Short Research Article
Patterns of Internet use among adolescents in Saudi Arabia

ABSTRACT

Background: Little is known about the pattern of use among adolescents in Saudi Arabia, who make up a significant portion (≈ 15%) of the population.
Method: We administered a survey to students (Grades 7-12, n =2321) in randomly selected middle and high schools in three cities of Saudi Arabia in 2020. We inquired about their demographics, lifestyle factors, devices, motivation for Internet use, and their family members' use.
Results: The mean (± SD) age of starting to use the Internet was 10.45 ± 3.02. Smartphones were the most used device (86.0%), followed by computers (6.3%), tablets (5.2%), game consoles (4.5%), and smart TVs (1.9%). The primary motivations for Internet use were social media (64.9%), watching videos (19.6%), gaming (6.2%), and other (studying, communication, etc.) (9.3%). Participants mostly described their parents' Internet use as moderate and their siblings' use as heavy. About a third (32.2%) of participants' parents did not supervise or place restrictions on their children's Internet use, a quarter (27.8%) of the parents only supervised their Internet use, a quarter (23.3%) placed restrictions only, and 16.7% engaged in both supervision and restriction.
Conclusion: Communication in families with adolescents is essential for evaluating Internet use and promoting digital wellbeing.

Keywords: Internet usage; social media; parental supervision; digital wellbeing; adolescence; Saudi Arabia

1. INTRODUCTION

The Internet has become the primary tool for acquiring information, communicating with people, and consuming various forms of entertainment. Adolescents all over the world, having been born after the 1990s Internet boom, are becoming more dependent on the Internet in their daily lives. The Internet has provided numerous benefits in terms of communication and education, but bad Internet habits have been linked to physical[1] and psychological [2] harm.

In Saudi Arabia, the percentage of people using the Internet had reachednearly 100% by the year 2021) [3]. Efforts have been made to characterize the pattern of Internet use among the Saudi population [4], but no particular focus was directed at the adolescent age group, which is when a large part of social and emotional development occurs [5].

This cross-sectional study aimed to characterize Saudi adolescents' relationship with the Internet, describe their online habits, and understand their parents' attitudes towards their Internet use.

2. MATERIAL AND METHODS

This was a cross-sectional study of middle and high school students enrolled in government schools in three cities of Saudi Arabia (i.e., Buraidah, Jeddah, and Riyadh) during the period of January to March 2020. The study was approved by the Research and Development Office at the Ministry of Education. More detailed methodology for this study have been published previously[6, 7].

2.1 Inclusion Criteria

Male and female students enrolled in grades 7 through 12 in government schools were included.

2.2 Sample Size

There are 2,406,490 individuals between the ages of 15 and 19 in Saudi Arabia (General Authority for Statistics, 2017), which is the average age range of students in grades 7 through 12. We collected data from schools in Buraidah (n=704), Jeddah (n=885), and Riyadh (n=732), arriving at a total sample of 2,321.

2.3 Sampling Strategy

We used a stratified, cluster sampling strategy using schools as clusters and gender for stratification. We obtained a list of all middle schools and high schools in each city from the General Directorate of the Ministry of Education. Aiming to enroll 125 students from each school, we needed 24 schools to fulfill the quota. We randomly selected eight schools from each city (four middle schools and four high schools; four boys' schools and four girls' schools).

2.4 Study Procedure

Each school was visited twice by trained research assistants. On the first visit, they explained the study to the school administration and to selected classrooms. Students were invited to participate, and willing students were given informed consent forms to be signed by their legal guardians. At the second visit, all students who did not bring an informed consent form indicating refusal were given a survey to complete (passive consent). The paper-based self-administered questionnaire took the participants 20-30 minutes to complete. The questionnaire was pretested on five adolescents who fit the inclusion criteria to confirm questions were clear and answer options were relevant and mutually exclusive.

2.5 Informed Consent

Research assistants provided an informed consent form to be signed by the participants' guardians and explained its content to the participants. The consent form included a general description of the purpose and procedures of the study, participants' risks and benefits, responsibilities of participation, the right to withdraw from the study, and data confidentiality.

2.6 Confidentiality

Collected information was kept confidential. Each participant was given a unique identification code which was used for the data entry and analysis. All survey materials were kept in a locked cabinet at Sulaiman Al Rajhi University.

2.7 Statistical Analysis

Descriptive statistics for the included variables are reported as frequency (percentage) for categorical variables and mean ± standard deviation for continuous variables. T-test was used to compare the age of starting Internet use between boys and girls. The chi-square test was used to compare the following categories between genders: primary motivation for using the Internet, device used, and screen time.

3. RESULTS

3.1 Demographics

The sample consisted of adolescents enrolled in middle and high school from the cities of Jeddah (38.1%), Riyadh (31.5%), and Buraidah (30.3%). All six levels of middle and high school were represented, with a slight majority being high school students (52.5%). Girls (54.4%) slightly outnumbered boys, and more than two-thirds (69.2%) were Saudi nationals. Most participants described their socioeconomic status as upper-middle class (65.1%), while others reported being rich (18.8%), lower-middle class (1.8%), or poor (14.3%). Almost all participants (99%) had at least one sibling, and about two-thirds (67.5%) had five or more (see Appendix A).

3.2 Adolescents' Internet Behaviors

The mean age ± SD of starting to use the Internet was 10.45 ± 3.02. More than half (51.0%) of the participants started using the Internet between 9 and 12 years of age, 23.7% started before age 8, and 25.3% started after age 13. Smartphones were the most used devices for accessing the Internet (86.0%). Computers were a very distant second (6.3%), followed by tablets (5.2%), game consoles (4.5%), and smart TVs (1.9%). Most participants (64.9%) described social media as their primary motivation for Internet use. Other participants cited watching YouTube, movies, and/or series (19.6%), gaming (6.2%), and other uses (studying, communication, etc.) (9.3%) as their primary motivation (see Table 1).

Table 1. Adolescents' Internet behaviors in Saudi Arabia (N=2321)

	Overall		Boys (n=1058)		Girls (n=1263)		Chi-square
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	***P* value**
Age when started using the Internet							
≤ 8 years	550	(23.7%)	261	(24.7%)	289	(22.9%)	
9-10 years	568	(24.5%)	272	(25.7%)	296	(23.4%)	.049
11-12 years	615	(26.5%)	251	(23.7%)	364	(28.8%)	
≥13 years	588	(25.3%)	274	(25.9%)	314	(24.9%)	
Uses a smartphone to access the Internet							
No	324	(14.0%)	169	(16.0%)	155	(12.3%)	<.010
Yes	1997	(86.0%)	889	(84.0%)	1108	(87.7%)	
Uses a tablet to access the Internet							
No	2200	(94.8%)	1036	(97.9%)	1164	(92.2%)	<.001*
Yes	121	(5.2%)	22	(2.1%)	99	(7.8%)	
Uses a computer to access the Internet							
No	2175	(93.7%)	997	(94.2%)	1178	(93.3%)	.341
Yes	146	(6.3%)	61	(5.8%)	85	(6.7%)	

Uses a smart TV to access the Internet							
No	2277	(98.1%)	1043	(98.6%)	1234	(97.7%)	.122
Yes	44	(1.9%)	15	(1.4%)	29	(2.3%)	
Uses a game console to access the Internet							
No	2216	(95.5%)	988	(93.4%)	1228	(97.2%)	<.001*
Yes	105	(4.5%)	70	(6.6%)	35	(2.8%)	
Primary motivation for using the Internet							
Social media	1506	(64.9%)	673	(63.6%)	833	(66.0%)	
YouTube, movies, series	456	(19.6%)	181	(17.1%)	275	(21.8%)	
Gaming	143	(6.2%)	109	(10.3%)	34	(2.7%)	<.001*
Other (study, communication etc.)	216	(9.3%)	95	(9.0%)	121	(9.6%)	
Daily screen time							
≤ 2 hours	672	(29.0%)	316	(29.9%)	356	(28.2%)	
3-4 hours	633	(27.3%)	303	(28.6%)	330	(26.1%)	.147
5-6 hours	411	(17.7%)	186	(17.6%)	225	(17.8%)	
≥ 7 hours	605	(26.1%)	253	(23.9%)	352	(27.9%)	

3.3 Families' Attitudes Towards the Internet

Participants were most likely to describe their parents' Internet use as moderate and their siblings' use as heavy. A higher proportion of female participants reported heavy Internet use among parents and siblings compared to male participants (*P*< .05) (Table 2). About a third (32.2%) of participants' parents did not supervise or place restrictions on their children's Internet use, a quarter (27.8%) of the parents only supervised their Internet use, a quarter (23.3%) placed restrictions only, and a sixth (16.7%) engaged in both supervision and restriction (see Table 2).

Table 2. Families' attitudes towards the Internet in Saudi Arabia (N=2321)

	Overall		**Boys (n=1058)**		**Girls (n=1263)**		**Chi-square**
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	***P*value**
Father's Internet use							
Nonuser	147	6.3%	90	8.5%	57	4.5%	
Light user	640	27.6%	333	31.5%	307	24.3%	
Moderate user	990	42.7%	429	40.5%	561	44.4%	<.001*
Heavy user	481	20.7%	180	17.0%	301	23.8%	
Not applicable	63	2.7%	26	2.5%	37	2.9%	
Mother's Internet use							
Nonuser	91	3.9%	57	5.4%	34	2.7%	
Light user	717	30.9%	343	32.4%	374	29.6%	<.001*
Moderate user	1018	43.9%	449	42.4%	569	45.1%	

Heavy user	472	20.3%	194	18.3%	278	22.0%	
Not applicable	23	1.0%	15	1.4%	8	0.6%	
Brother’s Internet use							
Nonuser	88	3.8%	50	4.7%	38	3.0%	
Light user	158	6.8%	69	6.5%	89	7.0%	
Moderate user	451	19.4%	225	21.3%	226	17.9%	.036
Heavy user	1490	64.2%	659	62.3%	831	65.8%	
Not applicable	134	5.8%	55	5.2%	79	6.3%	
Sister’s Internet use							
Nonuser	104	4.5%	56	5.3%	48	3.8%	
Light user	220	9.5%	122	11.5%	98	7.8%	
Moderate user	504	21.7%	241	22.8%	263	20.8%	
Heavy user	1318	56.8%	549	51.9%	769	60.9%	<.001*
Not applicable	175	7.5%	90	8.5%	85	6.7%	
Parents' control of Internet use							
No restriction or supervision	747	32.2%	333	31.5%	414	32.8%	.919

Supervision only	645	27.8%	295	27.9%	350	27.7%
Restriction only	541	23.3%	250	23.6%	291	23.0%
Full restriction and supervision	388	16.7%	180	17.0%	208	16.5%

4. DISCUSSION

Social networking is the major Internet activity of Saudi adolescents, which is similar to many parts of the world. In the United States,teenagers are increasingly reliant on social media; a survey in early 2018 showed that 70% of 13- to 17-year-olds checked social media multiple times daily, a dramatic increase from 34% in 2012[8]. Online social networking may produce desirable effects like enhancing communication, social connection, and even technical skills among adolescents [9], but at the same time, it exposes them to risks, including bullying, harassment, and abuse [10].

Smartphones are the primary tool Saudi adolescents use to access the Internet. This is similar to what was observed in the United States [11], Japan [12], and many other high-income Asian countries [13]. This is understandable given that social networking and communication are most commonly achieved through smartphones.

Early Internet use is related to increased problematic Internet use. In a Japanese study, weekly Internet use in boys under age 5 was found to be associated with 15 times increased risk of problematic Internet use later in life (defined as a score of ≥5 on Young's Diagnostic Questionnaire for Internet Addiction)[14]. Since one in every four Saudi adolescents reported starting to use the Internet before age 8, parents should be encouraged to minimize Internet use in this age group.

A third of parents did not enforce rules to restrict or supervise their children's Internet use, but lower-income families were more likely to institute full restriction and supervision. These findings are important given that parents tend to underestimate their children’s engagement in risky Internet behaviors and overestimate their monitoring of their children[15].

5. CONCLUSION

As in many high-income countries, adolescents in Saudi Arabia primarily use smartphones to access the Internet and use it mostly for social networking. Since smartphone use is pervasive among adolescents, their Internet use becomes more difficult to restrict and supervise. It is becoming more important to have open communication between children and their parents regarding what they do online.

CONSENT

An informed consent form to be signed by the participants' guardians was provided to all participants. Participants who did not bring an informed consent form indicating refusal were included (passive consent).

ETHICAL APPROVAL

This study was approved by the Research and Development Office at the Ministry of Education. The authors declare that all experiments have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki."

REFERENCES

1. Arora T, Hosseini-Araghi M, Bishop J, Yao GL, Thomas GN, Taheri S. The complexity of obesity in U.K. adolescents: relationships with quantity and type of technology, sleep duration and quality, academic performance and aspiration. Pediatr Obes. 2013;8(5):358-66. https://doi.org/10.1111/j.2047-6310.2012.00119.x
2. Siomos K, Floros G, Makris E, Christou G, Hadjulis M. Internet addiction and psychopathology in a community before and during an economic crisis. Epidemiol Psychiatr Sci. 2014;23(3):301-10. https://doi.org/10.1017/S2045796013000437
3. World Bank. Individuals using the Internet (% of population) - Saudi Arabia. World Bank. n.d. Accessed 12 June 2021. Available: https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=SA.
4. Simsim M. Internet usage and user preferences in Saudi Arabia. J King Saud Univ Eng Sci. 2011;23(2):101-7. https://doi.org/10.1016/j.jksues.2011.03.006
5. O'Keeffe GS, Clarke-Pearson K, Council on Communications and Media. The impact of social media on children, adolescents, and families. Pediatrics. 2011;127(4):800-4. https://doi.org/10.1542/peds.2011-0054
6. Saquib J, Saquib N, Colder Carras M, AlSalhi A, Labrique A, Rajab A, et al. Individual-level correlates of problematic internet use among adolescents: a nationally representative study in Saudi Arabia. Psychiatry Research Communications. 2022;2(4):100078. https://doi.org/10.1016/j.psycom.2022.100078
7. Saquib N, Saquib J, AlSalhi A, Colder Carras M, Labrique A, Al-Khani A, et al. The associations between family characteristics and problematic Internet use among adolescents in Saudi Arabia. Int J Adolesc Youth. 2023;28(1). https://doi.org/10.1080/02673843.2023.2256826
8. Common Sense Media. Is social networking changing childhood? Common Sense Media. 2009. Accessed 09 September 2024. Available: https://www.commonsensemedia.org/press-releases/is-social-networking-changing-childhood.
9. Ito M, Horst, HA, Bittanti M, Boyd D, Stephenson, BH, Lange, PG, Pascoe, CJ, Robinson, L. Living and learning with new media: Summary of findings from the Digital Youth Project. Cambridge, Massachusetts: MIT Press; 2008.
10. Patchin J, Hinduja S. Bullies move beyond the schoolyard: a preliminary look at cyberbullying. Youth Violence Juv Justice. 2006;4:148-69. https://doi.org/10.1177/1541204006286288
11. Madden M, Lenhart A, Duggan M, Cortesi S, Gasser U. Teens and technology 2013. Pew Research Center. 2013. Accessed 09 September 2024. Available: https://www.pewresearch.org/internet/2013/03/13/teens-and-technology-2013/

12. Japanese Ministry of Internal Affairs. Communications usage trend survey 2017. Japanese Ministry of Internal Affairs. 2018. Accessed 09 September 2024. Available: https://www.soumu.go.jp/johotsusintokei/tsusin_riyou/data/eng_tsusin_riyou02_2017.pdf.
13. Mak KK, Lai CM, Watanabe H, Kim DI, Bahar N, Ramos M, et al. Epidemiology of internet behaviors and addiction among adolescents in six Asian countries. Cyberpsychol Behav Soc Netw. 2014;17(11):720-8. https://doi.org/10.1089/cyber.2014.0139
14. Nakayama H, Ueno F, Mihara S, Kitayuguchi T, Higuchi S. Relationship between problematic Internet use and age at initial weekly Internet use. J Behav Addict. 2020;9(1):129-39. https://doi.org/10.1556/2006.2020.00009
15. Liau A, Khoo A, Ang P. Parental awareness and monitoring of adolescent Internet use. Curr Psychol. 2008;27:217-33. https://doi.org/10.1007/s12144-008-9038-6

APPENDIX

Appendix A. Participants' characteristics, national survey of students (grades 7 to 12) across Saudi Arabia (January-March 2020)

Characteristics	Count	(%)
Number of participants	2321	(100%)
Grade		
1st year of middle school	314	(13.5%)
2nd year of middle school	377	(16.2%)
3rd year of middle school	412	(17.8%)
1st year of high school	386	(16.6%)
2nd year of high school	337	(14.5%)
3rd year of high school	495	(21.3%)
Gender		
Boys	1058	(45.6%)
Girls	1263	(54.4%)
Nationality		
Saudi	1605	(69.2%)
Non-Saudi	716	(30.8%)
Socio-economic status		
Rich	437	(18.8%)
Upper-middle class	1511	(65.1%)
Lower-middle class	41	(1.8%)
Poor	332	(14.3%)
Number of siblings		
0	23	(1.0%)
1-4	730	(31.5%)

5-8	1145	(49.3%)
>8	423	(18.2%)
Academic performance		
Excellent (90-100%)	1171	(50.5%)
Very good (80-89%)	707	(30.5%)
Good (65%-79%)	380	(16.4%)
Fair (50-65%)	53	(2.3%)
Poor (<50%)	10	(0.4%)
Physical activity		
Very active	512	(22.1%)
Somewhat active	948	(40.8%)
Somewhat inactive	660	(28.4%)
Very inactive	201	(8.7%)
Diet		
Very healthy	260	(11.2%)
Somewhat healthy	1298	(55.9%)
Somewhat unhealthy	631	(27.2%)
Very unhealthy	132	(5.7%)
Smoking		
No	2210	(95.2%)
Yes	111	(4.8%)