



RESEARCH ARTICLE

LEVEL OF PHYSICAL ACTIVITY AND NUTRITIONAL STATUS: A CROSS SECTIONAL
STUDY AMONG ADOLESCENT BOYS IN NORTH INDIA

¹Sujith Mathew, ^{2,*}Sushma Kumari Saini and ³J. S. Thakur

¹Bee Enn College of Nursing, Jammu

²NINE, PGIMER, Chandigarh

³School of Public Health, PGIMER, Chandigarh

ARTICLE INFO

Article History:

Received 18th December, 2015
Received in revised form
20th January, 2016
Accepted 05th February, 2016
Published online 31st March, 2016

Key words:

Adolescent boys,
Physical activity,
Nutritional assessment.

ABSTRACT

Objective: To determine the level of physical activity and nutritional status of adolescent boys aged 15-19 years at Dadu Majra Colony, Chandigarh.

Methods: Cross-sectional study was done to interview 301 study subjects. Systematic random sampling was used in this study. Interview schedule was prepared from HEEADSS assessment tool for adolescents and following domains such as nutrition and activity were taken under for the study.

Results: Some of the adolescent boys spent time for regular exercise (39%) but others were having sedentary activities for > 3hours/day such as spending time in mobile phones (26.7%), computer (9.6%), television (27.6%), etc. They ate fruits (21.9%) and vegetables (73.4%) for all the days in a week but more than half of subjects reported that they attended parties with frequent intake of junk foods. Most of them were having healthy weight (75.7%).

Conclusion: More than half of the adolescent boys followed sedentary activities such as prolonged sitting in front of television, with computer and with mobile phones without any regular exercises or participation in sports. They ate junk foods without following a proper balanced diet. Some of the boys were underweight.

Copyright © 2016, Sujith Mathew et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Sujith Mathew, Sushma Kumari Saini and J. S. Thakur, 2016. "Level of physical activity and nutritional status: a cross sectional study among adolescent Boys in North India", International Journal of Current Research, 8, (03), 28681-28684.

INTRODUCTION

Adolescence is a time of opportunity, but also a time of risks. Many adolescents make the transition to adulthood in good health. Many others do not and may face some of the health problems such as problems resulting from under nutrition and over nutrition, injuries resulting from accidents, violence or mental health problems (WHO, 2012). Many habits acquired during adolescence will last a lifetime. Such routines and habits influence their health status. A balanced diet is essential for optimum growth during adolescence; poor nutrition can retard growth and delay sexual maturation. The desire to be attractive and to fit in with one's peers may lead to unhealthy dietary manipulations. Adolescents are exposed to undernutrition, micronutrient malnutrition as well as obesity. Their lifestyle and eating behaviours, along with underlying psychosocial factors, are particularly important threats to adequate nutrition (Parthasarathy *et al.*, 2010). A study was done by Basu *et al.*, 2005 regarding the prevalence of anemia among school going adolescents of Chandigarh in 2003.

It showed the prevalence of anemia was significantly higher amongst girls (23.9%) as compared to the boys (7.7 %). During adolescence physical capacities reach its height of development. But activity levels vary greatly whereas some adolescents lead very active lives, others are sedentary. Despite the well-known benefits of an active lifestyle, epidemiological studies have identified an increasing prevalence of inactivity among children and adolescents (Kelly *et al.*, 2012). Exercise affects the nutritional needs of the adolescent. Those who are physically active may have to increase their intake of both calories and nutrients to ensure optimum growth, whereas inactive teenagers may need to limit their caloric intake to prevent obesity. A study conducted by Vasickova *et al.*, 2013 found that girls show better knowledge related to physically active and healthy lifestyle than boys. But the boys declared more weekly physically active than girls (Vasickova *et al.*, 2013). There is convincing evidence between lifestyle diseases and unhealthy habits which are acquired during adolescence and persist in adulthood. An early investigation of diet and activities of adolescents will probably prevent its progression into serious diseases. Therefore, a study was undertaken to determine the activity level and nutritional status of adolescent boys residing at Dadu Majra Colony, Chandigarh.

***Corresponding author:** Sushma Kumari Saini,
NINE, PGIMER, Chandigarh.

Table 1. Time spend by adolescent boys for various activities in a day (N=301)

Hours per day	Studying at home n(%)	Watching TV n(%)	Use computer n(%)	Social network usage n(%)	Use mobile n(%)	Ride bicycle n(%)	Regular exercise/sports activities n(%)	Recreational activities/hobbies n(%)	Spend time with family n(%)
0.5	18(6.0)	48 (16.0)	29 (9.6)	41 (13.6)	110(45.8)	10 (3.3)	51 (17.0)	37 (12.3)	21(7.0)
1	75(25.0)	123 (40.9)	7 (2.3)	25 (8.3)	55 (22.9)	60 (19.9)	51 (17.0)	146 (48.5)	32(10.6)
2	50(16.6)	41 (13.6)	36 (12.0)	9 (3.0)	11 (4.6)	41 (13.6)	27 (9.0)	67 (22.3)	81(26.9)
3	11(3.7)	65 (21.6)	29 (9.6)	48 (16.0)	5 (2.1)	8 (2.7)	18 (6.0)	42 (14.0)	96(31.9)
4	10(3.3)	18 (6.0)	-----	22 (7.3)	53 (22.1)	-----	-----	9 (3.0)	39(13.0)
≥ 5	10(3.3)	-----	-----	-----	6 (2.5)	-----	-----	-----	32(10.6)

Table 2. Eating pattern of adolescent boys in a week (N=301)

Days per week	Miss the breakfast n(%)	Miss the lunch n(%)	Number of meals per day n(%)	Cereals n(%)	Pulses n(%)	Fruits n(%)	Vegetables n(%)	Dairy products n(%)	Fried food n(%)	Fast food/ take away n(%)	Packet foods n(%)
All the seven days	18(6.0)	-----	-----	301(100.0)	39(13.0)	66(21.9)	221(73.4)	194(64.5)	50(16.6)	58(19.3)	96(31.9)
Six days	-----	-----	-----	-----	-----	-----	-----	-----	28(9.3)	4(1.3)	-----
Five days	-----	-----	-----	-----	6(2.0)	33(11.0)	-----	20(6.6)	23(7.6)	-----	-----
Four days	6 (2.0)	-----	24(8.0)	-----	37(12.3)	31(10.3)	30(10.0)	19(6.3)	26(8.6)	27(9.0)	48(15.9)
Three days	33(11.0)	23(7.6)	245(81.4)	-----	138(45.8)	64(21.3)	50(16.6)	26 (8.6)	77(25.6)	98(32.6)	79(26.2)
Two days	39(13.0)	50(16.6)	32(10.6)	-----	77(25.6)	67(22.3)	-----	38(12.6)	52(17.3)	81(26.9)	48(15.9)
One day	33(11.0)	22(7.3)	-----	-----	4(1.3)	30(10.0)	-----	4(1.3)	45(15.0)	32(10.6)	30(10.0)

MATERIALS AND METHODS

A cross-sectional study was conducted among adolescent boys aged 15-19 years at Dadu Majra Colony, Chandigarh. An ethical clearance from Institute Ethical committee, PGIMER, Chandigarh was obtained before the study.

Inclusion Criteria

- All adolescent boys (15-19 years) those who were identified and registered during the survey.
- All adolescent boys (15-19 years) those who could devote time and wished to participate in research study were included after taking the written consent.

Exclusion Criteria

a) Adolescent boys who were differently abled.

The sample size of 301 was found adequate as per the calculation. House to house survey of the whole area to register the adolescent boys was done first. Adolescent boys (15-19 years) were identified for the study with help of the survey proforma.

From the 620 adolescent boys identified 602 adolescent boys were selected for study according to inclusion criteria and exclusion criteria. Systematic random sampling was being used in this study. Sampling ratio was calculated as 2 and by lottery method every 2nd subject was selected for interview. Thus, from the sampling frame every 2nd adolescent boy was interviewed with help of interview schedule. In this way, 301 subjects were interviewed totally. Interview schedule was prepared by selecting and modifying two domains of HEEADSS assessment tool for adolescents and following domains such as activity and diet were taken under for the study. The interview schedule for adolescent boys had four parts: sociodemographic profile, activity level and nutritional status assessment questionnaire, height and weight assessment and twenty hour recall of physical activity and food being eaten. House to house survey of the whole area was done to register the adolescent boys (15-19 years). An interview schedule, pretested and validated, was used to collect data from the 301 study subjects. The validity of the tool was checked by consultation with the experts from the field of nursing and community medicine. The reliability of the research tool was checked among ten subjects from another resettled colony in Chandigarh by using test-retest method. Retest was done after one week of test and the reliability was found good ($r = 0.76$). An informed written consent from the guardian of adolescent boy and assent from the participant was taken before the study. The privacy of the adolescent boy was maintained throughout the interview. The data was entered into SPSS.16.0 and was analyzed using descriptive statistics.

RESULTS

The mean age of adolescent boys was 16.87 ± 1.46 years (15-19 years). Among them 45.5 percent were from schedule caste/schedule tribe (SC/ST) and most of the boys were from nuclear family (95%). About 45.2 percent and about 38.9 percent were having educational status upto middle and 10th class respectively. They had a mean per capita income per month of Rs.2079.52± Rs.1022.65 (Rs.333.33 – Rs.11250.00). Around 55 percent and 36 percent adolescent boys were from a family having a socioeconomic status of upper lower and lower middle respectively (As per modified Kuppuswamy scale). Around 82 percent of boys were studying at school and about 25 percent were working as sales man, customer care executive, driver, sweeper, etc. One tenth of the interviewed adolescent boys worked 5 hours to 6 hours per day. About 18.6 percent boys were doing both education and job together. Most of the boys were living with their parents (96.7%) and they had various issues of argument with the family such as for roaming outside, for coming late at home, not studying, not going to shop to fetch stationeries, etc. About 19 percent boys were silent, but 14 percent boys went out from home, when there was any disagreement between the family members. About 38.2 percent boys replied that common activities with their family were having food together (38.2%), helping mothers (19.6%), watching television (14.3%), discussing about friends/relatives (12.9%) and having fun with siblings/parents (14.9%).

The present study found that some adolescent boys spent time for regular exercise (39%) but others were having sedentary activities for ≥ 3 hours/day such as spending time in mobile phones (26.7%), computer (9.6%), television (27.6%), etc. (Table 1). Twenty four hour physical activity recall revealed that 41.2 percent boys had done moderate activity for 30 minutes and 34.2 percent boys for 60 minutes in the previous day. Also about 38.3 percent boys had done vigorous activity for 60 minutes. Around 87.4 percent boys had sound religious beliefs and spent time in prayers. About 41.2 percent boys slept for 8 hours in a day and 30 percent boys slept less than 8 hours in a day.

In this study, around 13.0% adolescent boys missed the breakfast and 16.6 percent missed the lunch at least twice a week. About 81.4 percent boys had three meals in a day. All the boys had cereals daily and 45.8 percent boys had pulses thrice a week. They ate fruits (21.9%) and vegetables (73.4%) for all the days in a week. Dairy products were consumed by 64.5 percent boys daily. About 25.6 percent had fried foods and 32.6 percent had fast food or food from take away at least thrice a week. Around 31.9 percent boys used to have packet foods daily (Table 2). About 58.5 percent boys had eight glasses of water (250 ml/glass) in one day. Around 15.6 percent boys had the habit of adding extra salt while eating. More than seventy percent of the adolescent boys were having healthy weight and nearly 23 percent boys were under weight (According to WHO growth chart for boys). Around 5.6 percent boys replied that they were sleep deprived and reduced appetite. About 83.4 percent boys replied that they did not hear about food pyramid guidelines.

DISCUSSION

In India around 243 million adolescent 10-19 years old are living today and constitute about one-fifth of India's population (UNICEF report, 2012) (Progress for Children, 2012). The transition from childhood to adulthood involves dramatic physical, sexual, psychological and social developmental changes, all taking place at the same time. In addition to opportunities for development this transition poses risks to their health and well being (WHO, 2009). About one-fourth of the boys interviewed were working and more than one tenth of adolescent boys worked more than 20 hours per week. According to International Labour Organization (ILO) adolescent working more than 20 hours per week is considered as adolescent labour. Associations between work intensity (especially over 20 hours per week) and problem behaviors (e.g., smoking, alcohol use) are quite robust. In the current study nearly half of the boys spent at least half an hour for regular exercise or sports activities daily and another half did not do any regular exercises or participate in sports activities following a sedentary life style. Physical activity is essential for long- and short-term physical and mental health outcomes and may improve academic and cognitive performance. Based on their extensive review of the literature, Strong et al. recommended that children participate in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily (Strong et al., 2005). The current study found that around three-fourth of boys had done moderate activity at least for 30 minutes and about one-third of boys were doing vigorous activity for 60 minutes in a day. A study done by Swaminathan et al., 2010 in South India concluded that there were significant declines in moderate-to-vigorous physical activity over a single year follow up, largely due to a decrease in physical activity at school and there is a gap between State educational policies that promote physical well-being of school-going children and actual practice (Swaminathan et al., 2011).

Current recommendations suggest that children should have no more than 1–2 hours of high-quality television and/or screen time per day, but most exceed these limits. In the current study, one-fourth of the boys utilized more than two hours for watching television in a day and more than one-tenth boys spent at least two hour in front of computer daily. Also, one-third boys needed minimum three hours per day for social networking in mobile phone and in computer. Intensive use of Electronic Media Contact (EMC) has been associated with poorer perceptions of health, poorer sleeping habits and engagement in risk behaviours (Currie et al., 2009). This study showed that about one-third of boys slept for less than 9 hours in a day but normally it should range 9 hours to 10 hours in a day. In a study Julie Maslowsky et al., (2013) found that sleep duration showed age-related trends, with decreases across the adolescent period from 8.5 hours per night at age 13 years to 7.3 hours at age 18 years (Maslowsky and Ozer, 2013). A study by Asarnow et al., (2014) concluded that the significance of evaluating and monitoring bedtime in adolescents and the importance of intervention strategies that target bedtimes in an effort to reduce associated functional impairments, and improve academic and emotional outcomes (Asarnow et al., 2013).

In this study, about one fifth boys in this study had been found underweight. A study done by Venkaiah et al. in India showed that the prevalence of undernutrition is higher in boys (53.1%) (Venkaiah et al., 2002). This study found that more than one-tenth of the boys missed the breakfast and missed the lunch at least twice a week. In a study done by Ranjana et al., 2013 found that 68% adolescents missed the breakfast (Ranjana et al., 2013). In the current study more than half of boys had meals from fast food centres at least three times in a week. A study by Boutellea et al., 2007 stated that fast-food purchases for family meals were positively associated with the intake of fast foods and salty snack foods for both parents and adolescents; and weight status among parents (Boutellea et al., 2007). This study found that around half of the boys had fruits for at least thrice a week. Fruit consumption when young is linked to many positive health outcomes. It promotes optimal health in childhood, growth and intellectual development, lower levels of body fat and, in combination with vegetables, better bone density for boys (Currie, 2011). The present study provides a glimpse about the prevailing lifestyle of the adolescents and found an alarming risk in various issues such as adolescents eating junk foods, prolonged use of social networking web sites and following a less active lifestyle in the current setting. The study shows the need for counseling the adolescents regarding the importance of physical activity and for having a proper nutritious dietary pattern.

Conclusion

The study concluded that some of the adolescent boys were following healthy lifestyle but majority lacked a proper orientation towards healthy behaviours. More than half of the adolescent boys followed sedentary activities such as prolonged sitting in front of television, with computer and with mobile phones without any regular exercises or participation in sports. They ate junk foods without following a proper balanced diet. Some of them were underweight. This study is supporting evidence and may help the policy makers, nurses, counselors and other health care providers to modify the current interventions and policies and to make services adolescent friendly. Adolescent boys should be screened for malnutrition, sedentary lifestyle, dietary pattern, etc. in the school settings or at clinical settings by a trained health care provider.

REFERENCES

- Asarnow, L.D., McGlinchey, E., Harvey, A.G. The effects of bedtime and sleep duration on academic and emotional outcomes in a nationally representative sample of adolescents. *Journal of Adolescent Health*. 2014;54(3):350-6. doi:10.1016/j.jadohealth.2013.09.004.
- Basu, S., Basu, S., Hazarika, R., Parmar, V. Prevalence of anaemia among school going adolescents of Chandigarh. *Indian Pediatrics* [Internet]. 2005 [cited 2013 Feb 14];42(1):593-7. Available from: <http://www.indianpediatrics.net/june2005/june-593-597.htm>
- Boutellea, K. N., Fulkerson, J. A., Sztainer, D. N., Story, M., French, S. A. Fast food for family meals: relationships with parent and adolescent food intake, home food availability and weight status. *Public Health Nutrition*. 2007 Jan; 10(1):16-23. doi: <http://dx.doi.org/10.1017/S136898000721794X>
- Currie, C. editor. Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey. Copenhagen: WHO Regional Office for Europe; 2012. Report No.: Health Policy for Children and Adolescents, No. 6.
- Kelly, P., Matthews, A., Foster, C. Young and physically active: a blueprint for making physical activity appealing to youth. UK: WHO 2012.
- Making health services adolescent friendly: developing national quality standards for adolescent friendly health services. Geneva: WHO; 2012.
- Marking progress against child labour-Global estimates and trends 2000-2012 [Internet]. International Labour Office, International Programme on the Elimination of Child Labour (IPEC) - Geneva: ILO, 2013. [cited 2014 Mar 21]. Available from: http://www.ilo.org/wcmsp5/groups/public/ed_norm/ipcec/documents/publication/wcms_221513.pdf
- Maslowsky, J., Ozer, E. J. Developmental trends in sleep duration in adolescence and young adulthood: evidence from a national united states sample. *Journal of Adolescent Health* [Internet]. 2013 [cited 2014 Mar 20]; Available from: [http://www.jahonline.org/article/S1054-139X\(13\)00736-2/abstract](http://www.jahonline.org/article/S1054-139X(13)00736-2/abstract)
- Parthasarathy, A., Menon, P. S., Agarwal, R. K., Choudhury, P., Thacker, N. C., Ugra, D. et al, editors. IAP text book of pediatrics. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2010.
- Progress for Children: A report card on adolescents. USA: UNICEF; 2012 Apr.56 p. Report No.:6
- Ranjana, S., Mahomoodally, F. M., Ramasawmy, D. Is healthy eating behaviour common among school adolescents in Mauritius?. *Curr Res Nutr Food Sci*. 2013;1(1):11-22. doi: <http://dx.doi.org/10.12944/CRNFSJ.1.1.02>
- Strengthening the health sector response to adolescent health and development. Geneva: Department of child and adolescent health and development family and community health (WHO); 2009. 12 p.
- Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, et al. Evidence based physical activity for school-age youth. *The Journal of Pediatrics*. 2005 June. 146(6); 732-7. doi:10.1016/j.jpeds.2005.01.055
- Swaminathan, S., Selvam, S., Thomas, T., Kurupad, A. V., Vaz Mario. Longitudinal trends in physical activity patterns in selected urban south Indian school children. *Indian J Med Res*. 2011 Aug;134:174-180.
- Vasickova, J., Lukasik, K. G., Groffik, D., Fromel, K., Skalik, K., Svozil, Z., Wąsowicz, W. Knowledge in adolescent girls and boys related to physically active and healthy lifestyle. *Acta Univ* [Internet]. 2012 [cited 2013 Jan 20]; 42(1):27-33. Available from: <http://www.gymnica.upol.cz/index.php/gymnica/article/viewFile/319/203>
- Venkaiah, K., Damayanti, K., Nayak, M. U., Vijayaraghavan K. Diet and nutritional status of rural adolescents in India. *European Journal of Clinical Nutrition*. 2002;56(11):1119-25. doi: 10.1038/sj.ejcn.1601457
