

Obesity and low vision as a result of excessive Internet use and television viewing

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Abstract

The technological age has resulted in children spending prolonged hours in front of television (TV) and computer screens (on the internet). The aim of this prospective cross-sectional study is to determine the effect of this phenomenon on both childhood obesity and low vision in the State of Qatar. A total of 3000 school students aged 6 to 18 years were approached from September 2009 to March 2010 and 2467 (82.2%) students agreed to participate. Face-to-face interviews based on a designed questionnaire were conducted. The highest proportion of obese children were aged between 15–18 years (9.4%; $p < 0.001$); spent ≥ 3 hours on the internet (5.6%; $p < 0.001$), and spent between 5–7 hours or less sleeping (4.1%; $p < 0.001$). Forty-six (1.9%) children spent ≥ 3 hours/day on the internet, and were either overweight/obese and had low vision. The study findings confirmed a positive association between obesity and low vision as a result of excessive time spent on the TV view and internet use.

Keywords: Excessive Internet use, television viewing, video game, obesity, low vision, children

Introduction

Since the introduction of television (TV) and other forms of mass communication (such as the Internet), concerns have been raised throughout the world for their impact on people's lifestyles; of particular concern has been the influence of such technologies on the lives of vulnerable groups such as children. Thus it is not surprising that numerous studies have been conducted to investigate the various potential risks associated with TV viewing (and exposure to other forms of technology). An underlying theme of the literature is the negative effect of the 'time spent' by children on TV/computer screens and the impact of this especially on children adopting sedentary lifestyle habits that are associated with obesity (Robinson, 1999, Crespo et al. 2001). Nonetheless, a surprisingly

small number—only one study (Kerr and Tapin 2002)—of studies have investigated the impact of this phenomenon on low vision, which this study will investigate in addition to associations with obesity.

Subjects and methods

A multi-stage stratified random sampling technique was used to select the schoolchildren randomly. A true random sample of the study population of 3,000 students (1.5% of the total students in Qatar) aged 6–18 years were approached from September 2009 to March 2010, and 2,467 (82.2%) students agreed to participate. Face-to-face interviews based on a designed questionnaire covering questions relating

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to socio-demographic factors, physical activity, dieting information, television viewing and computer use, and a vision assessment were conducted. The survey instrument was tested on 125 students and thus validated the questionnaire.

Ethical clearance for the study was obtained both from the Supreme Council of Education and Higher Education and Hamad Medical Corporation.

Age-specific and sex-specific categories of overweight and obese body mass index cut-off points, for the studied children, were defined as over the 85th and 95th percentiles, respectively, in accordance with the Qatari growth pattern curves devised by Bener and Kamal (2005).

The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) was used for definition of visual impairment categories. Eye examination was determined using a Slit Lamp (Topcon) and visual acuity with tumbling E letters at a distance of 6 m (20 feet). The participants' visual acuity without correction was measured separately for each eye. Low vision and blindness was defined as having best corrected vision in good eye

worse than 20/60 lower to 20/400 and worse than 20/400, respectively.

Student's *t*-test, the non-parametric Mann-Whitney test, the chi-square and Fisher's exact tests (two-tailed), one-way analysis of variance and the Spearman rank correlation coefficient were performed for the analysis.

Results

Table I presents the lifestyle habits and physical activity of the studied children according to body mass index. Of the 2,467 studied school children, 591 (24.0%) were either overweight (18.8%) or obese (5.1%). The highest proportion of obese children were aged between 15 and 18 years (9.4%; $P < 0.001$); spent ≥ 3 h on the Internet (5.6%; $P < 0.001$), and spent between 5 and 7 h or less sleeping (4.09%; $P < 0.001$). Moreover, 15.6% and 7.6% of the studied children who ate fast food on a daily basis were either overweight or obese, respectively.

Figure 1 is a Venn diagram that illustrates the proportion of those who spent ≥ 3 h/day on the Internet, in addition to being overweight or obese and had low vision.

Table I. Co-morbid lifestyle habits and physical activity of studied children according to body mass index ($n = 2,467$).

Variable	Body mass index			P value
	Normal (< 85 th percentile)*	Overweight (85th–95th percentile)*	Obese (> 95 th percentile)*	
<i>n</i>	1,876	464	127	
Gender				
Male	861 (74.1)	236 (20.3)	65 (5.6)	< 0.001
Female	1,015 (77.8)	228 (17.5)	62 (4.8)	
Age group				
Primary (6–10 years)	922 (94.8)	37 (3.8)	14 (1.4)	< 0.001
Intermediate (11–14 years)	480 (78.4)	102 (1.7)	30 (4.9)	
Secondary (15–18 years)	474 (53.7)	325 (36.8)	83 (9.4)	
Number of hours using Internet				
< 3 h/day	532 (82.0)	92 (19.8)	25 (3.9)	< 0.001
≥ 3 h/day	1,344 (73.9)	372 (20.5)	102 (5.6)	
Number of sleeping hours				
≤ 5 h	584 (71.4)	190 (23.2)	44 (5.4)	< 0.001
6–7 h	731 (71.5)	230 (22.5)	61 (6.0)	
> 7 h	561 (89.5)	44 (7.0)	22 (3.5)	
How often watching TV/video game				
Frequently	748 (80.4)	134 (14.4)	48 (5.2)	< 0.001
Infrequently	1,128 (73.4)	330 (21.5)	79 (5.1)	
Watching TV while eating				
During breakfast	653 (70.4)	216 (23.3)	59 (6.4)	< 0.001
During lunch	924 (75.2)	234 (19.1)	70 (5.7)	0.42
During dinner	1,135 (75.6)	283 (18.9)	83 (5.5)	0.554
Physical activity				
Vigorous activities 30 min/day	1,093 (75.8)	273 (18.9)	76 (5.3)	0.924
Moderate physical activities	1,025 (74.2)	277 (20.0)	80 (5.8)	0.039
Climbing flights of stairs	1,494 (72.7)	438 (21.3)	122 (5.9)	< 0.001
Daily walking 15 min	1,763 (75.5)	448 (19.2)	124 (5.3)	0.027
Do you eat fast food?	1,375 (76.8)	321 (17.9)	94 (5.3)	0.192
Frequency of eating fast food				
Daily	373 (76.7)	76 (15.6)	37 (7.6)	0.084
Weekly	672 (75.5)	174 (19.6)	44 (4.9)	
Monthly	500 (76.2)	127 (19.4)	29 (4.4)	
Occasionally	331 (76.1)	87 (20.0)	17 (3.9)	

*Bener and Kamal (2005). Data presented as n (%).

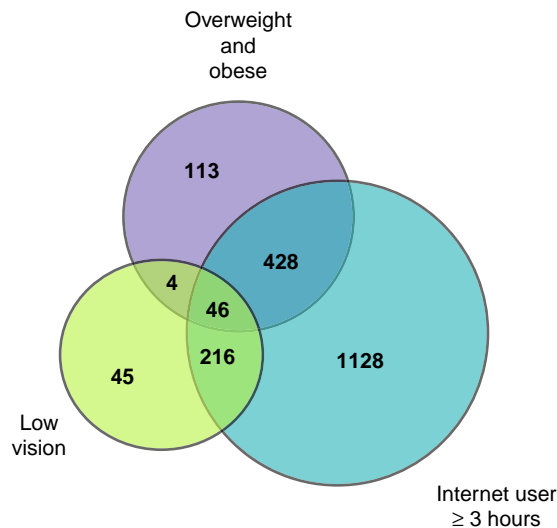


Figure 1. Venn diagram showing the overlapping of excessive Internet user with low vision and overweight / obese students ($n = 2,467$). Internet viewer ≥ 3 h = 1,818. Low vision = 311. Overweight and obese = 591.

Discussion

This study clearly indicates that children in Qatar show no exception to the global trend of rising obesity in developing countries (World Health Organization 2010). A particularly worrying trend is the fact that most of the overweight and obese children were in the 15–18 years age group, which means that they will continue their poor lifestyle habits into adulthood. The present study findings concur with previous studies that have demonstrated the odds ratio of becoming obese is significantly higher for those who spend > 4 h on the TV or computer (Musaiger et al. 2003, Andersen et al. 2005).

Overweight and obese children in the current study were sleeping significantly fewer hours than the recommended daily minimum of 9 h per night (Taras and Potts-Datema, 2005). This reinforces the documented relationship between lack of sleep and obesity (Van Cauter and Knutson, 2008, Ozturk et al. 2009, Magee et al. 2010).

While only one study (Kerr and Tapin 2002) has investigated the relationship between low vision and

time spent on TV and computer screens, our current findings clearly indicate that this is an important area for future research and public health awareness campaigns.

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References

- Andersen L, Lillegaard I, Overby N, Lytle L, Klepp K, Johansson L. 2005. Overweight and obesity among Norwegian schoolchildren: Changes from 1993 to 2000. *Scand J Public Health* 33:99–106.
- Bener A, Kamal A. 2005. Growth patterns of Qatari school children and adolescents aged 6–18 years. *J Health Popul Nutr* 23(3): 250–258.
- Crespo CJ, Smit E, Troiano RP, Bartlett SJ, Macera CA, Andersen RE. 2001. Television watching, energy intake, and obesity in US children. *Arch Pediatr Adolescent Med* 155: 360–365.
- Kerr CM, Tappin DM. 2002. Do poor nutrition and display screens affect visual acuity in children? *Br J Community Nurs* 7:80–89.
- Magee CA, Iverson DC, Caputi P. 2010. Sleep duration and obesity in middle-aged Australian adults. *Obesity* 18(2):420–421.
- Musaiger A, Lloyd O, Bener A, Al-Neyadi S. 2003. Lifestyle factors associated with obesity among male university students in the UAE. *Nutr Food Sci* 33:145–147.
- Ozturk A, Mazicioglu M, Poyrazoglu S, Cicek B, Gunay O, Kurtoglu S. 2009. The relationship between sleep duration and obesity in Turkish children and adolescents. *Acta Paediatr* 98(4): 699–702.
- Robinson TN. 1999. Reducing children's television viewing to prevent obesity: A randomized controlled trial. *JAMA* 282: 1561–1567.
- Taras H, Potts-Datema W. 2005. Sleep and student performance at school. *J School Health* 75(7):248–254.
- Van Cauter E, Knutson KL. 2008. Sleep and the epidemic of obesity in children and adults. *Eur J Endocrinol* 159(Suppl 1):S59–S66.
- World Health Organization. 2010. Childhood overweight and obesity. Available online at: <http://www.who.int/dietphysical-activity/childhood/en/> (accessed 7 March 2010).

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