



EVALUATION OF PHYSICAL ACTIVITY LEVELS AND OBESITY AMONG SCHOOL GOING ADOLESCENTS.

Himanshi Makkar Assistant Professor, Department of Home Science, MCM DAV College, Chandigarh

Harjot kaur Mann Assistant Professor, Department of Home Science (Food and Nutrition), MCM DAV College, Chandigarh - Corresponding author

ABSTRACT **Aim** Evaluation of physical activity level and obesity among school going adolescents. **Methodology** A total of 1002 subjects comprising of boys and girls aged 15-18 years were studied cross-sectionally in schools of Chandigarh. Data was categorized into three groups: overweight (≥ 75 th to < 85 th percentile), obese (≥ 85 th percentile) non-overweight (< 75 th percentile) using age- and sex-specific percentiles of BMI [1; 2]. To study the degree of physical activeness of the respondents modified PAQ-A scale was used (The Physical Activity Questionnaire).

Result Sixty seven percent of the sample population performed low physical activity (boys 22.6%, girls 26.3%) respectively. Adolescents performing low physical activity were found to be overweight. 48% of both girls and boys are found to be obese in the present study.

Conclusion Assessment of physical activity revealed that a negligible part of the study population indulge in vigorous activity and in those performing moderate physical and low physical activity 21.67% and 35.06% were found to be obese respectively. In urban areas, parents encourage indoor activities like watching television and playing video games than outdoor activities due to heavy traffic and other safety reasons which was the major reason for undertaking this study.

KEYWORDS : obesity; adolescence; physical activity

Obesity can be explained as the excessive amount of body fat or adipose tissue. It is determined by Body Mass Index (BMI). Obesity is the consequence of calorie disproportion and is aggravated by genetic, social factors like socio-economic status, race/ ethnicity, media, marketing, the physical environment and environmental factors like upsurge in physical inactivity due to the escalation of sedentary work, altering modes of transportation and drop in outdoor recreational activities. The most important consequence of childhood obesity then tracks down into adulthood. Excess weight in this age is the leading cause of pediatric hypertension, and overweight children are at a high risk for developing long-term chronic conditions, including adult onset diabetes mellitus, coronary heart disease, orthopedic disorders and respiratory diseases [3; 4]. It is more likely to persist when its onset is in late childhood or adolescence.

Adolescence is characterized by steep drop in physical activity [5; 6], an increasing amount of media exposure [7], inactivity [8] and poor food choices [9]. Excessive TV watching, the growing use of video and computer games has likely contributed to reduced physical activity. Physical activity (PA) levels have declined globally in recent decades [10]. Regular PA decreases many of the health risks associated with obesity or being overweight [11].

The highest proportions of the world's obese people (13%) live in the United States whereas China and India together represent 15% of the world's obese population [12]. In India the prevalence of obesity is 12.6% in women and 9.3% in men. In other words, more than a 100 million individuals are obese in India. Therefore, India is truly in the midst of an obesity epidemic, which has serious health ramifications. Obesity is associated with a higher risk of mortality and morbidity, as it is the very important risk factor of Non Communicable diseases like cardiovascular diseases and Diabetes mellitus [13].

As a result various public health strategies are being used to combat obesity. The Diabetes Foundation of India has started a Health Awareness Program for the Prevention of Obesity & Diabetes through Healthy Eating and Active Lifestyle Project "MARG":

Methodology

Research design: The present cross-sectional study was designed in such a way that equal representation of students from different parts of Chandigarh could be used for the assessment of obesity. A written informed consent was obtained from Director of School Education followed by oral permission from the Principal of each school situated in various areas of Chandigarh.

Subjects: Study population was students from 15 -18 years of age i.e. from class 9th to 12th. Students were selected from each class by the

simple random technique, till the desired sample from each class was met. It was assumed that from each institution, at least 100 subjects would be recruited.

Questionnaire: For data collection self-structured questionnaire was used. The questions had been prepared in English. The Physical Activity Questionnaire for Adolescents is a nine-item, seven day self-report recall questionnaire designed and extensively used for surveillance and monitoring. The Physical Activity Questionnaire for Adolescents (PAQ-A) is self-administered [14]. It was developed to assess general levels of physical activity for high schools students in grades 9th to 12th. Questionnaire consisted of multiple choices, closed ended and open ended questions. To study the degree of physical activity various questions were asked from respondents based on types of sports/ games played over a week, intensity and frequency in doing that particular physical activity. Low physical activity implies that students were active only for 1-2 days over a week while moderately indicates that students were active for about 3-4 days a week and highly active implies that students were active for most days of week.

Obesity and overweight assessment: Height was measured in centimeters (cm) using a portable anthropometric rod. Weight was measured in kilograms (Kg) using a standardized weighing machine. Body mass index (BMI) was calculated using the formula weight (Kg) divided by height in square meters (m^2).

Statistical analysis: The Indian Academy of Paediatrics (IAP) Growth Chart Committee recommendations were followed for height, weight and BMI assessment of 5-18 year old Indian children. Physical activities were categorized as low, moderate and high level of activity. Associations were assessed using χ^2 test. For all statistical tests, $p < 0.05$ was taken as the significant level.

Results

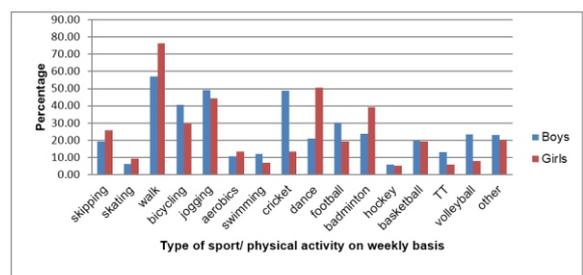


Figure 1: Types of physical activity preferred

This figure shows the preferences and types of sports played by boys and girls on weekly basis.

It was seen that girls shows less interest in vigorous activities. Walking is the favorite physical activity performed by majority of girls (75%) while boys enjoy jogging, playing cricket, walking and bicycling. Approximately 50% of boys played cricket and 50% girls enjoyed dance.

Percentage of students active during school time	Boys (%)	Girls (%)
Rarely	21	28
Sometimes	52	55
Often	27	17

The above table shows that except for 21% boys and 28% girls who do not play at all during free period or in PE (physical education) classes. 27% boys and 17% girls were always physically active during school time either in free period or during Physical education classes. 45.5% boys and 38.12% girls were performed physical activity quite often during free period or in PE classes. Hence, physical activity levels during school or physical education class between boys and girls is almost same.

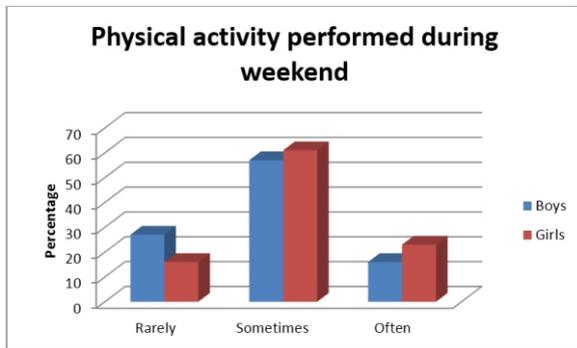


Figure 2: Degree of physical activity of adolescents during weekend

Figure 2 shows the degree of physical activity of boys and girls over the weekend. The majority of boys (51%) and girls (59%) were found to be active at least a couple of times on weekends. Boys and girls showed nearly equal degree of physical activity during weekends. Excessive TV watching, the growing use of video and computer games has likely contributed to the reduced physical activity. In a study conducted by [15] among urban adolescents of 12-17 years of age in Hyderabad, it was also seen that the prevalence of overweight among adolescents who were sedentary, watching television 3 hrs/day, was significantly higher compared with those who watched 0 or 3 hrs/day.

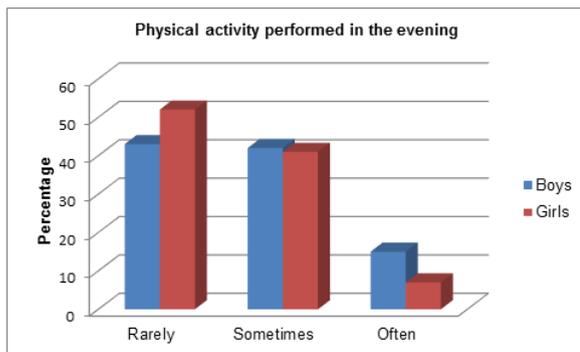


Figure 3: Degree of physical activity after school time

Figure 3 showed the degree of physical activity performed by boys and girls on weekly basis after their school time on weekdays. Almost 50% of both boys and girls did not perform any vigorous activity in the evening. Time spent on sedentary behavior increased with school grade, and girls were more sedentary than boys on both weekdays and

weekends. Similar results have been reported in previous studies [16]. Moreover, children who spent less time on sedentary behavior spent more time on light physical activity, and vice versa, on both weekdays and weekends. Suggesting that a strategy focused on reducing sedentary behavior would concomitantly promote light physical activity.

	Physical activity	Percentage of overweight	Percentage of obesity
Boys	Low	17.81	4.79
	Moderate	16.50	5.83
	High	0	0
Girls	Low	23.70	2.60
	Moderate	16.24	4.27
	High	0	0

Table 2 shows association of overweight and obesity to that of degree of physical activity of boys and girls. The prevalence of obesity is more in both boys and girls. For measuring the degree of physical activeness of the respondents modified PAQ-A scale was used (The Physical Activity Questionnaire).

Reason	Boys (%)	Girls (%)
Injury	3.99	2.79
Trip	7.98	2.59
Indoor play	14.97	6.79
Homework	60.88	83.03
Household chores	3.99	3.19
Other	8.18	1.60

Some adolescents who were not involved in any type of physical activity for the last week gave various reasons for not performing any physical activity. Almost 60% of boys and 83% of girls marked that the homework was the main reason for them not performing any physical activity. While 14.74% boys and 6.79% girls indulged in some kind of indoor games (games on mobile phones, computers and internet surfing) another reason which stopped them from doing physical activity. In another study conducted by [17] to document patterns of physical activity in south Indian school children aged 8 to 15 yr and examine changes over a one year period it was seen that there was a significant increase in homework/ tuitions after school and a significant decrease in moderate-to-vigorous physical activity.

Discussion

The sedentary lifestyle of children and adolescents has been attributed mainly to television-watching, computer games, internet surfing, priority to academic excellence and ever-increasing mechanized transport. Due to which both boys and girls (48%) are found to be obese in the present study. Time spent on sedentary behavior increased with school grade, and girls were more sedentary than boys on both weekdays and weekends. 14.74% boys and 6.79% girls indulged in some kind of indoor games (games on mobile phones, computers and internet surfing) another reason which stopped them from doing physical activity. Moreover, children who spent less time on sedentary behavior spent more time on light physical activity, and vice versa, on both weekdays and weekends. Walking is the favorite physical activity performed by majority of girls (75%) while boys enjoy jogging, playing cricket, walking and bicycling. The type of physical activity undertaken also affects the adiposity. Girls performed less strenuous activity as they are encouraged by pressure from their peer group to seek other activities associated with their preferred perceptions of femininity. In urban areas, parents encourage indoor activities like watching television and playing video games than outdoor activities due to heavy traffic and other safety reasons which was the major reason for undertaking this study.

References

1. Khadilkar VV, Khadilkar AV, Cole TJ, Sayyad MG. Crosssectional growth curves for height, weight and body mass index for affluent Indian children, 2007. Indian Pediatrics 2009; 46: 477-89.
2. Marwaha RK, Tandon N, Ganie MA, Kanwar R, Shivaprasad C, Sabharwal A, et al. Nationwide reference data for height, weight and body mass index of Indian schoolchildren. Natl Med J India 2011; 24: 269-77.

3. Dietz, W. H. (1981). Obesity in infants, children, and adolescents in the United States I. Identification, natural history, and aftereffects. *Nutrition Research*, 1(1), 117-137.
4. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. *Pediatrics* 1998; 101(Supplement 2): 518-525.
5. Kimm SY, Barton BA, Obarzanek E et al. Obesity development during adolescence in a biracial cohort: the NHLBI Growth and Health Study. *Pediatrics* 2002; 110: e54.
6. USDHHS. The Surgeon Generals Call to Action to Prevent and Decrease Overweight and Obesity. US Department of Health and Human Services, Rockville, MD, 2001.
7. Roberts D, Foehner U and Rideout V. Generation M: media use in the lives of 8–18 year-olds. In: K. F. Foundation (Ed.) Kaiser Family Foundation. Menlo Park, CA, 2005.
8. Kaur H, Choi WS, Mayo MS, Harris KJ. Duration of television watching is associated with increased body mass index. *The Journal of pediatrics*. 2003 Oct 31;143(4):506-11.
9. Palumbo, F. M. and Dietz, W. H. Childrens television: its effects on nutrition and cognitive development. *Pediatr. Ann.* 1985; 14: 793, 796–798, 800–801.
10. Ng, Shu Wen, and Barry M. Popkin. Time use and physical activity: a shift away from movement across the globe. *Obesity Reviews* 13.8(2012): 659-680.
11. Blair SN, Brodney S . Effects of physical inactivity and obesity on morbidity and mortality: current evidence and research issues. *Med Sci Sports Exerc.* 1999 Nov; 31(11 Suppl):S646-62.
12. Ng, Marie et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, Volume 384, Issue 9945, 766-781
13. Agarwal S, Basannar DR, Bhalwar R, Bhatnagar A, Bhatti VK, Chatterjee K et al. *Textbook of Public health and Community Medicine*. Pune: AFMC in collaboration with WHO, India. 2009: 1041-101
14. Kowalski, K., Crocker, P., & Donen, R. *The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) Manual*. College of Kinesiology, University of Saskatchewan.
15. Laxmaiah A, Nagalla B, Vijayaraghavan K, Nair, M. Factors affecting prevalence of overweight among 12- to 17-year-old urban adolescents in Hyderabad, India. *Obesity (Silver Spring)* 2007; 15: 1384–1390.
16. Kettner S, Kobel S, Fischbach N, Drenowatz C, Dreyhaupt J, Wirt T. Objectively determined physical activity levels of primary school children in south-west Germany. *BMC Public Health* 2013; 13: 895.
17. Swaminathan S, Selvam S, Thomas T, Kurpad AV, Vaz M. Longitudinal trends in physical activity patterns in selected urban south Indian school children. *The Indian journal of medical research* 2011; 134(2): 174.