

# Victimization in traditional and cyberbullying as risk factors for substance use, self-harm and suicide attempts in high school students

Mohammad Saeed Azami<sup>1</sup>, Farhad Taremian<sup>2\*</sup>

<sup>1</sup>Department of Clinical Psychology, University of Social Welfare and Rehabilitation Science, Tehran, Iran

<sup>2</sup>Department of Substance Abuse and Dependence Research Center, University of Social Welfare and Rehabilitation Science, Tehran, Iran

\*Corresponding author: fa.taremian@uswr.ac.ir

## Abstract

**Background:** Traditional bullying (or peer bullying) is considered a common and unpleasant experience among students and has serious consequences such as mental health problems and unhealthy behavior. In recent years, another type of bullying named cyberbullying has emerged as a growing problem with negative effects on school achievement, physiology, and mental health of its victims.

**Objective:** The purpose of this research is to examine and compare the roles of traditional and cyberbullying victimization in substance use, self-harm and suicide attempts.

**Methods:** This was a cross-sectional study and conducted in 2019. A total of 425 high school students were selected for the study in Kermanshah, Iran. For conducting the survey, a multi-stage cluster randomized procedure was used and 18 classes in six different high schools in three urban areas were selected. A total of 400 students (mean age 16.61 years, 53.2% girls) responded to the survey, and it provided usable information for the research. Data were analyzed through binary logistic regression analyses.

**Results:** The analysis results revealed that 54.2% of students (n = 217) have experienced traditional or cyber victimization. Any kind of victimization was associated with self-harm. Cyber victimization alone and the combination of cyber plus traditional victimization showed significant association with suicide and substance use. Risk of substance use, self-harm, and suicide was higher when students experienced both types of bullying than when they experienced just one kind of bullying alone.

**Conclusions:** The results of this study suggest that traditional and cyber victims may require immediate intervention to reduce the negative effects of victimization. Also, prevention programs should consider the possible relationship between traditional and cyber victimization and substance use, self-harm, and suicide.

**Keywords:** Traditional bullying victimization; cyber-victimization; substance use; self-harm; suicide attempt

## Introduction

Traditional bullying (or peer bullying) is defined as a repetitive and damaging act that contains a power imbalance (1). Research has shown that many students have experienced traditional bullying victimization. A study indicated that the prevalence rates of being a victim of traditional bullying in the last month were 16.2% (2). The results of other studies demonstrated that about 30 to 50% of students were bullied at school (3-5). Also, a study was accomplished in Iran and its results revealed that the percentages of students who were victims and perpetrators of traditional bullying were 22.6% and

15.7%, respectively (6). Unfortunately, it seems that bullying is not an uncommon phenomenon.

In recent years, we have been faced with another type of bullying, which occurs through electronic devices. This kind of bullying is known as cyberbullying. Patchin and Hinduja (7) introduced cyberbullying as intentional and repeated damage, which occurs through the medium of electronic text. Research indicates that many students experience cyberbullying victimization (cyber victimization). For example, a study reports that 17.3% of students are victims of cyberbullying (3). Also, prevalence of cyber victimization was reported to be 10.2% in

Canada (8). A study was developed in Iran, and its results revealed that 11.4 and 1.1% of boys and girls were cyberbullying victims, respectively. Whereas, 7.5 and 1.1% of boys and girls were social network victims, respectively (9). Aboujaoude et al. (10) developed a review article, and their results demonstrated that between 20 and 40% of children and adolescents have been victims of cyberbullying.

Research shows that there is a significant association between involvement in bullying and low academic achievement (11-13). Some studies investigated the influences of traditional bullying on physiological health, and their results showed that students who have experienced traditional bullying at least 2 or 3 times a month, were more likely to report stomachache, headache, back pain and neck/shoulder pain in comparison with non-bullied students. In addition, bullying victimization increases the likelihood of weekly pain (14). Another study revealed that school victims were more likely to develop many difficulties such as sleep problems, tension, bedwetting, and fatigue (15). Also, traditional bullying victimization can have serious psychological consequences as well. A literature survey showed that overt victimization in school was positively associated with fear of negative evaluation, loneliness, social avoidance and depressive symptoms for both girls and boys (16). Other studies found that traditional victimization increases the likelihood of smoking and drinking (17, 18), self-harm (19, 20), and suicide (21, 22). In a review article, Smokowski and Kopasz (23) declared that traditional bullying victimization has many short-term and long-term effects. The short-term consequences were comprised of reduced school performance, absenteeism, headache, loneliness, suicidal ideation, and even suicide. The long-term effects included depression, low self-esteem, and interpersonal difficulties.

Like traditional bullying, cyberbullying can cause serious problems for its victims as well. It is reported that cyber victims are faced with the higher rates of leaving school early, being absent from school, and getting lower grades than a non-involved group (24). Cyber-victimization was associated with headaches, recurrent abdominal pain, and sleeping problems (25). Furthermore, a systematic review and meta-analysis showed that there is a significant relationship between cyber victimization, lower school attendance, and lower academic achievement (26). In addition, cyber victims are at greater risk for many problems such as substance use, panic symptoms, self-harm, depression, suicidal ideation, suicide attempts, as well as skipping school and suspension from school (27). A study of adolescents indicated that cyber victimization was positively related to depression, anxiety, self-harm, suicidal thoughts, and

suicide attempts (odds ratios ranging from 1.55 to 3.49). In addition, the higher rates of victimization coincided with higher odds ratios (28). A systematic review was developed to compare cyber victims with non-victims. The results revealed that cyber victims were 2.35 times more likely to harm themselves and they were 2.57 times more likely to attempt suicide (29). A review of the impacts of cyber victimization on adolescent health showed that cyber victims reported increased depressive affect, anxiety, loneliness, as well as suicidal behavior and somatic symptoms (30). In summary, cyber victimization--like traditional victimization--can generate important issues.

To explain how bullying victimization can cause adverse consequences, *General Strain Theory* (31) may help. This theory claims that experiencing negative and unjust events can cause frustration and anger, and these feelings can lead to destructive behavior. Therefore, we can say that if a student were bullied at school, he or she may feel frustrated, and the repetitive nature of bullying can cause more and more frustration to the point that he or she cannot take it anymore and commits suicide just to redeem him/herself from this overwhelming and devastating situation. Also, *The Interpersonal Theory of Suicide* may be useful as well. According to this theory, desire for suicide is caused by the presence of both thwarted belongingness and perceived burdensomeness (32). Bullying experiences may represent thwarted belongingness because students may feel social isolation (33). They also may feel that their frequent need for help and support has become a burden on others, and this develops the perception of burdensomeness (34). Interaction between these two factors may lead to suicide.

Previous research has demonstrated that traditional and cyber victimization have almost the same consequences, but what will happen if a student experiences both of them? Which kind of bullying can cause more problems for its victims? In one study, there was an association between both kinds of bullying and psychosomatic problems. From a statistical point of view, there were no significant differences between traditional and cyber victims in psychosomatic problems (35). A study of students in 9<sup>th</sup> to 12<sup>th</sup> grade showed that 6.4% were victims of cyberbullying, 16.5% were victims of traditional bullying, and 9.4% were victims of both kinds of bullying. Controlled analyses indicated that the distress rate was higher among victims of both cyber and traditional bullying. Victims of only one form of bullying also reported elevated levels of distress. In this regard, the victims of cyberbullying only were more likely to report depressive symptoms, self-injury, suicidal ideation and suicide attempts than the victims of traditional bullying only (36). In other

research, it was reported that traditional victims felt their bullying was harsher and meaner than cyber victims reported. In addition, it had more effects on their lives, but the correlates of their mental health showed that cyber victims reported significantly more social problems and higher levels of depression and anxiety than the other group (37). This inconsistency in the results of the research studies motivated us to examine which kind of victimization is a stronger risk factor for self-harm and suicide attempts. Also, some studies show that victims of traditional and cyberbullying were more likely to use drugs (17, 18, 27), but there is not enough evidence to determine the effects of experiencing both kinds of victimization on substance use, which drugs these adolescents are more likely to use, or which kind of victimization is a stronger risk factor for substance use in adolescents. Therefore, we decided to examine substance use as a possible consequence of victimization in traditional and cyberbullying. In summary, we examine the possible role of traditional and cyberbullying victimization as risk factors for substance use, self-harm, and suicide.

## Method

### *Participants and procedures*

This is a cross-sectional study conducted in 2019. The sample was comprised of 425 students from six high schools in the city of Kermanshah, Iran. This study has been configured with respect to the following procedure. The city of Kermanshah has three urban areas. In addition, there is a gender separation in Iran's schools. To provide a representative sample for our study, we randomly selected two high schools in each urban area (one for girls and one for boys) and three classes in each school. Finally, we chose 18 classes in six different high schools; a multi-stage randomized cluster sampling procedure was developed for solving the problem. In this sample, 226 students (53.2%) are girls and 199 of them are boys (46.8%). The average age of participants is 16.61 and the standard deviation is 0.95.

The research ethics committee at the University of Social Welfare and Rehabilitation Sciences approved the permission to conduct this study. In addition, the Education and Training administration in Kermanshah province permitted us to conduct this study in Kermanshah's high schools.

Prior to beginning the survey, we informed the students that they were free to refuse or discontinue participation with no penalty. In addition, we received informed consent from the school and all students involved in the survey. We also noted that the provided information by the students would not be revealed to anyone. Students completed the

paper-pencil questionnaire and it was written during a one-hour class in Persian language.

## Measures

### *Victimization*

#### *Cyber victimization*

Students completed a Persian version of the E-Victimization Scale (38). This questionnaire contains five items. As an example, a question was developed as follows: "How many times did someone tease you using emails, texting, or social networks?" Students were asked to present the number of times they had been cyber victims during the past two months. The answer was configured by a five-point scale (1 = never, 2 = 1 to 5 times, 3 = 6 to 10 times, 4 = 11 to 20 times and 5 = more than 20 times). We changed the original time range (last week) to the last two months to synchronize with the time range in traditional victimization questions. We also changed the original two-point scale (0 to 6 times and more than 6 times) to a five-point scale. Then, we dichotomized the responses in 0 = did not experience cyber victimization and 1 = experienced cyber victimization. Hajlo et al. (39) validated this questionnaire in Iran and reported that the Cronbach's alpha was 0.87. In this study, Cronbach's alpha was 0.85 for this questionnaire.

#### *Traditional victimization*

Students completed three questions about traditional victimization from the *Revised Olweus Bully/Victim Questionnaire* (40). An example question is "I was threatened or forced to do things I didn't want to do". Students were asked how often they had experienced traditional victimization during the past two months: (a) never, (b) once or twice, (c) two or three times a month and (d) about once or several times a week. Then, we dichotomized the responses as 0 = did not experience traditional victimization and 1 = experienced traditional victimization. In Iran, Rezapour and colleagues (41) validated the bullying perpetration and victimization scales of the *Olweus Bullying Questionnaire* and reported that the test-retest values showed a good level of reliability for both of these scales. In addition, Cronbach's alpha values were 0.80 and 0.82 for victimization and perpetration subscales, respectively. In the current study, Cronbach's alpha was 0.73.

A composite variable was created from these two victimization variables, with the following four groups: cyber only; traditional only; cyber and traditional; and has not experienced victimization.

*Substance use*

To measure substance use, we just asked one question about each substance, for example, “How many times did you smoke cigarettes in the last couple of months?” Students were asked to indicate the frequency of smoking cigarettes on a five-point scale (1 = never to 5 = so many times). Then, we dichotomized the responses as 0 = did not smoke cigarettes and 1 = smoked cigarettes. We performed this procedure for alcohol, hashish/marijuana, opium, and cigarettes/hookah (a single- or multi-stemmed instrument for vaporizing and smoking flavored cannabis, tobacco sometimes opium, whose vapor or smoke is passed through a water basin—often glass-based—before inhalation- in Iran mostly used for tobacco).

*Self-harm*

To measure self-harm, we just asked one question: “Have you intentionally harmed yourself without trying to suicide?” The student responded with “Yes” or “No”.

*Suicide attempts*

To measure suicide attempts, we just asked one question: “Have you intentionally harmed yourself by trying to suicide?” The student responded with “Yes” or “No”.

**Data analysis**

To analyze data, we used SPSS statistical software (version 23). We used a binary logistic regression method in which an Odds Ratio can be calculated for a nominal dependent variable (for example, smoking cigarette: 1-Yes, 0-No) through combination of several independent variables. In this study, we used traditional and cyber victimization and gender as predictors for substance use, self-harm, and suicide. The statistical significance level was considered as  $p < 0.05$ .

As some of the students did not properly answer the questions, 25 cases were excluded from the analyses. (This is called social desirability and defined as the tendency of survey respondents to answer questions in a manner that will be viewed favorably by others (42). It can take the form of over-reporting “good behavior” or under-reporting “bad”, or undesirable behavior). Thus, a total of 400 students responded to the survey and they provided usable information for the research. This procedure represented a response rate of 94%.

**Results***Descriptive results*

Table 1 shows demographic characteristics for the sample, and the results demonstrated that 45.8 and 54.2% of the sample were boys and girls, respectively. The analysis results showed that about 61% of students had an average socioeconomic status. Also, the sample analysis revealed that 76% of students had smartphones. In addition, more than 90% of them were living with their mother or father at home. Furthermore, it was revealed that about 57% of them spent 2-7 hours on the Internet per day.

Table 2 presents the prevalence of traditional and cyber victimization. The results demonstrate that 45.8% of students did not experience any kind of bullying victimization ( $n = 183$ ). However, the results showed that 29.3% of students were victims of cyberbullying only ( $n = 117$ ), 11% were victims of traditional bullying only ( $n = 44$ ) and 14% were victims of both types of bullying ( $n = 56$ ).

As presented in Table 3, boys were more likely to be cyber victims, but the girls were more likely to be traditional victims and traditional-cyber victims. Table 3 presents substance use, self-harm and suicide rates. As shown in the Table 3, 26.7% ( $n = 104$ ) of students smoked cigarettes/hookah, 13.7% ( $n = 53$ ) drank alcohol, 6.2% ( $n = 24$ ) smoked hashish/marijuana, and 4.4% ( $n = 17$ ) smoked opium. In addition, 23.2% ( $n = 86$ ) of students had self-harm and 17.7% ( $n = 66$ ) of them tried to commit suicide. The cyber victim-only group had a higher frequency of all substances, self-harm, and suicide. Cigarettes/hookah and alcohol were more prevalent than other drugs. Substance use, self-harm and suicide is more prevalent in victims of any kind of bullying.

Table 4 presents substance use, self-harm and suicide rates according to gender. As shown in Table 4 smoking cigarette/hookah is almost equal among boys and girls. Boys more than girls drink alcohol. Boys more than girls smoked hashish/marijuana and opium. Also, girls more than boys harmed themselves and committed suicide. Table 5 presents Cramer’s V correlation between variables. The results demonstrated that victimization had a significant correlation with cigarette/hookah, hashish/marijuana smoking, alcohol drinking, self-harm and suicide, the last two had stronger correlation with victimization than any substance uses. In addition, gender exhibited a significant correlation with hashish/marijuana and opium smoking, alcohol drinking and suicide. Gender had stronger correlation with alcohol drinking than other substances.

**TABLE 1.** Demographic characteristic of the sample

	Frequency	Percentage
<b>Gender</b>		
Male	183	45.8
Female	217	54.2
<b>Socio-Economic status</b>		
Below-average	63	15.8
Average	242	60.8
Above-average	93	23.4
<b>Do you have a smartphone?</b>		
Yes	303	76.3
No	30	7.6
I don't have cellphone at all	64	16.1
<b>Is your father living with you at home?</b>		
Yes	368	92.5
No	12	3.0
He passed away	18	4.5
<b>Is your mother living with you at home?</b>		
Yes	384	96.7
No	9	2.3
She passed away	4	1.0
<b>Daily internet use</b>		
Less than 1 hour	129	32.4
2-4 hours	153	38.4
5-7 hours	72	18.1
7-10 hours	18	4.5
More than 10 hours	26	6.5

**TABLE 2.** Prevalence of traditional and cyber victimization

	Frequency	Percentage
Non-victim	183	45.8
Cyber only	117	29.3
Traditional only	44	11.0
Both	56	14.0

**TABLE 3.** Descriptive statistics (frequency and percentages) of victim's substance use, self-harm and suicide

	Traditional and cyber victimization status				
	Total N = 400	Non-victim n = 183	Cyber Only n = 117	Traditional Only n = 44	Both n = 56
<b>Gender</b>					
Male	183 (45.8)	83 (45.4)	60 (51.3)	16 (36.4)	24 (42.9)
Female	217 (54.2)	100 (54.6)	57 (48.7)	28 (63.6)	32 (57.1)
<b>Substance</b>					
<b>Cigarette/hookah</b>					
Yes	104 (26.7)	33 (18.3)	42 (37.2)	12 (28.6)	17 (30.9)
No	286 (73.3)	147 (81.7)	71 (62.8)	30 (71.4)	38 (69.1)
<b>Alcohol</b>					
Yes	53 (13.7)	17 (9.6)	23 (20.4)	3 (7.1)	10 (18.2)
No	335 (86.3)	161 (90.4)	90 (79.6)	39 (92.9)	45 (81.8)
<b>Hashish/marijuana</b>					
Yes	24 (6.2)	5 (2.8)	11 (9.9)	2 (4.8)	6 (10.9)
No	362 (93.8)	173 (97.2)	100 (90.1)	40 (95.2)	49 (89.1)
<b>Opium</b>					
Yes	17 (4.4)	4 (2.2)	6 (5.3)	3 (7.1)	4 (7.3)
No	373 (95.6)	176 (97.8)	107 (94.7)	39 (92.7)	51 (92.7)
<b>Self-Harm</b>					
Yes	86 (23.2)	21 (12.3)	33 (31.4)	12 (29.3)	20 (37.0)
No	285 (76.8)	150 (87.7)	72 (68.6)	29 (70.7)	34 (63.0)
<b>Suicide</b>					
Yes	66 (17.7)	16 (9.4)	23 (21.3)	8 (20.0)	19 (35.2)
No	307 (82.3)	155 (90.6)	85 (78.7)	32 (80.0)	35 (64.8)

**TABLE 4.** Descriptive statistics (frequency and percentages) of student’s substance use, self-harm and suicide

	Total N = 400	boys n = 183	girls n = 217
<i>Substance</i>			
<b>Cigarette/Hookah</b>			
Yes	110 (26.6)	56 (29.5)	54 (24.1)
No	304 (73.4)	134 (70.5)	170 (75.9)
<b>Alcohol</b>			
Yes	58 (14.1)	39 (20.6)	19 (8.5)
No	354 (85.9)	150 (79.4)	204 (91.5)
<b>Hashish/marijuana</b>			
Yes	25 (6.1)	19 (10.2)	6 (2.7)
No	384 (96.9)	168 (89.8)	216 (97.3)
<b>Opium</b>			
Yes	19 (4.6)	16 (8.4)	3 (1.3)
No	395 (95.4)	174 (91.6)	221 (98.7)
<b>Self-harm</b>			
Yes	92 (23.4)	37 (20.4)	55 (25.8)
No	302 (76.6)	144 (79.6)	158 (74.2)
<b>Suicide</b>			
Yes	69 (17.5)	22 (12.6)	47 (21.4)
No	326 (82.5)	153 (87.4)	173 (78.6)

**TABLE 5.** Cramer’s V correlations between variables

	Cigarette/ hookah	Alcohol	Hashish/ marijuana	Opium	Self-harm	Suicide	Gender	Victimization
Cigarette/hookah								
Alcohol	0.576**							
Hashish/marijuana	0.317**	0.394**						
Opium	0.312**	0.361**	0.633**					
Self-harm	0.226**	0.089	0.089	0.094				
Suicide	0.244**	0.043	0.038	0.061	0.566**			
Gender	0.061	0.174**	0.155**	0.169**	.063	0.115*		
Victimization	0.185**	0.155*	0.147*	0.103	0.244**	0.235**	0.090	

Note. \* $p < 0.05$ ; \*\* $p < 0.01$

**TABLE 6.** Odds Ratios (95% Confidence Interval) and significance obtained from the binary logistic regression of risk factors on substance use

	Substance					
	Cigarette/hookah			Alcohol		
	OR <sup>a</sup>	B	CI	OR <sup>a</sup>	B	CI
Male	1.372	.316	(0.866, 2.174)	<b>2.916**</b>	<b>1.070</b>	<b>(1.563, 5.443)</b>
<i>Victimization</i>						
Cyber only	<b>2.598**</b>	<b>0.955</b>	<b>(1.516, 4.450)</b>	<b>2.337*</b>	<b>0.849</b>	<b>(1.173, 4.654)</b>
Traditional only	1.851	.616	(0.855, 4.009)	0.819	-0.199	(0.225, 2.979)
Cyber & traditional	<b>2.004*</b>	<b>0.695</b>	<b>(1.008, 3.984)</b>	2.174	0.777	(0.916, 5.159)
	Hashish/marijuana			Opium		
	OR <sup>a</sup>	B	CI	OR <sup>a</sup>	B	CI
Male	<b>3.951**</b>	<b>1.374</b>	<b>(1.515, 10.304)</b>	<b>6.579**</b>	<b>1.884</b>	<b>(1.832, 23.632)</b>
<i>Victimization</i>						
Cyber only	<b>3.622*</b>	<b>1.287</b>	<b>(1.211, 10.836)</b>	2.286	0.827	(0.622, 8.396)
Traditional only	2.039	0.712	(0.374, 11.109)	4.324	1.464	(0.895, 20.896)
Cyber & traditional	<b>4.431*</b>	<b>1.489</b>	<b>(1.275, 15.399)</b>	3.623	1.287	(0.855, 15.346)

Note. **Bold** indicates significant results; \*\* $p < .01$ , \* $p < .05$ , <sup>a</sup>non-victim group as the referent group

**TABLE 7.** Odds Ratios (95% Confidence Interval) and significance obtained from the binary logistic regression of risk factors on self-harm and suicide

	Self-harm		
	OR <sup>a</sup>	B	CI
Male	0.771	-0.260	(0.464, 1.281)
<i>Victimization</i>			
Cyber only	<b>3.344**</b>	<b>1.207</b>	<b>(1.803, 6.203)</b>
Traditional only	<b>2.886*</b>	<b>1.060</b>	<b>(1.277, 6.522)</b>
Cyber & traditional	<b>4.199**</b>	<b>1.435</b>	<b>(2.048, 8.606)</b>
	Suicide		
	OR <sup>a</sup>	B	CI
Male	<b>0.515*</b>	-0.663	<b>(0.287, 0.924)</b>
<i>Victimization</i>			
Cyber only	<b>2.748**</b>	<b>1.011</b>	<b>(1.369, 5.516)</b>
Traditional only	2.295	0.831	(0.900, 5.853)
Cyber & traditional	<b>5.460**</b>	<b>1.697</b>	<b>(2.534, 11.765)</b>

Note. Bold indicates significant results \*\* $p < .01$ , \* $p < .05$

### Regression results

Logistic regression assumptions were tested, and there was no evidence of multicollinearity or outliers. Results of the binary logistic regression analyses are presented in Tables 6 and 7.

According to the results, males were 3 times (OR = 2.91, 95% CI: 1.563-5.443) more likely to drink alcohol, almost 4 times (OR = 3.95, 95% CI: 1.512-10.304) more likely to smoke hashish/marijuana, and almost 6.6 times (OR = 6.57, 95% CI: 1.832-23.632) more likely to smoke opium than girls. Also boys were less likely to attempt suicide than girls.

The results demonstrated that cyber victims were 3 times (OR = 2.59, 95% CI: 1.516-4.450) more likely to smoke cigarettes/hookah, 2.3 times (OR = 2.33, 95% CI: 1.173-4.654) more likely to drink alcohol, 3.6 times (OR = 3.62, 95% CI: 1.211- 10.834) more likely to smoke hashish/marijuana, 3.3 times (OR = 3.34, 95% CI: 1.803-6.203) more likely to harm themselves and 2.7 times (OR = 2.74, 95% CI: 1.369-5.516) more likely to attempt suicide than non-victim group.

The results demonstrated that traditional victims were 2.9 times (OR = 2.88, 95% CI: 1.277-6.522) more likely to harm themselves than non-victim group.

The results demonstrated that cyber and traditional victims group were 2 times (OR = 2.00, 95% CI: 1.008-3.984) more likely to smoke cigarettes/hookah, 4.4 times (OR = 4.43, 95% CI: 1.275-15.399) more likely to smoke hashish/marijuana, 4.2 times (OR = 4.19, 95% CI: 2.048-8.606) more likely to harm themselves and 5.4 times (OR = 5.46, 95% CI: 2.534-11.765) more likely to attempt suicide than non-victim group.

### Discussion

Results showed that cyber victimization was significantly associated with smoking cigarettes/hookah and hashish/marijuana, drinking alcohol, self-harm, and suicide. This finding is associated with other works (27). Patchin and Hinduja (43) said that cyber victimization is associated with low self-esteem. With respect to low self-esteem and suicide relationship (44), we can say that bullying victimization can cause low self-esteem, and thus this can lead to suicide or substance use. As mentioned earlier, bullying victims may feel social isolation, their frequent need for help from family and friends could lead them to feel they have become a burden on other people, and according to *The Interpersonal Theory of Suicide*, interaction between these two factors may lead to suicide (32), or they may harm themselves to relieve overwhelming negative feelings.

Results showed that traditional victimization was significantly associated with self-harm. This finding is associated with other work (45). Concerning *The Stress-diathesis Model*, interaction between pre-dispositional vulnerability and stressful events can cause mental health problems like depression (46). A stressful event (e.g. bullying victimization) may lead to depression and self-harm. Concerning *General Strain Theory* (31), the frustration and aggression that a student feels because of being a victim of bullying, can lead to destructive behavior. One example of that behavior can be self-harm.

Results showed that being bullied in both ways was significantly associated with cigarette/hookah and hashish/marijuana smoking, and especially self-harm and suicide attempts. These results were in line with previous studies that found those who experienced

both traditional and cyberbullying were at great risk for suicide (45) and self-harm (36). This group feels more pressure and frustration because of their victimization experience, and according to *General Strain Theory* (31), this issue can lead to more damage for them. Also, they experience more stressful events. According to the stress-diathesis model, they may develop mental health problem (46). It seems that due to being bullied at school and in cyberspace, they may get the impression that they do not have control on their life. They may feel that no matter what they do, they are going to be teased, mocked and harassed by others. This issue may cause learned helplessness and mental health problems (47). Also being bullied at school and cyberspace may increase thwarted belongingness and perceived burdensomeness more than being bullied only at school or cyberspace, and according to *The Interpersonal Theory of Suicide* (32), the more is person perceives burdensomeness and thwarted belongingness, the more they are at risk for suicide.

Another goal of this study was focused on comparison of the consequences of traditional bullying to those of cyberbullying. It seems that cyber victimization is more dangerous than traditional victimization. This outcome is consistent with other research (24). This may be because cyberbullying can happen anywhere and anytime, so its victims think that they cannot stop their bullies and that they have no control over what might happen. This could lead them to develop learned helplessness. Research shows that learned helplessness can cause mental health problems (47), and this issue may be able to explain why cyber victimization has more consequences.

### Limitations

This study has some limitations including (a) using self-report questionnaires, students may make the more socially acceptable answer rather than being truthful; (b) this survey was developed for high school students, and thus the achieved results may not be generalized to other social groups; (c) because of the cross-sectional design of the study, the attained results can't be interpreted as cause and effect relationships and (d) we did not consider other potential confounders, such as personality or family factors, which may have had an impact on the association between victimization and substance use, self-harm and suicide attempts.

### Clinical significance

This study shows that there is a difference between traditional and cyberbullying consequences and it is concluded that cyber victimization is more serious. Research findings indicated that those who experienced both kinds of bullying require more

attention, especially for self-harm and suicide attempts. The present study suggests that any kind of bullying needs immediate intervention to reduce the negative effects of the victimization experience. In addition, prevention programs should consider the possible effects of traditional and cyber victimization on substance use, self-harm, and suicide attempts in students.

### Conflicts of interest

The authors declare no conflicts of interest.

### References

1. Walden LM, Beran TN. Attachment quality and bullying behavior in school-aged youth. *Can J School Psychol* 2010;25(1):5-18.
2. Tan L, Ganapathy SS, Sooryanarayana R, Hasim MH, Saminathan TA, Mohamad Anuar MF, et al. Bullying victimization among school-going adolescents in Malaysia: prevalence and associated factors. *Asia Pac J Public Health* 2019;31(8\_suppl):18S-29S.
3. Kowalski RM, Morgan CA, Limber SP. Traditional bullying as a potential warning sign of cyberbullying. *School Psychol Inter* 2012;33(5):505-19.
4. Price M, Chin MA, Higa-McMillan C, Kim S, Frueh BC. Prevalence and internalizing problems of ethnoracially diverse victims of traditional and cyber bullying. *School Ment Health* 2013;5(4):183-91.
5. Oriol X, Miranda R, Unanue J. Bullying victimization at school and subjective well-being in early and late Peruvian adolescents in residential care: The contribution of satisfaction with microsystem domains. *Child Youth Serv Rev* 2020;109:104685.
6. Lotfi S, Dolatshahi B, Mohammadkhani P, Campbell MA, Rezaei Dogah E. Prevalence of bullying and its relationship with trauma symptoms in young Iranian students. *Practice Clin Psychol* 2014;2(4):271-6.
7. Patchin JW, Hinduja S. Bullies move beyond the schoolyard: a preliminary look at cyberbullying. *Youth Violence Juv Justice* 2006;4(2):148-69.
8. Mobin A, Feng CX, Neudorf C. Cybervictimization among preadolescents in a community-based sample in Canada: prevalence and predictors. *Can J Public Health* 2017;108(5-6):e475-e81.
9. Arabshahi F, Fakhri A, Serami M, Ketabi M, Golestaneh Z, Akbari H, et al. An investigation of the bullying through social networks among junior high school students: an experience in Kashan, Iran. *Int J School Health* 2018;5(1):e59607.
10. Aboujaoude E, Savage MW, Starcevic V, Salame WO. Cyberbullying: review of an old problem gone viral. *J Adolesc Health* 2015;57(1):10-8.
11. Beran TN, Lupart J. The relationship between school achievement and peer harassment in Canadian adolescents: the importance of mediating factors. *School Psychol Inter* 2009;30(1):75-91.
12. Nansel TR, Overpeck M, Pilla RS, Ruan WJ, Simons-Morton B, Scheidt P. Bullying behaviors among US youth: prevalence and association with psychosocial adjustment. *JAMA* 2001;285(16):2094-100.
13. Huang L. Exploring the relationship between school bullying and academic performance: the mediating role of students' sense of belonging at school. *Educ Stud* 2020:1-17.



14. Garmy P, Hansson E, Vilhjálmsdóttir R, Kristjánisdóttir G. Bullying and pain in school-aged children and adolescents: a cross-sectional study. *SAGE Open Nurs* 2019;5:2377960819887556.
15. Fekkes M, Pijpers FI, Fredriks AM, Vogels T, Verloove-Vanhorick SP. Do bullied children get ill, or do ill children get bullied? a prospective cohort study on the relationship between bullying and health-related symptoms. *Pediatrics* 2006;117(5):1568-74.
16. Storch EA, Nock MK, Masia-Warner C, Barlas ME. Peer victimization and social-psychological adjustment in Hispanic and African-American children. *J Child Fam Stud* 2003;12(4):439-52.
17. Luk JW, Wang J, Simons-Morton BG. Bullying victimization and substance use among US adolescents: mediation by depression. *Prev Sci* 2010;11(4):355-9.
18. Tharp-Taylor S, Haviland A, D'Amico EJ. Victimization from mental and physical bullying and substance use in early adolescence. *Addict Behav* 2009;34(6-7):561-7.
19. Fisher HL, Moffitt TE, Houts RM, Belsky DW, Arseneault L, Caspi A. Bullying victimisation and risk of self harm in early adolescence: longitudinal cohort study. *BMJ* 2012;344:e2683.
20. McMahon EM, Reulbach U, Keeley H, Perry IJ, Arensman E. Reprint of: bullying victimisation, self harm and associated factors in Irish adolescent boys. *Soc Sci Med* 2012;74(4):490-7.
21. Klomek AB, Sourander A, Niemelä S, Kumpulainen K, Piha J, Tamminen T, et al. Childhood bullying behaviors as a risk for suicide attempts and completed suicides: a population-based birth cohort study. *J Am Acad Child Adolesc Psychiatry* 2009;48(3):254-61.
22. Kim HH-s, Chun J. Bullying victimization, school environment, and suicide ideation and plan: focusing on youth in low-and middle-income countries. *J Adolesc Health* 2020;66(1):115-22.
23. Smokowski PR, Kopasz KH. Bullying in school: An overview of types, effects, family characteristics, and intervention strategies. *Child Schools* 2005;27(2):101-10.
24. Kowalski RM, Limber SP. Psychological, physical, and academic correlates of cyberbullying and traditional bullying. *J Adolesc Health* 2013;53(1):S13-S20.
25. Sourander A, Brunstein Klomek A, Ikonen M, Lindroos J, Luntamo T, Koskelainen M, et al. Psychosocial risk factors associated with cyberbullying among adolescents: a population-based study. *Arch Gen Psychiatry* 2010;67(7):720-8.
26. Gardella JH, Fisher BW, Teurbe-Tolon AR. A systematic review and meta-analysis of cyber-victimization and educational outcomes for adolescents. *Rev Educ Res* 2017;87(2):283-308.
27. Sinclair KO, Bauman S, Poteat VP, Koenig B, Russell ST. Cyber and bias-based harassment: associations with academic, substance use, and mental health problems. *J Adolesc Health* 2012;50(5):521-3.
28. Elgar FJ, Napoletano A, Saul G, Dirks MA, Craig W, Poteat VP, et al. Cyberbullying victimization and mental health in adolescents and the moderating role of family dinners. *JAMA Pediatr* 2014;168(11):1015-22.
29. John A, Glendenning AC, Marchant A, Montgomery P, Stewart A, Wood S, et al. Self-harm, suicidal behaviours, and cyberbullying in children and young people: systematic review. *J Med Internet Research* 2018;20(4):e129.
30. Nixon CL. Current perspectives: the impact of cyberbullying on adolescent health. *Adolesc Health Med Therap* 2014;5:143.
31. Agnew R, White HR. An empirical test of general strain theory. *Criminology* 1992;30(4):475-500.
32. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner Jr TE. The interpersonal theory of suicide. *Psychol Rev* 2010;117(2):575.
33. Joiner T. Why people die by suicide: Harvard University Press; 2007.
34. Bauman S, Toomey RB, Walker JL. Associations among bullying, cyberbullying, and suicide in high school students. *J Adolesc* 2013;36(2):341-50.
35. Beckman L, Hagquist C, Hellström L. Does the association with psychosomatic health problems differ between cyberbullying and traditional bullying? *Emot Behav Difficult* 2012;17(3-4):421-34.
36. Schneider SK, O'donnell L, Stueve A, Coulter RW. Cyberbullying, school bullying, and psychological distress: a regional census of high school students. *Am J Public Health* 2012;102(1):171-7.
37. Campbell M, Spears B, Slee P, Butler D, Kift S. Victims' perceptions of traditional and cyberbullying, and the psychosocial correlates of their victimisation. *Emot Behav Difficult* 2012;17(3-4):389-401.
38. Lam LT, Li Y. The validation of the E-Victimisation Scale (E-VS) and the E-Bullying Scale (E-BS) for adolescents. *Computers Hum Behav* 2013;29(1):3-7.
39. Hajlo N, Ghasemi Nejad MA, Jangi S, Hossain SA. Relationship between the dark triad personality and cyber bullying in student internet users. *J Kermanshah Univ Med Sci* 2015;19(1):24-31.
40. Olweus D. Revised Olweus bully/victim questionnaire. *Br J Educ Psychol* 1996.
41. Rezapour M, Soori H, Khodakarim S. Testing psychometric properties of the perpetration of and victimization scales with olweus bullying questionnaire in middle Schools. *J Safety Promot Injury Prev* 2014;1(4):212-21.
42. Krumpal I. Determinants of social desirability bias in sensitive surveys: a literature review. *Qual Quant* 2013;47(4):2025-47.
43. Patchin JW, Hinduja S. Cyberbullying and self-esteem. *J Sch Health* 2010;80(12):614-21; quiz 22-4.
44. McGee R, Williams S, Nada-Raja S. Low self-esteem and hopelessness in childhood and suicidal ideation in early adulthood. *J Abnorm Child Psychol* 2001;29(4):281-91.
45. Peng Z, Klomek AB, Li L, Su X, Sillanmäki L, Chudal R, et al. Associations between Chinese adolescents subjected to traditional and cyber bullying and suicidal ideation, self-harm and suicide attempts. *BMC Psychiatry* 2019;19(1):324.
46. Braet C, Vlierberghe LV, Vandevivere E, Theuwis L, Bosmans G. Depression in early, middle and late adolescence: differential evidence for the cognitive diathesis-stress model. *Clin Psychol Psychother* 2013;20(5):369-83.
47. Miller WR, Seligman ME. Depression and learned helplessness in man. *J Abnorm Psychol* 1975;84(3):228-38.