Med. J. Cairo Univ., Vol. 87, No. 7, December: 4221-4226, 2019
www.medicaljournalofcairouniversity.net

Prolonged Daily Screen-Time among Saudi Secondary School Students

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Abstract

Background: Media is a powerful educational tool for children and adolescents, but they may have a great negative effect on their health. Prolonged screen-time is a risk for several chronic diseases.

Aim of Study: To assess daily screen-time among Saudi secondary school students.

Subjects and Methods: Following a cross-sectional study design in Abha City, a total of 384 secondary school students were included. A self-administered questionnaire was developed by the researcher to assess students' screen-time (i.e., more than two hours per day).

Results: Screen times of about three-fourths of secondary school students were more than two hours. Smartphones were the most frequently used electronic devices (71.1%), followed by the watching television (54.4%), videogames (50.8%), and computers (39.1%). Screen times increase significantly during weekends (p<0.001). Screen times were significantly higher among males (p=0.001). Students with higher Grade Point Average (GPA) had significantly more screen times (p<0.001). Moreover, students' prolonged daily screen-time was significantly associated with higher family monthly income (p=0.03).

Conclusions: Most secondary school students have prolonged daily screen time. The most frequently used electronic devices are smartphones. Use of electronic devices increases during weekends and entertainment is the most frequent purpose for prolonged screen time. Screen-time is significantly higher among boys, those with high GPA and among students in families with high monthly income.

Recommendations: Health education of adolescents and their parents to raise their awareness regarding health risks associated with prolonged screen-time and how they can positively influence their children by enforcing family rules to limit using electronic devices.

Key Words: *Screen-time – Electronic devices – Adolescents.*

Introduction

NOWADAYS, with the rapid growth of the digital environment, children and adolescents grow up watching televisions, and using videogames, smartphones and computers, tablets, and mobile phones associated with their development [1]. However, despite the fact that media is a powerful educational tool for children and adolescents, they may have a great negative effect on their health. With the associated sedentary activity, prolonged screen-time is a risk for several chronic diseases, including obesity, declining levels of fitness, malnutrition, and sleep problems [2].

The American Academy of Pediatrics recommended that consistent limits should be placed on the time spent by children using media, less than two hours daily, and to make sure that media does not take the place of adequate sleep, physical activity or other behaviors essential to health [3].

Therefore, the present study aimed to assess screen-time among Saudi secondary school students in Abha City, Saudi Arabia.

Subjects and Methods

Following a cross-sectional study design in Abha City, Saudi Arabia. All students registered for the scholastic year 2017-2018 at governmental secondary schools in Abha City constituted the study population. The total number of students registered in governmental secondary schools in Aseer Region is 32351 students (18739 boys and 13612 girls), distributed over 168 schools (98 for boys and 70 for girls).

The minimum sample size for this study has been decided according to Dahiru et al., [4], (with a 50% assumed proportion of participants with prolonged screen-time and a maximum acceptable error of 0.05) to be 384 students.

Data were collected during November-December 2018. A multistage stratified random sample was applied by selecting schools and students from the Directorate of Education in Abha

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City, Aseer Region. Four governmental general secondary schools were selected by simple random sampling technique (two for boys and two for girls) by drawing the names of schools from the sampling frame. After that, three classes of students were randomly selected from each school using a simple random sampling technique (one class for each scholastic grade). All students in a selected class were invited to participate in the study so as to fulfill the required total sample size.

A self-administered questionnaire was used. The questionnaire was designed by the researcher. The study questionnaire consisted of demographic and personal data of students, estimated number of screen-time hours spent by the student. Face and content validity of the study tool was assessed by three academic professors of Pediatrics, Family Medicine and Community Medicine at King Khalid University. Internal consistency of the study questionnaire was assessed by Cronbach's alpha reliability coefficient, which showed values ranging from 0.7 to 0.8.

A pilot study was applied on 40 students (20 boys and 20 girls at two secondary schools) to test the study tool's applicability and all necessary modifications were made by the researcher to meet the study objectives. Collected data from the pilot study were not used in the main study.

Prior to data collection, all necessary official approvals were fulfilled, i.e., approval of the Educational Affairs in Aseer Region and the selected study schools' directors.

Participation in the study was based on a written informed consent to be signed by each participant student. The researcher stressed that participant responses should not be shared with colleagues. Anonymity of responses was considered to guarantee honest and more accurate self-reporting. All collected data were kept completely confidential and were not used except for research purposes.

The Statistical Package for Social Sciences (SPSS Version 25) was used for data entry and statistical analysis. p-values less than 0.05 were considered as statistically significant.

Results

Table (1) shows that 72.1% of students were less than 15 years old, while 27.9% were 15 years or older. Half of students (50%) were males. About one fourth of students (22.4%) were at their first scholastic grade, while 46.9% were at their second grade and 30.7% were at their third grade. The GPA of 46.9% of students was above 90%, 41.4% had 80-90%, while 11.7% had <80%.

Table (2) shows that 60.7% of students' fathers and 54.7% of students' mothers were 40-50 years old, 18% of students' fathers and 25.5% of students' mothers were less than 40 years old, while 21.4 of students' fathers and 19.8% of students' mothers were more than 50 years old. The majority of parents (93.2%) were married, while 3.6% were divorced and 3.1 % were widowed. Half of students' fathers (50%) and 36.7% of students' mothers were university graduates, while 31.8% of students' fathers and 47.1% of students' mothers had high school degrees, 4.7% of students' fathers and 9.1% of students' mothers were illiterate, while 13.5% of students' fathers and 7% of students' mothers had postgraduate degrees. Most students' fathers (59.9%) were full-time employed, while 40.1 % were part-time employed. Most students' mothers (77.1%) were unemployed. The monthly income of 20.8% of students' families was less than 5000 SR, 44% had 5000-9999 SR, 30.5% had 10,000-19999 SR and 4.7 had 20,000 SR or more. Almost half of students' (48.2%) had 4-6 siblings, 29.2% had less than 4 siblings, while 22.7% had more than 6 siblings. The majority of students (88%) were living with their parents, while 4.2% were living with their fathers only and 7.8% were living with their mothers only.

Table (3) shows that 28.9% of students use electronic devices for less than 2 hours, 45.1% of students use electronic devices for 2-4 hours, while 26% use them for more than 4 hours. The smartphones were the most frequently used electronic devices (71.1%), followed by the television (54.4%), videogames (50.8%), and computers (39.1%), as shown in Fig. (1).

Table (4) and Fig. (2) show that use of electronic devices increases significantly at weekends (p <0.001). Entertainment was the main purpose for use of electronic devices more than 2 hours daily, followed by watching TV and lastly educational purposes. Use of electronic devices for entertainment and watching TV were significantly more during weekends than weekdays (p<0.001 and p=0.02, respectively). However, use of electronic devices for educational purposes did not differ significantly during weekends.

Table (5) shows that use of electronic devices for more than two hours was significantly higher among male students than female students (p= 0.001). Moreover, there was a significantly higher tendency for longer use of electronic devices among

students with higher GPA (p<0.001). However, use of electronic devices did not differ significantly according to students' age groups, or scholastic grade.

Table (6) shows that students' prolonged screen-time was significantly associated with higher household monthly income (p=0.03). However, their screen-time did not differ significantly according to their other family characteristics.

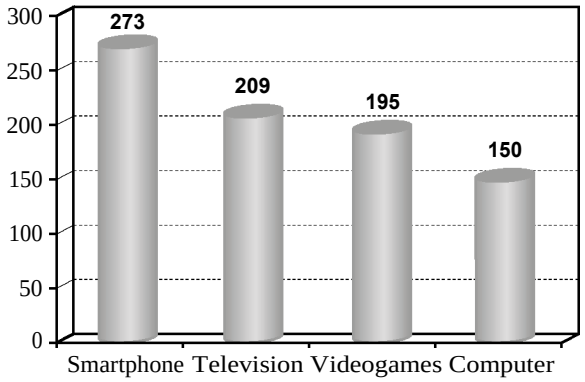

Fig. (1): Used electronic devices.

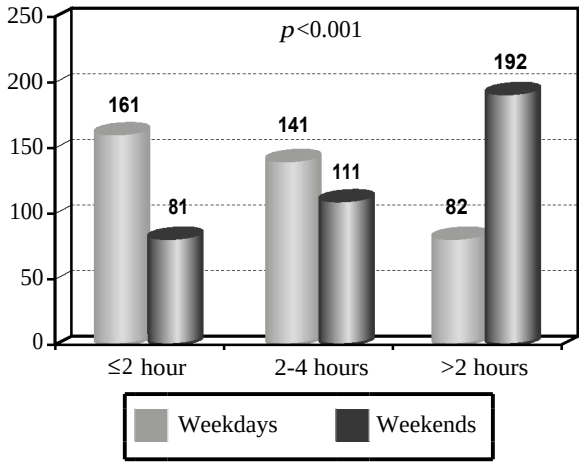

Fig. (2): Students' daily use of electronic devices during weekdays and weekends.

Table (1): Personal characteristics of participant students.

Characteristics	No.	%
Age groups:		
<15 years	277	72.1
>15 years	107	27.9
Gender:		
Male	192	50.0
Female	192	50.0
Scholastic grade:		
1st	86	22.4
2nd	180	46.9
3rd	118	30.7
Previous year's Grade Point Average (GPA):		
>90%	180	46.9
80-90%	159	41.4
<80%	45	11.7

Table (2): Personal characteristics of students' family.

Characteristics	No.	%
Fathers' age groups (in years):		
<40	69	18.0
40-50	233	60.7
>50	82	21.4
Fathers' age groups (in years):		
<40	98	25.5
40-50	210	54.7
>50	76	19.8
Parents' current marital status:		
Married	358	93.2
Divorced	14	3.6
Widowed	12	3.1
Fathers' educational level:		
Illiterate	18	4.7
School	122	31.8
University degree	192	50.0
Postgraduate degree	52	13.5
Mothers' educational level:		
Illiterate	35	9.1
School	181	47.1
University degree	141	36.7
Postgraduate degree	27	7.0
Father's employment status:		
Full-time	230	59.9
Part-time	154	40.1
Mother's employment status:		
Employed	88	22.9
Housewife	296	77.1
Household income (in SR):		
<5000	80	20.8
5000-9999	169	44.0
10,000-19999	117	30.5
>20,000	18	4.7
No. of siblings:		
<4	112	29.2
4-6	185	48.2
>6	87	22.7
Child living with:		
Father only	16	4.2
Mother only	30	7.8
Both parents	338	88.0

Table (3): Characteristics of using electronic devices (screen time) by participant students.

Characteristics	No.	%
Average duration of daily screen time:		
<2 hours	111	28.9
2-4 hours	173	45.1
>4 hours	100	26.0
Daily used electronic devices:		
Smartphone	273	71.1
Television	209	54.4
Videogames	195	50.8
Computer	150	39.1

Table (4): Frequency of students' different electronic devices activities during weekdays and weekends.

Purposes for screen time	<2 hours		2-4 hours		>4 hours		*p*-value
	No.	%	No.	%	No.	%	
Use of electronic devices:							
Weekdays	1	41	1	36.7	82	21.4	
Weekends		21	1	28.9	192	50.0	<0.001
Entertainment purposes:							
Weekdays	1	45	1	39.6	57	14.8	
Weekends	1	30	1	29.9	153	39.8	<0.001
Educational purposes:							
Weekdays	2	75		20.8	14	3.6	
Weekends	2	77		17.2	19	4.9	0.327
Watching TV:							
Weekdays	2	71		23.4	20	5.2	
Weekends	2	67		21.9	41	10.7	0.020

Table (5): Duration of students' screen-time according to their personal characteristics.

Personal characteristics	<2 hours		2-4 hours		>4 hours		*p*-value
	No.	%	No.	%	No.	%	
Age groups:							
<15 years	74	26.7	126	45.5	77	27.8	
›_15 years	37	34.6	47	43.9	23	21.5	0.238
Gender:							
Male	41	21.4	103	53.6	48	25.0	
Female	70	36.5	70	36.5	52	27.1	0.001
Scholastic Grade:							
1st	25	29.1	40	46.5	21	24.4	
2nd	46	25.6	76	42.2	58	32.2	
3rd	40	33.9	57	48.3	21	17.8	0.086
Grade Point Average (GPA):							
>90%	39	21.7	87	48.3	54	30.0	
80-90%	46	28.9	72	45.3	41	25.8	
<80%	26	57.8	14	31.1	5	11.1	<0.001

Table (6): Duration of students' screen-time according to their family characteristics.

Family characteristics	<2 hours		2-4 hours		>4 hours		*p*-value
	No.	%	No.	%	No.	%	
Fathers' age groups:							
<40 years	18	26.1	35	50.7	16	23.2	
40-50 years	68	29.2	101	43.3	64	27.5	
>50 years	25	30.5	37	45.1	20	24.4	0.845
Mothers' age groups:							
<40 years	24	24.5	48	49.0	26	26.5	
40-50 years	64	30.5	92	43.8	54	25.7	
>50 years	23	30.3	33	43.4	20	26.3	0.851
Current marital status:							
Married	101	28.2	161	45.0	96	26.8	
Divorced	4	28.6	6	42.9	4	28.6	
Widowed	6	50.0	6	50.0	0	0.0	0.265
Fathers' educational level:							
Illiterate	8	44.4	8	44.4	2	11.1	
School	42	34.4	51	41.8	29	23.8	
University graduate	45	23.4	94	49.0	53	27.6	
Postgraduate degree	16	30.8	20	38.5	16	30.8	0.192
Mothers' educational level:							
Illiterate	14	40.0	17	48.6	4	11.4	
School	58	32.0	71	39.2	52	28.7	
University graduate	33	23.4	71	50.4	37	26.2	
Postgraduate degree	6	22.2	14	51.9	7	25.9	0.125
Father's employment status:							
Full-time	65	28.3	112	48.7	53	23.0	
Part-time	46	29.9	61	39.6	47	30.5	0.153
Mother's employment status:							
Employed	29	33.0	36	40.9	23	26.1	
Housewife	82	27.7	137	46.3	77	26.0	0.582
Household income:							
<5000 SR	29	36.3	34	42.5	17	21.3	
5000-9999 SR	53	31.4	79	46.7	37	21.9	
10,000-19999 SR	27	23.1	48	41.0	42	35.9	
›_20,000 SR	2	11.1	12	66.7	4	22.2	0.030
No. of siblings:							
<4	26	23.2	60	53.6	26	23.2	
4-6	54	29.2	77	41.6	54	29.2	
>6	31	35.6	36	41.4	20	23.0	0.163
Child living with:							
Father only	7	43.8	5	31.3	4	25.0	
Mother only	10	33.3	15	50.0	5	16.7	
Both parents	94	27.8	153	45.3	91	26.9	0.474

Discussion

Findings of the present study revealed that more than half of secondary school students in Abha City use electronic devices for more than two hours, mainly smartphones (71.7%), TV (54.4%), videogames (50.8%), and computers (39.1%).

Similar findings were reported by Patriarca et al., [5] among adolescents aged 11-16 years in the Campania Region, South of Italy, who found that 52.5% of them always watched television, mostly more than two hours daily and the frequency of watching for at least two hours daily (74.9%), while two-thirds of the students played videogames for 1.6 hours daily and the computer was used by 85% of the sample for 1.6 hours daily.

In China, Jiang et al., [6] found that TV watching and playing on the computer were the most prevalent screen-time behaviors among adolescents. Playing with mobile phones was less prevalent. In USA, average time spent daily by adolescents in viewing TV was 3.1 hours, while those of videogames playing and computer using were 1.49 and 1.19 hours, respectively [7]. Moreover, in New Zealand, the average time spent daily by adolescents in viewing TV was 3.1 hours [8].

Results of this study showed that screen times increase during their weekends and entertainment was the most frequent purpose for using electronic devices. Students' screen times were significantly more among male than female students, and among students with high Grade Point Average (GPA). However, their screen times did not differ significantly according to other personal characteristics (e.g., age group, or scholastic grade). Moreover, screen-time was significantly more among students with higher household monthly income. However, their screen times did not differ significantly according to other family characteristics (e.g., parents' age group, current marital status, educational level, employment status, or number of siblings).

Our findings are in accordance with those of LeBlanc et al., **[9]**, who noted that boys reported significantly more video game/computer usage than girls. Bucksch et al., **[10]** also found that boys have more screen-time than girls and that there is more ST on weekends than on weekdays. Similarly, Ye et al., **[11]** reported that male sex, and weekends were significantly associated with prolonged screen time.

Hoyos Cillero and Jago **[12]** attributed the sex difference regarding screen-time to the observation that boys usually spend more time on computers and tablets than girls. Moreover, Babey et al., **[13]** reported that boys usually spend more time watching television than girls. Higher household income is associated with more TV watching, but with less computer use.

The lack of significant differences in the present study among students' screen-time according to their age may be explained by the relatively narrow age range, while the significantly more screen-time during weekends may be explained by the time spent at school during the weekdays, which is totally spared for free activities, including use of electronic devices, during weekends.

Jago et al., **[14]** suggested reducing TV-watching time through school-based educational components assisted by parental involvement with students' homework. Jiang et al., **[6]** added that health education should include adolescents' parents to raise their awareness regarding health risks associated with high screen-time and how they can positively influence their children by enforcing family rules to limit using electronic devices.

The significantly more screen-time among participant students in the present study with higher Grade Point Average (GPA) may reflect the educational benefits of electronic devices. However, Jiang et al., **[6]** emphasized the potential harms of excessive use of computers or tablet devices, even when it is for educational purposes.

Results of the present study can be useful for developing and planning effective future preventive strategies against to minimize screen-time among adolescents.

Based on findings of the present study, it can be concluded that most secondary school students in Abha City, have prolonged daily screen times (above two hours). The most frequently used electronic devices are mainly smartphones, TV, videogames, and computers. Use of electronic devices increases during weekends and entertainment is the most frequent purpose for prolonged use electronic devices. Screen-time is significantly higher among boys, those with high GPA and among students in families with high monthly income.

Therefore, immediate and comprehensive actions are needed in order to diminish time spent at watching television, playing videogames, and using computers by adolescents. TV-watching time can be minimized through school-based educational components assisted by parental involvement with students' homework. Moreover, it is necessary to provide health education of adolescents and their parents aiming to raise their awareness regarding health risks associated with high screen time and how they can positively influence their children by enforcing family rules to limit using electronic devices.

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التعرض اليومى المطول لطلاب المدارس الثانوية السعوديين آمام الشاشات الإلكترونية

الخلفية: إن الوسائط آداة تعليمية قوية للآطفال والمراهقين، ولكن – فى نفس الوقت – قد يكون لها تآثير سلبى كبير على صحتهم، حيث يشكل تعرضهم لفترة طويلة آمام الشاشات الإلكترونية خطراً على صحتهم، مما قد يؤدى إلى إصابتهم لعدة آمراض مزمنة.

هدف البحث: تقييم وقت التعرض اليومى للطلاب السعوديين بالمدارس الثانوية آمام الشاشات الإلكترونى.

منهجية البحث: آجريت الدراسة الحالية بمدينة آبها، بالمملكة العربية السعودية، متبعة النمط البحثى المستعرض، وقد تضمنت ٣٨٤ طالباً بالمدارس الثانوية. كما قام الباحث بتصميم إستبيان لتقييم وقت التعرض اليومى آمام الشاشات الإلكترونية المطول (آكثر من ساعتين فى اليوم) للطلاب.

النتائج: كانت آوقات التعرض اليومى آمام الشاشات الإلكترونية لحوالى ثلاثة آرباع طلاب المدارس الثانوية آكثر من ساعتين، وكانت الهواتف الذكية هى الآجهزة الإلكترونية الآكثر إستخداماً (٧١.١٪)، تليها مشاهدة التلفزيون (٥٤.٤٪)، وآلعاب الفيديو (٥٠.٨٪)، وآجهزة الكمبيوتر (٣٩.١٪). ولوحظت زيادة مرات التعرض للشاشات الإلكترونية بشكل كبير خلال عطلات نهاية الإسبوع (ح آقل من ٠.٠٠١)، وكان وقت التعرض للشاشات آطول بكثير بين الذكور (ح=٠.٠٠١)، وكان للطلاب الذين لديهم معدل تراكمى (GPA) آعلى آوقات تعرض آطول بكثير (ح آقل من ٠.٠٠١)، وعلاوة على ذلك، فقد إرتبط وقت التعرض اليومى للطلاب آمام الشاشات الإلكترونية بشكل كبير مع إرتفاع دخل الآسرة الشهرى (ح=٠.٠٠٣).

الإستنتاجات: يقضى معظم طلاب المدارس الثانوية وقتاً مطولاً بصفة يومية آمام الشاشات الإلكترونية، والآجهزة الإلكترونية الآكثر إستخداماً هى الهواتف الذكية. ويزداد إستخدام الآجهزة الإلكترونية خلال عطلات نهاية الإسبوع، ويعتبر الترفيه هو الغرض الآكثر شيوعاً للتعرض المطول آمام الشاشات الإلكترونية. كما يعد التعرض للشاشات الإلكترونية آطول بين الآولاد والطلاب ذوى المعدل التراكمى العالى وبين الطلاب فى الآسر ذات الدخل الشهرى المرتفع.

التوصيات: هناك ضرورة ملحة لتطبيق لتثقيف الصحى طلاب الثانوية وآولياء آمورهم، وذلك بهدف رفع وعيهم بشآن المخاطر الصحية المرتبطة بالتعرض لفترات مطولة آمام الشاشات الإلكترونية، وكيف يمكنهم التآثير إيجابياً على آطفالهم للحد من الإستخدام اليومى المطول للآجهزة الإلكترونية.