांमध्ये आपली छाप उमटवली आहे या सर्वांचा आढावा आपण या प्रकरणातून घेतला आहे.

हा आढावा घेत असताना त्यांची प्रत्यक्ष मुलाखत घेऊन त्याचप्रमाणे त्यांच्या कौटुंबिक सदस्यांकडून सौ. नेहा पावसकर यांच्या बाबत मिळालेल्या माहितीच्या आकलनामुळे पुढील माहिती संशोधकाने मांडली आहे. तसेच सौ. नेहा पावसकर यांच्या जवळचे मित्र परिवार खेळाडू संघटक, शिष्ये संघटनेतील कर्मचारी काही सरकारी कर्मचारी तसेच काही प्रमुख अधिकारी यांच्याकडून संकलित केलेल्या माहितीच्या आधारे त्यांच्या व्यक्तिमत्त्वाचा परिचय करून देण्याचा संशोधकाने आपल्या पद्धतीने परिपूर्ण प्रयत्न केलेला आहे.

#### आत्मपरिचय :

सौ. नेहा पावसकर यांच्या वैयक्तिक जीवनाची माहिती घेणे म्हणजेच त्यांचे जन्मस्थान, बालपण, शिक्षण, कौटुंबिक परिस्थिती याबद्दल जाणून घेणे, क्रीडा क्षेत्रातील बहुमोल समजला जाणारा शिवछत्रपती विशेष पुरस्कार पटकविण्याचा बहुमान मिळविणारी एक नवज्योती म्हणजे सौ. नेहा नलिन पावसकर होय. हा बहुमुल्य पुरस्कार गिर्यारोहण या खेळामध्ये देऊन गौरवण्यात आलेला आहे.

#### जन्म व बालपण :

या नवज्योतीचा जन्म महाराष्ट्र राज्यात मुंबई शहरातील विलेपार्ले (पश्चिम) येथील नानावटी रूग्णालय या ठिकाणी दि. २० मे १९६९ रोजी झाला. त्यांचे वडील श्री. मनमोहन श्रीधर नाईक व आई सौ. शुभांगी मनमोहन नाईक या दांपत्याच्या पदरी या नवज्योतीचे बालपण उभारले.

#### कौटुंबिक आढावा :

सौ. नेहा पावसकर यांच्या कौटुंबिक परिस्थितीकडे पाहिले असता असे दिसले की, त्यांची कौटुंबिक परिस्थिती फार हलाकीची होती. सौ. नेहा पावसकर यांच्या कुटुंबात त्यांचे वडील मनमोहन श्रीधर नाईक व आई शुभांगी मनमोहन नाईक आणि तीन बहिणी व भाऊ असा त्यांचा कौटुंबिक परिवार होता.

#### शैक्षणिक आढावा :

सौ. नेहा नलिन पावसकर यांनी शिक्षणाला खुप महत्त्व दिले. त्यांना शालेय जीवनात अनेक गोष्टींना सामोरे जावे लागले. त्यांचे शालेय शिक्षण हे प्रार्थना समाज, विलेपार्ले (मराठी माध्यम) या विद्यालयात झाले. जन्मतःच दृष्टी

अत्यंत अंधू असल्याने तिचे दहावीपर्यंतचे शिक्षण पूर्ण करण्यात फार अडचणी निर्माण झाल्या. त्यांना अपंगत्व (अंधपणा) हा जन्मापासूनच आहे. त्यांच्या दोन्ही डोळ्यांत एक डाग आहे. हा आजार त्यांना इयत्ता २ री मध्ये असताना समजला कालांतराने हळूहळू त्यांची दृष्टी ही कमी होऊ लागली.

जिद्दीने त्यांनी स्वतंत्रपणे ऑडिओ कॅसेटच्या आधारे आपले दहावीपर्यंतचे शिक्षण पूर्ण केले. दहावीच्या अंतिम परीक्षांमध्ये त्यांनी पेपर लिहण्यासाठी एका व्यक्तीची (रायटर) ची मदत घेतली. त्यांचे ११ वी व १२ वी चे शिक्षण हे महर्षी दयानंद महाविद्यालय, परेल येथे झाले.

#### आर्थिक परिस्थिती :

सौ. नेहा पावसकर यांचे लहानपणापासून आर्थिक परिस्थिती ही नाजूक होती, तरीही त्यांनी त्याकडे दुर्लक्ष करून आपले शिक्षण पूर्ण केले. त्यांनी छोट्या मोठ्या नोकऱ्या करून अनेक अडचणींना तोंड दिले.

#### विवाहबद्ध :

सौ. नेहा पावसकर यांचा विवाह हा श्री. नलिन दत्तात्रय पावसकर या डोळस व्यक्तीशी दि. १५ एप्रिल १९९५ रोजी झाला. त्यांचे पती सार्वजनिक बांधकाम विभाग (पी. डब्ल्यू.डी.) मध्ये लिपीक पदावर कार्यरत आहेत. प्रत्येक यशस्वी पुरुषाच्या मागे एका स्त्रीचा हात असतो त्याचप्रमाणे सौ. नेहा पावसकर यांच्यामागे त्यांच्या पतीचा हात आहे..

#### गिर्यारोहण त्याचबरोबर इतर खेळातील श्रीगणेशा :

सौ. नेहा पावसकर यांचा आवडता असा खेळाडू कोणच नव्हता. कारण त्या पाहू शकत नव्हत्या. त्यामुळे त्यांना खेळाडूची कामगिरी पाहता येत नव्हती. त्या स्वतःलाच आदर्श खेळाडू मानत होत्या. परंतु एके दिवशी त्यांच्या वाचण्यात आले की तारानाथ सेनॉय (अंध व्यक्ती) हा इंग्लिश खाडी पोहून जाणारा पहिला अंध व्यक्ती आहे. त्याने जागतिक विक्रम केला आहे. ही बातमी ऐकून त्यांनी पुढे निश्चित केले की ती व्यक्ती खेळामध्ये उत्तम कामगिरी करू शकते. तर आपण का नाही करू शकत. त्यानंतर त्यांनी जलतरण त्याचबरोबर इतर खेळांमध्ये सराव करून उत्तम कामगिरी केली व पुढे नविन नविन खेळाचा श्री गणेशा केला.

आंतरराष्ट्रीय स्पर्धापर्यंतचा त्यांचा यशस्वी प्रवास, त्यांनी मिळविलेल्या ढिगभर पारितोषिकांनी अधोरेखित झाला आहे. बुद्धीबळ व गिर्यारोहण हे त्यांचे विशेष आवडीचे खेळ आहेत. आतापर्यंत त्या चार वेळा राष्ट्रीय अंध महिला अंजिक्यपद विजेती ठरली आहे. तर नोव्हेंबर २००४ मध्ये इंग्लंड स्टॅफर्ड येथे आयोजित केलेल्या आंतरराष्ट्रीय खुल्या बुद्धीबळ स्पर्धेत बरोबरीने पाचवे स्थान मिळविले आहे.

#### अपंग खेळाडूसाठी घेतलेले परिश्रम :

सौ. नेहा पावसकर या स्वतः अंध असल्यामुळे अपंग व्यक्तीच्या काय अडचणी असतात हे डोळस व्यक्तीपेक्षा त्यांना जास्त माहित आहे. त्यांनी अपंग व्यक्तीसाठी अनेक परिश्रम घेतले आहे. त्यांनी अंध व्यक्तींना साहसी खेळ, त्याचबरोबर बुद्धीबळ खेळासाठी अधिक परिश्रम घेतले आहेत. सौ. नेहा पावसकर यांनी ऑल इंडिया अंध स्त्री हित असोसिएशन (AIASHA) यांची स्थापना केली. त्यांची संस्था मुख्यतः साहसी खेळ आणि सांस्कृतिक कार्यक्रमाच्या माध्यमातून नेत्रहिनांच्या जीवनात प्रकाश आणण्याचे प्रयत्न करून त्यांना निर्भोडपणे समाजात जगण्याची प्रेरणा देते. सौ. नेहा पावसकर संस्थेच्या मुख्य व्यक्ती (सचिव) असल्यामुळे त्या संस्थेच्या वतीने ट्रेकिंग हिमालयीन ट्रेकिंग, रॉक क्लायबिंग, रॅपलिंग, व्हॅली क्रॉसिंग, रिव्हर क्रॉसिंग, वाटरफॉल रॅपलिंग, बुद्धीबळ, अॅथलेटिक्स, राप्टींग, कयाकिंग, स्वीमिंग, क्रिकेट, योगा, रेकी, रोप मल्लखांब, कबड्डी या खेळात तसेच संगीत, नृत्य, संगणक, हॅमरेडिओ

यांची माहिती व मार्गदर्शन केले जाते व तसेच संगीत नृत्य स्पर्धांचे संस्थेच्या वतीने आयोजनही केले जाते.

### सन्मान सोहळे :

सौ. नेहा पावसकर यांनी नॅशनल असोसिएशन ऑफ ब्लाइन्ड (वरळी) येथे सर्व खेळांचे ज्ञान घेतले आहे व या संस्थेतर्फे विविध स्तरावर त्या सहभागी झाल्या.

सौ. नेहा पावसकर यांनी अंधत्व स्वीकारल्यानंतर अंधासाठी उपलब्ध असलेल्या व डोळसांच्या बरोबरीने अनेक साहसी खेळात भाग घेऊ लागली. हिमालयातील साडे तेरा हजार फुटावरील डोंगरी प्रशिक्षणाचे नेतृत्व करून हिमालयातील पहिल्या अंध व मुकबधीर गिर्यारोहण मोहिमेत सहभागी होऊन सतरा हजार दोनशे वीस फुटावरील क्षितीधर शिखरावर चढून भारतातील पहिली अंध महिला असा जागतिक विक्रम लिमका बुक ऑफ वर्ल्ड रेकॉर्ड १९९४ मध्ये नोंदविला आहे.

### सौ. नेहा पावसकर यांनी प्राप्त केलेले अतुलनीय पुरस्कार

क्रमांक	पुरस्कार	सन
१	शिवछत्रपती विशेष क्रिडा पुरस्कार	१९ फेब्रुवारी २००५
२	अपंगलेखा प्रतिष्ठा पुरस्कार	११ डिसेंबर २००५
३	सावित्रीबाई फुले समाजसेविका पुरस्कार	२० एप्रिल २००६
४	क्रिडारत्न पुरस्कार	२००९
५	सर्वश्रेष्ठ कर्मचारी पुरस्कार (राष्ट्रपती पुरस्कार)	३ डिसेंबर २०१०

### सौ. नेहा पावसकर यांचे सामाजिक कार्य :

- ❖ मुंब्रा, देवीडोंगर, ठाणे व जिवदानी देवी डोंगर, विरार, मुंबई गिर्यारोहण सराव व योगा प्रशिक्षण शिबीराचे आयोजन.
- ❖ सौ. नेहा पावसकर यांच्या महाप्रयत्नाने गांधीनगर वांद्रे येथे अंधांसाठी एम.एस.सी. आयटीचे प्रशिक्षण सुरू करण्यात आले.
- ❖ वैष्णोदेवी (जम्मू) येथे गिर्यारोहणाचे आयोजन.

### निष्कर्ष :

प्रस्तुत संशोधन पुस्तिका ही शिवछत्रपती विशेष पुरस्कार विजेती सौ. नेहा पावसकर यांची खेळातील कामगिरीचा त्याचप्रमाणे अपंग व्यक्तीसाठी घेतलेल्या परिश्रमाचा सखोल अभ्यास करून पुढील काही निष्कर्ष मुद्दे काढण्यात आले.

- ❖ सौ. नेहा पावसकर ह्या एक लहानपणापासून जिद्दी, कष्टाळू आहेत.
- ❖ सौ. नेहा पावसकर ह्या लहानपणापासून प्रखर इच्छाशक्ती असणारे आहेत.
- ❖ सौ. नेहा पावसकर यांना लहानपणापासून अजिंक्य राहण्याची सवय आहे.
- ❖ कोणत्याही खेळाडूवर अन्याय न होऊ देता, त्यांनी त्यांच्या हक्काची गोष्ट मिळवून देण्यासाठी सौ. नेहा पावसकर या नेहमीच कार्यरत असतात.
- ❖ अपंग व्यक्तींसाठी विशेषकरून अंध महिलांसाठी वेगवेगळ्या साहसी खेळांचे प्रशिक्षण करताना दिसतात.
- ❖ सौ. नेहा पावसकर यांनी खेळामध्ये अपंग व्यक्तीने जास्तीत जास्त सहभागी व्हावे यासाठी त्यांनी खूप परिश्रम घेतले आहे.

- ❖ सर्व अपंग अंध व्यक्ती सौ. नेहा पावसकर यांना खेळातील एक आदर्श व्यक्ती मानतात.
- ❖ सौ. नेहा पावसकर या सतत खेळासाठी लढल्या आणि लढत आहेत.

#### शिफारशी :

- ❖ चांगल्या गुणी खेळाडूंना शासनातर्फे पुरस्कृत करून त्यांना योग्य अशा शिष्यवृत्त्या देऊन त्यांना सन्मानित करण्यात यावे.
- ❖ अपंग व्यक्तीसाठी जास्तीत जास्त स्पर्धेचे आयोजन करावे, त्यामुळे त्यांची खेळामधील आवड वाढेल.
- ❖ अपंग व्यक्तींना कमी दर्जा न देता इतर खेळाडूंप्रमाणेच मान द्यावा.
- ❖ शासनाने जाहीर केलेल्या क्रीडा योजना यांची माहिती जास्तीत जास्त खेळाडूपर्यंत पोचावी.
- ❖ अपंग व्यक्तींना खेळामध्ये जास्तीत जास्त सवलती द्याव्यात.
- ❖ अंध व अपंग खेळाडूंना खेळासाठी सरकारकडून आर्थिक मदत मिळावी.
- ❖ अंध व अपंग व्यक्तींसाठी जास्तीत जास्त प्रमाणात विविध स्पर्धा आयोजित कराव्या.
- ❖ अंध व अपंग व्यक्तींना सरकारी नोकरीमध्ये जास्तीत जास्त प्रमाणात सामावून घेतले पाहिजे.

#### संदर्भसूची

##### पुस्तके :

- ❖ पाटणकर, प्रभाकर (१९४८), हिमालयाशी झुंज, नाशिक.
- ❖ रॉय, श्रीकांत, पर्वताची हाक (१९६२), मुंबई.
- ❖ आलेगावकर प.म. (२०००), प्रगत क्रिडा मानसशास्त्र
- ❖ नाडकर्णी सुरेशचंद्र (१९८९), क्रिडा ज्ञान कोश, पुणे.

##### प्रबंध :

- ❖ हेरॉल्ड लाईड रे (१९७९), द लाइफ अँड कॉटयुल्युगन ऑफ ग्रिलब्रेट अँडससन (एम.डी.), अप्रकाशित पी.एच.डी.प्रबंध, विद्यापीठ.
- ❖ अँडलेड ग. इटर (१९५०), २ टेट, मॅकनजी पायोनीर इन फीजीकल एज्युकेशन, अप्रकाशित प्रबंध, कोलंबो विद्यापीठ.
- ❖ डायरोथी म. टकर (१९६०), कॅतरीन मॉनटगॅमेरो हर लाईफ प्रोफेशनल अँड टू फीजीकल एज्युकेशन, अप्रकाशित प्रबंध, कमन्स विद्यापीठ.
- ❖ एस. शिवरामन कृष्णन, क्रिकेट खेळाडू सुनिल गावसकर यांचे जीवनचरित्र, अप्रकाशित पी.एच.डी. प्रबंध, अलगप्पा, विद्यापीठ, राई कुडो
- ❖ राजकुमार (१९९४), तामिळनाडूच्या आदरणी मुख्यमंत्री जयललिता यांचे क्रीडा क्षेत्रातील योगदान, यांचा अभ्यास, अप्रकाशित एम. फिल. थेसिस, अलगप्पा विद्यापीठ.
- ❖ डेव्हिस ए.डी.पी. मुन्नी (१९९२), ऑलिम्पिक वेटलिफ्टर यांच्या जीवन चरित्राचा अभ्यास, अप्रकाशित मास्टर पदवी डेझरटेशन, पुणे विद्यापीठ.
- ❖ स्मिता पाटील (२००८), कै. बुवा साळवी यांचे कबड्डीच्या प्रगतीसाठी योगदान, प्रकाशित मास्टर पदवी प्रबंध, मुंबई विद्यापीठ

- ❖ गणेश वाघमारे (२००३), हिंद केसरी कुस्ती पटू योगेश दोडके यांचा जीवन चरित्राचा अभ्यास, अप्रकाशित मास्टर पदवी प्रबंध, पुणे विद्यापीठ.

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