Association of Television Watching on Physical Activity and Obesity among Children in Pokhara, Nepal

[1]Sushma Chhetri, [1]Dipendra Kumar Yadav

[1]School of Health and Allied Sciences, Faculty of Health Sciences, Pokhara University, Nepal

ABSTRACT

Sedentary behavior of children is increasing day by day due to use of modernized technologies like electronic medias and devices. Many studies are exploring the effects of prolonged television viewing on physical activity and obesity throughout the childhood. This study aims to assess the television viewing habits, leisure time physical activity and prevalence of obesity among children in Pokhara sub metropolitan, Nepal. A cross-sectional study was performed based upon six wards of Pokhara sub-metropolitan. Self developed questionnaire was used to evaluate the different parameters like socio-demographic, lifestyle characteristics and anthropometric characteristics. Anthropometric measurement was done using stadiometer and bathroom weighing machine. Data was entered in the Epi-Data software. Data were transferred into Statistical Package for Social Sciences (SPSS) software for analysis. Total 306 children aged 8-12 years included in the study, there was higher prevalence of television watching where 69.6 percent exceeded for more than 2 hours per day with mean TV viewing time to be 154.97±60.66 minutes per day. The daily time spent watching television was positively associated with obese children (p=0.005, OR=2.863, 95% CI= 1.343-6.103). More than 65 percent of children had low physical activity. Similarly, normal body mass category also showed positive association with physical activity level (p=0.04, OR=0.367, 95% CI=0.181-0.741) and leisure time physical activity level (p<0.001, OR=0.230, 95% CI=0.125-0.425). The current finding reveals that almost one third of children population exceeded the limit of 2 hours/day of TV viewing. Monitoring and limitation of children's TV viewing time along with encouragement in alternative entertainments like reading, walking and athletics and healthy eating habits should be done in order to reduce epidemic of obesity.

Key words: Television watching, Obesity, Physical activity, Children.

Corresponding address: Dipendra Kumar Yadav, PhD,
School of Health and Allied Sciences,
Faculty of Health Sciences, Pokhara University
E-mail: dipendrayadavph@gmail.com

INTRODUCTION

The trend of watching television has nowadays increasing globally. A multi center study showed that daily television in excess of one hour was reported in 79% of children and 89% of adolescents.[1] Most of the television viewing practices examined in the children shown significant associations with at least one type of sleep disorder like bed time resistance, delay in sleep out, anxiety around the sleep, and shorten sleep duration.[2]

Watching television has potential outcomes such as obesity, increasing sleep deprivation, exposure to advertising and consequent use of foods commonly advertised on television, and increased calorie intake while watching television.[1] However, increased hours of watching television in children have shown some negative consequences such as obesity, physical inactivity, attention problem, aggressiveness, sleep disorder etc.[3] Prolonged period of television viewing by children have been associated with parental television viewing time, number of television sets in household, existence of television on child bedroom, frequency of television watching by family members together, eating meals by watching television as well as existence of parental rule.[4]

Studies have shown that daily time of watching television was inversely associated with physical activity and positively associated with excess weight gain. Children spend much of their leisure time with low intensity and low caloric expenditure activities. Additionally, studies, showed a direct association between the habit of watching television and excess weight, regardless of physical activity and consumption of obesogenic foods and is environmentally influenced in part.[5,6,7,8]

Despite the fact that television can play significant role in children performance, many researchers have shown the negative impact of prolonged television viewing in children.

Various interventions have been implemented in order to reduce television viewing its associated consequences in children. The American Academy of Pediatrics recommends no screen time for children younger than 2 years and only high-quality, age appropriate viewing thereafter.[3]

We are interested to identify key factors that influences to long time screen view and their impact such as obesity on children in local setting. The aims of this study is to rule out the association between TV viewing with physical activity and obesity in a representative sample of 8-12 years old Nepalese children living in Pokhara valley.

METHODS

This was a cross-sectional study conducted in Pokhara, Nepal from July 2016 to December 2016. The sample size was determined by assuming worldwide television viewing 79 per cent with an error of five per cent, 95 per cent confidence limit, design effect of 1.2 and the sample size was 306.Study participants of this study were the children age group 8-12 years.

Simple random sampling technique was used to make the sample representative to the entire sub metropolitan. One third of the total wards were chosen by lottery methods. To represent all the population of Pokhara, lottery method was followed to take six different wards as the representatives from total eighteen wards. Firstly, list the total households of six wards and then required participants were calculated based on the equal percentage of the population of each ward. Children in between of age group 8-12 years who watch television were included in the study. This study was conducted after the ethical approval was obtained from Institution of review committee, Pokhara University. Assent was taken from their guardian before initiation the interview.

At the beginning of the interview, gave the detail information of the study to children mothers by visiting their home. Face to face interview was carried out by using structured questionnaires to retrieve information. Calibrated bathroom weighing machine and stadiometer were used for the measurement of weight and height respectively. Children with light cloths and shoes off were considered where height was measured to the nearest 1.0 cm using portable stadiometer and weight to nearest 0.1 kg using calibrated bathroom weighing machine. BMI was computed by dividing body weight by height squared (kg/m^2) in accordance to WHO classification. Physical activity were calculated as MET/mins[1] and categorized to different activity levels. The mean sitting time was calculated.

Data were entered in Epidata 3.1 version and analyzed by using SPSS version 20. Univariate analysis was analyzed as percentage and frequencies. The associations were tested by Chi-square test between different variables.

RESULTS

Gender distribution of the study sample (n=306) was almost equal (53.3% males) and the mean age was 10.13 years (SD = 1.43) with 64.7% of the children were of upper cast and 89.9% followed Hindu religion. Majority of mothers' have achieved at least primary level of education and most of them engaged in any type of paid work.

Table 1: Socio-demographic characteristics among participants

Characteristics	Frequency (n = 306)	Percentage (%)
Age in years		
8	59	19.3
9	43	14.1
10	79	25.8
11	50	16.3
12	75	24.5
Mean age = 10.13±1.430		
Gender		
Male	163	53.3
Female	143	46.7
Ethnicity		
Upper caste	198	64.7
Relatively advantaged janajati	60	19.6
Disadvantanged janajati	24	7.8
Dalit	18	5.9
Disadvantaged non-dalit	3	1.0
Religious minorities	3	1.0
Religion		
Hindu	275	89.9
Christain	15	4.9
Buddhist	13	4.2
Muslim	3	1.0
Mother education level		
Graduate or more	52	17.0
Higher secondary	111	36.3
Secondary	94	30.7

Primary	32	10.5
Non formal	13	4.2
Illiterate	4	1.3
Mother Occupation		
Business	114	37.3
Housewife	97	31.7
Private service	66	18.3
Government service	22	7.2
Labor	17	5.6

For the study population 69.6 % of parents reported their children's TV viewing level to be > 2 hours per day exceeding American academy of pediatrics (AAP) recommendation. The mean TV viewing time of children was 154.97±60.66 minutes per day (weekday = 141.14±58.86 minutes/day, weekend = 237.97±100.45 minutes/day).

Table 2: Proportion of children according to TV viewing time

Gender	≤ 2 hours per day	> 2 hours per day
Male	44 (27.0%)	119 (73.0%)
Female	49 (34.3%)	94 (65.7%)
Total	**93 (30.39%)**	**213 (69.61%)**

Table 3: TV viewing time among children

Variables	Mean (minutes/ day)	Standard deviation
Child TV viewing time	154.97	60.66
Weekday	141.14	58.86
Weekend	237.97	100.45

Among 306 children, 58.8 percent were involved in any of the physical activities besides the regular activities like house work; transportation etc. while 41.2 percent had no leisure time physical activity. The mean sitting time in weekday was 115.07±57.19 minutes per day with mean weekend 199.90±86.75 minutes per day. Majority of children, 65.4 percent had low level physical activity, 28.1 percent and 6.5 percent had moderate and vigorous activity respectively.

Table 4: Distribution of leisure time physical activity levels among children

Characteristics	Frequency (n=306)	Percentage (%)
LTPA level		
LTPA	180	58.8
No LTPA	126	41.2
Sitting time (mean)		
Weekday = 115.07±57.19 minutes/day		
Weekend = 199.90±86.95 minutes/day		
Physical activity level		
Low activity	200	65.4
Moderate activity	86	28.1
Vigorous activity	20	6.5

Of the studied children, the highest percentage i.e. 29.7 percent was with normal BMI followed with 28.4 percent severe thinness, 11.8 percent mild thinness, 10.8 percent moderate thinness and about 19.3 percent fell in obese category. Below normal range including it were classified as non obese whereas pre obese and obese class 1 were categorized as obese groups. The mean BMI of children was found to be 19.64±4.72.

Table 5: Anthropometric measurement of children

Category BMI	Frequency (n=306)	Percentage (%)
Normal range	91	29.7
Severe thinness	87	28.4
Pre obese	52	17.0
Mild thinness	36	11.8
Moderate thinness	33	10.8
Obese class1	7	2.3
Mean BMI = 19.64±4.72		

Results showed that, children's TV viewing time for more than two hours was 2.86 times more likely to be associated with obesity (p=0.005, OR=2.863, 95% CI= 1.343-6.103). Similarly, more physical activity of children was 0.367 times more likely to be associated with non obesity (p=0.04, OR=0.367, 95% CI=0.181-0.741). Likewise, the leisure time physical activity was 0.23 times more likely to be associated with non obesity (p<0.001, OR=0.230, 95% CI=0.125-0.425).

Table 6: Association of BMI category with TV viewing time, Physical activity level and LTPA

Variables	BMI category		χ^2	*p*-value	OR	95% CI
	Non obese	Obese				
TV viewing time						
≤2 hours/day	84 (90.3)	9 (9.7)	7.918	0.005*	2.863	1.343-6.103
>2 hours/ day	163 (76.5)	50 (23.5)				
Physical activity level						
Less PA	152 (76)	48 (24)	8.261	0.004*	0.367	0.181-0.741
More PA	95 (89.62)	11(10.38)				
LTPA level						
No LTPA	85 (67.46)	41 (32.54)	24.194	<0.001*	0.230	0.125-0.425
LTPA	162 (90)	18 (10)				

* p-value < 0.05 is considered statistically significant.

Gender, physical activity and leisure time physical activity were not found to be associated with TV viewing time. The mean sitting time of children for more than two hours was 2.406 times more likely to be associated with children TV viewing time was more than two hours per day (p< 0.001, OR=2.406, 95% CI=1.463-3.959).

Table 7 : Association between television viewing time with physical activity related factors

Variables	TV viewing time/day		χ^2	*p*-value	OR	95% CI
	≤ 2 hours	> 2 hours				
Gender						
Male	44 (26.99)	119 (73.01)	1.904	0.168	-	-
Female	49 (34.26)	94 (65.74)				
Physical activity level						
Less PA	65 (32.5)	135 (67.5)	1.213	0.271	-	-
More PA	28 (26.42)	78 (73.58)				
LTPA category						
No LTPA	41 (32.54)	85 (67.46)	0.469	0.494	-	-
LTPA	52 (28.89)	128 (71.11)				
Mean sitting time						
≤ 2 hour/day	55 (40.74)	80 (59.26)	12.229	<0.001	2.406	1.463-3.959
> 2 hour/day	38 (22.22)	133 (77.78)				

DISCUSSION

Childhood obesity has become a growing global epidemic issue now days. Being obese in childhood, are at risk of remaining obese during their adult life. On the other hand, children physical activity has been reduced now days, while the screen time with other digital instruments have been increased. Lifestyle recommendations for prevention and management of childhood obesity emphasize maintenance of daily moderate to vigorous PA for at least 60 min and highlight exacerbating factors such as television viewing and other screen time, which should be limited to not more than 2 hour per day.[6]

The weekly mean TV viewing time was found to be

154.97±60.66 minutes per day where 69.6 per cent of children watched television for more than two hours exceeding the AAP recommendation of screen time for children. This result was supported by studies with similar age group of children, which showed more than 60% of them watched TV for more than 2 hours.[5,6] Some other types of studies are also prevalent in the world where, amongst Greek children aged below age five, 26% of participants spend more than 2 hours watching television.[4]

Taking into account for gender, 73 percent of males and 65.7 percent of females watched television for more than 2 hours or more. A study had shown that more than eighty percent of both boys and girls aged between 10 to 12 years watched TV for more than 2 hours per day.[9] However, present study showed no statistical significance between males and females on TV viewing time (p=0.168). Another study showed that boys spend more time in screen related sedentary behavior than girls although the difference was not statistically significant (p=0.8).[10] Children of less educated mothers were watching an additional 2 hours of TV per day.[11]

Though engaged in any of the occupation, this study showed no statistical association between mothers occupation type and children television viewing time (p=0.508). This finding is supported by a study done in Greece which also showed no statistical association (p=0.552) between mothers occupation and child's screen time.[12]

Comparing the television viewing time of children with the recommended AAP guidelines, 69.6% children exceeded more than 2 hours of TV viewing time was more than in a study done in US cities and Canada[13, 14] which signify the patterns of television viewing time by children are more than the AAP recommendation of less than 2 hours per day in different parts of the world. The resulting factors might be parental TV viewing time, number of TV sets, TV in child bedroom, mothers education level, socio-economic status, eating meals by watching television, as an aid to fall asleep, to finish their work or to have rest and make their child eat their food.[2,4,13] When discussed based upon activity during leisure time, studies showed that children who watched TV for more than two hours daily and used motorized equipments were less likely to participate in any organized physical activity.[9,14] Eating while screen time is 1.67 times more likely to be associated with duration of television viewing and is statistically significant (p=0.004). Another study showed that TV were more likely to be on during meals in households with lower incomes and less educated mothers or single parents and wish to acquire sweets and candy shown in TV advertisements, may increase risk for obesity.[15]

Results showed that there was no statistical significance between television viewing time with physical activity level (p=0.271) and LTPA category (p=0.494), some study showed significant association (p<0.05).[5] However, mean sitting time was 2.41 times more like to be associated with television viewing time and are statistically significant (p<001). A study showed that 30 percent of participants had a sedentary lifestyles i.e. did not participate in moderate or vigorous activity at recommended level. Sedentary lifestyle was more common among participants in higher grades, females and racial and ethnic minorities.[10,13]

This study showed that obese children were 2.86 times more likely to be associated with television viewing time and is statistically significant (p=0.005). Similarly, obese children were also showed statistical significance with physical activity level (p=0.04) and LTPA level (p=0.00). This result was supported by a study done in Greece which showed significant association between BMI status and television viewing time of children (p=0.003). Likewise, children TV viewing time was three times more likely to be associated with obesity.[16-18]

Children's TV viewing habits have been reported to be associated with variety of significant behavioral consequences including obesity, poor eating habits, decreased physical activity and physical fitness, impaired school performance, sleeping disorder, attitude etc.[2] Efforts to reduce TV viewing among children can help reverse the epidemic of obesity in the country while promoting physical activity and healthy eating. Parents should monitor and limit children's TV viewing to no more than 2 hours per day as recommended by AAP guidelines and encourage alternative entertainments such as reading, travelling, athletics.[17]

CONCLUSION

The study concluded that, there is problem of television viewing among children for more than 2 hours per day. The mean daily TV viewing time of children was 154.97±60.66 minutes. About 19.3 percent of children fell in obese category. Mean BMI was 19.64±4.72. The association between obese children with TV viewing time (p=0.005) and physical activity level (p=0.04) along with LTPA level (p<0.001) of children are statistically significant. However, screen time of children is not significant with physical activity level. Parents should monitor and limit children's TV viewing to not more than 2 hours per day as recommended by AAP guidelines and encourage alternative entertainments like reading, walking and athletics.

ACKNOWLEDGEMENT

We want to forward my special thanks to institutional review committee of Pokhara University for providing ethical clearance for the research. Similarly, we would like to thank to all those participants who gave their valuable time and information for research without whom this study would not be completed.

REFERENCES

1. Braithwaite I, Stewart AW, Hancox RJ, Beasley R, Murphy R, Mitchell EA. The worldwide association between television viewing and obesity in children and adolescents: cross sectional study. PloS one, 2013 Sep 25; 8 (9):e74263.
2. Owens J, Maxim R, McGuinn M, Nobile C, Msall M, Alario A. Television-viewing habits and sleep disturbance in school children. Pediatrics, 1999 Sep 1;104 (3):e27.
3. Zimmerman FJ, Christakis DA. Children's television viewing and cognitive outcomes: a longitudinal analysis of national data. Archives of Pediatrics & Adolescent Medicine, 2005 Jul 1; 159 (7):619-25.
4. Kourlaba G, Kondaki K, Liarigkovinos T, Manios Y. Factors associated with television viewing time in toddlers and preschoolers in Greece: the GENESIS study. Journal of public health, 2009 Jun 1;31 (2):222-30.
5. Dutra GF, Kaufmann CC, Pretto AD, Albernaz EP. Television viewing habits and their influence on physical activity and childhood overweight. Jornal de Pediatria, 2015 Aug 31;91 (4):346-51.
6. Lazarou C, Soteriades ES. Children's physical activity, TV watching and obesity in Cyprus. The European Journal of Public Health, 2010 Feb 1;20 (1):70-7.
7. Faith MS, Berman N, Heo M, Pietrobelli A, Gallagher D, Epstein LH, Eiden MT, Allison DB. Effects of contingent television on physical activity and television viewing in obese children. Pediatrics, 2001 May 1;107(5):1043-8.
8. Fabio L. Ceschini, Douglas R. Andrade, Luis C. Oliveira, Jorge F. Araújo Júnior, Matsudo VKR. Prevalence of physical inactivity and associated factors among high school students from state's public schools. 2009.
9. Salmon J, Campbell KJ, Crawford DA. Television viewing habits associated with obesity: a survey of Melbourne school children. Medical Journal of Australia, 2006 Jan 16;184(2):64.
10. Mandich G, Burke S, Gaston A, Tucker P. The physical activity levels and sedentary behaviors of Latino Children in London. International journal of environmental research and public health, 2015 May 22;12(5):5528-39.
11. Certain LK, Kahn RS. Prevalence, correlates, and trajectory of television viewing among infants and toddlers. Pediatrics, 2002 Apr 1;109(4):634-42.
12. Manios Y, Kourlaba G, Kondaki K, Grammatikaki E, Anastasiadou A, Roma-Giannikou E. Obesity and television watching in preschoolers in Greece: the GENESIS study. Obesity, 2009 Nov 1;17(11):2047-53.
13. Lowry R, Wechsler H, Galuska DA, Fulton JE, Kann L. Television viewing and its associations with overweight, sedentary lifestyle, and insufficient consumption of fruits and vegetables among US high school students: differences by race, ethnicity, and gender. Journal of school health, 2002 Dec 1;72(10):413-21.
14. Kapil U, Bhadoria AS. Television viewing and overweight and obesity amongst children. Biomed J, 2014 Sep 1;37:337-8.
15. Habib K, Soliman T. Cartoons' effect in changing children mental response and behavior. Open Journal of Social Sciences, 2015;3 (09):248.
16. Coon KA, Goldberg J, Rogers BL, Tucker KL. Relationships between use of television during meals and children's food consumption patterns. Pediatrics, 2001 Jan 1;107(1)
17. Mendoza JA, Zimmerman FJ, Christakis DA. Television viewing, computer use, obesity, and adiposity in US preschool children. International Journal of Behavioral Nutrition and Physical Activity, 2007 Sep 25;4(1):1
18. Hancox RJ, Poulton R. Watching television is associated with childhood obesity: but is it clinically important?. International journal of obesity, 2006 Jan 1;30(1):171-5.