



A Cross-Sectional Study on Leisure Time Management and Physical Activity Index among Female Adolescent Medical Students in Delhi

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I. INTRODUCTION

Adolescence is the most promising and also most vulnerable span of life. Being the most energetic and enthusiastic, they spend their time in academic activities, sports, household chores and in various other activities. Free time to do something apart from scheduled academic work, business or household activities is conceptualized as leisure time [1]. Leisure time management is important as they cannot compromise with their scheduled academic activities. Leisure time activities differ across countries, age groups, sex and ethnic groups as per different studies but done mostly in Western countries [2–5]. Furthermore, those adolescents who are in professional courses might have less leisure time. Moreover, females might be more vulnerable because they are prone to less outdoor activities and outdoor sports in comparison to males. Thus it is very important to address these issues, particularly leisure time activity and time

management, because it serves as a basis for evidence generation in decision-making and policy formulation. An attempt was made to carry out a cross-sectional study in the adolescent female students pursuing a professional course in a medical college of New Delhi.

II. OBJECTIVES

- (1) To know the activities performed during leisure time by female adolescent medical students
- (2) To assess the level of physical activity among the study subjects.

III. METHODOLOGY

A descriptive cross-sectional type of study was conducted among adolescent female medical undergraduate students of Lady Hardinge Medical College, New Delhi, batches 2011 and 2012. This college is exclusively for girls pursuing MBBS



course. The subjects who were available on the particular date of interview and who gave their consent were enrolled in the study. The study was questionnaire-based. To know the activities performed during leisure-time, a predesigned, semi-structured, pretested questionnaire was used. The assessment was done taking average from the activities and time spent in a typical week (from Monday to Sunday) and represented as per day. Physical activity index was also assessed by using the global physical activity questionnaire version 2 (GPAQ v2) [6] which is a validated questionnaire that was developed as a modification of the International Physical Activity Questionnaire [7] for use in multi-ethnic settings by the World Health Organization. Confidentiality was maintained and all questionnaires were marked anonymously. Written valid assent and consent was taken from the study subjects. Physical activity index (PAI) was determined by the product of intensity, duration and frequency of all the physical activities performed during a normal day, i.e., calculated as

$$(\text{Intensity}) \times (\text{Duration}) \times (\text{Frequency}) = \text{Total score.}$$

Intensity for a physical activity was determined using a metabolic equivalent

(MET) value which was assigned to each reported activity according to the compendium produced by Ainsworth *et al.* [8]. Duration of a particular physical activity was calculated in minutes per day. Frequency was determined by asking the subjects as to how many times the activity had been performed in a typical week. These were then multiplied as shown in the formula to get the PAI score. Total intensity for a particular day was calculated by summing up the scores for all the activities. The result is interpreted as scores – 81 to 100 as very active lifestyle; 60 to 80 as active and healthy; 40 to 59 as acceptable but could be better; and 20 to 39 as not good enough; and under 20 as sedentary. Information was coded and recorded in spread sheet format in a computer. Handling of missing data was done. SPSSvs16 was used for analyzing data. Simple descriptive tests were used for analysis.

IV. RESULTS

The study was carried out in October 2012 among female medical students who were aged less than 19 years. Out of 304 students approached for study on a particular day, 256 (84.2%) gave consent to participate in the study. From the 256 filled proforma, 18 were found to be



having missing responses and two proforma with dual entry for same response. So after excluding them, finally 236 proforma were used for analyzing data. Characteristics of study subjects described in Table 1. All students were in late adolescent age group ranging from 17 to 19 years. The mean age of the study subjects was 18.5 ± 0.54 years. Nearly 61.7% of study subjects were residing in hostels inside the campus. 5% were residing in private hostels/accommodation outside the campus and 33.3% were day-scholars. The mean body-mass index (BMI) of the study subjects was 21.6 ± 3.6 and it ranged from 15.4 to 30.3. Sleeping hours ranged from 5 to 12 h with mean duration of 7.6 h. The time spent in college academic purpose was as scheduled from 8 am to 4 pm with low class absenteeism

record. The time spent in leisure activities ranged from one and half-hours to three and half-hours. Table 2 describes the common leisure activities of the study subjects along with the average time spent in respective activities in a typical day. Practice of exercise and Yoga as leisure activities was low while chatting and using electronic gadgets were preferred activities. Distribution of physical activity score with its interpretation is enumerated in Table 3. More than 86% of study subjects had physical activity score below the standard acceptable level. Only 8.5% had active physical activity score, i.e., score of 80 and above. Table 4 describes BMI and physical activity index score among study subjects.

Table 1: Characteristics of the Study Subjects.

Characteristics of study subjects	Mean	S.D.	Median	Range
Age (in years)	18.5	0.54	19	17–19
Height (in meters)	1.6	0.06	1.6	1.49–1.75
Weight (in kilograms)	55.5	9.24	55.5	35–83



BMI (in kg/m²)	21.6	3.6	21.4	15.4–30.3
Average time of sleep (in hours)	7.6	1.48	7	5–12
Average availability of leisure time (in minutes)	130.5	68.5	140	90–210

Table 2: Leisure Time Activities among Study Subjects in a Typical Day.

Type of leisure time activities	Average time spent (in minutes)		Median time spent (in minutes)
	Mean	SD	
Exercise	32.4	12.2	30
Yoga	18.6	6.4	15
Hobbies	19.1	6.6	15
Personal grooming*	30.3	9.8	30
Snacking/in restaurants	32.3	10.2	30
Outing and amusement	52.8	19.2	45
Chatting	76.4	46.2	80
Electronic gadgets	110.5	67.4	120

**Other than essential for routine*



Table 3: Level of Physical Activity among Study Subjects.

Physical activity index score	Number of study subjects	Percentage
100–81 (Very active lifestyle)	0	0
80–61 (Active and healthy)	20	8.5
60–41 (Acceptable but could be better)	12	5.1
40–21 (Not good enough)	40	16.9
≤ 20 (Sedentary)	164	69.5

Table 4: Body Mass Index (BMI) and Physical Activity Index (PAI) among Study Subjects.

Body mass index (BMI)	Mean physical activity index (PAI)	SD	Median [Range]
< 18.5	14.08	17.27	9 [1–48]
18.5–23.5	16.42	22.53	4 [1–80]
23.5–25.0	18.9	24.7	3.5 [1–64]
> 25	17	22.5	12 [1–64]

V. DISCUSSION

In this study, most of the time spent in leisure activities ranged from one and a half hours to three and half hours with an average of a little above 2 h a day. Leisure time was spent in using electronic gadgets and/or chatting/gossiping leading to sedentary activities which is common

among study subjects. Other researchers also found that a substantial part of the daily leisure time in adolescence was spent on activities like cultural and social activities. Cultural activities included activities like reading a book, listening to or playing music, watching TV, etc. Social



activities included activities as hanging out with friends or attending meetings, clubs, etc. [9].

Adolescence has been described as a critical period during which involvement in physical activity might contribute to a physically active lifestyle lasting into adulthood [10, 11]. Nearly 70% of the adolescent female medical students (i.e., in late adolescence) in this study had a physical activity score of less than 20 and nearly 3/4th of them had a poor physical activity. As suggested by several studies, the average rate of participation in leisure-time physical activity among adolescent decreased with increase in age [11–19].

In this study, the authors did not find any statistically significant relationship between BMI and physical activity. Several researchers (Verplanken and Melkevik) formulated the assumption that involvement in physical activities during adolescence resulted in forming a habit [20]. Though there is no significant relationship in BMI and PAI scores at this stage in this study, but later on this relationship might turn out to be highly significant.

In “The HUNT study” by Cuypers K *et al.*, among adolescent girls participation in cultural activities was negatively

associated with waist circumference (WC) ($B = -0.04$, 95%CI: -0.08 to -0.00) and with waist-hip ratio (WHR) ($B = -0.058$, 95%CI: -0.11 to -0.01). However, participation in social activities was positively associated with WC ($B = 0.040$, CI: 0.00 to 0.08) [9].

Some researchers also found that the relative participation in recreational outdoor activity may be explained by cultural characteristics. A study in Norway, where adolescents have daily access to nature, recreation parks and outdoor activity areas, it was common for them to spend leisure time doing outdoor activities, especially during weekends and holidays [21].

Secondly, many of the outdoor physical activities, especially team sports depend on a certain degree of social structure and organization, and might not be available everywhere. Sallis *et al.* [22] suggested that physical activities that can be performed without a team are easily carried over to late adolescence, such as walking, hiking and hard work such as gardening, etc. There is a strong need to address this problem from the very start as the significance of physical activity during adolescence is recognized as a public health measure by WHO for non-



communicable disease prevention. As per the assumption involvement in physical activities during adolescence result in forming a habit; promoting such activities may offer good opportunities for establishing lifelong involvement in physical activities, independent of the specific type of activity, which in-turn might help in reduction of non-communicable diseases in future.

VI. SUGGESTIONS

Leisure time planning and management are important concerns related to overall well-being for adolescents. The well-being of adolescents is associated with choices made during leisure time. Apart from time spent in academic activities in college, physical activity can be addressed only during leisure time. More and more adolescents should be told regarding the importance of leisure time. They need special guidance and help in these issues. Participation in organized recreation and physical activities/sports might help in skill development, stress reduction and constructive use of free time, thereby also reducing the future risk of NCDs. A strong need-based action program for leisure time management at the level of family/parents and college authorities involving adolescent students to have the desired

impact of healthy and active lifestyle is the need of the hour.

VII. LIMITATIONS

There are some limitations in this study. Leisure time spent and physical activity were self-reported thus had limited reliability and validity. The conclusions from this study may also be limited due to a possible selection bias in the sample. Some factors might have confounded the findings, such as parental socioeconomic status, etc., had not been assessed.

REFERENCES

- 1.Rojek, Chris, Susan M. ShawA.J. Veal (Eds).*A Handbook of Leisure Studies*.Houndmills, UK: Palgrave Macmillan. 2006.
- 2.Crespo CJ, Smit E, Andersen RE, et al. Race/ethnicity, social class and their relation to physical inactivity during leisure time: Results from the Third National Health and Nutrition Examination Survey, 1988–1994.*Am J Prev Med*.2000;18:46–53p.
- 3.Pichon LC, Arredondo EM, Roesch S, et al. The relation of acculturation to Latinas' perceived neighborhood safety and physical activity: A structural equation analysis.*AnnBehav Med*. 2007;34(3):295–303p.



4. Martinez-Gonzalez MA, Varo JJ, Santos JL, et al. Prevalence of physical activity during leisure time in the European Union. *MedSci Sports Exerc.* 2001;33(7):1142–6p.
5. Troped PJ, Saunders RP, Pate RR, et al. Correlates of recreational and transportation physical activity among adults in a New England community. *Prev Med.* 2003;37(4):304–10p.
6. Bull FC, Maslin TS, Armstrong T. Global physical activity questionnaire (GPAQ): Nine country reliability and validity study. *J Phys Activ Health.* 2009; 13(6):790–804p.
7. Bauman A, Bull F, Chey T, et al. The international prevalence study on physical activity: Results from 20 countries. *Int J Behav Nutr Physic Activ.* 2009;13:21p.
8. Ainsworth BE, Haskell WL, Whitt MC, et al. Compendium of physical activities: An update of activity codes and MET intensities. *MedSci Sports Exerc.* 2000;32(9 Suppl):S498–504p.
9. Cuyppers K, De Ridder K, Kvaløy K, et al. Leisure time activities in adolescence in the presence of susceptibility genes for obesity: risk or resilience against overweight in adulthood? The HUNT study. *BMC Public Health.* 2012;12:820p.
10. Malina RM. Tracking of physical activity across the lifespan. *Research Digest President's Council on Physical Fitness and Sports.* Washington D.C. Series 3. 2001;14:3–10p.
11. Aaron DJ, Storti KL, Robertson RJ, et al. Longitudinal study of the number and choice of leisure time physical activities from mid to late adolescence. Implications for school curricula and community recreation programs. *Arch Pediatr Adolesc Med.* 2002;156:1075–80p.
12. Aarnio M, Winter T, Peitonen J, et al. Stability of leisure-time physical activity during adolescence – A longitudinal study among 16-, 17-, and 18-year-old Finnish youth. *Scand J Med Sci Sports.* 2002;12:179–85.
13. Kemper HCG, Twisk JWR, Koppes LLJ, et al. A 15-year physical activity pattern is positively related to aerobic fitness in young males and females (13–27 years). *Eur J Appl Physiol.* 2001;84:395–402p.
14. Singer JD, Willett JB: *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence.* London: Oxford University Press; 2003.
15. West P, Reeder AI, Milne BJ, et al. Worlds apart: A comparison between physical activities among youth in Glasgow, Scotland and Dunedin, New Zealand. *SocSci and Med.* 2002;54: 607–19p.



16. Kristjansdottir G, Viljalmsson R. Sociodemographic differences in patterns of sedate and physically active behavior in older children and adolescents. *Acta Pædiatr.* 2001; 90: 429–35p.
17. Telama R, Leskinen E, Yang X. Stability of habitual physical activity and sport participation: A longitudinal tracking study. *Scand J Med Sci Sports.* 199;6:371–8p.
18. Telama R, Yang X, Laakso L, et al. Physical activity in childhood and adolescence as predictor of physical activity in young adulthood. *Am J Prev Med.* 1997;13:317–23p.
19. Telama R, Laakso L, Yang X. Physical activity and participation in sports of young people in Finland. *Scand J Med Sci Sports.* 1994;4:65–74p.
20. Verplanken B, Melkevik O. Predicting Habit: The case of physical exercise. *Psych Sport & Exerc.* 2008;9(1):.15–26p.
21. Lise Kjønniksen, Torbjørn Torsheim, Bente Wold. Tracking of leisure-time physical activity during adolescence and young adulthood: A 10-year longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity.* 2008;5:69p.
22. Sallis J, Zacarian J, Howell M, et al. Ethnic, socioeconomic, and sex differences in physical activity among adolescents. *J ClinEpidem.* 1996;49:125–34p.