Research Article

Exposure to Cyberbullying, Cybervictimization, and Related Factors Among Junior High School Students

Maryam Mohseny[1], Zahra Zamani [2, *], Shahin Akhondzadeh Basti[3], Mohammad-Reza Sohrabi [1], Ali Najafi [4] and Farzad Tajdini[1]

[1]Community Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2]Community Medicine, Tehran University of Medical Sciences, Tehran, Iran
[3]School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
[4]Medical Library and Information Sciences, Tehran University of Medical Sciences, Tehran, Iran

Corresponding author: Community Medicine, Tehran University of Medical Sciences, School of Medicine, Poursina ST, PO. Box: 14155-6447, Tehran, Iran. Tel: +98-9125804350. Email: zamanizhm@gmail.com

Abstract

Background: While social media have an immense effect on children and adolescent interactions, they also have serious and potential effects on physical and mental health. Cyberbullying, as a form of bullying using electronic means, is an example of this trend.

Objectives: The purpose of this study was to determine the prevalence of cyber-related behaviors and some of their related factors among high school students in Tehran.

Methods: This was a cross-sectional analytical study examining cyber behaviors in students in grades 7, 8, and 9. Since our study was conducted in line with an international study, we used the questionnaire of that research to collect data. Some of the characteristics of the adolescents and behavioral problems associated with them were examined, and students' experiences of cyberbullying and cybervictimization were asked in this study. A multi-stage cluster sampling was performed. The statistical population consisted of students from five districts of north, south, west, east, and center regions of Tehran, in which 1,456 questionnaires were completed.

Results: The prevalence rate of cyberbullying was 22.3% while that of cybervictimization was 18%. It was also demonstrated that both trends were more significant in boys than in girls. Other parameters such as substance use, body thought scale, school environment difficulties, peer, conduct, and emotional problems had significant correlations with cybervictimization (P = 0.03 for peer problems to P < 0.001 for emotional problems) and cyberbullying (P < 0.04 for peer problems to P < 0.001 for school environment). A significant relationship was also found between prosocial problems and cyberbullying (P = 0.01).

Conclusions: Cyberbullying and cybervictimization are more prevalent in boys than in girls. This phenomenon is related to many physical and mental health problems. This evidence can be used to inform decision-makers in the social arena to provide strategies for preventive programs and future interventions.

Keywords: Adolescent, Cyberbullying, Cybervictimization, Prevalence, School Health

1. Background

Bullying in school is an important problem everywhere in the world, and many students are likely to experience this phenomenon in their relationships with their classmates (1). Communication technologies such as social media, mobile phones, and the internet are used at increasing rates that have provided convenience; but they can also potentially expose the users to dangerous relationships that may endanger their physical and mental health. In a recent study, about one-third of adolescents reported being involved in cyberbullying as either a perpetrator, a victim, or both (2). Many previous studies noted a gender

difference in the cyberbullying prevalence. For instance, in a systematic review conducted in Spain, a higher rate of cyberbullying behavior was shown among boys with a prevalence up to 72% (3), and a meta-analysis of 109 studies conducted in 2014 showed that boys were more likely than girls to cyber-bully during early to mid-adolescence (4). Some of the known risk factors for cyberbullying include living with non-biological parents, perceptual problems, not feeling safe at school, hyperactivity, and emotional, peer, and conduct problems. However, some studies have shown that cybervictim suffer from emotional problems and peer problems more than cyberbullying perpetrators (5).

Cybervictimization has been associated with internalizing difficulties such as depression, loneliness, isolation, peer rejection, feeling of hopelessness, lower life satisfaction, suicidal ideation, suicide attempts, smoking and substance use, and anxiety symptoms (6). Students with disabilities are at an increased risk of experiencing cyberbullying than their peers without disabilities (7). Smoking and alcohol drinking are frequently seen in teenage bullies and victims, and also illicit drug use and sexually risky behaviors are reported in victimized male and female adolescents (8). The victims of cyberbullying often suffer from low self-esteem, insecurity, poor grades in school, and the inability to feel safe at their homes. One of the most important side effects in students who are cyberbullied is personality changes that make them withdrawn and moody rather than outgoing and social; thus, they do not tend to go to school and become distracted after being online or checking text messages (9). Suicide is another devastating outcome of cyberbullying victimization, which can increase suicidal thoughts by 14.5% and suicide attempts by 8.7%, and these effects are greater in men than in women (10). Besides, cyberbullying has psychosomatic symptoms (headaches, stomachache, etc.) and a lack of feeling safe in school (11). Cyberbullying students commit crimes and carry weapons inside and outside the school more than others (5).

The increasing use of social media among adolescents has caused the exacerbation of cyberbullying as a serious public health problem. These effects have been considered in previous traditional bullying investigations (12). Although studies have been conducted on the prevalence and consequences of cyberbullying in Iran, more studies are needed due to the importance of the subject (13).

2. Objectives

This research was the first study on cyberbullying in Iran that was conducted in the framework of an international comparative study representing Finland, which was simultaneously conducted in several European and Asian countries. The main purpose of our study was to evaluate the prevalence of cyber behaviors. Another important purpose was to evaluate the relationship between cyberbullying and cybervictimization in high school students and related factors mentioned in a questionnaire given to high school students.

3. Methods

3.1. Participants and Sampling

This was a cross-sectional analytical study. We used a multi-stage cluster sampling method to select among male and female students from governmental and nongovernmental schools. The Equation 1 was implemented to calculate the sample size. About one-third of adolescents, based on previous studies, reported being involved in cyberbullying as either a perpetrator, a victim, or both (2). Therefore according to the formula $\alpha = 0.05$, $z_{1-\frac{\alpha}{2}}^2 = (1.96)^2$ = 3.84, p = 0.35, d = 0.025; the sample size was calculated about 1400 students.

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 \times pq}{d^2} \tag{1}$$

3.2. Study Design

The study was approved by the Ethics Committee of Tehran University of Medical Sciences (1394.1413). The printed questionnaires were anonymous and distributed by four experienced interviewers (two men for boys and two women for girls). First, participants' informed consent was received. Participants were informed of the confidentiality of their responses and that the responses would be used only for research purposes. The students completed the questionnaires, and each questionnaire took an average of about 20 min to be completed. Over a period of six months, a total of 20 schools were studied in the five areas.

3.3. Study Protocols and Instruments

The research was part of an international comparative study on behalf of the Finland study, which was also conducted in several European and Asian countries. We used a comprehensive questionnaire designed for all countries that participated in this study. This questionnaire was first used in 2004 by André Sourander, the original designer of the project (14). We prepared the questionnaire based on a back-translation and used the Persian printed version. Cronbach's alpha was used for the reliability of the translated questionnaire, which was 0.73 for internal consistency (reliability). The validity and internal consistency of the Strengths and Difficulties Questionnaire (SDQ) were evaluated by Tehrani-Doost et al. in 2009, and strong correlations were found among subscales (15). The questionnaire included sections such as demographics, background, family status, aches and sleep, personal health, substance use and smoking, thoughts about their body, SDQ, experience about the need for outside help, struggles, suicidality, school environment, and experiences of cyberbullying. About 1,456 questionnaires were used to collect data. The gathered data included basic information on cyber behavior, feeling safe at school, psychosomatic symptoms (headache, stomachache, sleep problems), trying to get help from others, and high-risk behaviors.

The main part of the questionnaire was the SDQ subsection, which is an instrument for screening behavioral

and emotional problems in children and adolescents ([16]). The SDQ was developed by Goodman for mental and behavioral problem screening in children and adolescents ([17]). This questionnaire was used in previous studies in Finland ([18]). The reliability and validity of the SDQ were calculated by Goodman et al. ([19]). The SDQ is a behavioral screening tool consisting of 25 items. For each item in this structure, a score is determined from 1 to 3 (1 =Not true, 2= Somewhat true, 3 = completely true). The 25 SDQ items are divided between 5 scales of 5 items each, according to the instructions, included hyperactivity scale, conduct problems scale, emotional symptoms scale, peer problems scale, and prosocial scale ([20]). Variables such as thoughts about their body, school environment, smoking, and substance use were computed concerning cyberbullying and cybervictimization ([Table 1]). After collecting the questionnaires, we calculated the prevalence of cyberbullying and cybervictimization and their relationships with the variables mentioned.

3.4. Statistical Analyses

To perform statistical analysis, SPSS 22 software was used. We also conducted descriptive and analytic statistics to determine data distribution and the association between different variables and cyberbullying behaviors. To determine the association of demographic and qualitative variables with cyberbullying and cybervictimization, the Chi-square test was used. The t-test, Mann-Whitney test, and ANOVA test were used to assess the relationship between cyberbullying behaviors and quantitative variables. We used linear regression analysis as a model to predict cyberbullying behaviors.

4. Results

4.1. Descriptive Findings

In this study, 1,456 questionnaires were completed by the students (794 boys and 662 girls). Overall, these results indicated that the prevalence of cyberbullying was 22.3% and that of cybervictimization was 18%. Also, cyberbullying in boys (26.4%) was significantly greater than in girls (17.3%). Likewise, cybervictimization was significantly present at a higher rate in boys (19.5%) than in girls (16.1%). [Table 2] illustrates the demographic characteristics of the participants.

4.2. Analytical Findings

The relationship between the demographic characteristics of participants with cyberbullying and cybervictimization is shown in [Table 3]. The age group, gender, and school grade had significant correlations with cyberbullying and cybervictimization. Cybervictimization was more prevalent at ages of 16-17 years (21.9%, P = 0.002), in boys (19.5%, P = 0.05), and in the ninth grade (21.2%, P < 0.001). Additionally, cyberbullying was higher in the 16 - 17 age group (24%, P = 0.002), in boys (26.4%, P < 0.001), in the eighth grade (26.4%, P < 0.001), and in private high schools (30.2%, P = 0.008).

[Table 3] shows significant correlations between noncyber and cybervictimization and weight (58.12 vs. 61.95; P = 0.001), height (165.23 vs. 167.3; P < 0.001), peer problems (1.76 vs. 1.8; P = 0.03), conduct problems (1.49 vs. 1.65; P < 0.001), emotional problems (1.42 vs. 1.57; P < 0.001), body attitude problem (2.21 vs. 2.14; P = 0.001), problems related to school environment (2.52 vs. 2.34; P < 0.001) and personal smoking and substance use (1.86 vs. 1.76; P = 0.02).

Also, age, height, peer problems, conduct problems, prosocial problems, emotional problems, body attitude problems, problems related to the school environment, and smoking and substance use indicated significant correlations with cyberbullying. The mean variables in both subtypes included height 165.24 vs. 168.11 (P < 0.001), peer problems 1.76 vs. 1.8 (P < 0.04), conduct problems 1.48 vs. 1.64 (P = 0.001), prosocial problems 1.81 vs. 1.87 (P = 0.01), emotional problems 1.43 vs. 1.50 (P = 0.01), body attitude problems 2.21 vs. 2.15 (P = 0.002), problems related to school environment 2.53 vs. 2.34 (P < 0.001), and smoking and substance use 1.88 vs. 1.73 (P = 0.001).

As indicated in [Table 4], the incidence of cybervictimization was 20.7% (P = 0.04) in cases with physical problems, 25.8% (P = 0.009) in cases with smoking and substance use, and 26.7% (P = 0.02) in cases with a history of suicide. The term "physical problems" consisted of headaches, abdominal pain, and sleep disorders. The incidence of cyberbullying was 27.7% (P = 0.01) in cases with special diseases and 35.5% (P < 0.001) in cases with smoking and substance use. In a multivariate analysis using backward linear regression for cybervictimization (dependent variable), only the family situation (my parents with whom I live) and high school type were used in the model. Their coefficients were -0.098 and -0.103, respectively. The formula applied was cybervictimization = (0.412) + (-0.103 × high school type grade 9) + (-0.098 × family situation biology). In the multivariate analysis using backward linear regression for cyberbullying (dependent variable), only school type, sex, and father's job were considered in the model. Their coefficients were -0.080 and 0.051, respectively. The implemented formula was cyberbullying = (0.324) + (-0.80 × high school type) + (0.088 × sex01) + (father's job01 × 0.051).

Table 1. Association of Strengths and Difficulties Questionnaire and Other Variables with Cyberbullying and Cybervictimization Presented as Mean ± SD and Their Corresponding P-values

Computed Variables	Cybervictimization, Mean (SD)		P-Value	Cyberbullying, Mean (SD)		P-Value
	No	Yes		No	Yes	
Height	165.23 (9.47)	167.33 (7.47)	< 0.001	165.24 (9.51)	168.11 (9.72)	< 0.001
Weight	58.12 (13.99)	61.95 (15.42)	0.001	58.36 (14.45)	60.31 (13.89)	0.58
BMI	21.24 (4.3)	21.69 (4.32)	0.17	21.28 (4.34)	21.42 (4.32)	0.65
Peer problems	1.76 (0.3)	1.81 (0.33)	0.03	1.76 (0.30)	1.80 (0.32)	< 0.04
Conduct problems	1.49 (0.34)	1.65 (0.39)	< 0.001	1.48 (0.34)	1.64 (0.37)	0.001
Hyperactivity problems	1.88 (0.27)	1.91 (0.27)	0.14	1.88 (0.27)	1.90 (0.27)	<0.34
Prosocial problems	1.82 (0.33)	1.85 (0.32)	0.16	1.81 (0.33)	1.87 (0.33)	0.01
Emotional problems	1.42 (0.43)	1.57 (0.45)	< 0.001	1.43 (0.44)	1.50 (0.44)	0.01
Thoughts about body problems	2.21 (0.28)	2.14 (0.31)	0.001	2.21 (0.28)	2.15 (0.30)	0.002
School environment problems	2.52 (0.59)	2.34 (0.54)	< 0.001	2.53 (0.60)	2.34 (0.53)	< 0.001
Smoking and substance use	1.86 (0.33)	1.76 (0.42)	0.02	1.88 (0.32)	1.73 (0.44)	0.001

5. Discussion

The primary goal of the study was to identify the prevalence of cyberbullying and cybervictimization in grades 7, 8, and 9 students. According to our findings, the rate of cyberbullying was calculated to be 22.3%, while that of cybervictimization was 18%. Since there are considerable discrepancies in cyberbullying definition, methodology, and culture, prevalence disparities of cyberbullying status have been observed in studies performed in different geographical locations worldwide. Nonetheless, there were similarities in the reported prevalence between our findings and most previous research, such as a systematic review study conducted in Spain (2015) that showed one out of every five people was involved in some form of cyberbullying (3), which is almost consistent with our findings. However, some previous research reported a prevalence of up to 72% (21), but some others reported a very low prevalence (22). In the latest survey among high school students in Iran, 34.2% cybervictimization, and 27.3% cyberbullying were reported, which showed a slightly higher prevalence than in our study (13). This great difference can be due to time, place, or method of investigation.

Another important objective was to determine the gender role in cyberbullying. Our study illustrated that boys were more likely to be bullied and victimized than girls, and this occurred more in older age groups (P < 0.05). Similar to the present results, the majority of the previous studies confirm our findings of gender differences,

such as a recent meta-analysis in China that reported boys were more involved than girls in cyberbullying perpetration behaviors (23). However, a recent study conducted by Razjouyan et al. in Iran showed that females were more likely to be victims than males, while males were bullied more than females (P < 0.05) (13). Surprisingly, in a few studies such as cyberbullying surveys in Spain (2016) conducted in several different regions, no gender differences were found in cyberbullying perpetration (24).

Another finding of this study indicated significant correlations of Peer problems, conduct problems, and emotional problems (subscales of SDQ) with cybervictimization, and significant correlations of peer problems, conduct problems, prosocial problems, and emotional problems with cyberbullying (Table 4). Other subscales, such as thoughts about their body and school environment problems, had significant positive relationships with cybervictimization and cyberbullying. All of the subscales mentioned can be antecedents or consequences of cyberbullying and cybervictimization, and they harm the mental health.

Many surveys have evaluated the relationship between mental health problems, cyberbullying, and cybervictimization, as hinted by researchers such as Chadwick, who noted that hyperactivity, conduct problems, prosocial problems, perceived difficulties, psychosomatic symptoms (i.e., stomachache, headache, etc.), and feeling unsafe at school were experienced by the students involved

Table 2. Demographic Characteristics of Participants Indicating Frequency and Percentage

Demographic Variables	Frequency	Demographic Variables (%)	Demographic Variables	Frequency	Demographic Variables (%)
Gender			**Mother's occupation**		
Male	794	54.5	Doctor	17	1.3
Female	662	45.5	Engineer/teacher	5	0.4
Age Groups			Teacher	55	4.2
12 - 13	261	17.9	Self-employed	74	5.6
14 - 15	947	65	Employee	119	9.1
16 - 17	248	17	Housewife	1001	76.4
Grade			Unemployed	7	0.5
7th grade	367	25.2	Retired	33	2.5
8th grade	380	26.1	**Student background**		
9th grade	709	48.7	Tehran origin	946	65
High school type			Other	510	35
Public	1293	88.8	**Place of birth**		
Private	163	11.2	Tehran	1261	86.6
Parents with whom I live			Other	195	13.4
Biological parents	1330	93.1	**Native language**		
Biological father and foster mother	10	0.7	Persian	1409	96.8
Biological mother and foster father	7	0.5	Other languages	47	3.2
Biological father alone	14	1	**Birthplace of mother**		
Biological mother alone	55	3.9	Tehran	834	57.3
Adoptive child	5	0.4	Other	621	42.7
Father's occupation			**Native language of mother**		
Doctor	13	1	Persian	1293	88.8
Engineer/ teacher	71	5.4	Other	163	11.2
Teacher	20	1.5	**Birthplace of father**		
Self-employed	594	45	Tehran	780	53.6
Employee	447	33.9	Other	675	46.4
Laborer	45	3.4	**Native language of father**		
Unemployed	15	1.1	Persian	1266	87
Retired	62	4.7	Other languages	190	13
Others	53	4			

(11). Other analogous studies such as Samara's research found that cyber victims had emotional and peer problems, low self-esteem, and high levels of depressive symptoms, whilst cyberbullies demonstrated conduct problems, hyperactivity, and prosocial problems. Victims reported high rates of self-injury and suicidal tendencies and experienced long-term health risks. Also, being a bully is a risk factor for depression, anxiety, eating disorders, smoking, and substance abuse (25). Hamm's observations showed links between emotional problems, Peer problems and conduct problems, hyperactivity problems, and prosocial problems and cyberbully status, as well as between conduct, hyperactivity, emotional, and peer problems and cyber-victim status. Our findings support, to some extent, the results of studies conducted by a major author in this topic in which Sourander's survey indicated that Cybervictim-only status was associated with perceived difficulties, emotional and peer problems, and

Table 3. The Relationship Between the Demographic Characteristics of Participants with Cyberbullying and Cybervictimization

Demographic Variables	Cybervictimization, No. (%)		P-Value	Cyberbullying, No. (%)		P-Value
	No	Yes		No	Yes	
Age Groups			0.002			0.002
12 - 13	230 (89.5)	27 (10.5)		220 (85.9)	36 (14.1)	
14 - 15	752 (80.9)	177 (19.1)		701 (75.9)	223 (24.1)	
16 - 17	193 (78.1)	54 (21.9)		187 (76.0)	59 (24.0)	
Gender			0.05			< 0.001
Male	638 (80.5)	155 (19.5)		581 (73.6)	208 (26.4)	
Female	537 (83.09)	103 (16.1)		527 (82.7)	110 (17.3)	
Grade			<0.001			<0.001
7th grade	323 (89.2)	39 (10.8)		313 (86.7)	48 (13.3)	
8th grade	297 (80.9)	70 (19.1)		268 (73.6)	96 (26.4)	
9th grade	555 (78.8)	149 (21.2)		527 (75.2)	174 (24.8)	
High school type			0.06			0.008
Public	1049 (82.6)	221 (17.4)		995 (78.7)	269 (21.3)	
Private	126 (77.3)	37 (22.7)		113 (69.8)	49 (30.2)	
Parents with whom I live			0.2			0.07
Biological parents	1076 (82.3)	232 (17.7)		1018 (78.2)	284 (21.8)	
Only father or mother	71 (78.9)	19 (21.1)		63 (70.8)	26 (29.2)	
Father's occupation			0.43			0.15
Doctor	12 (92.3)	1 (7.7)		12 (92.3)	1 (7.70)	
Engineer	60 (87)	9 (13)		51 (73.9)	18 (26.1)	
Teacher	17 (89.5)	2 (10.5)		16 (88.9)	2 (11.1)	
Self-Employed	474 (80.9)	112 (19.1)		433 (74.3)	150 (25.7)	
Employee	355 (80.1)	88 (19.9)		351 (79.4)	91 (20.6)	
Laborer	38 (88.4)	5 (11.6)		35 (81.4)	8 (18.6)	
Unemployed	14 (93.3)	1 (6.7)		11 (73.3)	4 (26.7)	
Retired	53 (86.9)	8 (13.1)		53 (86.9)	8 (13.1)	
Others	43 (84.3)	8 (15.7)		38 (73.1)	14 (26.9)	
Mather's occupation			0.37			0.46
Doctor or engineer	21 (95.5)	1 (4.5)		17 (77.3)	5 (22.7)	
Teacher	48 (80.9)	6 (11.1)		46 (85.2)	8 (14.8)	
Self-employed	59 (80.8)	14 (19.2)		54 (75.0)	15 (25.0)	
Employee	97 (82.9)	20 (17.1)		99 (83.9)	19 (16.1)	
Housewife	798 (80.9)	188 (19.1)		746 (76.0)	236 (24)	
Retired	5 (71.4)	2 (28.6)		5 (71.4)	2 (28.60)	
Others	28 (87.5)	4 (12.5)		28 (90.3)	3 (9.7)	

not feeling safe at school. Cyberbully-only status was associated with perceived difficulties, hyperactivity, conduct problems, and not feeling safe at school. Cyberbully-victim status was associated with all of these risk factors ([5]).

Table 4. Association of Computed Variables with Cyberbullying and Cybervictimization Indicating Frequency and Percentage

Variables	Cyber victim, No. (%)		P-value	Cyberbully, No. (%)		P-value
	No	Yes		No, No. (%)	Yes,	
Special disease			0.13			0.01
No	975 (82.6)	206 (17.4)		928 (78.8)	249 (21.2)	
Yes	200 (79.4)	52 (20.6)		180 (72.3)	69 (27.7)	
Physical problems			0.04			0.18
No	423 (83.3)	85 (16.7)		396 (78.1)	111 (21.9)	
Yes	625 (79.3)	163 (20.7)		594 (75.8)	190 (24.2)	
Smoking and substance use			0.009			< 0.001
No	457 (85.1)	80 (14.9)		444 (83.1)	90 (16.9)	
Yes	69 (74.2)	24 (25.8)		60 (64.5)	33 (35.5)	
Suicide			0.02			0.15
No	482 (86.4)	88 (15.4)		460 (81)	108 (19)	
Yes	44 (73.3)	16 (26.7)		44 (74.6)	15 (25.4)	

Another interesting finding of our study was the association of smoking and substance use with both cyberbullies and victims. The findings were consistent with those of Sherill et al. (2016) and Sourander et al (2010) studies that found that greater cybervictimization was associated with a greater frequency of smoking and drinking (5). Similarly, Mishna et al. (2016) showed that the youth who committed cyberbullying had an increased risk of smoking and substance use. A significant relationship was found in our study between suicide and cybervictimization that is consistent with that of the Hinduja study, which reported that cyber victims and cyberbullies were 1.9 and 1.5 times more likely to commit suicide than others (26). As mentioned in the results, age group and high school grade had significant associations with cyberbullying and cybervictimization but not high school type.

The current study and comparative surveys examined the correlation of variables with traditional bullying and cyberbullying, but what needs to be done in future investigations is to evaluate how to enhance community standards and more importantly, individual skills and self-esteem to reduce violent behaviors and their negative effects. This is the first cross-sectional study on cyberbullying among junior high school students in Tehran, in which cyberbullying behavior was evaluated based on a questionnaire with the Strengths and Difficulties Questionnaire (SDQ) subsection as the main component. Also, no research has been conducted in Iran with a comprehensive survey of related factors.

However, these findings are limited by the use of a cross-sectional design. Therefore, the results cannot be used to obtain any causal interaction. Hence, a longitudinal study is recommended for this purpose. Besides, the results may not be generalizable to students in other areas of the country, as we could not directly compare cyberbullying and cybervictimization among students in different cities. Additionally, we only included junior high school students (grades 7 – 9), which is not holistic. Since cyberbullying is common at all ages, we suggest that other school grades be considered in future studies on cyberbullying. Another limitation of this study was a relatively low sample size. Accordingly, our findings should be used with caution.

5.1. Conclusions

Overall, our study revealed that cyberbullying behaviors are prevalent among adolescents and that gender plays a crucial role in cyberbullying behaviors. Emotional, prosocial, conduct, and peer problems, as well as demographic, physical, and behavioral characteristics, have a significant correlation with cyberbullying and cybervictimization. Smoking and substance use and suicide attempts occur commonly in this population. Our evidence can be used by decision-makers and policymakers to plan preventive strategies for future interventions including socialization skills training, problem-solving, and skills in forming friendships. Finally, this information can be provided to teachers, staff, and families to guide them on measures to assist children.

Supplementary Material

Supplementary material(s) is available here [To read supplementary materials, please refer to the journal web-

site and open PDF/HTML].

Footnotes

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