

Original research article

A study on practicality of implementing a community based physical activity program to increase physical activity levels

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Abstract

Background and Objectives: Physical activity, as defined by the World Health Organization, is any movement that expends energy. Playing, working, walking, cleaning, and relaxing are all included in this broad category of physical activity. For the purpose of evaluating the degree to which a community-based physical activity program modifies the overall level of physical activity in the community.

Material and Methods: An analysis of a community-based intervention's viability. In the Department of Community Medicine, Siddhartha Medical College, Vijayawada, Andhra Pradesh, India, community health department has launched an integral health and development program. A community-based physical activity program was deemed necessary after a multi-centric study. The study was conducted between the September 2022 to August 2023.

Results: In the Pre-intervention phase of the study, 100 participants came from the Intervention A areas and 100 from the Intervention B areas. There were 200 total study participants. The two intervention areas' sociodemographic features were examined and contrasted. The majority of the working class people in Intervention-B village were employed by MNREGA. It may be said that MNREGA was successful in improving the situation of the rural poor and had given social and economic security to a size number of women.

Conclusion: This research was designed to compare two interventions in two different geographic locations in order to assess the efficacy of a community-based physical activity program. To reduce cross-over and mixing as much as possible, the zones were specifically chosen to be separated from one another.

Keywords: Community, physical activity, feasibility study, intervention.

Introduction

The World Health Organization (WHO) provides a definition of physical activity as encompassing any form of bodily movement that necessitates the utilization of energy. Physical activity encompasses a range of endeavors, such as exercise, engagement in play, occupational tasks^[1], physical transportation, household duties, and recreational pursuits. Physical inactivity has been recognized as the fourth most significant risk factor contributing to worldwide mortality. Inadequate levels of physical activity constitute one of the four principal risk factors associated with non-communicable diseases. Engaging in regular physical activity is associated with a reduced likelihood of experiencing depression and cognitive deterioration in older persons^[2, 3].

Individuals who exhibit inadequate levels of physical activity face a heightened risk of all-cause mortality ranging from 20% to 30% as compared to those who partake in a minimum of 150 minutes of moderate intensity physical exercise each week, or an equivalent amount as recommended by the World Health Organization (WHO)^[4, 5]. The World Health Organization (WHO) reported that there was a 27% incidence of inadequate physical activity among middle-aged women in underdeveloped nations on a worldwide scale. Non-communicable diseases (NCDs) encompass a range of health conditions, primarily consisting of cardiovascular illnesses, malignancies, chronic respiratory disorders, and diabetes. Non-communicable diseases (NCDs) exhibit a disproportionate impact on individuals residing in low- and middle-income nations, wherein over 75% of NCD-related fatalities worldwide transpire^[6, 7].

Non-communicable diseases (NCDs) presently account for a greater number of global fatalities than the collective sum of all other causes. Projections indicate that the number of deaths attributed to NCDs is expected to rise from 3.8 crore in 2012 to 5.2 crore by the year 2030. Premature fatalities, defined as those occurring before the age of 70 years, account for approximately 42% of all non-communicable disease (NCD) deaths worldwide. These deaths are considered preventable^[8]. In the Indian context, it is observed that as of 2017, a significant proportion of mortality, specifically 61%, can be attributed to non-communicable diseases. This accounts for a total of 58,17,000 deaths. Approximately 23% of the

population is at risk of experiencing premature mortality due to the four primary non-communicable diseases (NCDs). Based on the findings of the ICMR-INDIAB survey conducted in 2014, it was observed that the prevalence of physical inactivity among rural women in India was recorded at 62.3%, indicating a significantly high rate compared to other regions within the country^[9, 10].

A cross-sectional study employing a multi-stage cluster sampling design was conducted in a village of Andhra Pradesh. The study revealed that a majority of the participants did not perceive a necessity to enhance their physical activity level, despite it being low. Furthermore, there was a notable lack of awareness regarding the potential health benefits of physical activity in relation to chronic diseases^[11]. A study conducted in the rural region of Vellore in 2012 revealed that 46.4% of rural women were found to be physically inactive. Additionally, a significant incidence of various risk factors associated with non-communicable diseases was seen, including overweight, central obesity, hypertension, diabetes, and metabolic syndrome. The majority of the observed rates of non-communicable diseases (NCDs) and their associated risk factors were found to be higher when compared to the statistical data available for Tamil Nadu and India. This necessitated the development of a community-oriented program aimed at enhancing the physical activity profile and dietary habits of the overall population, with the objective of preventing, mitigating, and delaying the occurrence of risk factors associated with non-communicable diseases^[11, 13]. The objective of this study was to assess the efficacy of a physical activity program implemented within a community setting, with the aim of examining its impact on the physical activity patterns of the community members. The objective of this study is to assess the impact of a community-based physical activity intervention on the level of physical activity among women aged 30-40 years in selected villages, with the aim of preventing Non-Communicable illnesses. The primary aim of this study was to assess the extent of physical activity among women aged 30-40 years residing in the chosen rural communities. The objective of this study is to examine the factors that influence physical activity levels among women aged 30-40 years residing in certain rural areas.

Material and Methods

This study presents a comprehensive analysis of a community-based intervention through a feasibility study. The comprehensive health and development project has been established by the Department of Community Medicine, Siddhartha Medical College, Vijayawada, Andhra Pradesh, India. The research was carried out in two distinct geographic regions within the chosen locations. Each geographical region comprised numerous settlements. The study was conducted between the September 2022 to August 2023.

Results: In the Pre-intervention phase, the study consisted of a total of 200 participants, with 100 individuals selected from areas implementing Intervention A and another 100 individuals selected from areas implementing Intervention B.

Table 1: Sociodemographics of the two study areas

Characteristics	Categories	Area A (100)	Area B (100)	Total (200)
		Number	Number	Number
Age	30-35	80	65	145
	36-40	20	35	55
Education	Nil	20	10	30
	Primary school	50	40	90
	Middle school	10	20	30
	High school	05	10	15
	Diploma	05	10	15
	Graduation	05	05	10
	Post-graduation	05	05	10
Occupation	Homemaker	30	40	70
	Semi-skilled	40	30	70
	Skilled worker	10	20	30
	Clerical	10	05	15
	Semi-profession	10	05	15
Marital Status	Unmarried	80	70	150
	Ever Married	20	30	50
Number of children	0	05	10	15
	1-2	90	80	170
	>2	05	10	15
Type of House	Pucca	80	70	150
	Mixed / Kutcha	20	30	50

The two research areas exhibited similarities in the majority of their socio-demographic features, with the exception of socio-economic status, where statistical discrepancies were observed. The bar graphic illustrates a higher representation of participants from lower social classes in Intervention-B area compared to Intervention-A area. The percentage of illiterate participants in Intervention-B area was 6%, but in area-A it was 2.5%. On the other hand, 6.2% of participants in area-A held postgraduate or

professional degrees, compared to only 0.7% in area-B. However, this difference was not found to be statistically significant. In the Intervention-B area, approximately 49.7% of the participants were engaged in occupations categorized as unskilled and semi-skilled jobs, with a majority of them being employed through the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA). In contrast, it was observed that 41.2% of participants residing in the Intervention-A area were employed in occupations categorized as unskilled and semi-skilled. The majority of these occupations involved engaging in daily wage labor within small-scale factories.

The subjects in both study locations exhibited similarities, with the exception of. The average number of years of education and the average monthly family income exhibit a statistically significant difference. The average number of years of schooling in area A was found to be substantially greater than that in region B, as indicated by a statistically significant p-value. Similarly, the mean per-capita monthly income exhibited a greater value in area-A compared to area-B, with a statistically significant difference observed between the two regions.

Table 2: Comparing sociodemographic mean values

Mean values	Area A	Area A
Mean Age	36.33	36.45
Mean Years of education	8.66	9.40
Mean Per capita monthly	2526.56	1502.65
Mean Years of marriage	15.03	16.01
Mean Number of children	3.07	3.15
Mean Years since last child birth	8.08	8.70
Mean number of Rooms at home	2.55	2.06
Mean number of Household members	3.70	3.88

The two study areas exhibited comparable proportions of study participants who self-reported non-communicable disorders. A total of 3.6% of the individuals exhibited diabetes mellitus, 1% had hypertension, and 7.1% demonstrated thyroid problems and were on pharmacological treatment. 31.1% of the participants reported having a family history of diabetes mellitus, while 22.7% reported having a family history of hypertension. A total of 8.7% of the participants reported a familial history of bronchial asthma, whereas 3.2% reported a familial history of cardiac diseases.

Table 3: Two study anthropometrics

Mean values of	Area A	Area B
Height (cm)	149.33	149.55
Weight (kg)	62.56	62.65
BMI	30.88	25.02
Waist circumference (cm)	90.65	85.91
Waist: Hip ratio	0.914	0.924

Statistically significant differences were seen in the mean waist circumference and mean waist-to-hip ratio between the two study locations. The participants in Intervention A exhibited greater waist circumference and waist-to-hip ratio compared to those in region B. The prevalence of individuals with a waist/hip ratio greater than 0.85 in study region A was found to be higher than that in study area B, with the observed difference being statistically significant.

Table 4: Physical activity percentage of study population

MET-minutes per week	Area A	Area B	Total
	Number	Number	Number
Active	55	48	103
Inactive	45	52	97

The individuals classified as active participants were those who engaged in a minimum of 600 metabolic equivalent of task (MET) minutes per week, involving either moderate or strenuous physical activities. In area-A, 45.6% of the participants were classified as 'Active', whereas in area-B, the corresponding percentage was 48.3%. The observed change did not reach statistical significance. In total, 46.92% of the participants demonstrated engagement in both categories. Furthermore, a total of 49 women from both villages indicated that they were obligated to seek permission from their husbands or elders in order to engage in activities such as walking or other forms of physical exercise.

In summary, it can be observed that participants residing in Area-B had comparatively lower levels of socio-economic status, mean education, and per capita monthly income in comparison to their counterparts in Area-A. The participants from Area-A exhibited statistically significant differences in waist circumference and waist/hip ratio, as well as higher mean Diastolic BP. Additionally, a greater

number of participants from Area-A were found to have Hypertension and were classified as overweight compared to those from Area-B. The average high-density lipoprotein cholesterol (HDL-C) levels were found to be considerably lower in Area-B compared to Area-A. Additionally, there was a significantly higher prevalence of impaired fasting glucose among participants in Area-B compared to Area-A. The average daily servings of fruit and the average frequency of fried food consumption were found to be substantially greater in Area-A compared to Area-B. The study revealed that the prevalence of Diabetes mellitus among women aged 30-40 in the designated areas was 9.93%.

Discussion

The objective of this study is to assess the efficacy of a physical activity program implemented within a community setting. The study was designed as an intervention study, with the intention of comparing two therapies across two distinct geographic regions. The selection of the locations was intentionally made with the objective of maximizing spatial separation in order to minimize the occurrence of cross-over and mixing as much as feasibly achievable^[14, 15]. The research aimed to exclusively incorporate women in the middle age demographic due to the subsequent justifications: Women in this age group who have young families often hold the belief that they should allocate a significant portion of their time to fulfilling the needs of their children, husband, and in-laws. Consequently, they tend to place less emphasis on their own personal health and well-being. Social factors such as inadequate familial support and a dearth of incentive to engage in outdoor physical activity^[15, 16].

A more complete and expansive approach is required for men to address the prevention of risk factors associated with non-communicable diseases (NCDs). This approach should encompass the cessation and regulation of tobacco and alcohol consumption, as these factors have a greater impact on the incidence of NCDs compared to physical activity^[17]. Research findings indicate that the likelihood of Non-Communicable diseases and their associated risk factors is highest during middle age and the pre-menopausal stage, following the geriatric age group. Therefore, it is logical to prioritize the prevention of risk factors associated with non-communicable diseases (NCDs) and conduct screenings for these factors among women aged 30-40, rather than focusing on a sample population that has already been diagnosed with NCDs. Additionally, empirical evidence suggests that individuals fulfilling the role of homemakers tend to allocate a significant portion of their daytime, particularly during the midday and early evening hours, to unproductive activities. Therefore, it was imperative to implement lifestyle modifications, specifically pertaining to physical activity, among women aged 30-40 years^[18, 20].

The research conducted was not designed as a Randomized Control Trial (RCT), but rather as a community intervention trial. A pre-intervention study was conducted using a simple random sampling method, followed by a post-intervention study to assess the effectiveness of the program. The program aimed to benefit not only the study participants but also the entire community. Furthermore, it was hypothesized that the potential for Investigator bias or Observer Expectancy effect would be minimized if different subjects were utilized for the pre and post intervention assessments^[21, 23].

The researchers hypothesized that the socio-demographic characteristics of the individuals in the study may be directly or indirectly related to their degree of physical activity. While the GPAQ is a widely recognized screening tool for physical activity that encompasses a broad range of activities, we aimed to delve deeper into the specific patterns of household activities such as cleaning, kitchen tasks, laundry, childcare, elderly care, and personal care^[24, 25]. The following activities, which have established MET-minute scores, have been selected from the Compendium of Physical Activities. The sample size for the post-intervention phase was unable to be achieved as a result of a combination of preventable and unforeseen situations^[26].

The health education modules were designed and developed with the intention of introducing the concepts around the consequences of insufficient physical activity, such as obesity, hypertension, stroke, hypercholesterolemia, and diabetes mellitus. Recommendations were provided regarding the attainment of sufficient physical exercise and a nutritious diet within one's daily routine. Several prevalent misconceptions were debunked, and the notion of equating physical activity to commonly consumed foods was introduced. During the Intervention-A phase, participants were provided with an orientation session on the equipment available at the community gymnasium. This session aimed to familiarize them with the various equipment, their intended purposes, and optimal ways to utilize them effectively^[27, 28].

The Trans-theoretical Model of Health Education posits that individuals who seek to adopt healthier behaviors progress through a sequence of stages, namely pre-contemplation, contemplation, preparation, action, and maintenance. An individual in the "Pre-contemplation stage" lacks awareness regarding their health hazards and the necessity of modifying their behavior. Conversely, an individual in the "Contemplation stage" possesses awareness regarding the risks, comprehends the advantages of adopting healthy behavior, and is considering taking action. An individual can be classified as being in the "Preparation stage" when they exhibit incremental modifications in their behavior, although have not yet fulfilled the criteria for actualized behavioral change^[29, 30].

The establishment of the community gymnasium was met with enthusiasm by the local community, who themselves proposed the location for the facility. During the installation process, precautions were taken

to ensure that the equipment was positioned at a distance from the road and oriented in a manner that did not directly face individuals passing by. However, numerous obstacles quickly emerged. The location served as a recreational space for youngsters during the evenings and also functioned as a social hub for the adult male residents of the region^[28, 30]. The utilization of the equipment was predominantly observed among younger males, but the focus of this study's examination was only on middle-aged women. While women tended to use the equipment in groups, several of them expressed hesitancy in utilizing it in the presence of men. Furthermore, the absence of a neighboring streetlight posed a challenge for individuals seeking illumination during the late nighttime hours. The aforementioned difficulties are gradually being addressed, since the intervention is now under progress^[29, 31].

Within the Intervention A area, a total of 24 women, accounting for 29.6% of the sample, reported having utilized the community gymnasium on at least one occasion. By conducting additional health education sessions to reinforce the messaging and enlisting the support of influential individuals within the local community, the level of acceptance towards the establishment of the community gymnasium is expected to improve^[30, 32].

Conclusion

The study revealed that within the designated study locations, the prevalence of diabetes mellitus among women aged 30-40 years was determined to be 9.93%. Additionally, the prevalence of hypertension was discovered to be 25.56%, dyslipidemia was seen in 42% of the participants, while overweight and obesity were prevalent in 56.65% of the women. Furthermore, central obesity was found to affect 73.14% of the participants, and metabolic syndrome was present in 42.7% of the women within the study population. 31.1% of the individuals reported having a family history of diabetes mellitus, while 22.7% indicated a family history of hypertension. A total of 8.7% of the participants reported having a family history of bronchial asthma, whereas 3.2% reported a family history of cardiac problems. Approximately 67% of the overall caloric consumption was derived from carbohydrates, a proportion that exceeded the recommended level to a modest extent. The average daily protein consumption was determined to be 50.08 grams, a quantity that can be considered sufficient. A mere 3.2% of the participants reported consuming a minimum of one serving of fruit every day. The study observed that the proportion of participants engaged in physical activity was first measured at 46.92%, and subsequently climbed to 48.70% following a two-month period of interventions. The average duration of inactive activity was 300 minutes per day.

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None

Conflict of Interest

None

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