

Original Research Article

Sedentary behaviour and their association with academic performance among high school students in South Tamil Nadu

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Received: 12 September 2019

Revised: 18 October 2019

Accepted: 19 October 2019

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ABSTRACT

Background: Sedentary behaviour refers to activities that require very low energy expenditure where sitting or lying is the dominant posture. It is reported that children spend approximately 80% of their day in sedentary behaviours. It is an important risk factor for physical, psychological and socio-emotional health among school children. Epidemiological studies have shown that spending excessive time in sedentary behaviors have a negative impact on academic performance. The objectives of this study were to study the proportion of sedentary behaviours among high school students. To find out whether any association exist between sedentary behaviors with academic performance.

Methods: A cross sectional study conducted from July to September, 2018 among high school students in a government school, Kanyakumari district. 213 students from class 9th and 10th standard participated in our study. Permission was obtained from school authorities after explaining the purpose of study. Data was collected using a pre tested questionnaire. Study variables included internet usage, watching television, duration of sleep, physical activity and academic performance. Data was entered in MS-Excel, analyzed for proportions, chi-square using SPSS version 16.0.

Results: 61% watched TV more than 2 hours a day. 59.6% of the students spend >2 hours a day for internet browsing. 60% of the students spend <30 minutes a day for doing exercise. 45% of the students reported sleeping for 8 to 10 hours. Internet browsing and watching TV have shown significant association with academic performance.

Conclusions: Sedentary behaviours are on the rise among school children. Multi component school-based interventions are necessary to minimize sedentary behaviours among school children.

Keywords: Academic performance, School children, Sedentary behaviour

INTRODUCTION

Sedentary behaviour has received considerable public and media attention in the recent times. Sedentary behaviour is defined as any waking behaviour characterized by an energy expenditure ≤ 1.5 METs while in a sitting, reclining or lying posture.^{1,2} Sedentary behaviours have increased among young people partly due to technological development of attractive home-based

entertainment devices and high levels of sitting at school, with or without computer screens.³ So, during leisure time most of the adolescents sit and play video and computer games. Girls also use the computer for diverse reasons like social contact and shopping.^{4,5} Television is the most common entertainment device which is available in most homes and widely used by young people.⁶ However computer (internet) is the most valued media among young people because of its wide variety of its use

including e-mail, social networking, playing games, watching movies and searching information.⁷

Recent research has shown that high levels of sedentary behaviour in young people have a negative impact on their health. High levels of sedentary behaviour have contributed to the increase in chronic diseases such as obesity, type 2 diabetes and heart problems among adolescents.^{8,9} Shaping the attitude of children and promotion of a healthy lifestyle, including constructive behavior is essential in the formative years of life.¹⁰ Hence this study is undertaken to find out the proportion of sedentary behaviours among high school students and whether any association exist between sedentary behaviors with academic performance.

METHODS

A cross sectional study conducted from June to August 2019 among high school students in a government school, Kanyakumari district. 213 students from classes 9th and 10th standard participated in our study. Permission was obtained from school authorities after explaining the

purpose of study. Data was collected using a self-administered, pretested questionnaire. Study variables included internet usage, watching television, duration of sleep, physical activity and academic performance. Academic performance was assessed from the average of their term and monthly exams. Score more than 70% was considered satisfactory and less than 70% as not satisfactory.

Data analysis

Data was entered in MS-excel, analyzed for proportions, chi-square using SPSS version 16.0.

RESULTS

61% of the students were watching television for more than 2 hours a day. 59% of the students reported to use internet for more than 2 hours a day. 60% of the students spend <30 minutes a day for doing physical activity. 45% of the students reported to sleep for 8 to 10 hours a day. 25% of the students had inadequate sleep for less than 8 hours a day.

Table 1: Association between sedentary lifestyle and academic performance.

Variable	Academic performance		Total	Percentage	X ²	P value
	Satisfactory	Not satisfactory				
Watching TV						
<2 hours	55	29	84	39	5.936	0.0148
>2 hours	46	83	129	61		
Internet usage						
>2 hours	72	54	126	59	21.1818	0.001
<2 hours	22	65	87	41		
Physical activity						
>30 minutes	56	39	85	40	10.716	0.001
<30 minutes	43	75	128	60		
Sleep						
<8 hours	21	32	53	25	5.7868	0.055
8-10 hours	42	53	95	45		
>10 hours	39	26	65	30		

Watching television had a significant association with academic performance ($p < 0.05$). Internet usage and physical activity had a highly significant association with academic performance ($p = 0.001$).

DISCUSSION

Television and academic performance

In our study 61% reported watching television for more than 2 hours a day which is comparable to a study done by Syed Noor-Amin in Kashmir in 2012 among 15-17 years students reported that 63.93% were found to watch TV for more than 2 hours a day and it indicates that low TV viewer adolescents exhibit a higher scholastic

achievement than the heavy TV viewer group of adolescents.¹¹

Despite the widespread use of computers and the Internet, television (TV) remains the dominant form of media in children's lives. A recent nationally representative survey found that 8- to 18-year-olds watch an average of 3 hours of television a day compared with 1 hour a day spent on recreational computer use. The studies associating television viewing to performance are primarily based on developed countries. The effect of television on children in developing countries, like India, might be different from that of the developed countries, owing to cultural and socioeconomic differences.¹¹

Further, there are few studies that found a positive influence of overall viewing time (including non-educational programs) on educational achievement. Study conducted by Singh et al in Mumbai showed that all the observed academic skills improved with both overall televisions watching time and watching of educational content particularly the observed reading, mathematics and writing skills.¹²

Study done by Kumar et al among students of class IX to XII in Pune found that there is no significant association between the number of hours of watching television per day and academic performance as measured by marks in examinations.¹³

Our study also showed a highly significant association between television watching and academic performance ($p < 0.01$).

Internet usage and academic performance

Information and communication technology have been proven one of the greatest innovations in teaching and learning. It helps students to broaden their academic knowledge and research by accessing to the information world. Even though there are multiple benefits linked with Internet use, there has been a growing concern regarding the risk associated with Internet overuse. It is reported that Internet has a significant diminution on student academic performance.¹⁴

59.6% of the students reported to use internet for more than 2 hours a day. Studies have found out that academic outcome of students who spent most of their time interacting in social media are positive as they were able to share and generate ideas and concepts related to their studies. They also use these sites for having fun as these social media sites are helpful in their academic work Mensah and Nizam concluded in their study that social media platforms has a significant impact on students' academic performance in Malaysia tertiary institutions.^{15,16} According to the study of Owusu-Acheaw et al, it was revealed that use of social media had affected the academic performance of their respondents negatively Their study further revealed that most of their respondents use social media sites to chat rather than for academic purpose.¹⁷ A study on impact of social media on academic performance of class X students conducted by state council of educational research and training in Nagaland, 2017 found 62% of the students were using internet similar to our study (59%) Most of them reported using social media through their mobile phone mostly at night with browsing time ranging from 3 hours or more and it has negative effect as it lowers the concentration on their studies. Our study also showed a highly significant association between internet usage hours and academic performance ($p < 0.001$).

Physical activity and academic performance

The impact of exercise on children's cognition implies a link to academic performance. Population studies provide evidence that inactivity and excess weight are associated with poor academic achievement. Time devoted to physical activity at school does not harm academic performance and may actually improve it. Small benefits have been detected with 20 minutes per day of vigorous physical activity.¹⁸

In our study only 40% of the students were involved in physical activity more than half an hour a day. Studies done by Balaji et al in Chennai 2018 revealed insufficient physical activity was more among 16-17 years (70.8%) compared to 13-15 years (57.5%) and found significant association between academic performance and insufficient physical activity.¹⁹ A systematic review of the literature (reporting a total of 50 unique studies) by Sarah et al in Atlanta (USA) demonstrated a positive relationship between physical activity and academic performance.²⁰

Erin et al reviewed a total of 125 published articles and majority of conclusions show a positive effect of physical activity and academic achievement.²¹

Role of sleep in academic performance

Sleep deprivation can impact various aspects of the mind and body, such as mood, energy, memory, efficiency, and importantly the ability to learn. Students ideally should get 8-9 hours of sleep a night. Recent studies have shown that adequate sleep is essential to feeling awake and alert, maintaining good health and working at peak performance and getting enough sleep is vital to academic success.

In the student-age population, studies have found that factors such as self-reported shortened sleep time, erratic sleep/wake schedules, late bed and rise times, and poor sleep quality have been found to be negatively associated with school performance for adolescents from middle school through college. Thus, there is ample evidence to indicate that the lack of adequate night time sleep can lead to disturbances in brain function, which in turn, can lead to poor academic performance.²²

Mari Hysing Allison G. Harvey assessed the association between sleep duration and academic performance in 16-19-year- old adolescents using registry based academic grades demonstrated significant relationship between sleep problems and poor academic performance.²³

Phillips et al studied 61 full-time undergraduates from Harvard College for 30 days using sleep diaries and concluded that students with more regular sleep patterns had better school grades on average.²⁴

Bugueno et al studied 322 students of the first and second year of high school students at Santiago de Chile and found a significant association between sleep and academic scores and concluded that bad sleep quality influences academic performance in these students.²⁵ But our study did not show any significant association between academic performance and duration of sleep.

CONCLUSION

This study shows that there is a significant association between some sedentary behaviors with academic performance. Statistically analyzing, Internet browsing (p value=0.001) and watching TV (p=0.018) and physical activity (p<0.001) were found to have significant association with academic performance.

Recommendations

Parents should be encouraged to incorporate age appropriate educational TV into their children's lives for stimulating children's cognitive development.

Internet is playing great role in today's changing education by providing innumerable resources and services. However, the use of internet has dark side also, therefore self-regulation is also important criteria while using internet in education.

Interventional strategies such as school and community health education programs and imparting life skills training and provision of staff training can be useful.

After-school programs that allow time for both academic enrichment and vigorous physical activity would meet the need of many families for a safe, constructive environment for children while parents are working. Integrating physical activity into classroom instruction has great promise, if adopted by educators at a dose adequate to affect achievement, and offers an alternative or complementary approach to ensure adequate physical activity.

Prevention of sedentary behaviours starts at home, where the socio-cultural environment begins to form the character and personality of the child. Education and awareness among parents are of paramount importance so that the child transforms into a healthy adolescent and a healthy adult.

ACKNOWLEDGEMENTS

We would like to thank all the participants of the study. Authors also acknowledge the great help received from the scholars whose articles cited and included in the references of this manuscript. The authors are also grateful to authors/editors/publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Manohar M, Uma SK, Rajendran J. Sedentary behaviour and their association with academic performance among high school students in South Tamil Nadu. *Int J Community Med Public Health* 2019;6:4929-33.