

## EFFECT OF YOGA ON MAXIMUM BREATH HOLDING TIME OF MENTALLY RETARDED GROUP

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### ABSTRACT

*The main principal objective of the present investigation is to find out the effect of yoga on mentally retarded group. The experiment method was adopted in this study. The sample consists of one hundred and twenty mentally retarded children from the total population of one hundred and fifty students of C.S.I mentally retarded school, Kotticode, Kanyakumari District were taken for the present study. Mentally retarded children ranking from Intelligence Quotient of fifty to fifty five percent and with thirteen to sixteen years of age were randomly selected as subjects. They were divided into four groups each consisting of thirty subjects. The groups were designated as group A (Age 13-14), B (Age 15-16) experimental group and C (Age 13-14), D (Age 15-16) control group*

*The physiological variable chosen for the study was Maximum Breath Holding Time. The chosen variable was monitored for significant improvement during mid-training period and post-training period.*

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### INTRODUCTION

Man is the most intelligent and admirable being among all the creations of God. His quest for knowledge is eternal and insatiable and education completely modifies the behavior and personality of the individual.

Mental retardation is the impairment in intelligence from early life, slow mental development during the growth period, reduced learning ability, lack of social and behavioral adjustment.

It is a state of mental defect from birth or an early age, because of which a person is unable to perform his duties as a member of the society. His span of attention is less and role of learning and ability to retain what is learnt is also less. His speech is also retarded because speech is something he has to learn from what he hears. Therefore, because of limited ability he learns to speak late and at a slower level. What he speaks may also be defective because his ability to discern is faulty.

It is a learning disorder in which the abilities of brain's memory recall, thought and reasoning are impaired. Parrot fashion learning of simple musical tunes, nursery rhymes as well as some activities of daily living can be achieved but normal language, comprehension and

schooling can never be present in severely retarded children. The cognitive learning is delayed even in a mildly retarded child.

Mental retardation is not a disease. It is a disability. It is not infectious. It can happen to any normal couple, rich or poor, educated or uneducated, urban or rural. Mental illness and mental retardation are two different entities. The mentally retarded behaves like a person much younger than himself. He remains child like when grown up.

The movements of the different parts of the body are controlled by the brain. The characteristics of the mentally retarded persons vary, depending upon the level of retardation. The terms currently used to describe the various degrees of mental retardation are mild, moderate, severe and profound. In a mentally handicapped child, the brain develops very slowly because it has been damaged, due to various reasons. This can happen before, during or after birth. Because of this damage the child's development is slow.

The yoga training should educate towards quality leisure functioning and using leisure. Yoga helps to habilitate and to rehabilitate the physical, social, emotional and intellectual quality of mentally retarded individuals.

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**METHOD**

Experimental method was employed for the present research study

**SAMPLE**

One hundred and twenty mentally retarded children of C.S.I mentally retarded school, Kotticode , Kanyakumari District were taken for the present study.

**DESIGN**

The random group design was employed for the study. Two group were subjected to the experimental treatment. During the period of experiment, Group A (Age 13-14) and B (Age 15-16) were given yoga practice, and C (Age 13-14) and D (Age 15-16) were given no practice. The yoga practice was given for the experimental group for one hour in the evening for all the days, excluding Saturdays and Sundays, for a period of twelve weeks

**DETAILS OF YOGA TRAINING**

General warming up was given for five to ten minutes and the Asanas were given for thirty five to forty five minutes on all the training days.

**STATISTICAL ANALYSIS**

A paired difference t-test was used to find out the effect of yoga on variable then analysis of covariance to used to find out the significance of the variable. Finally t-test was used to compare which group response the training significantly.

**ADMINISTRATION OF THE TEST  
MAXIMUM BREATH HOLDING TIME**

**Purpose:** To find out the ability of the subject to hold his breath for some time.

**Instrument:** A stop watch, a nose clip

**Procedure:** The test consisted of a voluntary forced inhalation and holding the breath as long as possible without inhaling or exhaling after holding the breath. The subject was asked to sit on the chair and the nose clip was clamped over the nostrils. The subject then took a voluntary forced maximal inhalation through his mouth. When the subject finished inhalation as indicated by raising the index finger by the subject, the stop

watch was started. It was stopped as soon as the subject relaxed. To prevent exhalation or inhalation through the mouth during the recording time the subject was asked to couple his lips tightly. To detect exhalation or inhalation through mouth the investigator maintained a careful watch on the subjects mouth. Two trials were permitted for each subject and the best time was recorded.

**Scoring:** The best of two breath holding time was recorded in seconds as the scores.

**RESULTS AND DISCUSSION**

**EFFECTIVENESS OF YOGA ON MAXIMUM BREATH HOLDING TIME**

**TABLE - 1**

**Effectiveness of Yoga on Maximum Breath Holding Time for total sample**

| Stage | Mean | SD  | N  | Pair        | mean difference | paired 't' |
|-------|------|-----|----|-------------|-----------------|------------|
| Pre   | 39.6 | 5.2 | 60 | Pre Vs Mid  | 0.3             | 2.73**     |
| Mid   | 39.9 | 5.2 | 60 | Pre Vs Post | 7.4             | 35.1**     |
| Post  | 46.9 | 5.1 | 60 | Mid Vs Post | 7.1             | 37.2**     |

\*\* : Significant at 0.05 level

Required Table value =1.67level

Effectiveness of yoga on maximum breath holding time is presented in Table .1. The average score regarding vital capacity at pre test level, mid level and post test level are 39.6, 39.9, and 46.9 respectively. An increase of 0.3 can be observed in maximum breath holding time during mid level assessment as a result of the implementation of yoga.

The paired t statistics (t=2.73) shows that this increase in maximum breath holding time is statistically significant at 0.05 level. The Table also shows that the increase in vital capacity between pre test level and post test level (t=35.1), mid level and post test level (t=37.2) are also significant at 0.05 level. Thus it can be concluded that yoga is effective on increasing maximum breath holding time.

**TABLE - 2**  
**Effectiveness of yoga (age group 13-14) on maximum breath holding time**

| Age  | Stage | Mean | SD  | N  | Pair        | mean difference | paired 't' |
|------|-------|------|-----|----|-------------|-----------------|------------|
| 3-14 | Pre   | 40.1 | 4.5 | 30 | Pre Vs Mid  | 0.2             | 2.41**     |
|      | Mid   | 40.3 | 4.5 | 30 | Pre Vs Post | 8.1             | 31.11**    |
|      | Post  | 48.3 | 4.4 | 30 | Mid Vs Post | 8.0             | 31.13**    |

\*\* : significant at 0.05 level

Required Table value =1.69 level

Effectiveness of yoga on maximum breath holding time is presented in Table . 2 . The average score regarding vital capacity at pre test level, mid level and post test level are 40.1, 40.3 , and 48.3 respectively. An increase of 0.2 can be observed in maximum breath holding time during mid level assessment as a result of the implementation of yoga.

The paired t statistics (t=2.41) shows that this increase in maximum breath holding time is statistically significant at 0.05 level. The Table also shows that the increase in vital capacity between pre test level and post test level (t=31.11), mid level and post test level (t=31.13) are also significant at 0.05 level. Thus it can be concluded that yoga is effective on increasing maximum breath holding time.

**TABLE - 3**  
**Effectiveness of yoga (age group 15-16) on maximum breath holding time**

| Age   | Stage | Mean | SD  | N  | Pair        | mean difference | paired 't' |
|-------|-------|------|-----|----|-------------|-----------------|------------|
| 15-16 | Pre   | 39.0 | 5.9 | 30 | Pre Vs Mid  | 0.4             | 2.09**     |
|       | Mid   | 39.4 | 5.8 | 30 | Pre Vs Post | 6.6             | 24.88**    |
|       | Post  | 45.6 | 5.4 | 30 | Mid Vs Post | 6.2             | 38.63**    |

\*\* : significant at 0.05 level

Required Table value =1.69 level

Effectiveness of yoga on maximum breath holding time is presented in Table .3 . The average score regarding vital capacity at pre test level, mid level and post test level are 39.0, 39.4,

and 45.6 respectively. An increase of 0.4 can be observed in maximum breath holding time during mid level assessment as a result of the implementation of yoga.

The paired t statistics (t=2.41) shows that this increase in maximum breath holding time is statistically significant at 0.05 level. The Table also shows that the increase in vital capacity between pre test level and post test level (t=24.88), mid level and post test level (t=38.63) are also significant at 0.05 level. Thus it can be concluded that yoga is effective on increasing maximum breath holding time.

**TABLE - 4**  
**Comparison of maximum breath holding time under yoga and control for total sample Analysis of Covariance (ANCOVA) Table**

| Stage                    | Mean    |      | Source         | Sum of Squares | df  | Mean Square | F        |
|--------------------------|---------|------|----------------|----------------|-----|-------------|----------|
|                          | Control | Yoga |                |                |     |             |          |
| Pre-test (X)             | 40.7    | 39.6 | Between Groups | 40.8           | 1   | 40.8        | 1.52     |
|                          |         |      | Within Groups  | 3174.5         | 118 | 26.9        |          |
|                          |         |      | Total          | 3215.3         | 119 |             |          |
| Post-test (Y)            | 40.7    | 46.9 | Between Groups | 1153.2         | 1   | 1153.2      | 44.3**   |
|                          |         |      | Within Groups  | 3071.5         | 118 | 26.0        |          |
|                          |         |      | Total          | 4224.7         | 119 |             |          |
| Adjusted Post-test (Y.X) | 40.2    | 47.5 | Between Groups | 1586.7         | 1   | 1586.7      | 1232.2** |
|                          |         |      | Within Groups  | 150.7          | 117 | 1.3         |          |
|                          |         |      | Total          |                |     |             |          |

\*\* : significant at 0.05 level

Required Table value =3.93 level

Analysis of covariance (ANCOVA) is used to determine whether the groups differ in average maximum breath holding time at post test level as a result of the yoga applied on one group.

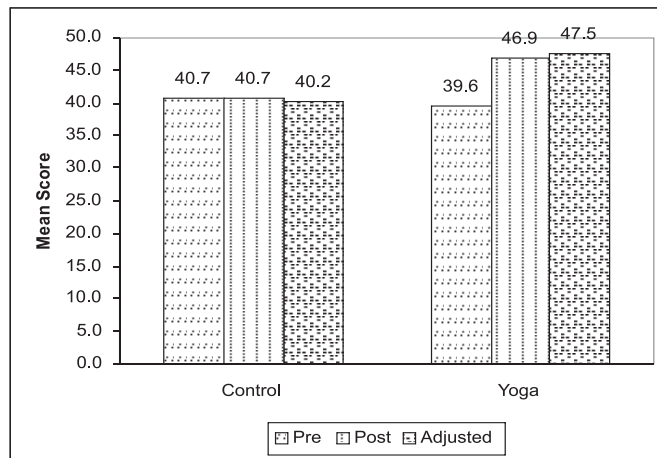
A preliminary analysis of variance (ANOVA) carried out for pre test and post test taken separately. The average maximum breath holding time at pre test level is 40.7 and 39.6 respectively for those in the control group and experimental group (Yoga). The F test applied to the initial maximum breath holding time score (Fx =1.52) shows that there is no significant difference in maximum breath holding time between the groups at pre test level. The F statistics for the final score (Fy =44.3) is

significant even at 0.05 level of significance, means that the average maximum breath holding time of experimental (46.9) group is significantly above that of control group (40.7) at post test level.

After correcting the final maximum breath holding time for difference in initial scores, F statistics was applied to the final score. The value of the ANCOVA ( $F_{y,x} = 1232.2$ ) is significant at 0.05 levels. From  $F_{y,x}$ , it is clear that the final average score on maximum breath holding time, after adjusted for the initial difference in experimental group (47.5) significantly differs from that in the control group (40.2). So it can be concluded that the yoga significantly increases the maximum breath holding time of students when compared with those students who have no yoga practice.

**FIG - 4.1**

**Comparison of maximum breath holding time under yoga and control for total sample**



**TABLE - 5**

**Comparison of maximum breath holding time under yoga and control for age group 13-14  
Analysis of Covariance (ANCOVA) Table**

| Stage                    | Mean    |      | Source         | Sum of Squares | df | Mean Square | F        |
|--------------------------|---------|------|----------------|----------------|----|-------------|----------|
|                          | Control | Yoga |                |                |    |             |          |
| Pre-test (X)             | 40.6    | 40.1 | Between Groups | 3              | 1  | 3           | 0.13     |
|                          |         |      | Within Groups  | 1249           | 58 | 22          |          |
|                          |         |      | Total          | 1252           | 59 |             |          |
| Post-test (Y)            | 40.6    | 48.3 | Between Groups | 889            | 1  | 889         | 42.1**   |
|                          |         |      | Within Groups  | 1225           | 58 | 21          |          |
|                          |         |      | Total          | 2115           | 59 |             |          |
| Adjusted Post-test (Y.X) | 40.4    | 48.5 | Between Groups | 987            | 1  | 987         | 968.09** |
|                          |         |      | Within Groups  | 58             | 57 | 1           |          |
|                          |         |      | Total          |                |    |             |          |

\*\* : significant at 0.05 level

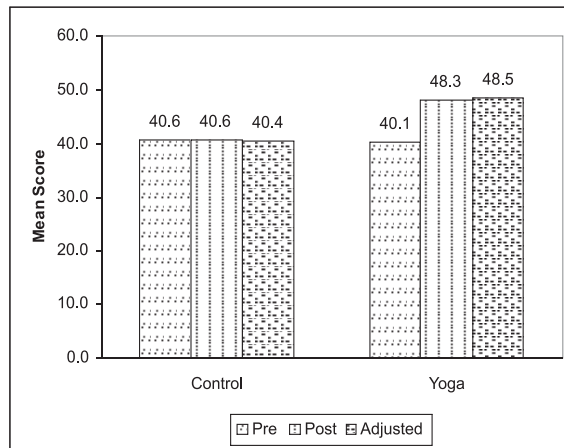
Required Table value = 4.02 level

A preliminary analysis of variance (ANOVA) carried out for pre test and post test taken separately. The average maximum breath holding time at pre test level is 40.6 and 40.1 respectively for those in the control group and experimental group (Yoga). The F test applied to the initial maximum breath holding time score ( $F_x = 0.13$ ) shows that there is no significant difference in maximum breath holding time between the groups at pre test level. The F statistics for the final score ( $F_y = 42.1$ ) is significant even at 0.05 level of significance, means that the average maximum breath holding time of experimental (48.3) group is significantly above that of control group (40.6) at post test level.

After correcting the final maximum breath holding time for difference in initial scores, F statistics was applied to the final score. The value of the ANCOVA ( $F_{y.x} = 968.09$ ) is significant at 0.05 levels. From  $F_{y.x}$ , it is clear that the final average score on maximum breath holding time, after adjusted for the initial difference in experimental group (48.5) significantly differs from that in the control group (40.4). So it can be concluded that the yoga significantly increases the maximum breath holding time of students when compared with those students who have no yoga practice.

**FIG - 5.1**

**Comparison of maximum breath holding time under yoga and control for age group 13-14**



**TABLE - 6**

**Comparison of maximum breath holding time under yoga and control for age group 15-16  
Analysis of Covariance (ANCOVA) Table**

| Stage                    | Mean    |      | Source         | Sum of Squares | df | Mean Square | F        |
|--------------------------|---------|------|----------------|----------------|----|-------------|----------|
|                          | Control | Yoga |                |                |    |             |          |
| Pre-test (X)             | 40.9    | 39.0 | Between Groups | 54             | 1  | 54          | 1.65     |
|                          |         |      | Within Groups  | 1905           | 58 | 33          |          |
|                          |         |      | Total          | 1959           | 59 |             |          |
| Post-test (Y)            | 40.9    | 45.6 | Between Groups | 331            | 1  | 331         | 11.06**  |
|                          |         |      | Within Groups  | 1738           | 58 | 30          |          |
|                          |         |      | Total          | 2069           | 59 |             |          |
| Adjusted Post-test (Y.X) | 40.0    | 46.5 | Between Groups | 614            | 1  | 614         | 643.23** |
|                          |         |      | Within Groups  | 54             | 57 | 1           |          |

\*\* : significant at 0.05 level

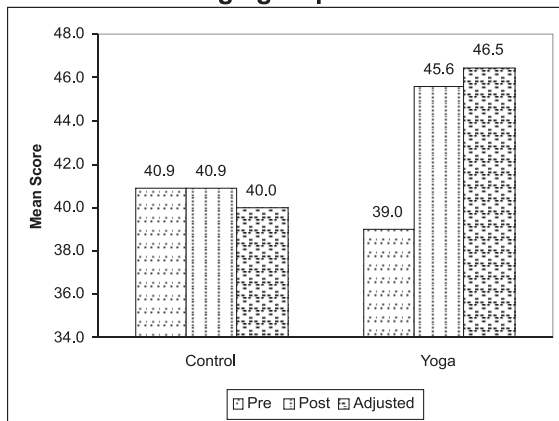
Required Table value = 4.02 level

A preliminary analysis of variance (ANOVA) carried out for pre test and post test taken separately. The average maximum breath holding time at pre test level is 40.9 and 39.0 respectively for those in the control group and experimental group (Yoga). The F test applied to the initial maximum breath holding time score ( $F_x = 1.65$ ) shows that there is no significant difference in maximum breath holding time between the groups at pre test level. The F statistics for the final score ( $F_y = 11.06$ ) is significant even at 0.05 level of significance, means that the average maximum breath holding time of experimental (45.6) group is significantly above that of control group (40.9) at post test level.

After correcting the final maximum breath holding time for difference in initial scores, F statistics was applied to the final score. The value of the ANCOVA ( $F_{y,x} = 643.23$ ) is significant at 0.05 levels. From  $F_{y,x}$ , it is clear that the final average score on maximum breath holding time, after adjusted for the initial difference in experimental group (46.5) significantly differs from that in the control group (40.0). So it can be concluded that the yoga significantly increases the maximum breath holding time of students when compared with those students who have no yoga practice.

**FIG - 6.1**

**Comparison of maximum breath holding time under yoga and control for age group 15-16**



**Comparison of percentage change in maximum breath holding time under yoga based on age**

| Age   | Mean | SD  | N  | t      |
|-------|------|-----|----|--------|
| 13-14 | 20.6 | 4.9 | 30 | 2.07** |
| 15-16 | 17.6 | 6.3 | 30 |        |

\*\*significant at 0.05 level

Required Table value = 2.04 level

Comparison of the increase in the maximum breath holding time due to the yoga based on age is presented in Table 7. The Table shows that the percent age increases in the maximum breath holding time are 3.6 and 2.7 respectively among students in the age group 13-14 and 15-16 respectively. The t-statistics ( $t = 2.07$ ) shows that students in the younger age group are more benefited in maximum breath holding time than elder students.

**Report of the variable maximum breath holding time for the subjects**

Training imparted has resulted in significant changes on the variable in all the subject trainees. Group wise relative improvement is reported here under.

1. The yoga group (age 13-14) improved better when compared with the control group (age 13-14).
2. The yoga group (age 15-16) improved better when compared with the control group (age 15-16)
3. The yoga group (age 13-14) improved better when compared with the yoga group (age 15-16)

**FINDINGS**

The younger yoga groups (age 13-14) responded to the training with positive result when compared with the progress of elder yoga group (age 15-16).

**CONCLUSION**

The yoga training provides an opportunity to increase fundamental Perceptual motor skills, rhythm, eye-hand and eye-foot co-ordination,

gross and fine motor control, endurance, strength, motor planning and skill performance. Participation in yoga training encourages improved additional behaviors, balance, attending and task orientation, discrimination, transfer and generalization of skills, sense perception and comprehension of body function. Improved motor performance leads to a more active role in self-care, social interaction and expression of feelings. Thus, there is no more education than the yoga training in performing wonders for the severely and profoundly retarded individuals.

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