



Original Research Article

Effect of Aerobic Exercise on Psychological Well-being of Housewives

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ABSTRACT

Background: Stress, if prolonged or of abnormal level can lead to long term physical & psychological problems. It can result in psychosocial responses like anxiety, hopelessness, irritability, general feeling of not being able to cope with the world, behavioral disruptions, avoidance of social and occupational activities. In Indian culture it is usually felt that males are more stressed than females. Also it is not always working women who are under stress; in fact housewives also are stressed in fulfilling family and social expectations.

Objective: Purpose of study is to assess the effect of aerobic exercise on psychological well-being of housewives.

Study design: Experimental study

Sample: Random sampling

Method: 60 housewives aged 25-45 were recruited into two groups. Group A, n=30, underwent 12 weeks of aerobic exercise program, group B, n=30, which did not participate in any form of exercise program. Perceived Stress Scale Index, Psychological General Well-Being Index and Pittsburg Sleep Quality Index were included as outcome measures.

Results: After 12 weeks of aerobic exercise program, the exercise group showed a significant improvement in the pre and the post aerobic training, Psychological General Well-Being Index scores, decrease in the perceived stress score and improvement in Sleep Quality Index score.

Conclusion: Study concludes that aerobic exercise has a beneficial effect on stress, general well-being and quality of sleep in housewives and can be used as a means of promoting psychological health in housewives.

Key words: Perceived Stress Scale, Psychological and General Well Being Index, Pittsburg Sleep Quality Index, Aerobic exercise.

INTRODUCTION

Every one of us experience stress, indeed a certain level of stress is vital if we are to meet crises. But if prolonged or of abnormal level can lead to long term physical & psychological problems. ^[1] Stress

is defined as an internal state which can be caused by physical demands on the body or by environment and social situations which are evaluated as potentially harmful, uncontrollable or exceeding our resources for coping. ^[2]

On one hand stress can result in a number of physical and medical responses like cardiovascular disease, gastrointestinal disease, respiratory disorders, immunological disturbances, dermatological disorders, musculoskeletal pain, fatigue, lethargy, impaired task performance and frequent minor illness. On the other hand it can result in psychosocial responses like anxiety, hopelessness, irritability, general feeling of not being able to cope with the world, drug and alcohol abuse, behavioural disruptions, avoidance of social and occupational activities inside and outside the home. [2]

In general, women have significantly higher rates than men for all disorder, particularly anxiety & depression. [3,4] Women from urban background are the worst affected in terms of depression. A higher prevalence rate of anxiety and depression was found in women and that the rate of these disorders increased steadily with age from 18 to 50 years. [4]

The possible risk factors for higher prevalence of depression and anxiety in women in India include age, socioeconomic status and education. (Mumford et al, 1997; Nandi et al, 1997).

Immediate and emergency response of the body to stress is mediated by the Sympathetic Nervous System through 'fight and flight' response. Stressors (physical, social & environmental causes of stress) are able to activate the nerve cells of hypothalamus so that more CRF (corticotrophin releasing hormone) is sent to the pituitary gland which causes increased secretion of cortisol from the adrenal gland. Cortisol and other similar hormones allow body to deal adaptively with stressors for long period of time. But maintained level of these hormones is harmful. [2]

The neurotransmitter serotonin is involved in regulating many important physiological (body-oriented) functions,

including sleep, aggression, eating, sexual behavior, and mood. More current studies suggest that in some people, low levels of serotonin trigger a drop in norepinephrine levels, which then leads to depression. [5]

Another line of research has investigated linkages between stress, depression, and norepinephrine. Norepinephrine helps our bodies to recognize and respond to stressful situations. Researchers suggest that people who are vulnerable to stress may have a norepinephrinergic system that doesn't handle the effects of stress very efficiently. The neurotransmitter dopamine is also linked to depression. Recently, another neurotransmitter, glutamate, has been implicated in psychological disorders as well, but more research is necessary at this time to determine the nature of this relationship. An inability to handle stress or anxiety can cause insomnia. You may develop severe sleeping disorders which leave you exhausted and less productive. [3]

The psychological disorders can have a pharmacological and a non-pharmacological approach. The non-pharmacological approach towards stress and anxiety include mental relaxation technique, physiological relaxation, cognitive behavioural modification techniques, and physical exercise. A growing body of evidence indicates that regular exercise improves psychological as well as physical health. Several studies have reported the following benefits of reduced anxiety, feeling of stress, depression, fatigue; improved alertness, concentration, mood, energy level and resistance to infection; improved appearance (including weight loss and physical fitness), confidence, self-esteem; as well as increasing social contact and enjoyment. [2]

In Indian culture it is usually felt that males are more stressed than females which are contradictory to the survey done by

Nandi et al. Also it is not always working women who are under stress; in fact housewives also are stressed in fulfilling family and social expectations. [4]

MATERIALS AND METHODS

Sixty healthy housewives between age 25-45 years with mean age of 36.17 ± 2.85 years for aerobic exercise group and 37 ± 3.75 years for control group were participated in this study. With Perceived stress score ≥ 12 , from a similar socioeconomic background were randomly assigned to aerobic exercise and control group (30 each). Informed consent was obtained from each participant. A detailed history and physical examination was done. Individual who had been physically active during the past 3 months, with any neurological, cardiovascular or musculoskeletal disorder and those diagnosed to have psychiatric disorder were excluded.

Outcome measures:

1. Perceived Stress Scale Index (PSSI)-14

PSS-14 is a 14 item questionnaire most widely used psychological instrument for measuring the perception of stress with high validity and reliability. [6,7] The questions in PSSI ask about feelings and thoughts during the last month.

2. Psychological General Well-Being Index (PGWBI)

It is a 22 item health related quality of life questionnaire which produces a self-perceived evaluation of psychological well-being, self-control, general health and vitality with high validity and reliability. [8]

3. Pittsburg Sleep Quality Index (PSQI)

The PSQI is an effective instrument to measure quality and pattern of sleep in adults with a high validity and reliability. It differentiates 'poor' from 'good' sleep by measuring seven areas: sleep quality, sleep

latency sleep duration, habitual sleep efficiency, sleep disturbance use of sleeping medication and day time dysfunction over the last month. [9]

Procedure

Baseline outcome measures were individually measured using the mentioned psychological instruments, for both the aerobic exercise group and the control (non exercise) group. In an effort to minimize the effects of positive expectations on the responses of aerobic group, the purpose of the study was not made explicit to the subject until the completion of questionnaire. Then all were told that the purpose of the project was to learn how various feelings and attitudes affect healthy individuals. The control group was instructed not to indulge in any type of exercise during this period.

Aerobic Exercise Programme

The subjects exercised 60 minutes once a day, 6 times a week, for 12 consecutive weeks at moderate intensity (65%- 80% of maximum heart rate). [10,11] which included warm up, conditioning and cool down. The conditioning programme was gradually increased within first week from 20-45 minutes, using combination of Treadmill, Cross Runner and Static Cycle depending upon the comfort of patient, but it was ensured that the subject exercised in the target heart rate range and at score 13 on Borg's Rating of Perceived exertion scale. [10,11] The subjects' blood pressure and pulse rate were measured before, during and after exercise.

They were instructed to inform when any of the following occurs – giddiness, shortness of breath, chest pain, excessive perspiration, palpitation and/or muscular pain. [10] Following completion of 12 weeks of aerobic exercise training the subjects were again asked to fill the questionnaires (PSSI, PGWBI, PSQI). The subjects in the

control group were also asked to fill the same questionnaires again after 12 weeks.

Data Analysis

Unpaired t test was used to find homogeneity of two groups for all the parameters and to compare the outcome measurement data between the two groups.

Paired t tests were used to determine whether PSSI, PGWBI and PSQI were significantly different before and after the intervention in the aerobic exercise group

and the control group and Unpaired t test was used to compare the outcome measures between the two groups. Each calculated t-value was used to test one tailed hypothesis for all the parameters. Out of 60 patients who participated in the study none were lost to follow up assessment at the end of the study. All 30 subjects in the aerobic exercise group attended at least 90% of all scheduled aerobic exercise sessions.

Table 1 (Perceived Stress Scale Index – PSSI)

Groups	Mean / SD	Pre	Post	t-calculated	P value	Significant
Aerobic Exercise Group (A)	mean	15	10.733	16.47	<0.0001	Yes
	SD	2.1655	0.907			
Control Group (B)	mean	14.96	14.23	2.665	>0.0001	No
	SD	2.04	2.29			

Table 2 (Psychological & General Well Being Scale - PGWBI)

Groups	Mean / SD	Pre	Post	t calculated	P value	significant
Aerobic Exercise Group (A)	Mean	69.3	79.03	14.32	< 0.0001	Yes
	SD	4.92	2.97			
Control Group (B)	Mean	69.26	69.53	0.7871	> 0.0001	No
	SD	5.55	5.81			

Table 3 (Pittsburg Sleep Quality Index – PSQI)

Groups	Mean / SD	Pre	Post	t calculated	P value	significant
Aerobic Exercise Group (A)	Mean	4.93	3.31	8.191	< 0.0001	Yes
	SD	1.08	0.46			
Control Group (B)	Mean	4.53	4.36	1.720	> 0.0001	No
	SD	1.10	1.09			

Comparison of outcome measures between the groups

There is statistically significant decrease in the perception of stress in aerobic group as compared to control group.

PSSI (post exercise)					
Parameters	Aerobic	Control	t calculated	P value	Significant
Mean	10.73	14.23	6.812	< 0.0001	Yes
SD	0.90	2.29			

There statistically significant improvement in the Psychological and General Well Being of the patient in aerobic group as compared to control group.

PGWBI (post exercise)					
Parameters	Aerobic	Control	t calculated	P value	Significant
Mean	79.03	69.53	7.969	< 0.0001	Yes
SD	2.97	5.81			

There is statistically significant decrease in sleep disturbances in aerobic group as compared to control group.

PSQI (post exercise)					
Parameters	Aerobic	Control	t calculated	P value	Significant
Mean	3.31	4.37	4.72	< 0.0001	Yes
SD	0.46	1.09			

DISCUSSION

There was significant improvement in the overall psychological well-being in subjects who participated in the aerobic exercise program, similar to the findings of Blumenthal et al ^[12] in 1982, The possible neurophysiological mechanism in this psychological benefit may be related to increase in B-endorphins, which increases as much as five times the resting level, depending upon the type of exercise. ^[13]

The aerobic exercise group experienced reduction in the level of stress measured by PSSI-14 and improvement in the scores of PGWBI scores as compared to non-exercise group. Also the difference in the pre and the post exercise period stress level in the exercise group is significant. Gues et al in 2007 ^[14] had similar findings. Similar results were obtained by Cramer et al ^[15] in 1991.

Gues et al ^[13] also found that improvement in psychological well-being after aerobic training only in clinically anxious or depressed subjects. This correlates with the present study, as more change in the scores of PSSI and PGWBI was seen in subjects with comparatively higher stress level before exercise.

There is statistically significant difference in the scores of PSQI scores between the two groups which shows that there was a significant improvement in the quality of sleep before and after the aerobic exercise programme. This is probably due to reduction in the stress level. Passos GS et al (2011) in his study on "Effects of moderate aerobic exercise training on chronic primary insomnia" found a significant increase in sleep efficiency, improvement in sleep onset latency, sleep quality and feeling of rested in the morning. ^[16]

The data analysis of this study show that the psychological status of the housewives who participated in the aerobic

exercise program for 12 weeks improved significantly relative to a comparable group of non-exercising housewives. However, none of the subjects in this study were diagnosed to have any psychological disorder or were on psychopharmacotherapy. Rather the data suggest that basically healthy, well-adjusted housewives can increase their sense of well-being compared to otherwise healthy people who do not exercise.

Several alternate explanations for the observed differences between the two groups and between the pre and the post psychological scores in the aerobic group may be suggested. The exercise group may have a greater expectation for improvement. The experimental design attempted to minimize the expectancy by assuring that neither of the subjects was informed about the purpose of the study, so that positive expectation would not be transmitted to the participants. Brooke et al ^[17] in 2010 examined whether aerobic and perceived fitness are associated with life stress, job stress and well-being. They found significant relation between well-being and life stress, whereas aerobic fitness was not associated with these variables. And that aerobic fitness had a positive relation with perceived fitness and perceived fitness may partially account for exercise-psychological enhancement relation.

MacMohan et al ^[18] in 1988 evaluated the effect of aerobic exercise on the self-concept depression level and physical fitness in 98 youths (comparative study). They demonstrated an association between participation in aerobic program and improved self-concept, mood and fitness. Improvement in psychological variables was not dependent on improved physical fitness.

Sixteen out of thirty women reported decrease in premenstrual mood fluctuations after commencing of the aerobic training.

However this was not taken as a study parameter. Also there was subjective reporting of enthusiasm which lasted the whole day in the exercise group. Maroukalis et al [19] in 1998 studied the effect of aerobic exercise on mood of adult women and their analysis indicated a significant beneficial effect on all dimensions of mood.

Nevertheless, findings of this study support the potential utility of regular physical exercise as a means of promoting psychological health in housewives. However its long term benefits need to be further evaluated.

CONCLUSION

It is concluded from this study that aerobic exercise has a beneficial effect on stress, psychological well-being and quality of sleep in housewives.

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