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ORIGINAL ARTICLE

Physical Activity Levels and Exercise Perceptions in Overweight and Obese Women

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Abstract

Objectives: Physical activity (PA) is a crucial component of a healthy lifestyle, with numerous benefits for overall well-being and the prevention of non-communicable diseases (NCDs). Physical activity by its ability to boost our immune system can also reduce the burden of communicable disease. Although there is considerable knowledge and research about barriers to activity, the level of physical inactivity and obesity is on a steep rise. Indicating that the interventions in place do not effectively target the barriers and a failing exists to recognize other factors influencing inactivity. The objective of this study is to investigate the levels of physical activity and the perceived benefits and barriers to exercise among overweight and obese women. **Methods:** This descriptive observational cross-sectional study involved 96 women aged 18-64 years. They underwent clinical examinations, BMI and body fat parameters were assessed. Global Physical Activity Questionnaire (GPAQ) and Exercise Benefits and Barrier scale were administered. GPAQ evaluates physical activity across various domains, while EBBS gauges individuals' perceptions of exercise benefits and barriers. **Results:** We found that 34.3% of the participants were physically inactive, 27.08% were moderately active, and 38.5% were highly active based on their MET scoring on the GPAQ questionnaire. Time spent on household chores and workplace attributed to most of the physical activity performed. The subjects were aware of the benefits of exercise. Time restraint, and viewing exercise as tiresome or hard work rather than a form of entertainment were some of the barriers. **Conclusion:** The physical inactivity among overweight and obese women was found to be 34.3%. Lack of time and personal fatigue was cited as being one of the major limiting factors to performing exercise. Interventions targeting these barriers as well as strategies that target the way exercise is perceived by the population, need to be initiated to enhance the levels of physical activity.

Keywords: Physical activity, Overweight women, Obese women, Global Physical Activity Questionnaire (GPAQ), Exercise Benefits and Barriers Scale (EBBS)

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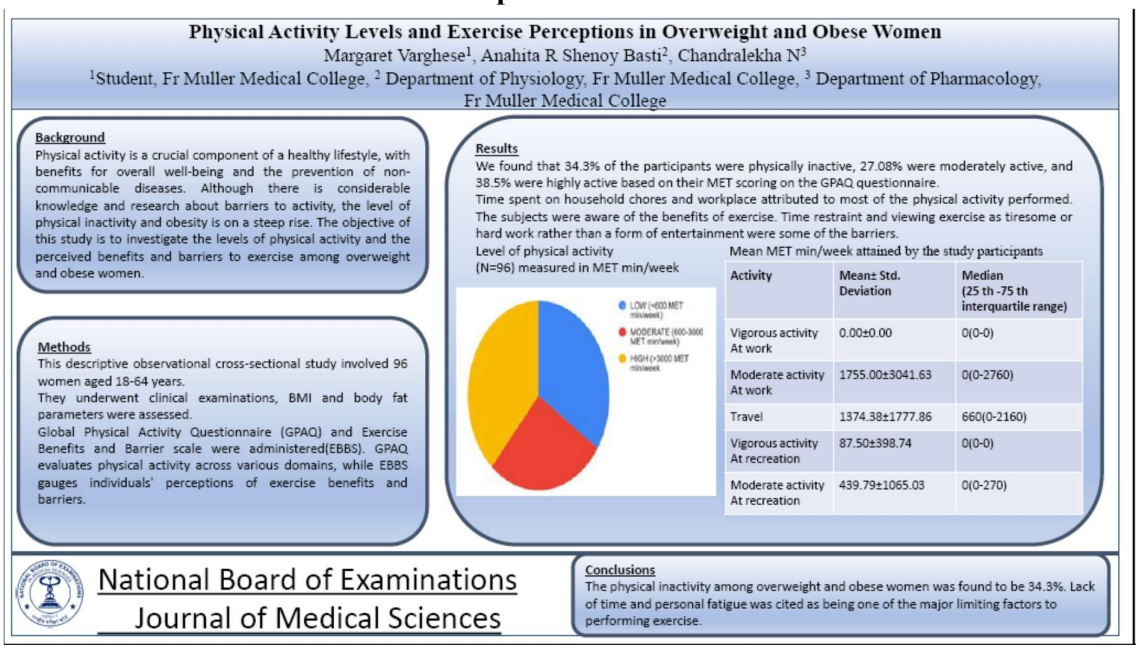
Graphical Abstract



Introduction

Physical activity (PA) is defined as any bodily movement produced by skeletal muscles that require energy expenditure, which includes exercises and activities undertaken while working, playing, and carrying out household work [1]. Regular physical activity has been shown to enhance quality of life, while insufficient physical activity is recognized as a major risk factor for mortality and morbidity worldwide [2]. Many Non-Communicable Diseases (NCDs) such as obesity, coronary artery disease, hypertension and diabetes mellitus can be prevented by regular PA. Also, several studies have shown that the aged populations with comorbidities had a higher risk of morbidity and mortality from COVID-19 [3,4]. Physical activity by its ability to boost our immune system can also reduce the burden of communicable diseases [5-7].

Due to the closure of gymnasiums, parks, and fitness centers as well as work from home and the need to wear a mask, there has been a reduction in the levels of physical activity after the onset of the COVID-19 pandemic [8].

Previous studies have shown a disparity between the activity levels in males and females with higher activity levels in males. Several factors contributing to this disparity include limited time availability, insufficient awareness, lack of access to safe roads, unfavorable sociocultural norms, household responsibilities, and inadequate social support and facilities [9–12]. Apart from physical and environmental barriers, psychological barriers have been also shown to play a pivotal role [10].

Although there is considerable knowledge and research concerning barriers to activity, the level of physical inactivity and obesity is on a steep rise. Indicating that the interventions in place do not effectively target the barriers and a failing exists to recognise other factors influencing inactivity.

To effectively reduce the level of inactivity in women we first need to re-examine the burden of physical inactivity

and to determine the barriers to activity. This will further help us in institutionalizing public health policies to combat NCDs.

Thus, this study was taken up with the objectives to assess the physical activity levels in overweight and obese women using WHO global physical activity questionnaire (GPAQ) and to determine the perceived benefits and barriers to exercise using exercise benefits and barrier scale (EBBS).

Material and Methods

This descriptive observational cross-sectional study was initiated after approval from the institutional ethics committee. 96 women in the age group of 18-64 years attending our OPD, health check-ups, and students and staff of our college, who were willing to participate in the study were screened. Those satisfying the inclusion and exclusion criteria underwent a brief clinical examination to rule out any systemic illness. Women belonging to the category of overweight and obese according to the WHO Asian BMI classification i.e. Women whose BMI is between 23-24.9kg/m^2 were considered overweight and BMI greater than 25 kg/m^2 were considered obese were included in the study. Pregnant women and women with disability were excluded from the study. A sample size of 96 was determined at 95% confidence interval using the formula n= z2*p * (1- p) / e2 [12], p-value based on the article [13] and considering allowable error at 10%.

The study procedure was explained to the subjects and an informed written consent was taken.

The height and weight of the subjects were recorded according to the standard protocol. Standing height was measured up to 0.1cm without footwear, with the subjects back to a wall and with both heels placed together and touching the base of the wall. Weight was recorded without footwear, to the nearest of 0.5 kg. BMI was calculated by using the formula weight in Kg / Height in $meter^2$ (Quetelet formula). Body composition was assessed using Omeron Karada scan. The body composition analyzer works on the principle of bioelectrical impedance. Total body fat percentage, fat mass, muscle mass, visceral fat, and basal metabolic rate were derived from it.

The Global Physical Activity Questionnaire (GPAQ) and Exercise Benefits and Barrier scale (EBBS) were administered. The Global Physical Activity Questionnaire (GPAQ), which has been developed by the World Health Organization (WHO) assesses physical activity [14]. This questionnaire has 16 questions arranged in 3 main domains – occupation, travel and leisure activities. GPAQ has been previously validated in Asian Indians and found to be reproducible and reliable. The responses to the frequency and duration questions were used to calculate the total amount of time a person spends doing physical activity or metabolic equivalent (MET) minutes per week.

For adults aged 18–64 years, WHO recommends at least 150 minutes of moderate-intensity physical activity throughout the week, or 75 min of vigorous-intensity physical activity throughout the week; or an equivalent combination of moderate- and vigorous-intensity activity accumulating at least 600 MET-minutes per week [15]. In our study, we have used this cut-off to define physically active versus inactive adults.

The EBBS is designed to determine the perceptions of individuals regarding the

benefits and barriers of participating in exercise. The EBBS is a 43-item rating scale consisting of two subscales, Benefits and Barriers. Ratings are obtained using a four-point response system. The EBBS has been tested for internal consistency, validity of its constructs, and test-retest reliability [16]. Prior permission has been obtained from the author to use the questionnaire.

The Data was collected by conducting interviews with the participants and it was entered in Microsoft Excel sheet and analyzed using SPSS software (IBM SPSS Statistics for Windows, Version 24.0. Armonk, New York, IBM Corp) for statistics. Data was presented as appropriate tables. Mean ± SD for data following normal distribution and median/ interquartile range was used for skewed values. EBBS questionnaire was graded using 4-point Likert's Scale. The mean and standard deviation for each question was calculated.

Results

In this study, we assessed the level of physical activity in overweight and obese women. The demographic characteristics of our study participants have been depicted in Table 1. The level of physical activity has been divided into low, moderate and high, expressed as MET min/week has been depicted in Table 2. The MET min/week attained by the study participants in three domains of physical activity being work, travel and recreation has been expressed in Table 3.

The exercise benefits scale score of the study participants has been expressed in Table 4.

The mean score of the exercise benefit scale and exercise barrier scale questions have been represented in Table 5 and Table 6, respectively.

Table 1. Demographic characters of the study population

Age group 20-30 yrs 31-40yrs Above 40	Frequency 40(41.7%) 20(20.8%) 36(37.5%)
Employment status Student Employed Homemaker	Frequency 17(17.7%) 27(28.12%) 52(54.16%)
Height in m	155.83±6.72*
Weight in kg	66.73±11.05*
BMI in kg/m^2	27.49±3.45*
Fat%	35.55±3.33*
Visceral fat	8.49±3.95*
Muscle fat	23.85±2.40*
Subcutaneous fat	31.45±4.28*
BMR	1360.10±181.76*

*mean±SD

Table 2. Level of physical activity of the study participants (N=96) measured in MET min/week

Levels of Physical Activity	Frequency (percentage)
Low (<600 MET min/week)	33 (34.37%)
Moderate (600-3000 MET min/week)	26 (27.08%)
High (>3000 MET min/week)	37 (38.54%)

Table 3. Mean MET min/week attained by the study participants in three domains of physical activity (work/ travel/recreation)

Activity	Mean± Std. Deviation	Median (25th -75th interquartile range)
Vigorous activity At work	0.00±0.00	0(0-0)
Moderate activity At work	1755.00±3041.63	0(0-2760)
Travel	1374.38±1777.86	660(0-2160)
Vigorous activity At recreation	87.50±398.74	0(0-0)
Moderate activity At recreation	439.79±1065.03	0(0-270)

Table 4. The exercise benefits scale total score of the study participants

	N	Minimum	Maximum	Mean± SD
EBBS total score	96	76	162	110.55± 18.76
BARRIERS score	96	16	51	34.17±6.15
BENEFITS score	96	59	111	76.39±14.07

Table 5. The exercise benefits scale responses of the study participants expressed in frequency (percentage)

	Strongly agree	Agree	Disagree	Strongly disagree	Mean±SD
Physical performance sub-scale					
Question 7	0(0.0%)	47(49.0%)	41(42.7%)	8(8.3%)	2.59±0.64
Question15	0(0.0%)	41(42.7%)	43(44.8%)	12(12.5%)	2.70±0.68
Question17	0(0.0%)	49(51.0%)	39(40.6%)	8(8.3%)	2.57±0.64
Question18	0(0.0%)	31(33%)	47(50%)	16(17%)	2.84±0.69
Question22	1(1.0%)	40(41.7%)	42(43.8%)	13(13.5%)	2.70±0.71
Question23	0(0.0%)	38(39.6%)	46(47.9%)	12(12.5%)	2.73±0.67
Question 31	0(0.0%)	37(38.5%)	49(51%)	10(10.4%)	2.72±0.64
Question 43	0(0.0%)	30(31.3%)	57 (59.4%)	9(9.4%)	2.78±0.60
Life enhancement subscale					
Question 25	0(0.0%)	43(45.3%)	50(52.6%)	2(2.1%)	2.57±0.54
Question26	0(0.0%)	48(50%)	36(37.5%)	12(12.5%)	2.63±0.70
Question 29	2(2.1%)	55(57.3%)	37(38.5%)	2(2.1%)	2.41±0.57
Question32	0(0.0%)	39(40.6%)	48(50%)	9(9.4%)	2.69±0.64
Question34	0(0.0%)	49(51%)	39(40.6%)	8(8.3%)	2.57±0.64
Question35	2(2.1%)	52(54.2%)	36(37.5%)	6(6.3%)	2.48±0.65
Question36	0(0.0%)	53(55.2%)	37(38.5%)	6(6.3%)	2.51±0.62
Question41	0(0.0%)	35(36.5%)	50(52.1%)	11(11.5%)	2.75±0.65
Psychological Outlook Sub-scale					
Question 1	0 (0.0%)	39 (40.6%)	48(50%)	9(9.4%)	2.69±0.64
Question 2	0 (0.0%)	43 (44.8%)	41 (42.7%)	12(12.5%)	2.68±0.69
Question 3	0 (0.0%)	45 (46.9%)	38 (39.6%)	13(13.5%)	2.67±0.71
Question 8	0 (0.0%)	35 (36.5%)	49(51%)	12(12.5%)	2.76±0.66
Question 9	5(5.2%)	40 (41.7%)	44(45.8%)	7(7.3%)	2.55±0.71
Question 20	0 0.0%	37 (38.5%)	48(50%)	11(11.5%)	2.73±0.66
Social Interaction sub-scale					
Question 11	2(2.1%)	66(68.8%)	27 (28.1%)	1(1.0%)	2.28±0.52
Question 30	2(2.1%)	69(71.9%)	21(21.9%)	4(4.2%)	2.28±0.57
Question 38	2(2.1%)	46 (47.9%)	40(41.7%)	8(8.3%)	2.56±0.68
Question 39	1(1%)	60(62.5%)	33 (33.3%)	3(3.1%)	2.39±0.57

Preventive Health sub-scale					
Question 5	1(1.0%)	8(8.3%)	69(71.9%)	18(18.8%)	3.08±0.56
Question 13	0(0.0%)	30 (31.6%)	56(58.8%)	9(9.5%)	2.78±0.60
Question 27	4 (4.2%)	19(19.8%)	66(68.8%)	7(7.3%)	2.79±0.63

Unit: Frequency (percentage)

Table 6. The exercise barriers scale responses of the study participants expressed in frequency (percentage)

	Strongly agree	Agree	Disagree	Strongly Disagree	mean± SD
Exercise Milieu Sub-scale					
Question 9	5(5.2%)	40(41.7%)	44(45.8%)	7(7.3%)	2.55±0.71
Question 12	6(6.3%)	48(50.0%)	37(38.5%)	5(5.2%)	2.43±0.69
Question 14	2(2.1%)	29(30.2%)	55(57.3%)	10(10.4%)	2.76±0.66
Question 16	15(15.6%)	60(62.5%)	20(20.8%)	1(1.0%)	2.07±0.64
Question 28	2 (2.1%)	18(18.8%)	64(66.7%)	12(12.5%)	2.90±0.62
Question 42	5(5.2%)	48(50.0%)	41(42.7%)	2(2.1%)	2.42±0.63
Time Expenditure Sub-scale					
Question 4	8(8.3%)	61(63.5%)	24(25.0%)	3(3.1%)	2.23±0.64
Question 24	5(5.2%)	45(46.9%)	39(40.6%)	7(7.3%)	2.50±0.71
Question 37	4(4.2%)	19(19.8%)	66(68.8%)	7(7.3%)	2.79±0.63
Physical Exertion Sub-scale					
Question 6	4(4.2%)	61(63.5%)	29(30.2%)	2(2.1%)	2.30±0.58
Question 19	6(6.3%)	37(38.5%)	52(54.2%)	1(1.0%)	2.50±0.63
Question 40	7(7.3%)	56(58.3%)	31(32.2%)	2(2.1%)	2.29±0.63
Family Discouragement Sub-scale					
Question 21	3(4.2%)	29(40.8%)	31(43.7%)	8(11.3%)	2.62±0.74
Question 33	2(2.1%)	31(32.3%)	46(47.9%)	1717.7(%)	2.81±0.74

Discussion

This study aimed to determine the level of physical activity and the perceived benefits and barriers to exercise in overweight and obese women. The mean BMI of our study participants was 27.49±3.45kg/m^2, 54.16% of them were homemakers (Table 1). We found that 34.3% of the participants were physically inactive, 27.08% were moderately active, and 38.5% were highly active based on their MET scoring on the GPAQ questionnaire (Table 2).

A study done in India, found the prevalence of self-reported physical inactivity among adults to be 52.1% [17], other Indian studies have found the level of inactivity to be 56.8% [18] and 49.7% [19]. The level of physical activity in these studies was much lower as compared to our study. This difference could be attributed to the fact that a large percentage (54.16%) of our study population were homemakers, who performed daily household chores adding to their levels of physical activity. As depicted in Table 3 moderate activity at work contributed to a significant portion of MET min/week followed by activity involving travel to and from work place. However, MET min/week spent on recreational activities was found to be low. This information can help initiate programs that will focus on increasing time spent on recreational activities.

The study also aimed to understand the perceived benefits and barriers to physical activity in our participants. For this, we utilised the Exercise benefit and barrier scale which is a four-response, Likert-type format with responses ranging from 4 (strongly agree) to 1 (strongly disagree). Barrier Scale items are reverse-scored. The total instrument scores can vary from 43 to 172, with higher scores indicating a more positive perception of exercise. When the Benefits Scale is used independently, scores range from 29 to 116. The total score obtained in our study was 110.55±18.767 (Table 4) indicating that the participants perceived exercise positively.

In the benefits scale, under the domain of physical performance subscale, it was observed that Question 18 'Exercising improves the functioning of my cardiovascular system' was the most agreed benefit with a mean score of 2.84±0.69, this could be because of increased awareness among the general population about the cardiovascular problems and the positive influence of exercise on the health and how it can prevent coronary artery disease and mortality. Under the domain Life Enhancement Sub-Scale Question 41 'Exercise improves overall body functioning for me' was the most agreed upon with a mean score of 2.75±0.65. In the domain Psychological Outlook Sub-scale, Question 8 'Exercise gives me a sense of personal accomplishment.' was mostly agreed upon with a mean score of 2.76±0.66.

Physical activity is known to act as an adjunct for alcoholism and de-addiction programs, helping in improving self-image, social skills, and cognitive functioning, also to reduce episodes of anxiety [20].

Under the domain of social interaction subscale Question 38 'Exercise is good entertainment for me', a mean score of 2.56±0.68 was obtained. The perception of exercise as a form of entertainment rather than a chore or punishment will help to improve adherence to exercise in the long term.

The responses to the barrier scale were reverse-scored, with a low score indicating that the participant was in agreement with the statement. The lowest

score was obtained for question 16 which stated 'Exercise facilities do not have convenient schedules for me'. Indicating a time restraint to perform exercise. Other questions with low scores were, 'Exercising takes too much of my time', 'Exercise tires me', and 'Exercise is hard work for me'. All these indicate that paucity of time is one of the major barriers to performing exercise along with personal limitations to perform exercise.

Under the domain of exercise milieu sub-scale Question 28: 'I think people in exercise clothes look funny.' was mostly disagreed upon by the study population. It can be explained that the general public is now aware of the pros of using sportswear, and that wearing them is not funny anymore but rather fancier.

It was found in the present study that 51%of the women did not have access to public exercising areas such as gymnasiums and parks which may have attributed to decreased levels of recreational-based physical activity in these women.

Another observation in the study was that 58.3% of the highly active group had an EBBS SCORE of more than 110.55± 18.767, whereas 69.69%of the inactive group had an EBBS SCORE of less than 110.55± 18.767, this can be interpreted as, people with high physical activity perceive comparatively fewer barriers, whereas the inactive group perceive a lot of barriers for exercising.

Conclusion

In conclusion, physical inactivity among overweight and obese women was found to be at 34.3%. Time spent on household chores and workplace attributed to most of the physical activity performed. Lack of time and personal fatigue was cited as being one of the major limiting factors to performing exercise.

Interventions that make it convenient to exercise, as well as strategies that target the way exercise is perceived by the population, need to be initiated to help increase the levels of physical activity and decrease the mortality and morbidity due to lifestyle-related disorders.

Limitation

The limitations of our study are a relatively small sample size and involving subjects from the hospital and college, so the results cannot be generalized to the general population.

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Conflicts of interest

The authors declares that they do not have conflict of interest.

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