

Traditional Versus Internet Bullying in Junior High School Students

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Published online: 24 March 2012
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Abstract To examine the prevalence of traditional and Internet bullying and the personal, family, and school environment characteristics of perpetrators and victims. Students (12–14 years old) in 35 junior high schools were randomly selected from the Jerusalem Hebrew (secular and religious) and Arab educational system ($n = 2,610$). Students answered an anonymous questionnaire, addressing personal, family, and school characteristics. Traditional bullying and Internet bullying for perpetrators and victims were categorized as either occurring at least sometimes during the school year or not occurring. Twenty-eight percent and 8.9 % of students were perpetrators of traditional and Internet bullying, respectively. The respective proportions of victims were 44.9 and 14.4 %. Traditional bullies presented higher Odds Ratios (ORs) for boys, for students with poor social skills (those who had difficulty in making friends, were influenced by peers in their behavior, or were bored), and for those who had poor communication with their parents. Boys and girls were equally likely to be Internet bullies and to use the Internet for communication and making friends. The OR for Internet bullying victims to be Internet bullying perpetrators was 3.70 (95 % confidence interval 2.47–5.55). Victims of traditional bullying felt helpless, and victims of traditional and Internet

bullying find school to be a frightening place. There was a higher OR of Internet victimization with reports of loneliness. Traditional bully perpetrators present distinctive characteristics, while Internet perpetrators do not. Victims of traditional and Internet bullying feel fear in school. Tailored interventions are needed to address both types of bullying.

Keywords Bullying · Internet · Junior high schools · Adolescents · Israel

Introduction

Violence is a public health threat [1, 2] of epidemic proportion, particularly among children [3]. The World Health Organization (WHO) defines violence as the intentional use of physical force or power [2]. Bullying, a frequent manifestation of violence, is characterized by an imbalance of power between the perpetrator and the victim [4]. According to the Health Behavior in School-Aged Children (HBSC) study, which encompassed 40 countries in Europe, Canada, Israel and the USA in 2005/2006, the proportion of adolescent boys and girls involved in bullying ranged from 8.6 to 4.8 %, respectively, in Sweden to 45.2 and 35.8 %, respectively in Lithuania [5]. In Israel, the proportions were 30.5 % of boys and 15.3 % of girls [5]. Another study in Israel found lower rates of bullying among secondary school students, and higher rates for Arab than for Jewish students [6]. Similar ethnic differences were found at younger ages [7], but in another study, ethnic differences were not statistically significant [8].

Individual, family, interpersonal relationship and school environment characteristics bear on bullying [9–12]. Some authors have found consistent bullying patterns across

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countries [13], while others have not [14]. Intra-national ethnic and racial characteristics are also inconsistent for bullies and victims [10].

A study addressing the long-term consequences of traditional bullying in Finland demonstrated that frequent bullies at age 8 are at higher risk for committing criminal offenses 8–12 years later [15, 16]. In a study of British and Welsh 7-year-old twins, mothers' reports of bullying victimization of either child during the previous 2 years was associated with difficulties in behavior and school adjustment [17]. Dutch 9–11-year-old children who were victims of bullying at the beginning of a school year were found to be at higher risk for psychosomatic symptoms at the school year's end [18]. There is also evidence that bullying victimization increases the risk of adjustment problems and psychiatric outcomes in late adolescence and adulthood [19], and that these effects might be stronger among the less affluent [20].

As electronic communication has increased in recent years, a new form of bullying has emerged. The communication technology revolution, particularly the penetration of the Internet in industrialized countries and in countries with transitional economies [21], has increased opportunities for harassment and abuse. A survey of Internet users in the United States aged 10–15 years in 1999–2000 found that 15 % of respondents were Internet aggressors, and 7 % were targets of aggressors or were both aggressors and targets [22, 23]. In 2005, the proportion of targets had increased to 9 % [24]. In a 2006 study, 35 % of respondents reported being targets of Internet harassment [25]. A 2008 survey of 10–17-year-olds found online victimization among 6 % within the past year and 9 % within their lifetime [26].

Some studies have compared traditional and Internet bullying. A Colorado study [27] of students in grades 5–11 found a 40.3 % rate of physical bullying and a 9.4 % rate of Internet bullying. A small study of 84 rural and suburban 13–18-year-olds showed that 64.3 % were traditional bullies and 21.4 % were Internet bullies; 71.4 and 48.8 % were victims of traditional and Internet bullying, respectively [28]. In Massachusetts, 15.8 % of 9–12-year-olds reported cyber bullying, and 25.9 % reported school bullying [29]. A 2005–2006 survey of US students also found a higher frequency of traditional bullying (ranging from 13.3 % for physical bullying, to 37.4 % for verbal bullying), than of cyber bullying (8.3 %). Similar proportions were found for victims (12.8, 41.0, and 9.8 % for physical, verbal, and cyber bullying, respectively) [30].

Most studies of bullying have addressed characteristics in selected domains or variables. Studies have focused on gender [31]; health characteristics of targets [32, 33]; and the relationship of Internet bullying to emotional and mental health [34, 35], social health [24], and traditional

bullying [25, 28, 36]. A few studies have compared specific characteristics of both traditional and cyber bullying and found that depression might be a common factor among victims [29, 37, 38].

One study that examined bullying comprehensively among adolescents in Northern Cyprus and Turkey, analyzed individual, peer, parental, teacher, and school factors related to bullying, but addressed only bullying aggressors [39].

Thus, this study fills a gap in knowledge by examining in a comprehensive way the prevalence and characteristics of traditional and Internet bullying among junior high school students in an entire city—Jerusalem, Israel. We analyzed the personal characteristics of perpetrators and victims and their relationships to peers and family, and to the school environment. We hypothesized that individual, family, and school characteristics differ between traditional and Internet bullying perpetrators and victims.

Methods

Study Population

The study population included Jerusalem junior high school students, 12–14 years old, in 35 randomly selected schools in the public education system, which includes the majority of schools in the city. Students at Hebrew secular ($n = 973$) and religious schools ($n = 795$), and Arab schools ($n = 842$) participated in the study. In Hebrew secular schools, girls and boys attend class together, while in Arab and Hebrew religious schools, girls and boys are gender segregated. The mean number of pupils per class was lowest in Hebrew religious schools for girls (26.3) and highest in Hebrew secular schools (33.2) and Arab schools for boys (38.6). Data were collected during March–May 2006. Sample size was calculated considering a prevalence of 10 ± 2 %. Each grade stratum and all classrooms were enumerated, and the number of students in each was ascertained. Classrooms were randomly selected from this framework, and all children in the selected classrooms were surveyed. Permission to survey students was obtained from the Ministry of Education and each principal and teacher in the schools. Parents were informed about the survey and provided passive consent. The questionnaires were pre-tested in classes that did not participate in the final sample. The response rate was 84 % (82 and 88 % in Hebrew and Arab schools, respectively). No information about non-respondents is available, as the questionnaires were anonymous. Questionnaires (in Arabic and Hebrew, and checked for consistency in both languages) were distributed and answered in class, and collected in closed envelopes.

Levels of traditional and Internet bullying were ascertained from answers to the questions “Did it happen that you participated in doing nasty or unpleasant things to children in this school term?” and “Did it happen that children did nasty or unpleasant things to you in this school term?” Possible answers were never, sometimes, or many times. Independent variables included type of school (Arab or Hebrew, secular or religious), grade level (as a proxy for age), gender, use of the Internet, personal characteristics, peer relations, family support, school environment and classroom environment, and socio-economic background. Questions were adapted from the HSBC survey used in Israel [40] (see “Appendix” for details).

Statistical Analysis

Analysis was performed using SPSS 14.0 [41]. Univariate analysis was performed with each of the four bullying dependent variables. The independent variables that were associated ($\alpha \leq 0.05$) with traditional or Internet bullying in the univariate analysis were introduced into a logistic regression model (with bullying or being bullied defined as at least sometimes = 1, and not bullying or not being bullied = 0). The final model contained groups for the personal, socio-demographic characteristics, uses of Internet, and family and school characteristics. Being a victim or a perpetrator of bullying was added as an independent variable in order to control for the effect of victimization or

perpetration, respectively. Type of school, grade level, and gender of respondents, as well as mothers’ working status and reported economic situation, were introduced within each model.

Random effects were analyzed, with classroom level as a primary unit, to control for cluster effects; β , SE, and P values are presented. The model for being bullied on the Internet could not be performed due to convergence problems. The intra-class correlation coefficient (ρ) was calculated except for being bullied on the Internet.

Results

Characteristics of the surveyed population are summarized in Table 1. There were more boys than girls, especially in Arab schools, and more girls than boys in Hebrew religious schools. The proportion of students with mothers who did not work, with poor economic status, and without a computer at home was highest among Arab students. More than 91 % of all students used the Internet, although the proportion was lower among students in Hebrew religious schools and Arab schools.

Prevalence

Twenty-eight percent of students reported traditional bullying perpetration “at least sometimes.” The proportion of

Table 1 Population characteristics (%)

	Hebrew secular $n = 973$	Hebrew religious $n = 795$	Arab $n = 842$	Total $n = 2,610$
Grade				
7	32.5	40.8	41.4	37.9
8	32.0	36.1	26.6	31.5
9	35.6	23.1	31.9	30.6
Gender				
Boys	50.6	43.8	64.8	53.2
Girls	49.4	56.2	35.2	46.8
Mother’s working status				
Working	83.9	78.1	9.1	58.0
Not working	16.1	21.9	90.9	42.0
Reported economic status				
Good	31.4	33.3	44.7	36.3
Fair	65.3	64.5	34.9	55.1
Poor	3.4	2.2	20.3	8.6
Use of computer (per day)				
Do not have computer	2.4	6.9	27.1	11.7
1/2–1 h	24.4	42.8	33.3	32.9
1–2 h	33.0	26.7	17.6	26.1
More than 2 h	40.2	23.5	22.0	29.3
Use of Internet	98.7	87.4	84.4	90.7

students who reported bullying perpetration was highest in Arab schools. Traditional bullying increased with age, and boys had twice the rate of bullying as girls. Internet bullying was reported less frequently (8.9 %) than traditional bullying, and the proportion of those who reported bullying perpetration was also highest among Arab students and boys. Nearly half (44.9 %) of all students reported that they had been victims of traditional bullying. Such reporting was extremely high among Arab students. A much lower percentage (14.4 %) of students reported that they had been victims of Internet bullying, with no statistically significant differences by school or grade, and small gender differences (Table 2).

A distinctive pattern of variables was independently associated with traditional or Internet bullying perpetration (Table 3), and with being victims of bullying (Table 4), in the multivariate analysis.

Bullying Perpetrators

We found a higher odds ratio (OR) of bullying perpetration among students in Hebrew religious schools and Arab schools than among students in Hebrew secular schools, and among boys than among girls. Victims of traditional bullying were also more likely to be perpetrators, as were those who reported that more than half of their peers used the Internet improperly. Additionally, students who were influenced by their peers to engage in dangerous things, were sometimes or frequently bored, had difficulty making new friends, or had poor communication with their parents were more likely to be perpetrators. School characteristics were not associated with traditional bullying.

The OR for Internet bullying was not significantly distinguished by type of school or gender. Victims of Internet bullying were more likely to be perpetrators. Those who

used the Internet to meet new people, those who met in person someone they had first met online, those who used the Internet to chat, and those who reported that most of their peers used the Internet improperly were also more likely to be perpetrators, as were students who were influenced by their peers to do dangerous things. Peer, family, and school characteristics were not associated with Internet bullying.

Victims of Bullying

Higher ORs of traditional bullying victims were evident for students who attended Arab schools, were boys, were bully perpetrators, used the Internet for chatting, estimated that up to half their peers used the Internet improperly, or reported feeling helpless. Unlike among perpetrators, students were more likely to be victims if they perceived their school to be more violent than other schools and were afraid in school.

Arab students were less likely than their counterparts in Hebrew secular schools to be victims of Internet bullying. No gender differences were found among victims of Internet bullying. Being an Internet bullying perpetrator strongly increased the OR of being an Internet bullying victim. Students who used the Internet to meet new people, met in person someone they had first met online, used the Internet for chatting, were influenced by friends to do dangerous acts, felt lonely, or were afraid to study and play in school were more likely to be victims.

Mothers' working status and reported economic background were not associated with any of the dependent variables.

Random effects were observed for traditional bullying, but not for Internet bullying. The values of the intra-class correlation coefficients for traditional bullying perpetrators

Table 2 Prevalence of traditional and Internet bullying* by type of school, grade and gender (%)

	Perpetrators		Victims		<i>n</i>
	Traditional	Internet	Traditional	Internet	
Total	28.1	8.9	44.9	14.4	2,562
Type of school	†	†	†		
Hebrew secular	23.1	7.4	31.1	15.0	962
Hebrew religious	25.9	6.0	34.4	12.9	779
Arab	36.2	13.3	71.0	15.0	821
Grade	‡				
7	25.1	8.6	47.1	13.1	976
8	29.1	7.8	41.7	13.9	801
9	30.9	10.5	45.4	16.3	785
Gender	†	†	†	†	
Boys	37.4	11.0	53.0	15.9	1,331
Girls	17.6	6.5	36.1	12.8	1,185

Total *n* are maximum number of cases. Missing cases; 75 for Hebrew religious schools

* (at least some times)

† $P < 0.001$

‡ $P < 0.05$

Table 3 The Odds Ratio (95 % Confidence Interval) of traditional or Internet bullying perpetrators by selected personal, peer relation, family, and school variables (Logistic regression)

	<i>n</i>	Bullying perpetrators	
		Traditional	Internet
Type of school			
Hebrew secular	790	1	1
Hebrew religious	539	1.37 (1.02–1.84)	0.93 (0.55–1.56)
Arab	559	1.36 (1.00–1.86)	1.27 (0.77–2.11)
Gender			
Girls	868	1	1
Boys	1,016	1.98 (1.51–2.59)	0.65 (0.41–1.02)
Victim traditional bullying			
No	1,037	1	
Yes	835	1.77 (1.37–2.29)	
Victim Internet bullying			
No	1,596		1
Yes	275		3.70 (2.47–5.55)
<i>Use of internet</i>			
Met people through Internet			
No	1,068	1	1
Yes	278	1.32 (0.94–1.84)	2.22 (1.41–3.50)
To know new people			
No	1,285	1	1
Yes	600	1.17 (0.89–1.55)	2.24 (1.42–3.52)
To chat			
No	1,391	1	1
Yes	493	1.17 (0.89–1.55)	1.71 (1.11–2.63)
Estimate % not using Internet properly			
Almost no one	387	1	1
A few	428	1.18 (0.79–1.76)	1.47 (0.53–2.42)
Half and half	630	1.42 (0.97–2.06)	1.13 (0.58–2.54)
A lot/all	442	2.49 (1.66–3.72)	3.42 (1.61–7.25)
<i>Personal characteristics</i>			
Pushed to do dangerous things			
No	834	1	1
Yes	1,051	1.55 (1.20–2.00)	1.64 (1.03–2.63)
Lonely			
No	1,059	1	1
Yes	825	1.19 (0.91–1.56)	0.64 (0.41–1.01)
Helpless			
No	1,137	1	1
Yes	748	1.28 (0.99–1.67)	1.22 (0.80–1.88)
Bored			
No	209	1'	1
Sometimes	1,172	1.65 (1.10–2.48)	1.17 (0.62–2.21)
Frequently	506	1.96 (1.25–3.07)	1.87 (0.94–3.73)
<i>Peer relations</i>			
Difficulty in making new friends			
Very easy	335	1	1
Easy	959	1.55 (1.11–2.16)	1.29 (0.72–2.32)
Hard/very hard	594	1.81 (1.26–2.60)	1.31 (0.72–2.41)

Table 3 continued

	<i>n</i>	Bullying perpetrators	
		Traditional	Internet
<i>Family and school characteristics</i>			
Communications with parents			
Good	1,226	1	1
Poor	658	1.57 (1.23–2.00)	0.93 (0.63–1.39)
Fear to study and play in school			
No	1,537	1	1
Yes	348	0.93 (0.69–1.26)	0.79 (0.49–1.27)
Assessment of violence at school			
Lower	834	1	1
The same/bigger	1,050	1.01 (0.80–1.29)	1.24 (0.82–1.88)
Variance of random effect			
β		0.3775	0.1652
SE		0.1995	0.1336
<i>P</i>		0.0021	0.2196
ρ		2.4 %	0

Figures in bold denote significant results
Denominators for each regression may differ by one to five cases in the different variables. Grade, mother's working status and economic level, students' relations and whether participated in activities were included in the analyses, but the ORs for the dependent variables were not statistically significant

and victims although statistically significant were rather low, 2.5 and 6.8 % respectively. The intra-class correlation coefficient was 0 for Internet bullying, consistent with the fact that Internet bullying is not classroom connected.

Discussion

Prevalence

The proportion of students involved in traditional bullying in our study in Jerusalem junior high schools is higher than in other studies that covered the whole country [5, 6, 8]. Dissimilarities in definitions, age groups, and periods studied may account for the differences. However, the context particular to Jerusalem may play a role. The city is characterized by a complex multicultural, ethnic, and religious environment that is unique in Israel. Further studies should be done to determine whether this is an influential factor in the prevalence of bullying.

Internet bullying is an evolving problem. Its report might be influenced by the perception of victimization, different thresholds for admitting perpetration, or by higher levels of tolerance regarding Internet interactions. While the concept of bullying was developed within the context of school, where ongoing face-to-face relationships occur, Internet bullying may be understood differently because it involves interaction with peers and strangers, and therefore may not be interpreted as bullying [42]. It will be important to follow up the trends as new technologies appear in the market and become more accessible. Furthermore, as public knowledge and awareness of cyber bullying increases, its understanding and reporting may change.

Our study revealed distinctive characteristics of perpetrators and victims, whether bullying was traditional or Internet-based.

Bullying Perpetrators

Our finding of a higher involvement in traditional bullying among pupils in Arab schools was consistent with findings in national studies in Israel [6, 8]. Both the Arab and Hebrew religious schools are gender segregated, and the predominance of bullying among boys may evidence the perpetration of bullying when the school environment is not shared by both genders. A Colombian study among ninth graders found that bullying was higher in all-boys schools and lower in all-girls schools [43].

The poor social skills and poor communication with parents reported by the bullies in our study may evidence a distorted understanding of relationships and a poor family environment. Such distortions might prompt a student to use aggressive behavior for problem solving and conflict resolution in a quest to gain acceptance from peers or to exercise dominance. A study in the United States showed that parental communication and social isolation were associated with bullying among white and black students [10], and another study showed that higher parental support was associated with lower traditional bullying (in its different manifestations) and cyber bullying [30].

Being a victim of bullying independently increases the likelihood of aggression, and vice versa, for both traditional and Internet bullying. It has been suggested that bullying others might be a response to being bullied rather than the opposite, due to fewer resources to cope with

Table 4 The Odds Ratio (95 % Confidence Interval) of traditional or Internet victims of bullying by selected personal, peer relation, family, and school variables (Logistic regression)

	<i>n</i>	Victims of bullying	
		Traditional	Internet
<i>Type of school</i>			
Hebrew secular	790	1	1
Hebrew religious	539	1.11 (0.85–1.46)	0.83 (0.58–1.20)
Arab	559	5.39 (3.99–7.28)	0.59 (0.40–0.87)
<i>Gender</i>			
Girls	868	1	1
Boys	1,016	1.47 (1.14–1.90)	0.90 (0.64–1.26)
<i>Perpetrator traditional bullying</i>			
No	1,037	1	
Yes	835	1.68 (1.29–2.17)	
<i>Perpetrator Internet bullying</i>			
No	1,596		1
Yes	275		3.67 (2.46–5.47)
<i>Use of internet</i>			
<i>Met people through Internet</i>			
No	1,068	1	1
Yes	278	0.64 (0.44–0.92)	1.87 (1.26–2.73)
<i>To know new people</i>			
No	1,285	1	1
Yes	600	1.09 (0.82–1.43)	1.79 (1.28–2.51)
<i>To chat</i>			
No	1,391	1	1
Yes	493	1.47 (1.12–1.94)	1.79 (1.30–2.48)
<i>Estimate % not using Internet properly</i>			
Almost no one	387	1	1
A few	428	1.41 (1.01–1.98)	0.89 (0.53–1.46)
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A lot/all	442	1.32 (0.90–1.93)	1.32 (0.79–2.20)
<i>Personal characteristics</i>			
<i>Pushed to do dangerous things</i>			
No	834	1	1
Yes	1,051	1.16 (0.91–1.48)	1.58 (1.14–2.20)
<i>Lonely</i>			
No	1,059	1	1
Yes	825	1.28 (0.99–1.65)	1.66 (1.17–2.36)
<i>Helpless</i>			
No	1,137	1	1
Yes	748	1.79 (1.41–2.27)	1.12 (0.82–1.54)
<i>Bored</i>			
No	209	1	1
Sometimes	1,172	1.33 (0.88–2.03)	1.65 (0.91–2.97)
Frequently	506	1.02 (0.70–1.50)	1.69 (0.97–2.93)
<i>Peer relations</i>			
<i>Difficulty in making new friends</i>			
Very easy	335	1	
Easy	959	0.94 (0.69–1.28)	1
Hard/very hard	594	0.73 (0.59–1.41)	0.96 (0.65–1.42)

Table 4 continued

	<i>n</i>	Victims of bullying	
		Traditional	Internet
<i>Family and school characteristics</i>			
Communications with parents			
– Variance of random effects could not be calculated in this model due to convergence problems	Good	1,226	1
	Poor	658	1.07 (0.84–1.35)
Figures in bold denote significant results	Fear to study and play in school		
	No	1,537	1
Denominators for each regression may differ by one to five cases in the different variables. Grade, mother's working status and economic level, students' relations and whether participated in activities were included in the analyses, but the ORs for the dependent variables were not statistically significant	Yes	348	2.52 (1.87–3.39)
	Assessment of violence at school		
	Lower	834	1
	The same/bigger	1,050	0.86 (0.64–1.15)
Variance of random effect			
	β		0.2246
	SE		0.0833
	<i>P</i>		0.0083
	ρ		6.8 %

stressful situations, mainly among those with mental health problems or from deprived backgrounds [19].

In the present study, no school variables were associated with bullying perpetration. An explanation for this finding may be that bullies' perceptions of their school might be in accordance with their own behavior and its acceptance in school, and therefore the school environment might not be seen as negative. However, this explanation diverges from findings in the study in North Cyprus and Turkey, where the school environment was associated with traditional bullying [39], in a study of bullying among 7th–11th graders in Israel [8], and in the cross-national study of bullying in 40 countries, of which Israel was a partner. In the latter study, as the number of negative school perceptions increased, the OR for bullying others increased in all countries [44].

The higher ORs of Internet bullying found with use of the Internet for communication purposes (but not for homework or shopping) is expected, because such usage facilitates exchanges of all kinds, including negative ones. This finding agreed with that of a study in London schools among 11–16 year olds [45]. In contrast to traditional bullying, no gender differences were found for Internet bullying, perhaps expressing the more relational type of bullying that girls engage in. However, no other specific personal, family or school variables characterized Internet bullies. Others have found an association between bullying and caregiver relationship or support [23, 30].

We did not find a set of characteristics that can identify those at risk of Internet bullying perpetration. All adolescents, boys and girls, of different ethnic and religious backgrounds are potentially at risk.

Victims of Bullying

Although our study found ethnic and religious differences in traditional bullying, cultural explanations related to interpretations of victimization cannot be dismissed [46]. Such explanations may include cultural differences in the perception of victimization or in readiness to admit victimization, even in an anonymous questionnaire.

While it is difficult to establish directionality in this cross-sectional study, the feelings of helplessness expressed by the victims of traditional bullying may be a consequence of the aggression they suffer. The effects of bullying on mental health have been shown in studies in different countries and at different ages. Studies have found adjustment problems following victimization as early as ages 5–7 years [17]. One study in the Netherlands among 9–11 year olds detected the development of psychosomatic and psychological problems after victimization. The same study also found that children with symptoms of depression and anxiety were at increased risk of being victimized by others [18]. Depression was also manifested among Australian and Swiss adolescents who had been bullied [38]. Studies in the United States at both the national level [9, 37] and the state level [29] have found that poor social and emotional adjustment, loneliness, and depression are associated with bullying victimization. Our finding that victims of traditional bullying consider their school a frightening and violent place has been found by others [10] and is expected, since most bullying occurs in school.

Gender was an equalizer for victims of Internet bullying. The use of the Internet by nearly all students in Hebrew secular schools may increase their exposure to

victimization. Although students reported that they used the Internet for communication purposes, loneliness was an independent variable associated with increased victimization. Lonely people might be an especially vulnerable group that can be identified and targeted by others. In the present study, victims of Internet bullying did not report the feelings of helplessness that were reported by victims of traditional bullying. This finding is in agreement with those of another study among Internet users, which found that most victims of online harassment are not negatively affected, and that only a small minority of victims are distressed by Internet bullying [42]. Other studies have found an association between Internet harassment and being upset [24], depressive symptoms [29, 34, 35, 37, 38, 47], and problem behavior such as delinquency and substance abuse [47]. Interestingly, our finding of an increased OR for victimization among students who were afraid to study and play in school may be due to the fact that the aggressors might be school peers [35].

Being a victim of internet bullying independently increased the OR of Internet aggression. Further study is needed to understand their interaction and the impact for those who are Internet bully-victims.

The strength of this study is that it is based on public schools within an entire city and provides information about both traditional and Internet bullying, addressing their characteristics comprehensively. However, there are some limitations. We did not investigate all means of virtual communication. The assessment of bullying, whether traditional or Internet-based, was conducted by means of similar direct questions. While this is an accepted method, used across cultures and in different languages [5], lately, more detailed questions have been used [48]. There are indications that direct questions and detailed questions on bullying may elicit different answers [35], and that answers to questions may depend on the respondent's role as an aggressor or victim [49], and the respondent's cultural and ethnic background [46]. Some studies have found that the concepts of repetition, power imbalance, and intentionality are not understood, or considered together, by the youngsters as integral to their perception of bullying [49–51]. Finally, respondents' answers in this study may have been affected by the wording used in the two different languages, Arabic and Hebrew. To mitigate this problem, consistency was checked.

Conclusions

Bullying is a frequent phenomenon among Jerusalem junior high students, and the Internet provides a new channel for perpetration. The personal and family characteristics of traditional bullies are distinctive, while it

appears that all youngsters, regardless of their gender or background, are at risk of Internet bullying perpetration. Victims of traditional bullying report feeling helpless, and victims of both traditional and Internet bullying find school to be a frightening place.

Further research is needed to understand youth' perceptions of bullying, particularly cyber bullying, and its assessment in different populations. Intervention programs should be tailored to different populations and contexts.

As the availability of technology increases worldwide, cyber bullying may emerge as a new global epidemic.

Acknowledgments This work was supported by a grant from the Sapir Fund, Israel. We thank Gleb Haynatzki, PhD, for his statistical advice.

Appendix: independent variables in the study

Use of media Number of hours watching TV/video per day; number of hours a day using the computer; uses of Internet for playing, meeting people, making new friends, receiving help for personal problems, chatting, playing games, doing homework, shopping; assessment of number of classmates using the Internet for non-deserving purposes such as pornography, violence, and others.

Personal characteristics Feeling lonely, bored, helpless; self confidence; doing dangerous things to prove that he/she can do it; reporting that students urge other students to do dangerous things; engage in sports; traveling with a driver who drank alcohol.

Peer relations Difficulty in making new friends; whether participated in activities; number of close friends.

Family support For school and personal matters (Parents help with school problems, parents ready to go to school to talk with teachers, stimulated to succeed, feels good within his family, is trusted, has fights at home. Answers; always, frequently, Seldom, never); communication with parents.

School environment Assessment of violence in school; whether students can study and play in school with no fear;

Students relationships Students enjoy being together; most students are kind and help, accept the student as he/she is (always, frequently, seldom, never);

Classroom environment whether teachers and students relate fairly to all students, whether students chatter and use cellular phones in class, whether students come late to class (strongly agree, agree, do not so much agree, strongly disagree).

Socio-economic background student's assessment of economic status; parents' working status; possession of car;

having own room; number of siblings; rank within the siblings; living arrangements

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