

Original Article

ASSESSMENT OF ELECTRONIC GADGETS USE AND ITS' EFFECTS ON DAILY LIFE AND HEALTH OF PRIMARY SCHOOL CHILDREN

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ABSTRACT

Background: Electronic devices are the latest exquisite invention of our modern life and it makes our life so easy and comfortable. Electronic gadgets are now used by the primary school children in a wider scale during the COVID-19 pandemic. It is imperative to explore its effect of daily life and health of the school children. The objective of the study was to determine the technological interaction of the children and how it is affecting their daily routine, grades and physical health.

Methods: This is a cross-sectional study among the students of grade four. A total 340 students were selected by random sampling method from four schools. Data were collected by face to face interview with a structured pretested questionnaire. The study was conducted at Dhanmondi Govt. Boys' High School, Kamrunnessa Govt. Girls School, Dhanmondi, Bangladesh International School and College (BISC), Mohakhali and SOS Hermann Gmeiner College, Mirpur, Dhaka, Bangladesh. Data were collected from May to October, 2019. Data analysis, findings and results were prepared in November and December, 2019.

Results: Among 340 respondents of this study, maximum (78.2%) students watch TV daily, 55.9% of them play with the mobile every day and half (50%) of the students use the tablet daily. Majority (79.7%) respondents have internet at their home and 36.5% of them use the net alone. The causes of usage are- 37.9% students use for entertainment purpose, 26.5% use for education purpose and 34.4% use for both entertainment and education purpose.

Conclusion: Children are the future generation of our country. So, it is a prime need to look into this problem and protect our children from the threat of electronic gadget use.

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INTRODUCTION

Electronic devices are the latest exquisite invention of our modern life. It makes our life so easy and comfortable. In order to perform our daily works we intentionally give these gadgets to our beloved children without knowing how grievously it would affect them. According to the expert opinions of

different researchers, children are not having stable emotion because when they use gadgets, their emotions are less stimulated.^{1, 2} Extensive use of gadgets from very early age will subsequently affect the child's cognitive and developmental growth, weight, alter the school performance and sleep pattern.³ It has been established that excessive use of screen media releases dopamine which might produce addiction which is similar to drug cravings.²

Now-a-days, parents used to control and influence their children's lives due to social unrest and due to adults' dysfunctional cultural practices, they prefer their children to play indoor games and provide them with the latest technical devices.⁴ Loss of natural surroundings in the neighborhood of the child and city is disrupting our children's relationship with nature.⁴ This environmental threat might develop anxiety, depression and attention-deficit problems in children.⁴ Considering all these, this study tends to find the current status of using the electronic devices.

METHODS

After getting the ethical clearance from Institutional Review Board of Bangladesh University of Professionals of Dhaka, Bangladesh, this cross sectional study was carried out among the students of grade 4 of four different schools of two wards of Dhaka city. Two schools from South Dhaka City Corporation, Dhanmondi Govt. Boys’ High School and Kamrunnessa Govt. Girls School, Dhanmondi were selected. Bangladesh International School and College (BISC), Mohakhali and one private school SOS Hermann Gmeiner College, Mirpur from North Dhaka City Corporation were chosen. The study used simple random sampling method to recruit the study participants in the study. The sample size was 340, calculated by using the formula for cross-sectional study: $n = z^2pq / d^2$, where n = sample size, $z = 1.96$ (95% confidence interval), p = proportion of impact on academic performance due to use of modern electronic gadgets among students= 33.0%= 0.33 [1], $q = 1-p = 1-0.33 = 0.67$, d = margin of error= 5%= 0.05. This size of samples was divided into four schools

and was labeled numerically. Then eighty-five students were selected by lottery. Three research instruments were used in this study for effective and adequate quantitative data collection. They are- 1) Scales for measurement of height and weight, 2) Questionnaire for the students for structured interview, 3) Review of the result cards and vision test. The students’ questionnaire was filled by interviewing them. Before interview a standardized set of questions were set determined by pilot study. Students’ physical tests were carried out by measuring weigh, height and reviewing the vision test. Lastly their report cards were collected to review their academic performances. After collection of data, analysis was be done by SPSS 20 using descriptive and cross-tab test. Then the results were formed and made necessary recommendations.

RESULTS

Among 340 respondents of this study, maximum (78.2%) students watch TV, 55.9% of them play with the mobile and half (50%) of the students use the tablet daily.

Table 1: Association between technological interaction and grades of the students (n=340)

Technology	Interactions	Frequency (%)	A+	A	B+	B	X2
Watch TV daily	Yes	266 (78.2%)	134	96	26	10	0.871
	No	70 (20.6%)	40	23	3	4	
	Sometimes	3 (0.9%)	2	1	0	0	
	Others	1 (0.3%)	1	0	0	0	
Play mobile phone daily	Yes	332 (97.6%)	171	120	28	13	0.153
	No	8 (2.4%)	6	0	1	1	
Use Tablet daily	Yes	170 (50%)	99	54	10	7	0.090
	No	170 (50%)	78	66	19	7	
Internet present at home	Yes	271 (79.7%)	135	101	25	10	0.249
	No	69 (20.3%)	42	19	4	4	
Use internet alone	Yes	124 (36.5%)	61	47	14	2	0.145
	No	216 (63.5%)	116	73	15	12	

Cause of use	For entertainment	129 (37.9%)	68	41	14	6	0.871
	For education	90 (26.5%)	48	35	5	2	
	Both	117 (34.4%)	59	42	10	6	
	Other purposes	4 (1.2%)	2	2	0	0	

Majority (79.7%) respondents have internet at their home and 36.5% of them use the net alone. The causes of usage are- 37.9% students use for

entertainment purpose, 26.5% use for education purpose and 34.4% use for both entertainment and education purpose.

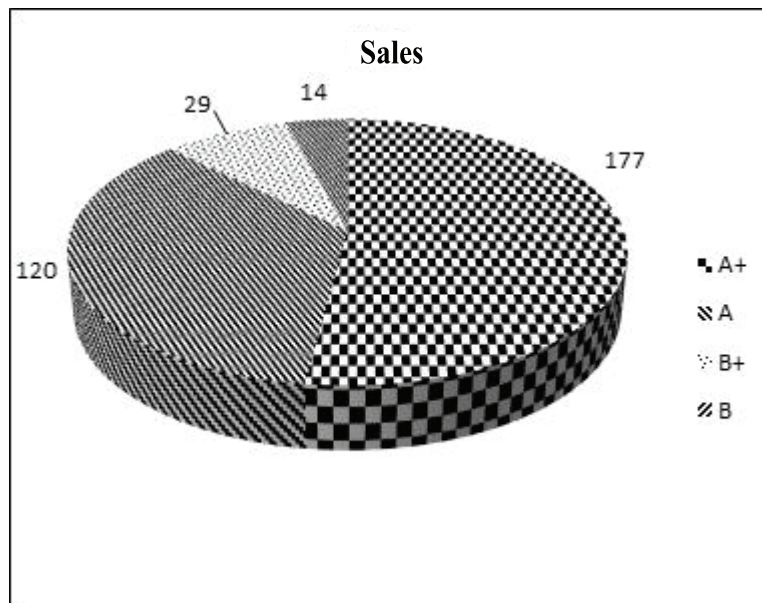


Figure 1: Pie chart showing grades of the students (n=340)

Fig1: Pie chart showing grades of the students (n=340)

Figure 1 shows the student's grades of the exam which include (177) 52.1% students got grade A+, (120)

35.3% got grade A, (29) 8.5% got B+ and (14) 4.1% got grade B.

Table 2: Association between purpose, duration of internet use and grades of the students (n=340)

Purpose	Duration	Frequency (%)	Grade				Chi-square test P-value
			A+	A	B+	B	
Watching TV in a day	1 hour	219 (64.4%)	109	82	18	6	.561
	2 hours	71 (20.9%)	42	19	4	6	
	3 hours	22 (6.5%)	10	8	3	1	
	4 hours	19 (5.6%)	10	7	2	0	
	0 hour	13 (3.8%)	6	4	2	1	

Playing mobile phone	1hour	261 (76.8%)	133	94	25	9	.228
	2hours	53 (15.6%)	27	19	3	4	
	3hours	13 (3.8%)	9	3	0	1	
	4hours	4 (1.2%)	1	4	0	0	
	0hour	8 (2.4%)	7	0	1	0	
HW done in internet	1-2 hours	174 (51.2%)	87	69	12	6	.436
	3-4 hours	18 (5.3%)	12	5	1	0	
	More than 4 hours	3 (0.9%)	2	0	1	0	
	Does not watch	145 (42.6%)	76	46	15	8	
Watching cartoon	1-2 hours	230 (67.6%)	122	85	17	6	.137
	3-4 hours	9 (13.8%)	22	15	7	3	
	More than 4 hours	47 (2.6%)	3	3	1	2	
	Does not watch	54 (15.9%)	30	17	4	3	
Playing online games	1-2 hours	194 (57.1%)	97	74	19	4	.021
	3-4 hours	13 (3.8%)	5	3	2	3	
	More than 4 hours	5 (1.5%)	4	1	0	0	
	Does not watch	128 (37.6%)	71	42	8	7	
Watching music video	1-2 hours	169 (49.7%)	88	58	14	9	0.889
	3-4 hours	26 (7.6%)	12	11	3	0	
	More than 4 hours	10 (2.9%)	4	4	1	1	
	Does not watch	135 (39.7%)	73	47	11	4	

Table 2 shows that 64.4% students watch TV for 1hour, 20.9% students watch 2 hours, 6.5% watch 3 hours and 5.6% students watch 4 hours a day. Majority students (76.8%) play with mobile for an hour, 15.6% students for 2 hours, 3.8% for 3hours and only 1.2% for 4 hours a day. About 42.6% students play with tablet for 1 hour, 5.3% for 2 hours and 2.1% students for 3 hours a day. Maximum

(67.6%) students watch cartoon, 57.1% students play online games and 49.7% students watch music video for 1-2 hours a day. The percentage of students who watch cartoon for 3-4 hours are 13.8% and more than 4 hours are 2.6%. About 3.8% students play online games for 3-4 hours and 1.5% for more than 4 hours. About 7.6% students watch music videos for 3-4 hours and 2.9% for more than 4 hours.

Table 3: Association between gender and use of different technologies

Technology	Daily use	MALE	FEMALE	Chi-square test p-value
		(n=224)	(n=116)	
TV	Yes	181	85	0.246
	No	41	29	
Mobile	Yes	219	113	.838
	No	5	3	

Tablets	Yes	118	52	0.170
	No	106	64	
Grades	A+	117	60	.538
	A	75	45	
	B+	21	8	
	B	11	3	
Cause of use of gadgets	For entertainment	89	40	.719
	For education	59	31	
	Both	73	44	
	Others	3	1	
Feeling when gadget is taken away	Angry	73	19	0.004
	Sad	34	17	
	Not Bothered at all	119	80	

Among 340 student participants, 224 are male and 116 are female (table 3). The numbers of students who watch TV daily are 181 males and 85 females. The numbers of male students who play with mobile and tablets daily are 219 and 118. The number of female students who play with mobile and tablets daily are 113 and 52 respectively. The ‘p’ value for

watching TV, mobile and tablets are > 0.05 which is non-significant. So, there is no relation between gender and watching TV, mobile or tablets. Also gender has no association with causes of gadget use (‘p’ value >.05). Gender has an association with the feelings when gadgets are taken away from them (‘p’ value <.05).

Table 4: Association between leisure activities and grades of the students (n=340)

Leisure activity	Type of activities	Frequency (%)	A+	A	B+	B	X2	
Works done during eating	Eat with all on table	208 (61.2%)	114	68	20	6	.770	
	Watch TV during eating	104 (30.6%)		40	7	7		
	Play mobile during eating	24 (7.1%)		50	10	2		1
	Watch Tab during eating	4 (1.2%)		2	2	0		0
Works done before sleeping	Watch TV	130 (38.2%)	69	39	13	9	.334	
	Play with mobile /tab	47 (13.8%)	22	20	4	1		
	Read books	163 (47.9%)	86	61	12	4		
Like to play in the park	Yes	264 (77.6%)	130	101	33	10	.000	
	No	36(10.6%)	26	7	2	1		
	Sometimes	37 (10.9%)	21	11	4	1		
	Often	3(0.9%)	0	1	0	2		

Favorite games to play	Online games	135 (39.7%)	75	47	9	4	.814
	Indoor games	104 (30.6%)	51	38	9	6	
	Outdoor games	101(29.7%)	51	35	11	4	

In table 4, we can see that 39.7% student’s favorite game is an online game, 30.6% students play indoor games and 29.7% students play outdoor games. About 30.6% students watch TV, 7.1% watch mobile while eating but maximum (61.2%) eat on the table

along with their family members. About 38.2% students watch TV before sleeping, 13.8% students play with mobile and 47.9% students used to read books before sleeping.

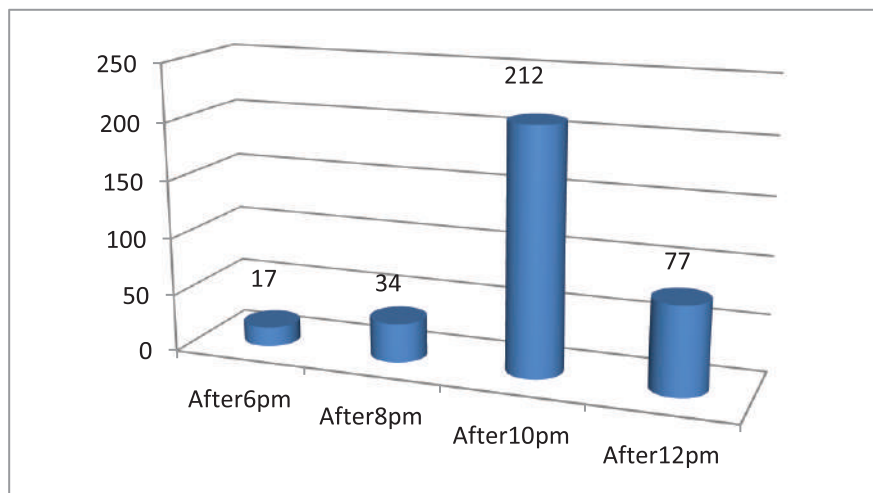


Figure 2: Sleeping time of the students (n=340)

Figure 2 show that maximum (62.4%) students used to sleep after 10 pm and (84.7%) rise after 6 am (figure 3). The number of students who used to sleep

after 8pm is 10% and after 12pm are respectively 10% and 22.6%.

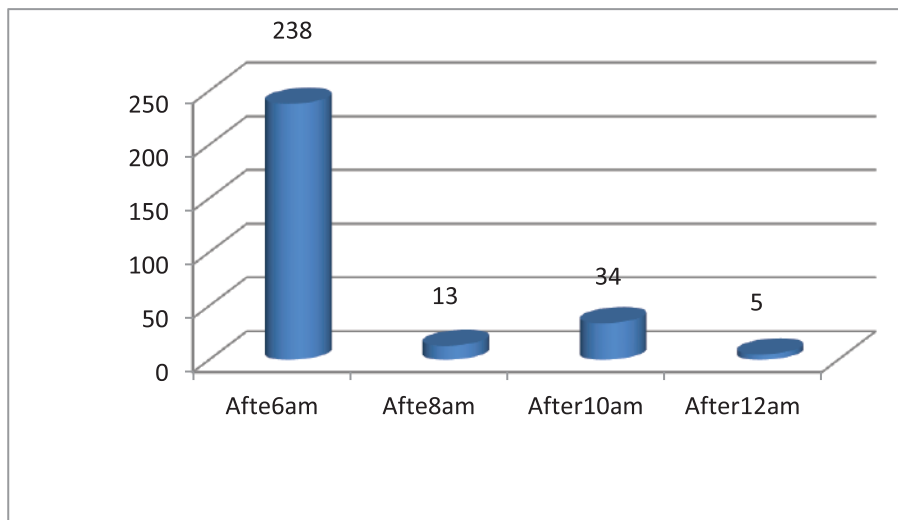


Figure 3: Rising time of the students (n=340)

Table 5: Association between gadgets handling by the parents and Grades of the students (n=340)

Gadgets use	Pattern of use	Frequency (%)					X2 p-value
			A+	A	B+	B	
Choice of internet use	Alone	120 (5.3%)	64	42	7	7	.222
	With parents	157 (46.2%)	78	62	13	4	
	With friends	63 (18.5%)	16	16	9	3	
Forbid to use gadgets	Father	91 (26.8%)	48	35	5	3	.522
	Mother	77 (22.6%)	46	23	6	2	
	Both	172 (50.6%)	83	62	18	9	
Cause of allow to use gadgets by the parents	When parents work	80 (23.5%)	40	31	7	2	.221
	When we go out	60 (17.6%)	30	20	5	5	
	To feed	71(20.9%)	38	26	6	1	
	As a reward	110 (32.4%)	63	36	8	3	
	Others	19 (5.6%)	6	7	3	3	
Feelings when gadget is taken away	Angry	92 (27.1%)	50	27	11	4	.012
	Sad	51(15.0%)	16	30	3	2	
	Not bothered	197(57.9%)	111	63	15	8	

In case of 26.8% students’ father, 22.6% cases mother and about half (50.6%) of the students’ both of the parents forbid using the gadgets (table 5). About 23.5% parents allow using gadgets when they are at work, 17.6% give them when they go out,

20.9% give them while feeding and 32.4% parents give them as a reward. When the gadgets are taken away, 27.1% kids are angry, 15% are sad and 57.6% are not bothered at all.

Table 6: Association between physical attributes of the students with technological interactions

Physical attributes	Measures	Frequency (%)	Watching TV			Playing mobile			Using tablet		
			Yes	No	‘p’	Yes	No	‘p’	Yes	No	‘p’
Weight	31-35kg	115(33.8%)	88	25	.78	110	5	.543	58	57	.973
	36-40kg	57(16.8%)	47	9		56	1		26	31	
	41-45kg	54(15.9%)	37	17		53	1		28	26	
	46-50kg	31(9.1%)	27	4		31	0		16	15	
	55-55kg	36(10.6%)	29	7		35	1		17	19	
	56-60kg	47(13.8%)	38	8		47	0		25	22	

Vision of eye	Normal vision	301(88.5%)	237	60	.765	294	71	.926	152	149	.610
	Myopia	39(11.5%)	29	10		38	21		18	21	
Other eye problem	Watering	51(15.0%)	43	7	.106	50	1	.948	30	21	.481
	Redness of eye	9(2.6%)	6	2		9	0		5	4	
	Others	3(0.9%)	2	1		3	0		2	1	
	Normal	277(81.5%)	215	60		270	7		133	144	
Any CNS problem	Headache	106(31.2%)	83	20	.242	103	3	.696	55	51	.640
	Normal	234(68.8%)	183	50		229	5		115	119	
Musculo-skeletal problem	Backache	30(8.8%)	24	5	.992	29	0	.837	14	15	.793
	Neck ache	1(0.3%)	1	0		1	0		1	0	
	Others	2(0.6%)	1	1		2	0		1	1	
	Normal	307(90.3%)	240	64		300	8		154	154	
Indigestion or gas problem	Yes	32(9.4%)	25	7	.931	31	1	.762	15	17	.426
	No	308(90.6%)	241	63		301	7		155	153	
Hearing problem	Earache	7(2.1%)	4	2	.002	7	0	.678	2	5	.252
	Normal	333(97.9%)	262	68		325	8		168	165	

The study found that 11.5% students have myopia, 15% students have watering of eyes, 31.2% complained headache 8.8% students complained backache, 9.4% students have indigestion and 2.1% have hearing problem (table 6). Hearing problem is found to be associated with watching TV ('p' value <0.05) and the other indicators did not find any association.

DISCUSSION

The aim of this study is to explore the use of gadgets mainly TV, mobile and tablets among primary school students and how their daily life is disordered by the fascinating usage of these gadgets. In our study, the hours of watching TV per day (64.4% = 1hour, 20.9% =2 hours, 6.5% =3 hours and 5.6% =4 hours), playing with mobile (76.8% =1 hour, 15.6% =2 hours, 3.8% =3hours and 1.2% =4 hours) are much higher than they should be expected to do so. The new strategy of using screen media suggested by American Academy of pediatrics is that child under

age 2 should not watch at all and those older children and teens should use for less than an hour or two a day. ⁵ A study among adolescents confirmed most (90.5%) students were using smartphones as a common gadget, among them, 50.2% were using for more than 7 hours a day. ⁶ In our study we also found that majority (97.6%) students play with mobile.

Regarding gender issues, adolescent girls preferred Internet for educational purposes more than boys, whereas adolescent boys used Internet more for recreational purposes. ⁷ In our study, most of the respondents used internet for entertainment purpose for a longer period of time. Most students watch cartoons (67.6%), play online games (57.1%) and watch music video (49.7%) for 1-2 hours a day. The numbers of male students (89) using only for entertainment is also high. But our study did not find any association with grades. Greater use of educational Internet was associated with an upper grade in academic attainment but higher social Internet use was associated with a lower grade of

academic attainment.⁷ But in our country the internet usage has not yet been started in the curriculum. Schools do not provide any homework or assignments done in the internet. Children used to watch educational programs according to their own choice and spend their time in playing online games, watching cartoons and recreational programs.

Majority (90.6% and 87%) students of the excessive users of mobile phones and tablets would react sad, angry, or anxious if their mobile device was taken away from them.⁸ When the gadgets are taken away, 27.1% kids are angry, 15% are sad and the male students are more reactive than the female students are found in this study.

Researchers revealed that the backlighting from screen media can affect the circadian rhythms and change sleeping pattern of the adolescents.⁹ About 37.9% students watch TV before sleeping and 13.8% students play with mobile before sleeping. It is an alarming issue for the kids as if they continue to watch the gadgets before sleeping; their circadian rhythm would change and it would hamper their school performances. In school days maximum (62.4%) students used to sleep after 10 pm and 84.7% students rise after 6 am. Ideal sleeping time for 10/11 years' children is ten to eleven hours.¹⁰ In this study we found that almost all children sleep less than 10 hours which will affect their normal development. Good sleep also helps recover from eye strain and necessary for efficient brain working and good health.⁴

In this study, 39.7% student's favorite game is an online game, 30.6% students play indoor games and 29.7% students play outdoor games. Parents are keeping children indoors in order to keep them safe from danger. It is interrupting the child to connect to nature due to their over-protecting behavior¹¹. The adolescence suffered from moderate to severe health issues such as backache, carpal tunnel syndrome, itchy eyes, and sleeping problems.¹² In this study, students found to report headache (31.2%), backache (8.8%), myopia (11.5%) and watering of eyes (15%).

CONCLUSION

Children are the most precious thing for the family. If they do not grow well, then the parents are devastated as well as the nation. Technology is not a culprit. Parents should take care that the children could use it sensibly and discreetly, so that they could resolve the harms and make a better outcome. The authority and law makers should introduce the technology and make the best use of it in student's curriculum.

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REFERENCE

1. Jamir L. et.al. Epidemiology of technology addiction among school students in rural India. *Asian journal of psychiatry*. 2019 Feb 1;40:30-8.
2. Suhana, M. Influence of Gadget Usage on Children's Social-Emotional Development. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, (2017). volume 169 International Conference of Early Childhood Education (ICECE 2017) Copyright © 2018, the Authors. Published by Atlantis Press. 224. (<http://creativecommons.org/licenses/by-nc/4.0/>).
3. Wolf C. Children's Environmental Health in the Digital Era: Understanding Early Screen Exposure as a Preventable Risk Factor for Obesity and Sleep Disorders. 2018, 5, 31; doi:10.3390/children5020031 www.mdpi.com/journal/children
4. Gelsthorpe, J. Disconnect from nature and its effect on health and well-being. A public engagement literature review. *Natural History Museum*. April 2017
5. AAP Adjusts Screen Time Guidelines for Children © 2020 Children's Medical Center, PA. All Rights Reserved. www.cmc-pa.com/toddlers/aap-adjusts-screen-time-.
6. Kumar AK et al. Assessment of gadgets addiction and its impact on health among undergraduates. *International Journal of Community Medicine and Public Health*. 2018 Aug; 5(8):3624-3628. <http://www.ijcmph.co> 11.
7. Kim, S. (2011). E Effects of Internet Use on Academic Achievement and Behavioral Adjustment among South Korean Adolescents: Mediating and Moderating Roles of Parental Factors. *Child and Family Studies - Dissertations*. Paper 62. http://surface.syr.edu/cfs_etd
8. Master, K. M. Impact Of Electronic gadgets On Psychological Behavior Of Middle School

- Children In Uae. GMJ. ASM 2016; 5(S2):S54–S0. www.gulfmedicaljournal.com
9. Dein, N. A. Z. E. Harmful Effect of Commonly Used Electronic Devices on Adolescence and its Safeguard at Shebin El-Kom. IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959,p-ISSN:2320–1940 Volume2, Issue1(Sep.– Oct. 2013), PP 32-46 www.iosrjournals.org
10. Suni, E. How Much Sleep Do Babies and Kids Need? Children and Sleep. Sleep Foundation September 24, 2020.www.sleepfoundation.org › articles › how-much-sleep-.
11. Lee S. T. Daily Physical Activity and Screen Time, but Not Other Sedentary Activities, Are Associated with Measures of Obesity during Childhood. International Journal of Environmental Research and Public Health, (2015). 12, 146-161; doi:10.3390/ijerph120100146. ISSN 1660-4601 www.mdpi.com/journal/ijerph.