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RESEARCH ARTICLE

ASSOCIATION OF PHYSICAL ACTIVITY ON BODY FAT PERCENTAGE AND ANTHROPOMETRIC INDICATORS AMONG ADULTS OF NORTH 24 PARGANAS, WEST BENGAL, INDIA

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ABSTRACT

Background: The crucial stage of young adulthood (18-29 years, n=500) is characterized by changes in lifestyle that frequently result in less physical activity and a higher risk of obesity. Although body fat percentage is a more accurate measure of adiposity than standard anthropometric measurements, less is known about how sports-specific physical activity affects body fat in this age group. **Objectives:** In young individuals between the ages of 18-29 years, the study sought to determine the impact of physical exercise on body fat percentage and investigate its relationship with anthropometric variables. **Methods:** Young adults participated in a cross-sectional study that used a non-probability purposive sampling technique. A systematic questionnaire is used to gather information on sports-specific physical activity, such as football, badminton, skipping, cricket, and excercising. Body mass index (BMI) and waist-hip ratio (WHR) are computed after anthropometric measures, including height, weight, waist circumference, and hip circumference, C are recorded using standard protocols and a conventional approach is used to determine the percentage body fat. Multiple linear regression, the chi-square test, and pearson's correlation are among the statistical analysis. Significance is established at $p<0.05$ **Results:** Cricket's ability reduce adiposity is demonstrated by a strong negative correlation ($p<0.001$) between its duration and body fat percentage. There are slight but positive correlations between skipping and badminton. There are no significant correlations found with waist circumference or WHR, but there is a significant correlation ($p<0.001$) between physical activity level and BMI categories. BMI, WC, and WHR are found to be significant predictors of body fat percentage by multiple regression analysis, explaining for a large fraction of the variation. **Conclusion:** The results indicate that While BMI is remains a reliable indicator of obesity, young individuals' body fat can be significantly reduced by engaging in rigorous physical activity. In order to prevent obesity and related health problems in this age group, it is crucial to promote regular, high-intensity physical activity.

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INTRODUCTION

Young adulthood, especially the 18-29 age range, is a crucial period of transition marked by more independence, changes in lifestyle, and behavioral changes that can have a great impact on long-term health consequences. Due to academic pressure, occupational commitments, and more screen time, this time is frequently linked to lower levels of physical activity, with increases the risk of weight gain and fat accumulation. During this early adulthood,the accumulation of excess body fat is one of the main risk factor for the emergence of non-communicable disease like diabetes, metabolic syndrome, and cardiovascular disease. Although BMI is frequently used to assess nutritional status, it does not distinguish between lean and fat mass. Therefore, anthropometric measurements like waist circumference (WC), waist-hip ratio (WHR) offer insight into fat distribution, but body fat percentage is thought to be a more reliable indicator of adiposity. Exercise is essential for controlling body composition, as prior studies have repeatedly shown.Higher levels of physical exercise are linked to reduced adiposity and better metabolic health outcomes, according to Janssen and LeBlanc (Janssen & Leblanc, 2010). In a similar vein, a study demonstrate moderate to intense exercise dramatically lowers body fat and cardiometabolic risks (Ekelund *et al*., 2012). According to strong *et al*. maintaining a healthy body composition across all age group requires physical activity (Strong *et al*., 2005). Freedman *et al*. reported that a significant correlation between body fat percentage and BMI, indicating that BMI is remains a valuable proxy measure despite its drawbacks (Freedman *et al*., 2005). However, another study noted that BMI might not accurately represent fat distribution, highlighting the significance of WC and WHR

(Nevill *et al*., 2006). Body composition in young adults is greatly influenced by lifestyle factors, including food habits, work patterns, and physical inactivity. Regular physical exercise is linked to reduced body fat and increased cardiovascular fitness, as shown by Andersen *et al*. (Andersen *et al*., 2006). Telford *et al*. found that compared to low intensity activities,high-intensity physical exercise is more effective at reducing adiposity (Telford *et al*., 2012). Despite a large body of reseach, few studies have looked at how sports-specific physical activity affects young people' body fat percentage, especially in developing nations. In order to fills this gap, the current study examines the association between various forms of physical activity and body fat percentage in people between the ages of 18 and 29.

OBJECTIVES

- To investigate the relationship between body fat percentage and sports-specific physical activities.
- To examine the impact of physical activity on body fat percentage among adults of North 24 parganas.
- To evaluate the association between physical activity status and anthropometric indicators such as BMI, WHR, WC
- To determine the effect of anthropometric indicators on body fat percentage of this population.

METHODOLOGY

Study area and design: The present study is conducted among young adults (18-29years, n=500) of North 24 Parganas, West Bengal. The association between physical activity, body fat percentage and anthropometric indicators in adults are examined using a cross-sectional approach.

Inclusion criteria: The study included individuals aged between 18-29 years who are present when the data is collected. Individuals who give their informed consent and are willing to participate are included in the present study.

Exclusion criteria: Individuals who known metabolic abnormalities, chronic illness, or physical impairments that could affect body composition are not allowed to participate. People whose data was contradictory or incomplete are also excluded from the analysis.

Data collection tools and measurements: Standardized procedures were followed for taking anthropometric measurements. An anthropometer is used to measure participants' height while they stood upright and without shoes.A calibrated weighing scale is used to measure weight, and the standard formula (kg/m^2) is used to calculate BMI. Hip circumference was measured at the maximal circumference of the buttocks, while waist circumference was measured at the midpoint between lower rib and iliac crest. WHR is computed by waist circumference divided by hip circumference. To ensure accuracy, body fat percentage is calculated using a standardized and reliable method.

Statistical analysis: The SPSS version 16.0 is used to analyze the data. The association between sports-specific physical activity and body fat percentage is evaluated using Pearson's correlation & examine the effect of physical activity on body fat percentage, multiple linear regression is used. The relationships between categorical variables including physical activity status and BMI, WC, and WHR categories were investigated using the chi-square test. Statistical significance was defined as a p-value of less than 0.05.

RESULTS

Table 1 represents the correlation between sports specific physical activities and body fat percentage. Increased cricket involvement considerably lowers body fat, according to the data, which showed a strong negative association between cricket duration and body fat percentage ($r= -0.557$, $p<0.001$). Skipping showed a weak but significant positive connection ($r=0.099$, $p=0.026$). Football, badminton, and exercise durations did not exhibit statistically significant correlations.
Table 2 illustrates the multiple linear regression analysis showing the effect of physical activity on body fat percentage. The analysis revealed that the duration of cricket is a significant negative predictor (Beta= -0.557, $p <0.001$). There are weak positive correlations between badminton ($p=0.040$) and skipping ($p=0.021$). 32.4% of the variation in body fat is explained by the model ($R^2=0.324$). Table 3 represents the association between physical activity status and categorical anthropometric indicators. There was a statistically significant correlation ($X^2=39.808$, $p<0.001$). People who are physically active are more likely to fall into the normal and overweight categories, while people who are not physically active are more likely to be underweight.On the other hand, the association between physical activity status and WHR category. There is no discernible correlation ($p=0.105$) that indicate fat distribution are not substantially affected by physical activity. Similar trends is show in association between physical activity status and WC category. There is no significant correlation ($p=0.341$) is observed among these two which suggest waist circumference is not significantly affected by physical activity alone. Table 4 demonstrate the effect of anthropometric indicators on body fat percentage using Multiple Linear regression analysis. The strongest positive correlation was found with BMI (Beta=1.105, $p<0.001$). Additionally, WC is a significant ($p=0.001$) and WHR showing a strong inverse relationship. 61.4% of the variation is explained by the model ($R^2=0.614$). This indicate that body fat can be accurately predicted by anthropometric measures, particular BMI.

DISCUSSION

The current study offers significant insights into the relationship between body fat percentage and physical activity among young adults (18-29years old), a demographic traits that is especially vulnerable to lifestyle-related health risks because of a decrease in physical activity and an increase in sedentary behavior. The results underline the significance of participating in high-intensity physicalactivity during early adulthood by showing that intense sports-specific activities, especially cricket, are linked to much lower body fat percentage. The results of Aars *et al*., who found that increased physical activity is linked to positive changes in body composition, such as decreases in fat mass and improvements in metabolic health among young adults (Aars *et al*., 2019), are in line with the strong negative correlation found in this study between the duration of cricket and body fat percentage. On the other hand, the current study did not discover any meaningful correlations between physical activity and fat distribution metrics such waist circumference and waist-hip

Table 1. Correlation between sports specific physical activities and body fat percentage

Physical activity (Sports specific)	r-value	p-value
Exercise duration	-0.054	0.226
Badminton duration	0.055	0.216
Skipping duration	0.099	0.026*
Cricket duration	-0.557	<0.001***
Football duration	-0.061	0.174

Table 2. Multiple Linear regression analysis showing the effect of physical activity on body fat percentage

Predictor	B	SE	Beta (standardized)	t-value	p-value
Constant	27.349	0.414	-	66.071	<0.001
Exercise duration	0.005	0.016	0.011	0.283	0.777
Badmintion duration	0.050	0.024	0.077	2.063	0.040*
Skipping duration	0.026	0.011	0.086	2.320	0.021*
Cricket duration	-0.087	0.006	-0.557	-14.915	<0.001***
Football duration	-0.015	0.024	-0.023	-0.606	0.545

Model summary: R2=0.324,Adjusted R2= 0.317,F=47.311,P<0.001

Table 3. Association between physical activity status and categorical anthropometric indicators

Physical activity status	BMI categories					Chi-square(X^2)=39.808 df=3,p- alue=<0.001
	Underweight n(%)	Normal weight n(%)	Overweight n(%)	Obese n(%)	Total n(%)	
Physically Inactive	24 (17.5)	66 (48.2)	31 (22.6)	16 (11.7)	137 (100)	
Physically Active	12 (3.3)	148 (40.8)	153 (42.1)	50 (13.8)	363 (100	
	WHR categories					
	Normal n(%)		At risk n(%)		Total n(%)	Chi-square(X^2)=2.626 df=1,p-value=0.105
Physically Inactive	94 (68.6)		43 (31.4)		137 (100)	
Physically Active	275 (75.8)		88 (24.2)		363 (100)	
	WC categories					
	Normal n(%)		At risk n(%)		Total n(%)	Chi-square(X^2)=0.908 df=1,p-value=0.341
Physically Inactive	82 (59.9)		55 (40.1)		137 (100)	
Physically Active	234 (64.5)		129 (35.5)		363 (100)	

Table 4. Multiple Linear regression analysis showing the effect of anthropometric indicators on body fat percentage

Predictor	B	SE	Beta (standardized)	t-value	p-value
Constant	38.197	3.569	-	10.702	<0.001
WC	0.130	0.039	0.175	3.372	0.001***
BMI	1.951	0.102	1.105	19.038	<0.001***
WHR	-85.710	6.173	-0.697	-13.884	<0.001***
Model summary: R^2=0.614,Adjusted R^2= 0.611,F=262.764,P<0.001					

ratio. This result is consistent with Dalene *et al*., who found that physical activity has a greater impact on total adiposity than on the distribution of central fat (Dalene *et al*., 2017). This implies that although exercise has a role in controlling weight, other variables including hormone fluctuations, genetic predisposition, and eating patterns may have an impact on fat distribution. BMI is a reliable indicator of body fat percentage is in line with earlier research. Aloufi *et al*. reported that young individuals' body fat percentage and BMI are found to be significantly correlated, suggesting that BMI remains a practical and helpful measure of adiposity (Aloufi *et al*., 2022). This is especially crucial for large-scale investigations when it might not be possible to quantify body fat directly. Variations in the intensity,frequency, and duration of these activities may account for the weak positive correlation shown in the current study between some activities, such skipping, and body fat percentage. Previous studies have shown that the type, intensity, and consistency of physical activity all affect how it reduces body fat. According to Del'Arco *et al*. , differences in the body fat percentage may not be entirely explained by physical activity alone since lifestyle factors, such as food and physical activity, interact to influence body composition outcomes (Del'Arco *et al*., 2021). Additionally, the result of this study are consistent with other research showing that changes in lifestyle throughout early adulthood, such as taking on more work or academic responsibilities, may result in lower levels of physical activity and a higher risk of obesity. This emphasizes the necessity of focused efforts meant to encourage young adults to lead active lifestyles. Overall, the current study confirms previous research by showing that physical activity especially high-intensity sports is essential for young adults to lose body fat. It also emphasizes the complexity of factors that affect adiposity, such as the limited contribution of physical activity to the distribution of fat and the continuous significance of anthropometric measures like BMI.

CONCLUSION

The present study offers comprehensive evidences that among young individuals between the ages of 18-29, physical exercise significantly affects body fat percentage. While moderate or less intense activities- especially cricket are found to be useful in lowering obesity. Physical activity was substantially correlated with BMI, but not with waist circumference or waist-hip ratio, suggesting that factors other than physical activity may have an impact on fat distribution. The best predictor of body fat percentage among the anthropometric

measures is BMI, which is followed by Waist circumference and Waist-hip ratio. These results highlight the continuous relevance of BMI as a useful and reliable tool for determining obesity in population-based research. In order to prevent excessive fat storage and lower the risk of chronic diseases, the study emphasizes the importance of encouraging young individuals to engage in frequent, high-intensity physical activity. To ensure long-term health benefits, public health initiatives should concentrate on promoting active lifestyle, especially in early adulthood. To provide a more thorough picture of body composition dynamics, future study should take into account additional variables like nutritional consumption, socioeconomic factors, and genetic impacts.

REFERENCES

Aars, N. A., Jacobsen, B. K., Morseth, B., Emaus, N., & Grimsgaard, S. (2019). Longitudinal changes in body composition and waist circumference by self-reported levels of physical activity in leisure among adolescents: The Tromsø study, Fit Futures. *BMC Sports Science, Medicine & Rehabilitation*, *11*, 37. https://doi.org/10.1186/s13102-019-0150-8

Aloufi, A. D., Najman, J. M., & Mamun, A. A. (2022). The Association between Body Weight Misclassification in Adolescence and Body Fat and Waist Circumference in Adulthood: A Longitudinal Study. *Nutrients*, *14*(22), 4765. https://doi.org/10.3390/nu14224765

Andersen, L. B., Harro, M., Sardinha, L. B., Froberg, K., Ekelund, U., Brage, S., & Anderssen, S. A. (2006). Physical activity and clustered cardiovascular risk in children: A cross-sectional study (The European Youth Heart Study). *Lancet*, *368*(9532), 299–304. https://doi.org/10.1016/S0140-6736(06)69075-2

Dalene, K. E., Anderssen, S. A., Andersen, L. B., Steene-Johannessen, J., Ekelund, U., Hansen, B. H., & Kolle, E. (2017). Cross-sectional and prospective associations between physical activity, body mass index and waist circumference in children and adolescents. *Obesity Science & Practice*, *3*(3), 249–257. https://doi.org/10.1002/osp4.114

Del'Arco, A. P. W. T., Previdelli, A. N., Ferrari, G., & Fisberg, M. (2021). Food intake, physical activity and body composition of adolescents and young adults: Data from Brazilian Study of Nutrition and Health. *BMC Public Health*, *21*(1), 1123. https://doi.org/10.1186/s12889-021-11171-3

Ekelund, U., Luan, J., Sherar, L. B., Esliger, D. W., Griew, P., Cooper, A., & International Children's Accelerometry Database (ICAD) Collaborators. (2012). Moderate to vigorous physical activity and sedentary time and cardiometabolic risk factors in children and adolescents. *JAMA*, *307*(7), 704–712. https://doi.org/10.1001/jama.2012.156

Freedman, D. S., Wang, J., Maynard, L. M., Thornton, J. C., Mei, Z., Pierson, R. N., Dietz, W. H., & Horlick, M. (2005). Relation of BMI to fat and fat-free mass among children and adolescents. *International Journal of Obesity*, *29*(1), 1–8. https://doi.org/10.1038/sj.ijo.0802735

Janssen, I., & Leblanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *The International Journal of Behavioral Nutrition and Physical Activity*, *7*, 40. https://doi.org/10.1186/1479-5868-7-40

Nevill, A. M., Stewart, A. D., Olds, T., & Holder, R. (2006). Relationship between adiposity and body size reveals limitations of BMI. *American Journal of Physical Anthropology*, *129*(1), 151–156. https://doi.org/10.1002/ajpa.20262

Strong, W. B., Malina, R. M., Blimkie, C. J. R., Daniels, S. R., Dishman, R. K., Gutin, B., Hergenroeder, A. C., Must, A., Nixon, P. A., Pivarnik, J. M., Rowland, T., Trost, S., & Trudeau, F. (2005). Evidence based physical activity for school-age youth. *The Journal of Pediatrics*, *146*(6), 732–737. https://doi.org/10.1016/j.jpeds.2005.01.055

Telford, R. D., Cunningham, R. B., Fitzgerald, R., Olive, L. S., Prosser, L., Jiang, X., & Telford, R. M. (2012). Physical education, obesity, and academic achievement: A 2-year longitudinal investigation of Australian elementary school children. *American Journal of Public Health*, *102*(2), 368–374. https://doi.org/10.2105/AJPH.2011.300220

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