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Research Article

Adolescent Physical Activity: Understanding the Influence of Parents and Community

1 Anjum Inamdar* and 2 Harshada Thakur

1*-2 .Department of Food Science and Nutrition, S.N.D.T. College of Home Science Pune

Corresponding Author: anjuminamdar589@gmail.com

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Abstract

Background:

"Adolescent physical activity: Understanding influence of parents and community" Background Adolescents aged 10–19 years make up nearly 22% of India's population. This phase marks the onset of physical changes, including growth spurts and the development of secondary sexual characteristics. These transformations can render adolescence one of the most demanding, stressful, and uncertain periods for teenagers, as well as for their parents, teachers, and healthcare providers**(Shrivastav et al., 2016).** Physical activity is an essential component of adolescent health and plays a significant role in maintaining a healthy nutritional status. Regular physical activity not only promotes cardiovascular fitness, but also contributes to the overall growth and development of adolescents. Consistent participation in physical activity during childhood is widely acknowledged as a factor enhancing health and overall well-being **(Andersen et al., 2006).** Conversely, inadequate physical activity has been associated with increased occurrences of type II diabetes mellitus, hypertension, colon cancer, depression, osteoporosis, and obesity **(Trost et al., 2001)**

Objective

The study was conducted to understand the influence of parents and community resources on the physical activity of adolescents. Peer influence and peer pressure was studied as an influencing factor for physical activity This study also aims to understand the correlation between the Physical activity Questionnaire score and the BMI of adolescents.

Materials and Methods

A cross sectional study was conducted. The modified PAQ was used, assessing the Physical activity in the past 7 days. Additional questions regarding the parental

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Materials and Methods

A cross sectional study was conducted. The modified PAQ was used, assessing the Physical activity in the past 7 days. Additional questions regarding the parental encouragement and peers' influence along with community resources availability was asked. The data was collected from two schools of Pune, and 195 participants' responses were collected using the questionnaire, and the data was analysed for finding the correlation. Result The data showed the negative correlation between PA and BMI indicating, BMI goes up with decreasing PA. Only 1 girl and no boys were found to be obese and overweight; 5 (4.5%) boys and 4 (4.82%) girls, and 23 boys (20.9%) and 37 (44%) girls were underweight. A non-significant correlation was found between parents' influence and PAQ score showing no correlation. Availability of community resources such as walking tracks and open gym increased PAQ score. Gender disparities were seen in activity level during lunch breaks where girls tend to sit and talk while boys had moderate activity in the form of running and walking.

Keywords Adolescent,

Physical activity, Parents influence, Peer influence, community resources.

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Introduction

Physical activity is an essential component of adolescent health and plays a significant role in maintaining a healthy nutritional status. Regular physical activity not only promotes cardiovascular fitness, but also contributes to the overall growth and development of adolescents. The anthropometric assessment of children aged 13 to 16 years is an important area of research that aims to understand the physical development and activity levels of adolescents. Accurate measurement and assessment of anthropometric indicators such as height, weight, and body mass index are crucial for evaluating the overall health and nutritional status of this age group (WHO 2017). The best parameter for evaluating the nutritional status of teenagers is body mass index, which takes into account both age and sex. Anthropometric assessments not only provide valuable information about the nutritional status of adolescents but also serve as indicators for predicting various health problems, co-morbidities, and overall quality of life **(Yusni and Meutia, 2019).**

Parental encouragement to be active was associated with increased physical activity among males and younger females 5 years later. Younger adolescents appear to be especially influenced by their same sex parent **(Bauer, 2008).** An indirect association was identified between the physical activity of parents and friends with physical activity level of the adolescents, mediated by social support. Social support was directly associated with physical activity in adolescents of both genders and indirectly mediated by self-efficacy**(Cheng, 2014).** Positive health behaviours among young individuals are influenced by a range of factors with parents exerting significant influence over their children's physical activity behaviours **(Davison et al., 2003; Gustafson and Rhodes, 2006)** Varied factors may underline this parental influence, including direct demonstration of physical activity, facilitation or removal of barriers to participation in sports, and encouragement through positive reinforcement for engaging in physical activities with children **(Sallis et al., 2000)** Physical activity among children and adolescents has demonstrated positive impacts on body weight. Additionally, active children are more inclined to sustain their activity levels into adolescence and adulthood **(Strong et al., 2005).**

In a study conducted in Low to middle income countries, among the adolescents aged 13 to 17, the prevalence of meeting the physical activity (PA) guidelines was 14.9%. Additionally, the prevalence of engaging in physical education classes for 5 days or more per week was 16.5%. and rest did not meet the recommended PA levels. **(Zhan et al., 2021)**

In India, approximately 18.3% of female adolescents aged 2–17 years fall into the overweight or obese category13 . According to the 2015–16 National Family Health Survey (NFHS-4), the prevalence of obesity among women was 20.6%, while for men in the 15–49 age group, it stood at 18.9%. These figures show a slight increase compared to the NFHS-3 study conducted in 2005–06. **(Gadekar et al., 2019).**

In recognition of this strong link between physical activity and major non- communicable diseases, member states of WHO agreed to a 10% relative reduction in the prevalence of insufficient physical activity by 2025, as one of the nine global targets to improve the prevention and treatment of non-communicable diseases (WHO, 2017). Low physical activity in childhood has become a social norm globally and is an important factor contributing to the obesity epidemic. Obesity in turn, reduces physical activity, leading to a vicious circle **(Sarah et al., 2018)**

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As physical activity and sports behaviours typically formed earlier in life and often persist into adulthood it's crucial to have a thorough comprehension of this correlation. Recognizing the role of parental, peer and community influence on children's physical activity behaviours can serve as fundamental to research in the field of nutrition and health**(Kraut et al., 2013).**

Methodology

This study adopted a cross-sectional design to investigate how parental and community factors influence physical activity among adolescents aged 13 to 15 years in Pune city. The target population included adolescents aged 13 to 15 years, attending schools in Pune. Sample size of 195 adolescents from age group 13 to 15 years both male and female was selected and simple random sampling was used. Currently enrolled in participating schools and willing to participate along with having parental consent. Adolescents unable to perform physical activities due to physical or chronic health conditions were excluded. Consent forms, explaining the study's purpose, procedures, risks, and benefits, were provided to both the adolescents and their guardians. Consent was obtained in writing, signed by the parents or guardians.

The data Investigator took anthropometric measurements of each participant, includingheight and weight. A stadiometer was used to measure height, and a digital scale will measure weight. BMI was calculated using a growth chart. The participants were instructed to remove any heavy clothing and accessories before recording weight on the digital weight scale. Participants were also requested to remove hair ‘puff’, headbands and shoes before recording height on the stadiometer. Modified Version of the PAQ (WHO)which included questions on physical activity frequency, type, duration, and motivations for engagement and questions on parental and community influences on physical activity, aligning with the study's focus was used.The questionnaire was translated into Marathi (the local language) to ensure clear understanding by both adolescents and parents. The investigator was available to answer any questions or clarify any ambiguities in the questionnaire. Pilot study was conducted with 30 participants to verify the reliability of the modified questionnaire. Cronhbach alpha coefficient was used to assess the internal consistency, the reliability score was 0.9

Statistical Methods

Correlation analysis was used to explore the relationships between anthropometric measurements (e.g., BMI) and physical activity behaviors, including types of activities and overall engagement levels. Spearman’s correlation for continuous and categorical variables was used for e.g., BMI and parenteral encouragement correlation. Kendell tau b test was used for finding correlation between two categorical variables such as BMI and physical activity score. IBM SPSS software version 29.0.2.0 (20) was used

Result

A study was conducted on 195 participants residing in Pune. The participants were adolescent ranging from 13 to 15 years of age both male and female. The relationship between physical activity score (PAQ) parenteral encouragement and community influence was studied

Anthropometric Assessment

Total 195 participants data was collected. From which 110 were males and 84 were females. The average height of male participants was 150± 6.083 cm. And mean for male participants was 45.40±7.37 kg. The mean height for female participants was 147.87± 6.740 cm. The mean weight for

female participants was 41.48±7.497 kg. BMI was calculated using the WHO anthroplus software (WHO 2009). Z scores for BMI was recorded. The mean for BMI in males was 20.14 ± 2.918 while the mean for z score was 0.30 The mean for BMI in females was 18.92 ± 2.962, while the mean for Z score is 0.06± 1.502. The mean age of participants was 13.83± 1.114 years. Our findings corelate with previous studies done to find the prevalence of obesity in adolescent population conducted in the south India region. The prevalence in that study was 6.8% were classified as obese, while approximately 17.1% were found to be overweight. The remaining 53.8% fell within the normal BMI category, with 22.3% categorized as underweight.

Sports played and frequency

This suggests that while a substantial portion of boys participants ride bicycles, with a significant number riding frequently, girls are less likely to engage in biking, with fewer participating at higher frequencies through the week. The data underscores potential gender differences in bicycle riding habits. Boys jog less frequently than girls. Boys have a wider variety of jogging habits, with some not jogging at all (26.4%) and others jogging frequently (29.1% jog 3-4 times). Girls tend to jog more routinely, with a higher percentage participating frequently (30.1% jog 7 or more times). Overall participants, a vast majority of participants, 175 (90.0 percent), reported not engaging in aerobics at all. The remaining reported frequencies were notably lower, with (10 percent) participating 1-2 times This may show the less popularity of aerobics in middle class Indian adolescents and lack of resources for performing aerobics. Over half (54.5% of males and 54.2% of females) did not participate in swimming. Among those who did, males exhibited infrequent participation, with the majority swimming 1-2 times (27.3%) or 3-4 times (12.7%). Notably, a higher percentage of females participated more frequently, with 8.4% swimming 7 or more times compared to only 2.7% of males.

Physical Activity in School

The frequency of participation in PE class was sometimes as reported by the majority of participants. Only 30% of overall participants reported regular engagement in the PE class. This data may indicate the changing self-perception of adolescent male and females regarding their body image and peer influence, as they are becoming more aware of their body image. The mean of what the students do in the lunch time indicated, running and playing a little bit. Majority of female participants 31 (37.3 percent) out of 84 participants reported sitting, chatting or doing school work during lunch time. Whereas majority of male participants reported “Running and playing a little bit” Overall, the physical activity or sports played during lunchtime is lower to moderate level, can be attributed to short time duration of lunch break.

After school physical activity

In the Physical Activity Questionnaire, "Right After School Physical Activity" typically refers to any physical activity or exercise that participants engage in immediately after their school ends. This could include activities such as participating in sports practices, going for a run, or riding a bicycle, or any other form of physical activity that takes place directly after the school ends. Thinking about the mean afterschool activities of adolescent population irrespective of the gender, majority of the participants chose the option of never followed by once in last week, indicating the lower participation in immediate after school physical activities.

Screen time

The mean screen time for 110 male participants was 2-3 ± 1.13 hours daily, while 86 female participants reported 2-3 ± 0.574 hours. Both genders reported similar screen time, with males showing greater variation. This included time spent on all screens for study and leisure. The study found a weak, non-significant correlation between screen time and obesity, contrary to recent studies showing higher obesity rates with more than 2 hours of screen time daily.

Physical activity partner

The majority of participants reported their usual physical activity partners as friends: 63.6% of males and 50.6% of females, indicating high peer influence. Additionally, 12.7% of males and 20.5% of females engaged in activities alone, while 6.4% of males and 12.0% of females did so with family. Some engaged with both friends and family: 16.4% of males and 15.7% of females. Both genders predominantly engage in activities with friends. Male participants seem slightly less likely to engage in activities with family compared to females.

PAQ score and BMI correlation

The child's physical activity (PA) level was evaluated using the PAQ-A, a self-administered questionnaire designed for adolescents. It comprises nine items, with a 7-day recall period. Each item is rated on a 5-point scale , and the scores are aggregated to calculate a total PA score. Students are categorized into low (scores 1–3), moderate (scores 3–4), or high (scores 4–5) PA levels based on their PAQ-A scores. The correlation coefficient between BMI and score for PAQ is (p-0.088) Kendell tau b. There is a weak negative correlation between BMI and score for PAQ. As BMI increases, score for PAQ tends to decrease slightly, but the correlation is very weak.

PAQ score and availability of community physical activity resources correlation

Overall, the results suggest that availability of resources like walking and cycling tracks along with gardens and open gyms might be associated with higher scores on PAQ (potentially better physical activity levels).The correlation between participants and unavailability of resources for exercising indicates that there is a insignificant positive correlation between the score for physical activity questionnaire score and the unavailability of resources for exercising

Correlation between peer influence and PAQ score

The negative correlation between score for PAQ and Peers influence is statistically non significant (p -0.141) spearman's correlation, indicating a weak negative correlation. This suggests that as the influence of peers increases, the score for PAQ tends to decrease slightly. Conversely, the correlation between PAQ score and Peers pressure is positive but not statistically non significant (p - 0.110) suggesting a negligible relationship between PAQ score and peer pressure. Notably, there's a statistically non significant negative correlation between Peers influence and Peers pressure (p 0.623) indicating that as peer influence increases, peer pressure tends to decrease significantly. This could imply a dynamic where positive peer influence might counteract negative peer pressure.

Parental influence

The correlation between parenteral encouragement and score for PAQ has a value of (p 0.234)which is statistically non significant, thus it indicates that there is no strong correlation between the PAQ score and parenteral encouragement.

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Discussion

These findings align with previous research indicating gender disparities in biking behaviors among adolescents. For instance, a cross sectional study found that boys were more likely to engage in biking activities compared to girls, attributing this difference to sociocultural norms and perceptions surrounding gender-specific physical activities **(Smith, & Knighton, 2018)** Similarly, another study reported similar trends, noting that boys were more likely to participate in outdoor physical activities such as biking, while girls preferred indoor activities or sports **(Mandic et al., 2022)**.

Research showed that boys tended to engage in intermittent bouts of physical activity, including jogging and playing football, while girls preferred consistent exercise regimens18 . Similarly, a longitudinal study conducted for 5 years found that adolescent girls were more likely to adopt regular jogging habits as part of their daily exercise routine compared to boys, who preferred intermittent and varied physical activities **(Lee et al., 2015)**

This result can be compared with the research conducted by Patel and Shah which was centered on rural communities in India, it revealed contrasting findings, with a higher prevalence of swimming participation among females compared to males. The study attributed this trend to cultural practices and the availability of natural water bodies in rural areas, where swimming is often considered a necessary life skill rather than a recreational activity **(Patel et al., 2018)**

According to the World Health Organization, a staggering 81% of adolescents attending school worldwide are not meeting recommended levels of physical activity. This trend is particularly pronounced among school-going adolescents, with 84% of boys and 78% of girls failing to meet WHO guidelines. Interestingly, adolescents from the WHO South-East Asia Region exhibited the lowest prevalence of insufficient physical activity, at 74%.**(Lyn, 2010**) Research confirms that well-designed after-school programs promote physical activity in youth, aiding in obesity prevention. Studies in Western nations consistently show that physical activity in children correlates with reduced sedentary behavior. Additionally, existing research suggests that media messaging effectively promotes physical activity among adolescents **(Hieftje et al., 2013).** Multiple factors contribute to lower female participation in physical activity, such as limited access to playgrounds, societal expectations of domestic roles, and the stigma surrounding female sports in Indian villages. Girls often prefer indoor games and may perceive themselves as less suited for physical activity compared to males.

Conclusion

Study assessed physical activity (PA) levels in adolescents and found a weak negative correlation between BMI and PA score, indicating slightly lower activity levels with higher BMI. There was a trend where higher PAQ scores were associated with greater availability of resources for physical activity, but these correlations were weak. Peer influence increased with decreased peer pressure. No significant association was found between low PA and obesity, but low PA could increase the risk of future obesity. Girls were less active than boy in school PA, similar to findings in other studies. Overall, the study found a low prevalence of obesity (1 participant) and overweight (9 participants), but a high prevalence of underweight (60 participants). Physical activity partners were mostly peers, showing strong peer influence

Parental encouragement did not significantly affect PAQ scores. The study aligns with findings that girls, especially in South Asia, have lower physical activity due to societal restrictions. Increased peer influence was linked to decreased peer pressure

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Ethical Approval - This study does not require any ethical approval.

Participant Consent - Consent forms, explaining the study's purpose, procedures, risks, and benefits, were provided to both the adolescents and their guardians. Consent was obtained in writing, signed by the parents or guardians.

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