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A CO-RELATIONAL STUDY BETWEEN BMI AND AEROBIC FITNESS AMONG HOUSEWIVES

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ABSTRACT

BACKGROUND: Body Mass Index (BMI) has been one of the easiest ways to determine the transition of a person from normal weight to obesity. Obesity is also associated with high morbidity, including diseases like hypertension, diabetes, infertility, dyslipidemia, depression, and ischemic heart diseases. Aerobic fitness benefits many parts of the body, including the heart, lungs, muscles, bones, blood, the immune system, and the nervous system. The purpose of this study is to determine the association between BMI and aerobic fitness among housewives.

METHODOLOGY: In this study, 60 housewives aged 30 to 40 years were recruited. BMI was calculated from anthropometric data. The Physical Fitness Index was calculated by performing the Harvard Step Test. Statistical analysis was performed using SPSS version 24.0.

RESULT: A negative correlation was found between BMI and the physical fitness index.

CONCLUSION: The physical fitness index of housewives varies inversely in relation to BMI.

KEY WORDS: Physical fitness, BMI, obesity, cardio respiratory illness, aerobic fitness, overweight.

INTRODUCTION

Obesity and overweight are described as a global epidemic by the World Health Organization (WHO). WHO describes obesity as the most neglected public health problem affecting every region of the globe [1]. According to the WHO, nearly 20 to 40% of the adult population and 10 to 20% of children are affected by obesity [2]. Globally, slightly higher proportions of women are overweight (40% women against 38% men) and obese (15% women against 10% men) [1]. Obesity prevalence rates have increased worldwide in the last three decades, reaching a prevalence of 10-14% among the housewife population. In rural areas, 75% of obesity in housewives is caused by decreased physical activity. A study assessing obesity among housewives in India showed the overall prevalence of obesity and overweight was 12.1% and 14.2% respectively.[4]

Body Mass Index (BMI) has been one of the easiest ways to determine the transition of a person from normal weight to obesity. WHO defines overweight and obesity using a BMI of >=25 as overweight and a BMI >=30 as obese.[1] Obesity has an adverse effect on the body, can lead to different health disorders, and is associated with increased morbidity.

Physical fitness plays an important role in improving health and well-being. There are several components of physical fitness, including aerobic fitness and body composition.[3] Aerobic fitness refers to the ability of the lungs, heart, and circulatory system to efficiently deliver oxygen to working muscles. In relation to health disorders, a high level of aerobic fitness reduces the risk for conditions such as type 2 diabetes, cardiovascular disease, hypertension, cancer, and osteoporosis.[3]

Increased obesity causes a decrease in functional capacity, creating a need for the assessment of BMI and aerobic fitness among housewives, as most are not physically active besides day-to-day activities and household chores. The aim of this study is to find out the co-relation between BMI and aerobic fitness among housewives aged 30 to 40 years.

ALTERNATE HYPOTHESIS

There will be a significant co-relation between BMI and aerobic fitness among housewives aged 30 to 40 years.

NULL HYPOTHESIS

There will be no significant co-relation between BMI and aerobic fitness among housewives aged 30 to 40 years.

CRITERIA FOR SELECTION

INCLUSION CRITERIA

- Age group 30-40 years.
- Housewives.
- Sedentary and non-sedentary lifestyle.
- Subjects willing to participate.

EXCLUSION CRITERIA

- Any cardiac conditions.
- Respiratory diseases.
- Vascular conditions like DVT, varicose veins.

- Lower limb fractures.
- Pregnant women.
- Post partum women till 1 year.

METHODOLOGY

An observational descriptive co-relational study was done in Latur city for a duration of 6 months. Approval was obtained from the institutional ethical committee. A total of 60 housewives aged 30-40 were selected using a purposive sampling technique.

$$\text{BMI} = \frac{\text{WEIGHT (in kg)}}{(\text{height sq})(\text{in m})}$$

PROCEDURE

Ethical clearance was taken from the institutional ethical committee. 60 subjects were selected as per the inclusion and exclusion criteria. The procedure, purpose, and advantages of the study were explained to the participants, along with their right to withdraw, and a consent form was filled out.

1. BMI Calculation: BMI was recorded by calculating height in meters using a measuring tape and weight in kg using a weighing machine. BMI was then calculated using the standard formula.

BMI	Weight status
Below 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Overweight
30.0-34.9	Obesity class I
35.0-39.9	Obesity class II
Above 40	Obesity class III

2. Aerobic Fitness Test: The subject's fitness level was measured using the Harvard step test. After a resting period of 3-5 minutes, the resting heart rate was measured. Subjects were provided with a step or platform of 25 to 30 cm height and instructed to step up and down at a rate of 30 completed steps per minute for 5 minutes or until exhaustion. After 5 minutes, subjects immediately sat down, and their heartbeats were counted from 1 to 1.5 minutes, 2 to 2.5 minutes, and 3 to 3.5 minutes post-procedure.

OUTCOME MEASURES

- **Body Mass Index:**

BMI = WEIGHT (in kg) / height² (in m)

- **Fitness Index:**

Fitness Index = (100 × test duration in seconds) / (2 × sum of heart beats in recovery period)

Rating	Fitness Index
> 96	Excellent
83-96	Good
68-82	Average
54-67	Low Average
< 54	Poor

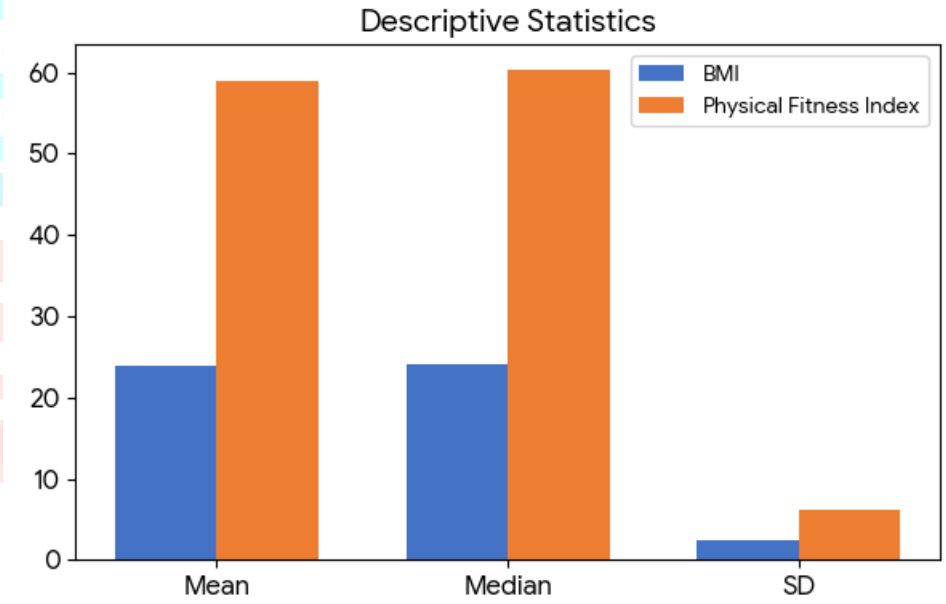
STATISTICAL ANALYSIS

Data was collected using a structured Performa and entered into an MS Excel sheet. Analysis was done using SPSS 24.0 version IBM USA. Qualitative data was expressed in proportions, while quantitative data was expressed in terms of Mean and Standard deviation. Descriptive statistics included Mean, standard deviation, and standard error of mean. A p-value of <0.001 was considered highly significant. The correlational coefficient between BMI and Aerobic fitness was analyzed using the Pearson 'r' correlational coefficient test.

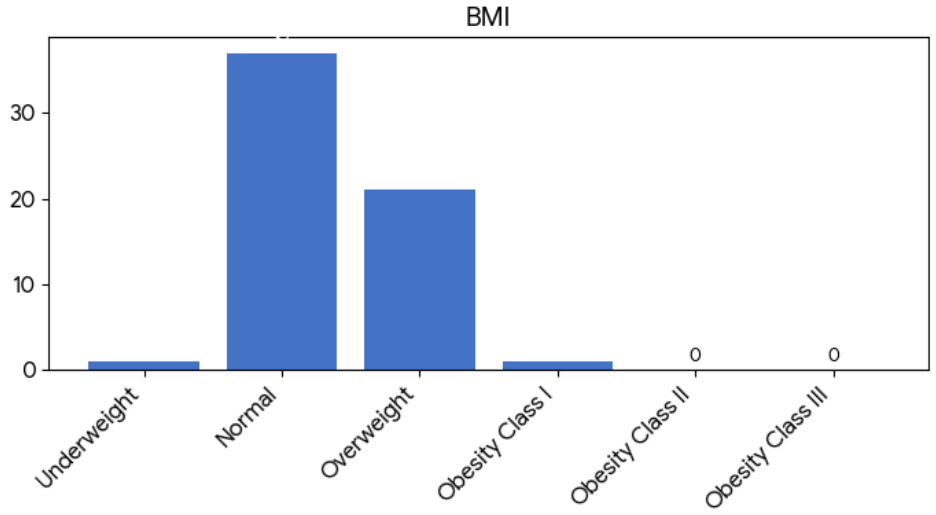
RESULTS

Table 1: Descriptive details of BMI and Physical Fitness Index

Variable	Mean	Median	SD
BMI	23.98	24	2.44
Physical fitness index	58.99	60.4	6.20



The data reveals that the majority of housewives (37) had a BMI within normal ranges, 21 were overweight, 1 was underweight, and 1 was in obesity class I.



Regarding physical fitness, 43 housewives had a below-average fitness index, 16 had poor fitness, and only 1 had an average level.

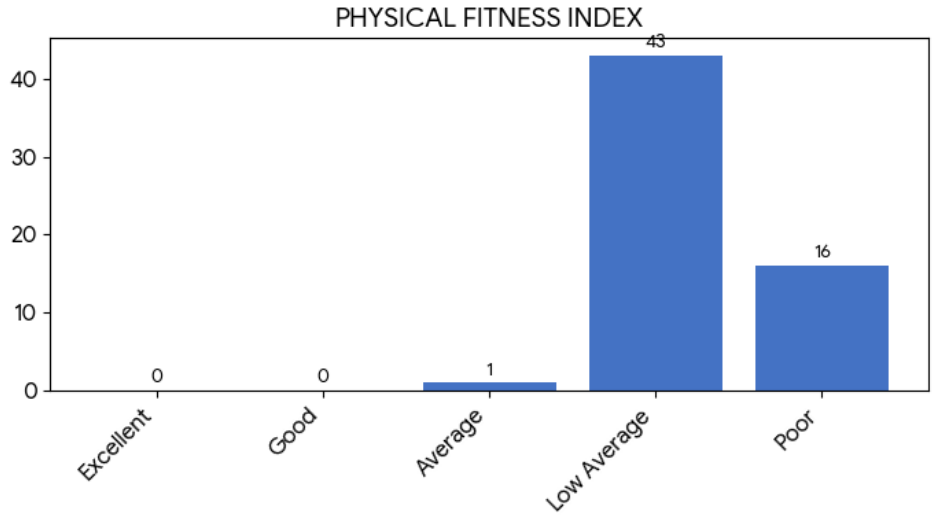
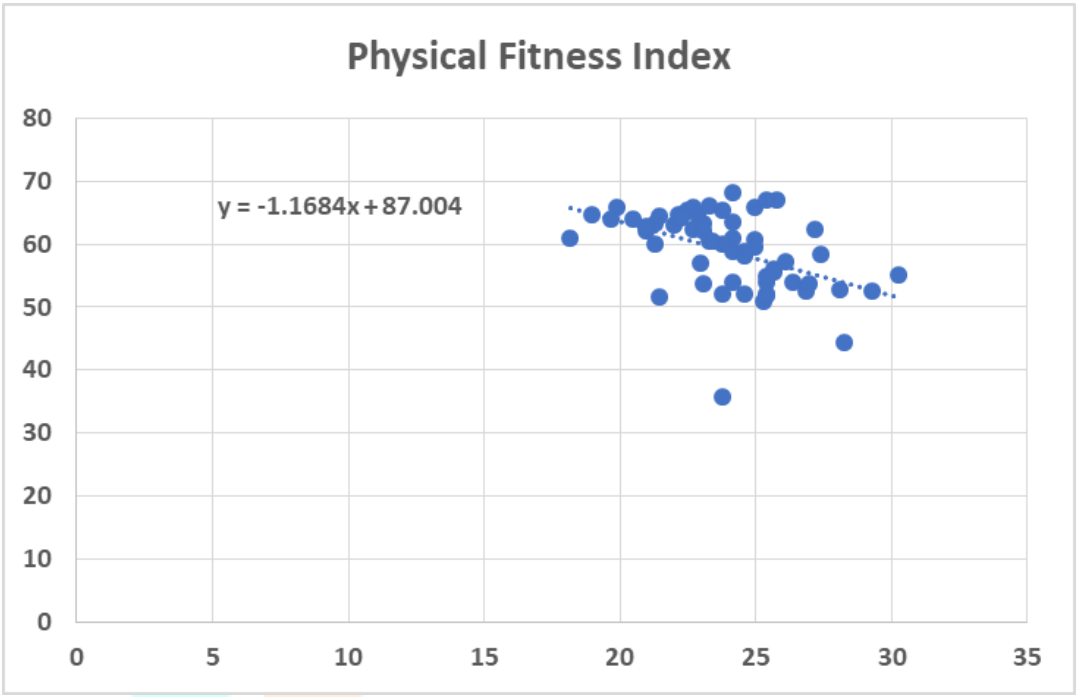


Table 2: Correlation between BMI and physical fitness index

Variable	R value	Unstandardized β	P value
BMI vs. PFI	-0.464	-1.168	<0.001*

*Linear regression analysis; * indicates a significant association.

A correlation value of -0.464 indicates a moderate negative correlation between BMI and the physical fitness index. Linear regression analysis showed that for every one-unit change in BMI, the physical fitness index will reduce by -1.168 units. The regression equation is: PFI = 87.004 – 1.168 (BMI).



DISCUSSION

This study was designed to evaluate the correlation between BMI and Aerobic Fitness in 60 housewives aged 30 to 40 years. The findings demonstrate a significantly inverse correlation between BMI and Aerobic Fitness, indicating that for every one-unit change in BMI, the physical fitness index is reduced. The correlation coefficient (r) was -0.464 and the (p) value was <0.001, reflecting that higher BMI is linked to a lower Physical Fitness level.

Most housewives had a BMI within normal ranges, but there was a significant decline in their physical fitness level, creating a major health concern for women at mid-life. Housewives perform a multitude of household chores, resulting in a lack of time for self-care, and the daily exertion causes a lack of interest in aerobic training.

These findings align with previous literature. Nur Zakiah Mohd Saat et al. found that low-income housewives have low physical exercise levels and are more likely to be overweight. Hye Bok Na et al. also reported a negative relation between BMI and physical fitness, noting that even thin-appearing individuals may have a high body fat percentage. Dr. K Ranjith et al performed a study for determination of physical fitness using modified harvard step test in male and female medical students, and they found out that that there is significant difference in physical fitness Index. Also, there is significant difference in height and weight in males than female so PFI affects by body size Praphul Joshi et al. and Prabha Shetty et al. similarly demonstrated that participants with a healthy BMI achieved higher fitness scores, establishing a direct negative correlation between obesity and cardio respiratory fitness.

CONCLUSION

The present study concludes that there is an inverse co-relation between BMI and the Physical fitness index among housewives; with every unit increase in BMI, there is a decrease in physical fitness. Even with BMI sitting primarily in normal ranges, a significant decline in overall physical fitness was observed, presenting a major health concern for mid-life women.

LIMITATIONS

- The study was conducted only in housewives of a particular age group (30 to 40 years) in a specific area.

FUTURE SCOPE

- The study can be conducted with other outcome measurements.
- Subjects can be taken from a different population with a different age group.
- Subjects having comorbidities can also be included in the study.
- More specific parameters should be used to determine fitness.

Clinical Implications

The information obtained from this study can therefore be used in the compilation of health-related fitness programs and awareness about aerobic fitness can be applied. Health promotion policies and physical activity programs can be designed to improve fitness levels.

DATA AVAILABILITY

The dataset generated and/or analyzed during the current study is available from the corresponding author on reasonable request.

FUNDING

Self.

CONFLICT OF INTEREST

The authors confirm that they have no conflicts of interest.

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