

EFFECT OF DIFFERENT FORMS OF EXERCISE ON MENTAL WELL BEING.

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Background: Exercises in different forms, if performed regularly, have a beneficial effect on the various systems of the body. Yoga has been studied and found to have positive effects on physical fitness, mood, anxiety level, and cognitive functioning. This study is being under taken to find out the effect of exercises of different forms like swimming and yoga on mental well being and concentration of the subject and to find out the difference between benefits gained by yoga and swimming. **Objective:** To study effects of Yoga and Swimming on mental wellbeing and concentration of subjects and compare the benefits gained by yoga and swimming practice. **Method:** It was a cross-sectional study. Total of 90 subjects were included in study after taking prior written informed consent. 30 subjects were practising yoga regularly and 30 subjects were swimming regularly for minimum of 6 weeks. 30 subjects were not practising any form exercise. Mental well being assessment was done with help of WHO-5 criteria and concentration level was assessed by Letter cancellation task. Data was analyzed & frequency table was prepared with help of SPSS 13 software. **Results & Discussion:** WHO-5 criteria for mental well being mean score was more in yoga group subjects (21.37 ± 2.456) and swimming group subjects (21.20 ± 4.139) than of non exercising group subjects (18.33 ± 3.367). Also mean score of yoga group was higher than swimming group. Difference between swimming and non-exercising groups was statistically significant. Difference between Yoga and non-exercising groups was statistically highly significant ($P < 0.0001$). Letter cancellation task results were higher in yoga group subjects (70 ± 13.17) than non exercising group subjects (58.83 ± 12.93). Difference was statistically significant. Mean scores were higher in yoga and swimming group subjects than in non-exercising subjects.

Conclusion: Results of this study suggest that regular exercise in any form like aerobic endurance exercise or yoga can bring definitive significant improvement in mood and concentration and overall mental well-being. Changing sedentary habits and replacing it with more active physical behaviour in form of either exercise like swimming, jogging, cycling or practice of Yoga will reduces the occurrence of mental health diseases like depression, anxiety, suicidal tendency, etc.

Key words: Letter Cancellation Task, Swimming, WHO-5 criteria, Yoga,

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Introduction:

Exercises in different forms, if performed regularly, have a beneficial effect on the various systems of the body. It also relieves stress, improves memory, helps you sleep better, and boosts overall mood.¹ People who exercise regularly tend to do so because it gives them an enormous sense of well-being. They feel more energetic throughout the day, sleep better at night, have sharper memories, and feel more relaxed and positive about themselves and their lives. And it's also powerful medicine for many common mental health challenges. The modality of exercise that is most beneficial and economic for masses has now become the topic of research. Yoga practices including quieter asanas, slow and deep breathing, meditation and guided imagery, increased activation of parasympathetic nervous system lead

to mental relaxation. It also causes sensory and motor attenuation.² Yoga has been studied and found to have positive effects on physical fitness, mood, anxiety level, and cognitive functioning.. Aerobic exercises, including jogging, swimming, cycling, walking, gardening, and dancing, have been proved to reduce anxiety and depression. These improvements in mood are proposed to be caused by exercise-induced increase in blood circulation to the brain and by an influence on the hypothalamic-pituitary-adrenal (HPA) axis and, thus, on the physiologic reactivity to stress.³ This physiologic influence is probably mediated by the communication of the HPA axis with several regions of the brain, including the limbic system, which controls motivation and mood; the amygdala, which generates fear in response to stress; and the hippocampus, which

plays an important part in memory formation as well as in mood and motivation. There are few studies reported that compare the effects of aerobic exercise like swimming and yoga on mental health.

Exercise and mental health remains an under-researched and underinvested area compared to other fields of health service research the importance of exercise is not adequately understood or appreciated by patients and mental health professionals alike. Evidence has suggested that exercise may be an often-neglected intervention in mental health care.⁴

This study is being undertaken to find out the effect of exercise in different form like swimming, yoga on mental well being of the subject and to find out the difference between benefits gained by yoga and swimming.

Material and Methods:

It is a cross-sectional study. Total of 90 subjects were included in study after taking prior written informed consent. 30 subjects were practicing yoga regularly and 30 subjects were swimming regularly for minimum of 6 weeks. 30 subjects were not practicing any form of exercise.

First group comprising subjects performing yoga included people doing yoga at different yoga training centers affiliated to "Adarsh Ahmedabad" NGO (sindhuhavan-Thaltej, navrangpura and azad society). Second group comprising of regular swimmers included members of Ahmedabad municipal Corporation swimming pools (Kankaria, Madhupura). Third group comprising people not doing any kind of exercise include people from random selection with matched criteria like age and socioeconomic status. Informed consent forms were signed by each subject before participation. All methods applied in this study were in accordance with the ethical standards of the Institutional review Board and permission of IRB was taken.

Study design: - Cross sectional study

Sample Size: - 90 subjects all in age group of 30-45 yrs

Group I – 30 subjects performing yogic exercises for minimum 40 min/day for at least 4 days/week since 6 weeks

These subjects were performing Yogasanas, Pranayama and Meditation daily in the morning

hours from 7am to 8am at the Yoga centre, under the supervision of qualified Yoga instructors. Yoga exercises included:

- Prayer: 02 minutes
- Surya Namaskar : 08 minutes
- Asanas : 20 minutes
- Pranayam: 15 minutes

Group II -30 subjects engaged in swimming for minimum 40 min/day for at least 4 days/week since 6 weeks

These subjects were regular swimmers attending AMC swimming pools between 7am to 7:45 am. Their session included 10 min of warm up exercises in water and then practice with different styles like

	Over the last two weeks	All of the time (5)	Most of the time (4)	More than half or the time(3)	Less than half of the time (2)	Some of the time (1)	At no time (0)
1	I have felt cheerful and in good spirits						
2	I have felt calm and relaxed						
3	I have felt active and vigorous						
4	I woke up feeling fresh and rested						
5	My daily life has been filled with things that interest me						

freestyle, butterfly, and backstroke swimming.

Group III - 30 subjects who are not doing any type of physical exercise.

These subjects were selected by random selection with matched criteria like age and socioeconomic status, who are not engaged in any type of exercise

Inclusion criteria: -

1. Persons with 30-45 yrs age
2. Exercise duration > 6 wks

Exclusion criteria:-

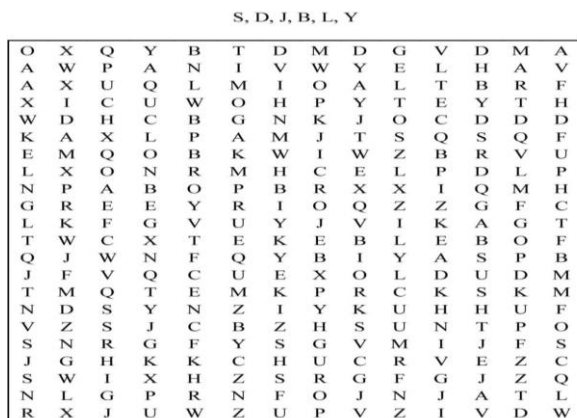
1. Patient of any psychiatric illness.
2. Person with history of psychiatric illness were excluded by thorough history and clinical examination.

Parameters: Mental well being assessment was done with help of WHO-5 criteria and

concentration level was assessed by Letter cancellation task.

i. Letter cancellation Task ⁵ –

This is a test of attention, visual search and mental speed. The participant is handed a page of random letters of the alphabet set out in rows and columns, and is asked to cross out as many target letters (S,D,J,B,L,Y) as possible within 90 seconds. An example is given at the top of the page to show the respondent how to cross out the letters. The page comprises 22 rows and 14 columns and there are 65 target letters in all. Respondents are asked to work across and down the page as though they were reading, and to perform the task both as quickly and as accurately as possible. When 90 seconds has elapsed, the respondent is asked to underline the letter they reached. The total number of letters searched provides a measure of speed of processing. The number of target letters(S,D,J,B,L,Y)missed up to the letter reached, provides a measure of accuracy. We also measured search efficiency which was defined as the percentage of letters correctly crossed out divided by the number of target letters up to the point reached.



ii. WHO (Five) Well-Being Index (1998 version) ⁶

Please indicate for each of the five statements which are closest to how you have been feeling over the last two weeks. Notice that higher numbers mean better well-being.

Scoring: The raw score was calculated by totalling the figures of the five answers. The raw score ranges from 0 to 25, 0 representing worst possible and 25 representing best possible quality of life. To obtain a percentage score ranging from 0 to 100,

the raw score was multiplied by 4. A percentage score of 0 represents worst possible, whereas a score of 100 represents best possible quality of life.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS software of statistical analysis. Results of three groups were compared using ANOVA test. Results of two groups were compared using Paired T test.

Data was analyzed & frequency table was prepared with help of SPSS 13 software.

Result: WHO-5 criteria for mental well being mean score was more in yoga group subjects (21.37±2.456) and swimming group subjects(21.20±4.139) than of non exercising group subjects(18.33±3.367). Difference between swimming and non-exercising groups was statistically significant. Difference between Yoga and non-exercising groups was statistically highly significant (P<0.0001). Letter cancellation task results were higher in yoga group subjects (70±13.17) than non exercising group subjects (58.83±12.93). Difference was statistically significant. Mean scores were higher in yoga and swimming group subjects than in non-exercising subjects .In table 3, we compared the results of the two tests between the two groups of swimming and yoga and we did not find statistically significant difference.

Table 1: Comparison of performance on WHO-5 criteria and LCT between swimmers and non-exercising groups.

Sr. No.	Parameter	Swimming		Non exercising		P value
		Mean	SD	mean	SD	
1	WHO-5	21.20	4.139	18.33	3.367	0.0046*
2	LCT	64.37	25.36	58.83	12.93	0.2909

*Difference between scores of swimming group and non-exercising group is statistically significant (P<0.05)

Table 2: Comparison of performance on WHO-5 and LCT between Yoga and non-exercising groups.

Sr. No.	Parameter	Yoga		Non exercising		P value
		Mean	SD	Mean	SD	
1	WHO-5	21.37	2.456	18.33	3.367	0.0002**
2	LCT	70.00	13.17	58.83	12.93	0.0016*

**Difference between scores of WHO-5 criteria in yoga group and non-exercising group is statistically

highly significant*Difference between scores of LCT in yoga group and non-exercising group is statistically significant

Table 3: Comparison of performance on WHO-5 criteria and LCT between swimmers and yoga groups.

Sr. No.	Parameter	Swimming		Yoga		P value
		mean	SD	Mean	SD	
1	WHO-5	21.20	4.139	21.37	2.456	0.84
2	LCT	64.37	25.36	70.00	13.17	0.28

Discussion:

In our study we found that that mental well being state of yoga group subjects and swimming group subjects was better than of non exercising group subjects. There was not much significant difference in mental well being state between subjects from two groups performing two different forms of exercise. Thus any form of exercise improves mental well being compared to non-exercising people. Letter cancellation task results were better in yoga group subjects than non exercising group subjects showing higher concentration levels in yoga group. Also concentration level was higher in yoga and swimming group subjects than in non-exercising subjects. The vast majority of studies have shown decrease in tension and depression with acute bouts of moderate intensity exercise (Berger & Motl, 2000)⁷. Moderate intensity exercise might not optimize fitness and sport training benefits, but it had consistently been associated with desirable mood changes (Berger & Owen, 1988)⁸. Many studies have proved efficacy of yoga in reducing anxiety (Gupta et al, 2006; Brown & Gerbarg, 2005).^{9,10} Lichtman and Poser (1982) have found immediate effects of a single exercise session on mental functioning. It was found that participants scored higher on measurements of cognitive functioning and had greater mood improvements (participants reported feeling happier) after an exercise class than after a hobby class. These findings led the authors conclude that short bouts of exercise have a

positive effect on cognitive functioning and mood states.¹¹

Conclusion:

Results of this study suggest that regular exercise in any form like aerobic endurance exercise or yoga can bring definitive significant, improvement in mood and concentration and overall mental well-being. Changing sedentary habits and replacing it with more active physical behaviour in form of either exercise like swimming, jogging, cycling or practice of Yoga will reduce the occurrence of life style diseases like diabetes, cardiovascular diseases, obesity, cancer, stroke etc.

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