# IMPACT OF RECREATIONAL GAMES ON PSYCHO-NEURO-PHYSIOLOGICAL VARIABLES OF ADULT TRIBALS

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## INTRODUCTION

The benefits of physical exercise for health are widely credentialed (Boyle et al., 2007). Those who engage in regular exercise are likely to reduce or avoid disability due to the positive effects on, for example, cardiovascular and pulmonary functioning, bone density, and muscle mass (Fletcher et al., 1996). The exercise pattern should be preserved year-round, year after to keep the benefits. This may look like an impossible task with personal activity needed for out weighting the possible reward. But, once a regular practice of exercise is established, activities become easy and natural. In fact, many people don't maintain their regular level of exercise (Vodak, 1995).

The Santhal tribes are the oldest tribes in Indian shipped from the Pre Aryan times. The Santhal tribes which are still found in some regions of eastern India are West Bengal, Orissa and Jharkhand. Santhal dance is observed in a group of girls and boys accompanied by instruments Dhol, Flutes, Pipes and Cymbals. In West Bengal Santhals involve the jungle areas around Midnapore and are poorly tolerated by the laborers in the plain regions of West Midnapore and Bankura district. However, according to Walter Hamilton, the Santhals are "a mild, sober, industrious people, and remarkable for sincerity and good faith"(Bose, 1985).

Outdoor recreation attributes to well being done on a regular basis. There are several types of activity involving walk up, brisk walking, bird observation, socialised with fellow mates, picnic, nature study, hiking etc. Driver and Knopf (1976); Driver and Cooksey (1977); Driver (1985); Godbey et al. (1992); Tinsley et al. (2002); Kacznski and Henderson (2007) have found beneficial effects of outdoor recreation in solving the deteriorates of stress and obesity. Stress reduction appears to be an important improvement reported by older visitors to local parks (Godey and Blazey, 1983). Negative moods decreased after spending time in a parks and a park users reported lower levels of anxiety and sadness (More and Payne, 1978).

Age-related deteriorate of the cerebellum (Raz et al., 2001; 2005) and the proprioceptive system (Goble et al., 2009) may associate to deficits in multi-joint coordination for adults. Central mechanisms of the elderly have some deficits that affect the engagement of movement and control with visual guidance (Welford et al., 1969). A longer period of time is occurred to initiate the movement and to guide the

movement in elderly compared to young people (Fitts, 1992). A number of irregularities in the kinematics of movement have also been influenced in older people (Morgan et al., 1994). Systematic age differences in movement-to-target reaction times were found. The deleterious impacts of age in eye-hand coordination and motor control of the upper extremities may decrease functional ability, physical activity, and self care in the adults.

Therefore, the research scholar is interested to investigate the degree of importance of the recreation games, which are essential to attain an outlet for self expression, for release of tension, stress and for the attainment of satisfaction in life for adult tribals who are socially ignored and disregarded due to their backwardness. It makes a path for adult tribals to contact with others and form a relationship which offers momentous opportunities to perform and expand social skills through activities and thereby such study was being undertaken.

## STATEMENT OF THE PROBLEM

The main purpose of the study was to determine whether recreational games would have greater impact on selected Psycho-Neuro-Physiological variables of adult tribals.

Hence the present researcher intended to take this study for investigation and stated the problem as under: **"IMPACT OF RECREATIONAL GAMES ON PSYCHO-NEURO-PHYSIOLOGICAL VARIABLES OF ADULT TRIBALS".**

## OBJECTIVES

The study was conducted with following objectives:

- To determine the influence of Recreational games on selected Psycho-Neuro-Physiological variables such as, Self Esteem, Life satisfaction, Locus of control, Self efficacy, Illusion, Tactile Sense, Hand Eye Co-ordination, Gross movement of hands, finger and arms, Depth Perception, Reaction time, Resting Heart rate, Systolic blood pressure and Diastolic blood pressure.
- To formulate a suitable training schedule on Recreational games for the adult tribals.
- To identify the status of the subjects on Psycho-Neuro-Physiological abilities.

## HYPOTHESES

Following hypotheses were formulated to conduct the present study:

**a.** It was hypothesized that there would be no significant improvement due to recreational games training in selected Psycho-Neuro-Physiological variables among male adult tribals.

**b.** It was hypothesized that there would be no significant improvement due to recreational games training in selected Psycho-Neuro-Physiological variables among female adult tribals.

## DELIMITATIONS

The present study was delimited to the following condition:

- This study was delimited to 40 male and female adult tribals of 50-55 years of age. Out of 40, 20 in each category were selected from Bankura district in West Bengal.
- This study was restricted to sixteen weeks of recreational games training Programme.
- This study was further delimited to following Psycho-Neuro-Physiological variables such as, Self Esteem, Life satisfaction, Locus of control, Self efficacy, Illusion, Tactile Sense, Hand Eye Co-ordination, Gross movement of hands, finger and arms, Depth Perception, Reaction time, Resting Heart rate, Systolic blood pressure and Diastolic blood pressure.

## LIMITATIONS

The present study was conducted under the following limitations:

- In this study the personal lifestyle, the diet, the daily habits and other activities were recognized as a limitation.
- The heredity and previous fitness experience of the subjects were treated as the limiting factors of this study.

- Sociological aspect of their day-to-day life interaction with their environment was not considered for this study.
- Motivation, attitude and interests of the subjects were also limiting factors for the present study.
- In this study climatic condition and Environmental temperature could not be controlled.
- Financial condition and time were also not considered in this study.

## REVIEW OF RELATED LITERATURE

**Ken et al. (1999)** investigated the training effects of daily jogging and nutritional control on treatment of obesity in middle-aged and older women, physical training for six months was prescribed. Training group members were 11 obese housewives aged (45-34). As a result of instruction about nutrition and physical training for six months, the subjects' body weight and Rohrer's index markedly decreased. In addition to that, some items of blood contents and aerobic function improved and symptoms of hyperlipidemia decreased. In conclusion, it was considered that nutritional control as well as physical training would be indispensable as a prescription for middle-aged and older obese people.

**Edermann et al. (2004)** examined the influence of cup stacking on hand-eye coordination and reaction time of 24 boys and 18 girls in second grade as measured by the Soda Pop and Yardstick tests, respectively. Two physical education classes were randomly assigned as treatment and control groups and were pre- and post-tested for hand-eye coordination and reaction time. The treatment group participated in a 5-week cup-stacking program. Significant improvements were noted for both hand eye coordination and reaction time between the pre- and post-test scores for this group but not for the control group.

**Jusoff et al. (2005)** conducted a study on the academic and non academic workers to judge their satisfaction in life. Some inconsistent things such as age and gender showed significant difference in their life satisfaction. The results suggested that the workers were moderately comfortable with their life. The demographic variables such

as age, their experience and their life satisfaction showed significant differences but the category of staff and gender found no significant difference in life satisfaction.

**Toit et al. (2010)** examined the effect exercise in the visual skill performance. Twenty six (26) rugby players aged 18 to 26 were subjected to three different sports vision tests. The players were exposed to a period of isolated exercises for physical exertion intervention between the pre- and post sports vision tests. From the results, an improvement in performance was observed by players exposed to these exercises. A significant improvement ($p<0.05$) was observed in the number of successful catches and simultaneous ball throw, while a non significant improvement was seen in the number of successful throws through a ring (accurate passing).

**McKeen (2013)** performed a cross-sectional study to investigate, an intervention involving motor skills training, whole body exercise, sports and games was used to improve balance, fine and gross motor manual control and reaction time in a group of adults with autism and ID. Fine motor skill was measured using the 25 Grooved Pegboard Test, gross motor skill of the upper extremities was measured with the Box and Blocks Test, and reaction time was measured with the Stick Catching Test. Results revealed that significant fine motor improvement occurred at retention when compared to baseline and gross motor improvement approached statistical significance but only when the sums of both trials at each session were taken. Statistically significant improvements were not found for reaction time testing or for any static balance variables.

**Bhunia (2014)** conducted a study to determine the influence of Yoga, traditional games & sports for global human resource development. In Yogic practices, there is a harmonious development of all the muscles of the body, internal organs, nerves and frame. The experts name few Yogasana and Pranayam for physical and mental health and advice for Meditation. Beside this, Traditional games and sports are part of intangible heritage and a symbol of the cultural diversity of our societies. Generally Traditional Games and Sports are indigenous in nature. Experts say it is one of the excellent ways to remain healthy, fit, well being, and recreate. Through playing of these games human resource development is possible. However, Human resource development means improvement of working capacity.

**Moriah et al. (2018)** investigated a systematic review to estimate the pooled effects of community-based, recreational-level group sports on cardiometabolic risk factors and fitness parameters among adults. The systematically searched electronic databases for English articles reporting the effectiveness of recreational-level group sports, published between January 1, 1965 and January 17, 2017. The extracted baseline and end of intervention means for cardiometabolic and fitness parameters. Random- or fixed-effects meta-analyses were used to obtain pooled pre/post change in outcome means within intervention participants and between groups. From 2,491 screened titles, 23 publications were included (N=902, age [mean ± SD] 46.6 ± 11.7 yrs), comprised of 21 soccer and two rugby interventions. Intervention participants achieved larger improvements compared to control subjects in weight, BMI, waist circumference, body fat, total cholesterol, LDL cholesterol, systolic blood pressure, diastolic BP, VO2 max and RHR. Most studies (n=16) were classified as high-quality, and found no evidence of publication bias. The systematic review found significant cardiometabolic and fitness improvements following group sport participation, primarily recreational soccer.

## METHODOLOGY

In this chapter, the methodology employed on the topic **"IMPACT OF RECREATIONAL GAMES ON PSYCHO-NEURO-PHYSIOLOGICAL VARIABLES OF ADULT TRIBALS"** was Selection of subjects, **S**election of variables, Selection of Tests, Collection of Data, Training schedule, Design of the Study, Statistical procedure and Level of Significance adopted have been explained.

## SELECTION OF SUBJECTS

For the present study, 40 adult tribals were randomly selected for the study from village Pandri, Bankura district in West Bengal. The age of all the subjects utilized in the study was within the range of 50-55 years. The subjects were divided into two experimental groups, named as Group 'M' (Male) and Group 'F' (Female). Each group consisted of twenty (N=20) subjects for the training period of Sixteen (16) Weeks. The purpose of the study was clearly explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the

study. It was ensured from the health examination records of the subjects that all of them were medically fit.

## SELECTION OF VARIABLES

Taking into consideration of feasibility criteria, availability of instruments and the relevance of the independent and dependent variables in the present study, the following variables were selected.

### INDEPENDENT VARIABLES:

- Recreational games.

### DEPENDENT VARIABLES:

#### Psychological Variables

- Self Esteem.
- Life Satisfaction.
- Locus of Control.
- Self Efficacy.

#### Neuropsychological Variables

- Illusion.
- Tactile Sense.
- Hand Eye Co-ordination.
- Gross movement of hands, finger and arms.
- Depth Perception.
- Reaction Time.

#### Physiological Variables

- Resting Heart Rate.
- Systolic Blood Pressure.
- Diastolic Blood Pressure.

## SELECTION OF TESTS

As per the available literature, the following standardized tests and procedures were used to assess the selected dependent variables which are presented in Table-1.

**Table-1**

| S.No | Criterion Variables | | Test/Instruments | Unit of Measurement |
|---|---|---|---|---|
| 1 | Psychological | Self Esteem | Self esteem scale by Dr. Santosh Dhar and Dr. Upinder Dhar | Numbers |
| 2 | | Life Satisfaction | Life satisfaction scale by Prof. Hardeo Ojha | |
| 3 | | Locus of Control | Locus of control scale by Sanjoy Vohra | |
| 4 | | Self Efficacy | Self efficacy scale by Dr. A. K Singh and Dr. Shruti Narayan | |
| 5 | Neuropsychological | Illusion | Muller layer Visual illusion Test | Centimeters |
| 6 | | Tactile Sense | Aesthesiometer | Millimeters |
| 7 | | Hand Eye Co-ordination | Mirror drawing test | Seconds |
| 8 | | Gross movement of hands, finger and arms | Finger Dexterity Test | Seconds |
| 9 | | Depth Perception | Howard and Dolman apparatus | Centimeters |
| 10 | | Reaction Time (Audio and Visual) | Reaction Time Apparatus | Seconds |
| 11 | Physiological | Resting Heart Rate | Pulse Oximeter | Beats/min |
| 12 | | Systolic Blood Pressure | Blood pressure monitor | mmHg |
| 13 | | Diastolic Blood Pressure | Blood pressure monitor | mmHg |

## COLLECTION OF DATA

The recreational games were given as per the training schedule of Sixteen weeks. Data were collected in three phases such as the pre-test i.e. at the beginning of the programme session, the during-test or mid-test i.e. after the eight week of the programme session, and post test i.e. after the sixteen week of the training session on the selected criterion variables.

**TRAINING SCHEDULE**

The detailed training schedule is presented in the table below.

**TRAINING SCHEDULE FOR EXPERIMENTAL GROUPS**

| | |
|---|---|
| Type | Recreational Games. |
| Intensity | 60%-75% of maximum heart rate. |
| Duration | 35 minutes (5 mts warm up + 24 mts recreational games work out + 2 mts recovery time + 4 mts warm down ) for first 4 weeks; 45 minutes (5 mts warm up + 32 mts recreational games work out + 3 mts recovery time + 5 mts warm down ) for second 4 weeks; 55 minutes (5 mts warm up + 40 mts recreational games work out + 4 mts recovery time + 6 mts warm down ) for third 4 weeks and 65 minutes (5 mts warm up + 48 mts recreational games work out+ 5 mts recovery time + 7 mts warm down ) for last 4 weeks. |
| Frequency | 3days per week (Monday, Wednesday and Friday for male and Tuesday, Thursday and Saturday for female) |
| Recreational games Schedule | ✓ Recreational games routine had applied in four schedules with proportional enhancement in intensity.<br>✓ Intensity of the recreational games training schedule had been changed in every four weeks by increasing the repetitions. |

| Weeks | Recreational games Training Per Session | Duration (In minutes) | Repetition | Recovery between two games (In Minutes) | Intensity | Total Duration (In Minutes) |
|---|---|---|---|---|---|---|
| I to IV Weeks | Warming up<br>No of games 3<br>Warming down | 5<br>24<br>4 | 1 | 1 (Total 2) | 60% | 35 |
| V to VIII Weeks | Warming up<br>No of games 4<br>Warming down | 5<br>32<br>5 | 2 | 1 (Total 3) | 65% | 45 |
| IX to XII Weeks | Warming up<br>No of games 5<br>Warming down | 5<br>40<br>6 | 1 | 1 (Total 4) | 70% | 55 |
| XIII to XVI Weeks | Warming up<br>No of games 6<br>Warming down | 5<br>48<br>7 | 2 | 1 (Total 5) | 75% | 65 |

## EXPERIMENTAL DESIGN

To investigate the "**IMPACT OF RECREATIONAL GAMES ON PSYCHO-NEURO-PHYSIOLOGICAL VARIABLES OF ADULT TRIBALS"** on different phases of recreational games on Psycho-Neuro-Physiological variables on adult tribals for both sexes, the simple random sampling and single group repeated measure design was adopted in this study.

## STATISTICAL PROCEDURE

The data gathered were duly analyzed through statistical procedures. The different statistical procedures used in this study were as follows:

- To establish the reliability of Data, Pearson's product moment correlation was used.
- Repeated Measures Analysis of Variance was used to test the significant of mean difference over the progress of (pre-test, mid-test and post-test)

recreational game on criterion measure; separately of two experimental groups [Group M (Male) and Group F (Female)].

- Further the Least significant difference post hoc test was used to find out the superiority of a phase over the others.

All the data were analyzed using Statistical Package for Social Sciences (SPSS Version 26).

## LEVEL OF SIGNIFICANCE

For testing the difference among Pre Treatment phase, During Treatment Phase and Post Treatment Phase scores and also for comparing the means of two different groups [Group M (Male) and Group F (Female)] 0.05 level of significance was fixed to test the hypotheses.

## RESULTS, CONCLUSIONS AND RECOMMENDATIONS

## RESULTS OF THE STUDY

Within the limitations and delimitations of the study, the following conclusions are drawn.

- There was a significant improvement on Psycho-Neuro-Physiological variables such as Self esteem, Life satisfaction, Locus of control and Self efficacy due to the impact of recreational games training.
- There was no significant changes to be observed on Psycho-Neuro-Physiological variables such as Illusion, Tactile Sense, Hand Eye Co-ordination, Gross movement of hands, finger and arms, Depth Perception, Reaction time, Resting Heart rate, Systolic blood pressure and Diastolic blood pressure due to the impact of recreational games training.

## TESTING OF HYPOTHESES

Firstly it was hypothesized that there would be no significant improvement due to recreational game training in selected Psycho-Neuro-Physiological variables among male adult tribals.

After sixteen weeks of recreational games training resulted in significant improvement in Self Esteem, Life satisfaction, Locus of control and Self efficacy. Thereby Null hypothesis was rejected at 0.05 level of confidence. However, Illusion, Tactile Sense, Hand Eye Co-ordination, Gross movement of hands, finger and arms, Depth Perception, Reaction time, Resting Heart rate, Systolic blood pressure, and Diastolic blood pressure showed no changes thereby null hypothesis was accepted.

Secondly it was hypothesized that there would be no significant improvement due to recreational game training in selected Psycho-Neuro-Physiological variables among female adult tribals.

After sixteen weeks of recreational games training resulted in significant improvement in Self Esteem, Life satisfaction, Locus of control and Self efficacy. Thereby Null hypothesis was rejected at 0.05 level of confidence. However, Illusion, Tactile Sense, Hand Eye Co-ordination, Gross movement of hands, finger and arms, Depth Perception, Reaction time, Resting Heart rate, Systolic blood pressure, and Diastolic blood pressure showed no changes thereby null hypothesis was accepted.

## CONCLUSIONS

Based on the findings of the study, it is concluded that recreational games training is appropriate enough to enhance psychological well-being of adult tribals in short duration that contributes to maintain and improve their quality of life. The results of this study make obvious that recreational games based training is an effective modality to gain positive psychological benefits, such as a sense of optimism, happiness, affirmative moods and feelings of adult tribals. Engagement in recreational games experienced health promotion fostered positive social interactions (Chang et al., 2014) and optimistic views of their own health, which is a critical predictor of psychological well-being and survival in later life (Ruthig et al., 2011).

## RECOMMENDATIONS

Based on the results of the study the following recommendations have been made.

- similar study may be undertaken to find out the need and its influence of other important Variables directly and indirectly related to the nature of work and life style of people living in rural areas.
- In the present study, only 16 weeks recreational games training programme was taken in the form of treatment. It is suggested that in future the researchers may undertake study of long term recreational games training programme as treatment on similar variables.
- Investigation can be conducted on sedentary and obese men or women as subjects of the same age group.
- Similar study may be done on middle age people.
- A detailed further study with longer duration may be conducted to alter the changes in the selected criterion variables.
- In the present study only forty subjects were taken. It is suggested that for better observation, more numbers of subjects may be taken.
- Similar study either on different dependent variables or on different age groups can be a relevant option.
- It is recommended that recreational games training may be introduced among teen agers in various educational institutes for improvement in anthropometric, body composition as well as fitness parameters.

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