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RESEARCH

Depression and suicide ideation among secondary school adolescents involved in school bullying

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Background: Depression, isolation, low self-esteem, and lack of hope are just a few of the characteristics evident in adolescents involved in bullying. The aims of this study are as follows: to examine the association between involvement in school bullying and depressive symptoms and suicide ideation among victims, bully victims, and those uninvolved; to investigate the effects of vulnerability factors on depression and suicide ideation among subjects aged 17 involved in school bullying. **Methods:** A self-reported school-based survey was completed by 290 secondary school students aged 17 years, attending the third grade, coming from 15 different classes of secondary schools in the Tuzla (coming from each municipality in the Tuzla Canton), 2007. Using peer nominations, three groups were established: victims, bully victims, and un-involved participants as control group subjects. Data were obtained using a self-rated questionnaire on bullying, Beck inventory to identify depression and suicide ideations, and state-trait anxiety scales to assess anxiety state/trait among examinees. Data analysis was performed using SPSS version 12.0. **Results:** There was an increased prevalence of depression (29.0% versus 8.8%) and suicidal ideation (16.1% versus 3.5%) in adolescents who have been victims in relationships to respondents who were uninvolved subjects. There was an increased prevalence of depression (17.5% versus 8.8%) and suicidal ideation (15.8.1% versus 3.5%) in adolescents who have been bully victims in relationships to respondents who were uninvolved subjects too. Adolescents who are victims and those who are bully victims are more likely to have suicide ideation compared to uninvolved subjects. Discontent with financial situation is a vulnerability factor associated with elevated levels of depression in victims. **Conclusion:** In evaluations of students involved in bullying behavior, it is important to assess depression and suicide ideation.

Key words: bully victims; depression; irritability; secondary school age students; suicide ideation; victim; vulnerability factors

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Background

School bullying has generally been described as peer-related aggression, involving an imbalance of power, repeated over time, which can be sub-categorized according to whether the aggression is physical, verbal, or psychological (ie, spreading nasty rumors, social exclusion, and malicious text messages; Olweus, 1993; Wolke *et al*., 2001; Wolke and Samara, 2004).

Salmon *et al*. (1998) found an association between being bullied and being depressed. Several studies have already examined the negative effects of bullying, which highlight psychosocial

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consequences such as depression, anxiety, and psychosomatic symptoms (Kaltiala-Heino *et al*., 1999; 2000; Kumpulainen and Räsänen, 2000; Juvonen *et al*., 2003; Fekkes *et al*., 2004; Klomek *et al*., 2007; 2008; 2008a; 2009; Herba *et al*., 2008). For example, Klomek *et al*. (2007) concluded that victimization and bullying are potential risk factors for adolescent depression and suicide. Suicide ideation is the core symptom of major depressive disorder, which overlaps considerably among children, adolescents, and adults. Different symptoms predominate in each age group (Salmon *et al*., 1998; Due *et al*., 2005; Sadock and Sadock, 2008; 2009). Being bullied is strongly associated with a wide range of psychosomatic symptoms and depression. These associations are similar to the complaints known to be associated with child abuse (Klomek *et al*., 2009). Among boys, frequent bullying and victimization are associated with later suicide attempts and completed suicides but not after controlling for conduct and depression symptoms; frequent victimization among girls is associated with later suicide attempts and completed suicides, even after controlling for conduct and depression symptoms (Klomek *et al*., 2008). Klomek *et al*. found (2008a) that frequent exposure to all types of peer victimization was related to high risk of depression, suicide ideation, and suicide attempts compared to students not victimized. Infrequent victimization was also related to increased risk, particularly among females. Depression, isolation, low self-esteem, lack of hope, fear, insecurity, and violent or self-destructive behavior are just a few of the characteristics evident in victims of bullying (Mynard and Joseph, 1997; Kaltiala-Heino *et al*., 1999; 2000; Kumpulainen and Räsänen, 2000; Fekkes *et al*., 2004; Camodeca and Goossens, 2005; Patterson, 2005; Gini, 2008). Negative feelings and emotions increase the risk factors associated with adolescence. Negative feelings, combined with a mixed array of changes in their bodies, their relationships with their peers and adults, and their emotions, increase the risk factors associated with adolescence (Schulz *et al*., 2005; Keenan *et al*., 2006). Anxiety, a fear of going to school, feelings of being unsafe and unhappy at school, and low self-esteem have all been reported as consequences of being repeatedly bullied (Bowers *et al*., 1992). Being bullied has been associated with poorer perceived health, depression, and mental disorders in adulthood (Bowers *et al*., 1992; 1994).

Recent literature on school bullying increasingly recognizes a subset of children, who are both victimized and victimize others (ie, bully others) (Juvonen *et al*., 2003; Herba *et al*., 2008). Evidence suggests that bully victims may be a distinct group from individuals who are only bullies or only victims (Kumpulainen and Räsänen, 2000; Wolke *et al*., 2001; Juvonen *et al*., 2003; Wolke and Samara, 2004; Herba *et al*., 2008). Other authors have referred to this group as bully victims (Kaltiala-Heino *et al*., 1999; 2000; Kumpulainen and Räsänen, 2000; Fekkes *et al*., 2004; Horowitz *et al*., 2004; Patterson, 2005; Herba *et al*., 2008; Klomek *et al*., 2008; 2008a; 2009).

Vulnerability factors

General family characteristics, such as low involvement with parents, low parental warmth, low family cohesion, and single familial structure, have been found to be related to greater bullying among young people (Hartup, 1996; Forero *et al*., 1999; Espelage and Swearer, 2003; Flouri and Buchanan, 2003; Ferguson *et al*., 2005). A range of factors encompassing family, personality, and peer relationships influence a depressed adolescent's vulnerability to suicide ideation and attempt (Ferguson *et al*., 2005). In a survey study of sixth-graders in Finland, a majority of students participated in the bullying process in some capacity, and their various participant roles were significantly related to social status within their respective classrooms (Kaltiala-Heino *et al*., 2000).

The war that lasted from 1992–1995 had transformed the former Yugoslav Republic Bosnia and Herzegovina from a country with an average national income into a poor one. The collapse of the former socialist system and the war both led to physical and socioeconomic devastation and unemployment. Despite the success of the post-war reconstruction, the economy never managed to recover. Acutely induced and widespread poverty and a high level of unemployment represent fairly recent phenomena in the everyday life of Bosnia and Herzegovina (Tioungsou and Yemstov, 2005; World Bank, 2005). At present, about 19.5% of the population are below the poverty limit and suffer serious

shortages in almost all aspects of their lives (Tioungsou and Yemstov, 2005). Pranjić *et al*. (2007) showed in their study that the depression evolving during adolescence is strongly associated with the poverty and life with stepparents, that is, the life in an insecure environment. Gender was associated too with the prevalence of depression, so that the girls were revealed to be at major risk. Risks of having a negative self-perception resulting from depressive experiences, observed in Bosnia and Herzegovina adolescents, were mainly based on the unemployment state of the parents and a poor familial socioeconomic state. The possible explanation of the results obtained in this study could be that relationships with friends are of high importance to an adolescent's financial situation. Adolescents who were unsatisfied with their financial situation had the feeling of being abandoned by others (Veenestra *et al*., 2007). Adolescents from families of low socioeconomic position were more than twice as likely to report not feeling safe at school. They also reported more physical and psychological symptoms (Klomek *et al*., 2007). Another potential moderating variable is gender. Gender could impact differently on both suicide ideation and bullying behavior; boys tend to be bully victims, whereas girls tend to be passive victims. Furthermore, suicide ideation is more common among girls, and suicidal behavior is more common among older children and adolescents compared to younger children (Hartup, 1996; Forero *et al*., 1999; Flouri and Buchanan, 2003; Espelage and Swearer, 2003; Ferguson *et al*., 2005; Veenestra *et al*., 2007).

Aims

It would seem that adolescents who are victims of school bullying and/or bully victims might be at greater risk on a number of mental health symptoms. In reviewing the literature, no research of this nature within a Bosnia and Herzegovina context was found. Little is known about the predictive association between bullying behavior with depression and suicidal ideation at age 17. The main aim of the study is to test the association between school bullying exposure (main predictor, bully victims versus uninvolved, and victims versus uninvolved) and depressive disorders and suicide ideation. The other aim of the study is to examine the effect of moderating vulnerability factors (ie, gender, deprivation, which in our case means self-reported discontent with family financial situation), which might moderate the relationship between bullying and depression and suicidal ideation among secondary school adolescents aged 17 years.

Methods

The survey uses a two-stage probability sampling technique. In the first stage, primary sampling units are secondary schools, which are selected with a probability proportional to their enrollment size. In the second stage, classes are chosen randomly within a selected school. All the students within the selected classes are eligible for participation. Before administering the survey to adolescents, approval from the Tuzla Canton Ministry of culture, sport, and education was obtained. The survey and procedures were approved by the Ethics Research Committee at the Tuzla University School of Medicine.

Each student gave written informed consent to participate in the study. Students' participation was anonymous and voluntary. Assessments were performed using paper-and-pencil tests during class sessions (this takes between 30 and 40 min), supervised by one of the authors. On the day of testing, students completed the questionnaires anonymously in order to assure confidentiality of their responses and ethical behavior (WHO, 2007). During the interview, the interviewer (one of the authors) was alone with the examinees.

During May–June 2007, 389 secondary school adolescents aged 17 years (ie, students born in 1989; mean age = 17, SD = 0.345) from 12 schools, which offer four-year education in the municipality of Tuzla, participated in the self-report survey. We did not include students from vocational schools because they have neither a three-year education nor schools for students with special needs.

Subjects

Of the 389 adolescents, only 290 had full data sets in an appropriate manner (142 girls and 148 boys; response rate 74.5% (Table 1). There were 179 (61, 7%) participants from nine classes of grammar schools (mostly girls) and 111 (38, 3%) participants

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Table 1 Socio-demographic and personal factors for enrolled examinees (characteristics compared between adolescents who were bullied and adolescent who were uninvolved witnesses)

	Uninvolved witnesses $n = 171$ (59.0)	Adolescent who were bullied $n = 119$ (41.0)	*P*-value[a]
Sex			0.247
Females	113 (49.6)	29 (46.7)	
Males	115 (50.4)	33 (53.3)	
Place of residence			0.008
Same as before the war	194 (85.1)	38 (61.3)	
Refugee/immigration	34 (14.9)	24 (38.7)	
Family structure, adolescent lives with			0.001
Both parents	194 (85.1)	38 (61.3)	
Mother or father	34 (14.9)	23 (37.1)	
Other relative (s)	0 (0.0)	1 (1.6)	
Active participation in sport			0.001
Yes	93 (40.8)	18 (29.0)	
No	135 (59.2)	44 (71.0)	
School achievement			0.001
Very good marks	175 (76.7)	53 (85.5)	
Bad marks	53 (23.3)	9 (14.5)	
Empathy to school			0.703
Yes	148 (64.9)	43 (69.4)	
No	25 (11.0)	5 (8.0)	
Sometimes	55 (24.1)	14 (22.6)	
Satisfaction with relationship with close friends			0.002
Yes	209 (91.7)	48 (77.4)	
No	2 (0.8)	2 (3.2)	
Sometimes	17 (7.5)	12 (19.4)	
Satisfaction with relationship with mother			0.001
Yes	185 (81.1)	35 (56.5)	
No	17 (7.5)	5 (8.0)	
Sometimes	26 (11.4)	22 (35.5)	
Satisfaction with relationship with father			0.092
Yes	108 (47.4)	19 (30.6)	
No	5 (2.2)	7 (11.3)	
Sometimes	115 (50.4)	36 (58.1)	
Satisfaction with relationship with teaching staff			0.001
Yes	201 (88.2)	45 (72.6)	
No	27 (11.8)	17 (27.4)	
Satisfaction with financial situation			0.001
Yes	227 (99.6)	37 (59.7)	
No	1 (0.4)	25 (40.3)	
Smoking cigarettes			0.161
Yes	4 (1.7)	2 (3.2)	
No	224 (98.3)	60 (95.1)	
Alcohol consumption			0.001
Yes	8 (3.5)	11 (17.7)	
No	220 (96.5)	51 (82.3)	
Depression (Beck score)			0.001
No	169 (74.1)	29 (46.8)	
Mild depression	39 (17.1)	15 (24.2)	
Limited level of depression	8 (3.5)	4 (6.5)	
Moderate depression	10 (4.4)	6 (9.6)	
Severe depression	2 (0.9)	6 (9.7)	
Serious depression	0 (0.0)	2 (3.2)	
State of anxiety (STAI1 score)			0.001
No	165 (72.5)	29 (46.7)	
Moderate	62 (27.1)	28 (45.2)	
Serious	1 (0.4)	5 (8.1)	

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Table 1. *Continued*

Trait anxiety (STAI2 score)			0.005
No	131 (57.5)	24 (38.7)	
Moderate	93 (40.8)	34 (54.8)	
Serious	4 (1.7)	4 (6.5)	
Suicidal ideation			0.001
Yes	2 (0.9)	10 (16.1)	
No	226 (99.1)	52 (83.9)	
Missing school during last 30 days			0.007
No	132 (57.9)	2 (3.2)	
Rarely	90 (39.5)	56 (90.3)	
Often	6 (2.6)	4 (6.5)	
School			0.470
Technical high school	150 (65.8)	39 (62.9)	
Grammar school	78 (34.2)	23 (37.1)	
Being a bully			0.004
Yes	37 (16.2)	20 (35.2)	
No	191 (83.7)	42 (67.8)	

[a] Mann–Whitney test.

from six classes of technical schools (mostly boys), and there was no significant difference found between those who agreed to be interviewed and those who did not in relation to gender and age. Students were selected for interview based on how they responded to the screening measures. Research team members conducted the data collection.

Measures

Adolescents understand the term bullying very well and a recent publication has shown that the perspectives of bullies and victims were comparable (Veenestra *et al*., 2007). There was no limit to the number of adolescents that could be nominated in response to these questions, and nor were adolescents required to nominate anyone.

We selected participants based on history of being bullied in two groups, adolescents who being bullied and adolescents who being bullies (Table 1). Adolescents were presented with a list of their classmates and were required to rate them on the following dimensions: victims only, bully victims, and those uninvolved in bullying.

Questionnaires

Bullying questionnaire

The semi-structured questionnaire was developed for this research. The questionnaire consisted of 13 items measuring school bullying, which were based on both theoretical hypotheses related to the social context of adolescents and measurements confirmed in other studies (Olweus, 1994; WHO, 1995; Pranjić *et al*., 2006). Involvement in bullying was assessed by two parallel questions that asked participants to report the frequency with which they bullied others in school and away from school at the current time. Similarly, being bullied was assessed by two parallel questions asking respondents to report the frequency at which they were bullied in school and away from school at the current time. Since the analysis focused on the relationship of bullying behavior to overall psychosocial adjustment, frequencies of bullying behavior inside and outside the school were combined for analyses. Response categories were: never; once or twice; sometimes; about once a week; and several times a week (WHO, 1995; Pranjić *et al*., 2006). The questionnaire contained items on the frequency of bullying; bullying behavior, where it took place, and several other health and demographic items (gender; place of residence; family structure-adolescent lives with parents, mother or father, or other relative (s); active participation in sport; school achievement; perception of empathy to school; perception of satisfaction with relationship with close friends; perception of satisfaction with relationships with mother; perception of satisfaction with relationship with father; perception of satisfaction with relationship with teaching staff; perception of satisfaction with family

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financial situation; smoking habit, alcohol abuse, intention to leave school). The questions on general bullying behavior and where it took place were based on the version of the questionnaire and measurements confirmed in other studies or previous surveys (WHO, 1995; Bennet *et al*., 1997; Pranjić *et al*., 2006). There were also explicit questions about participants' experience of the most frequent types of bullying behavior, for example, spreading nasty rumors, verbal abuse, shunning/exclusion, pushing, teasing, threats, mockery about religion, threats, teasing because of religious or national reasons, social exclusion and isolation, and malicious text messages (Olweus, 1993; 1994; Wolke *et al*., 2001; Wolke and Samara, 2004). Participants were classed as uninvolved subjects (not participating in bullying) or being bullied permanently by others as victims (several times a week) and being bully victims during the last year (Herba *et al*., 2008; Patterson, 2005).

The items of the bullying questionnaire that was used to assess perceptions of satisfaction not only with the mother but also with the father, teachers, and close friends, and with the family financial situation indicate the satisfactory inner consistency of the questionnaire (Cronbach's α-coefficient = 0.797). Cronbach's α was satisfactory for items measuring school bullying ($\alpha = 0.745$) and for assessed peer relationships ($\alpha = 0.823$), reflecting the satisfactory inner consistency of the questionnaire.

The Back Depression Inventory Second Edition (BDI-II)

BDI-II is a 21-item self-report instrument intended to assess the existence and severity of symptoms of depression translated into Bosnian/Croatian/Serbian. When presented with the BDI-II, a patient is asked to consider each statement as it relates to the way they have felt for the past two weeks, to more accurately correspond to the DSM-IV criteria. Each of the 21 items corresponding to a symptom of depression is summed to give a single score for the BDI-II. There is a four-point scale for each item ranging from 0 to 3. On two items (16 and 18), there are seven options to indicate either an increase or decrease of appetite and sleep. Cut score guidelines for the BDI-II are given with the recommendation that thresholds be adjusted based on the characteristics of the sample, and the purpose for use of the BDI-II. Total score of 0–13 is considered minimal range, 14–19 is mild, 20–28 is moderate, and 29–63 is severe. One of the items on the BDI is a question about thoughts of self-harm. We classed the students as having severe suicidal ideation if they chose either 'I have definite plans about committing suicide' or 'I would kill myself if I had the chance' (Bennet *et al*, 1997).

State-Trait Anxiety Inventory (STAI)

Anxiety was measured most widely by STAI (Olweus, 1994). The STAI clearly differentiates between the temporary condition of 'state anxiety' (STAI1) and the more general and long-standing quality of 'trait anxiety' (STAI2). The STAI has 40 questions with a range of four possible responses to each question. STAI1 and STAI2 were used for psychological assessment (Olweus, 1994; Hartup, 1996). Scores from 20–80 are proportional to the level of anxiety; a score of a moderate anxiety ranges from 40–59; or a score of a serious anxiety ranges from 60–80 (Spilberger, 1989; Salmon *et al*., 1998).

Statistical analysis

Differences between the examinees' demographic status, relationships with parents, friends, and teachers, perception of financial family state, various aspects of bullying, victims only, bully victims or uninvolved subjects, and self-rated health symptoms were assessed by means of χ^2 test (Mann–Whitney test). Calculated odds ratio (OR) and 95% confidence intervals (CIs) for socio-demographic and personal factors were estimated by the exact correlation method between bullying victims, bully perpetrators, and adolescents who were not involved in bullying. Differences between the BDI score and STAI score were determined by Student's t-test. In order to test the associations between bullying behaviors as independent variables with depression (Beck score > 17) and suicidal ideation, multivariate ANOVA (analysis of variance, linear regression model) was used. A logistic regression model was used to identify relevant bullying behavior among examinees as predictors/protectors of being victims/bully or uninvolved-witness subjects on the basis of predictors calculated standardized coefficient β and 95% CIs. To determine the contribution of most frequent psychological health symptoms to the prediction

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of victims or bully victims, multivariate logistic regression analyses were used (Model 1-the independent variables dichotomized health symptom variables, Model 2-the independent variables (vulnerability factors) dichotomized health symptom variables + gender and satisfaction with financial situation). The dependent and independent variables in logistic regression analyses were dichotomized on the basis of their cutoff scores, for example, high versus moderate/low (1–3 versus 4 and 6). All statistical analyses were performed with Statistical Package for Social Sciences, version 12.0 (SPSS Inc., Chicago, IL, USA) and $P < 0.05$ was regarded as significant.

Results

Characteristics of the study participants

Table 2 presents the socio-demographic and personal characteristic differences between all enrolled secondary school students, students who have been victims, bully victims, and who have not been bullied. Among them 59% were uninvolved adolescents, 20% (57/290) were bully victims, and 21% victims (62/290) were involved in bullying during the current school year. The prevalence of the self-rated level of depression (8.8% versus 29.0%), level of state of anxiety (27.5% versus 53.3%), and suicidal ideation (3.5% versus 16.1%) was significantly lower among adolescents who were uninvolved in relationships with adolescents who were victims.

Who are victims, bully victims, or uninvolved subjects?

Data in Table 3 show adjusted OR with CI for socio-demographic and personal factors between victims, bully victims, or uninvolved participants in school bullying. The results found that being bully victims was associated with being boys (OR = 1.94 95% CI, 2.82, 1.05), unsuccessful in school achievement (OR = 1.32 95% CI, 1.10, 1.58), who do not like school (OR = 1.27 95% CI, 1.10, 1.47), and who are satisfied with the financial situation (OR = 1.68 95% CI, 0.89, 3.17; twice as much as victims). Participants who are victims were four times more likely to report depression than uninvolved participants and over twice as much as bully victims. They were 2.2 times more discontent with the financial situation than uninvolved adolescents. We also found the following factors as positively associated with victims: being refugees, living with one parent, and living in poverty. Common features for victims and bully victims are poor relationships with close friends, mother, father, and teachers. Suicide ideation is as frequent in victims as it is in bully victims. Frequent exposure to bullying was related to high risks of depression and suicide ideation compared with uninvolved subjects. The findings indicate that both victims and bully victims are at high risk. The odds of suicide ideation in adolescents who are bully victims were OR = 4.42 (95% CI, 2.91, 6.71) and in adolescents who are victims they were OR = 4.45 (95% CI, 3.13, 6.33). Our students, who are discontent with their financial situation or who live with one parent, are more at risk of being bullied.

The association of bullying behaviors and depression, and suicide ideation

Psychopathology was associated with bullying behavior both in and away from school. Students who are exposed to bullying had significantly higher Beck and STAI1 scores when compared to the subjects who are not exposed to bullying (Table 4). Finally, bully victims have significantly higher Beck scores of depression in relation to uninvolved subjects.

As shown in Table 5, the following bullying behavior was associated with depression and with suicide ideation in bullied adolescents: verbal abuse, shunning/exclusion, threats, and teasing. Threats and violence away from school were associated with depression in bully perpetrators. Exposure to verbal abuse, pushing, and mockery about religion could predict depression and suicidal ideation in uninvolved subjects. Satisfaction with financial situation could be important protective factors for depression and suicidal ideation in our examiners.

Psychological health symptoms associated with bullying

In order to examine potential predictors of depression and suicidal ideation (independent variables) in adolescents involved in bullying, a two-stage multiple logistic regression analysis was used. In this way, results found in the first step

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Table 2 Adjusted odds ratio (95% CI) for socio-demographic and personal factors in total sample (compared in: adolescents who were bullies, who were bullied and uninvolved-witnesses; $n = 290$ respondents)

Socio-demographic and personal factors[a]	Adjusted odds ratios with 95% CI		
	Bully ($n = 57$)	Bully victims ($n = 62$)	Uninvolved witnesses ($n = 171$)
Sex			
Females	0.19 (0.08, 0.43)	0.45 (0.15,1.34)	0.76 (0.22, 2.23)
Males	1.94 (2.82,1.05)	0.84 (0.58, 0.15)	0.55 (0.21, 2.31)
Active participation in sports			
No	1.54 (0.90, 2.61)	1.61 (0.59, 4.40)	1.00 (0.95, 1.05)
Yes	0.90 (0.81, 1.01)	0.97 (0.91, 1.03)	0.99 (0.33, 2.96)
Successful in school			
No	1.32 (1.10, 1.58)	0.99 (0.93, 1.06)	0.99 (0.94, 1.05)
Yes	0.41 (0.26, 0.65)	1.07 (0.36, 3.15)	1.02 (0.27, 3.82)
Empathy to school			
No	0.40 (0.25, 0.64)	1.04 (0.92, 1.19)	0.84 (0.53, 1.32)
Yes	1.27 (1.10, 1.47)	0.98 (0.93, 1.04)	0.44 (0.15, 1.29)
Live with both parents			
No	0.97 (0.84, 1.11)	1.71 (1.03, 1.31)	0.39 (0.25, 0.60)
Yes	1.19 (0.56, 2.54)	0.20 (0.83, 0.48)	0.21 (0.07, 0.61)
Are you a refugee?			
No	0.79 (0.42, 1.48)	0.95 (0.90, 1.02)	0.82 (0.19, 3,39)
Yes	1.07 (0.88, 1.28)	2.67 (0.34, 20.7)	1.01 (0.93; 1.09
Satisfied with relationship with close friends			
No	1.64 (0.96, 1.59)	1.41 (1.04, 1.90)	0.44 (0.27, 0.70)
Yes	0.52 (0.30, 0.91)	0.33 (0.13, 0.88)	0.28 (0.94, 0.87)
Satisfied with relationship with mother			
No	1.15 (0.95, 1.29)	1.37 (1.13, 1.66)	0.41 (0.27, 0.63)
Yes	0.67 (0.41, 1.10)	0.32 (0.13, 0.77)	0.27 (0.09, 0.78)
Satisfied with relationship with father			
No	1.12 (1.00, 1,25)	1.15 (1.02, 1.29)	0.56 (0.34, 0.92)
Yes	0.61 (0.37, 1.02)	0.49 (0.18, 1.35)	0.57 (0.13, 1.07)
Satisfied with relationship with teaching staff			
No	1.84 (0.87, 1,24)	1.31 (1.03, 1.66)	0.48 (0.08, 0.17)
Yes	0.86 (0.45, 1.61)	0.26 (0.11, 0.64)	0.19 (0.30, 0.76)
Satisfied with financial situation in family			
No	1.23 (0.96, 1,58)	6.86 (5.03, 9.34)	0.04 (0.07, 0.30)
Yes	1.68 (0.89, 3.17)	0.72 (0.56, 0.93)	0.19 (0.06, 0.55)
Depression (Beck score > 17)			
Beck score > 17	1.23 (0.65, 2.30)	2.63 (1.70, 4.05)	0.65 (0.48, 0.87)
Beck score < 17	0.94 (0.79, 1.13)	0.65 (0.48, 0.87)	0.00
State of anxiety (STAI1 score > 40)			
STAI1 score > 40	1.49 (0.45, 4.93)	3.54 (2.10, 5.98)	0.35 (0.11, 1.15)
STAI1 score < 40	0.88 (0.55, 1.41)	0.35 (0.11, 1.15)	0.00
Trait anxiety (STAI2 score > 40)			
STAI2 score > 40	0.00	2.05 (0.84, 4.98)	0.72 (0.37, 1.37)
STAI2 score < 40	1.24 (1.17, 1.34)	0.72 (0.37, 1.37)	0.00
Having suicidal ideation			
Yes	4.42 (2.91, 6.71)	4.45 (3.13, 6.33)	0.20 (0.58, 0.72)
No	0.30 (0.13, 0.80)	0.20 (0.58, 0.72)	0.00

[a] All socio-demographic and personal factors are used here as dichotomous variables.

that suicide ideation strongly predicted permanent exposure to bullying behavior and being victims. Although feelings of anger, loss of confidence, loss of self-esteem, being frustrated, loss of concentration, headache, palpitation/sweating, being hopeless about the future, being unable to start/finish tasks, and having depression were significantly predicted with discontent with family

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Table 3 Beck, STAI1, and STAI2 scores compared between adolescents who were bullied, who were bullies, and who were uninvolved witnesses

	Mean ± SD		*t*-test[a]	*P*-value
	Adolescents who were bullied	Uninvolved witnesses		
Beck score	14.83 ± 13.34	8.08 ± 8.02	42.404	0.001
STAI1 score	41.24 ± 11.420	35.72 ± 8.804	9.211	0.003
STAI2 score	43.29 ± 11.016	38.88 ± 9.492	2.225	0.137
	Adolescents who is being bully	Uninvolved witnesses	*t*-test[a]	*P*-value
Beck score	10.93 ± 11.70	8.08 ± 8.02	4.873	0.028
STAI1 score	38.13 ± 9.521	35.72 ± 8.804	0.003	0.956
STAI2 score	40.20 ± 10.749	38.88 ± 9.492	0.478	0.490

[a] *t*-test, independent sample test.

Table 4 The bullying behaviors and selected socio-demographic factors as predictors for depression and suicidal ideation in adolescents who were bullied, who were bullies and who were uninvolved-witnesses

Predictors[a]	Depression (Beck score > 17)		Suicidal ideation	
	β	95% CI	β	95% CI
Adolescents who were bullied				
Verbal abuse	0.098	0.160, 2.175[b]	0.093	0.778, 0.809[b]
Shunning/exclusion	0.040	0.067, 3.314[b]	0.161	1.952, 0.512[b]
Threats	0.060	4.141, 1.308[b]	0.093	1.362, 0.304[b]
Teasing	0.125	7.965, 3.215[b]	0.324	0.028, 0.972[b]
Adolescents who were bullies				
Threats	0.060	4.992, 1.026[b]	0.093	1.362, 0.304[b]
Violence away from school	0.023	4.042, 1.242[b]	0.011	1.638, 0.161
Uninvolved witnesses				
Verbal abuse	0.107	4.992, 1.742[b]	0.093	1.362, 0.304[b]
Pushing	0.107	6.866, 2.666[b]	0.138	0.831, 0.568[b]
Mockery about religion appertained	0.111	5.595, 2.039[b]	0.213	0.913, 0.530[b]
Socio-demographic factors				
Sex	0.008	0.493, 1.026	0.009	0.635, 1.094
Satisfaction with financial situation	0.088	0.276, 1.669[b]	0.089	0.677, 0.865[b]

Linear regression analysis.
[a] Each predictor here used as dichotomous variables.
[b] $P < 0.001$ each predictors are used here as dichotomous variables.

financial situation (second step; ($P = 0.001$). The significant vulnerability factors that might moderate the relationship between bullying and depression are no doubt discontent with financial situation/deprivation, but not with regard to suicide ideation. On the other hand, it has been established that being contented with the financial situation is a predictor of suicidal ideation in bully victims. If a bully victim is depressive, then depression is worsened by being contented with the financial situation. They cope with this feeling by drinking alcohol and smoking cigarettes ($P = 0.05$).

Predictors with the highest contribution for being bully victims and being frustrated/annoyed were suicide ideation, intention to leave school (all in the second step; $P = 0.001$), smoking cigarettes (second step; $P = 0.05$), being boys, and being satisfied with the financial situation.

Discussion

In this study, 21% of the respondents were self-reported to have been permanently exposed to bullying behavior as victims, although 20% were

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Table 5 The multivariate logistic regression associations of the most frequent psychological health symptoms (independent variables) and bullying (being bullied or being a bully; Model 1), controlled for selected socio-demographic factors among 112 respondents involved in school bullying (Model 2)

Symptoms[a,b]	Being bully		Being bullied	
	Model 1 $\beta 1$	Model 2 $\beta 2$	Model 1 $\beta 1$	Model 2 $\beta 2$[c]
Feeling of anger	0.4975	1.0175	0.6749	0.8694[b]
Loss of confidence	0.5731	0.9752	0.7846	0.8319[b]
Loss of self-esteem	0.5274	0.9838	0.5401	0.8516[b]
Being frustrated/annoyed	0.6322	0.9175[b]	0.7124	0.8687[b]
Loss of concentration	0.5100	1.0050	0.6732	0.8716[b]
Stomach ache	0.5095	0.9936	0.4963	1.0075
Headache	0.5005	1.0115	0.6782	0.8651[b]
Palpitation/sweating	0.5050	1.0025	0.6127	0.9079[b]
Fatigue	0.5130	0.9990	0.5439	0.9697
Sleeplessness	0.5274	0.9838	0.5439	0.9697
Being hopeless about the future	0.5070	1.0110	0.6698	0.8760[b]
Nausea	0.4956	1.0090	0.5535	0.9528[a]
Being unable to start/finish tasks	0.5274	0.9838	0.6765	0.8672[b]
Depression	0.5274	0.9838	0.6765	0.8672[b]
Smoking cigarettes	0.5471	0.9602[a]	0.5480	0.9624
Drinking alcohol	0.6065	0.9216[b]	0.6615	0.8870[a]
Have intention to leave school	0.6689	0.9000[b]	0.7768	0.8403[a]
Suicidal ideation	0.6192	0.9026[b]	0.9339[b]	0.7372
Socio-demographic				
Man	–	0.9456[b]	–	0.4768
Discontent with financial situation	–	−1.0204[a]	–	0.9676[b]

Multivariate logistic regression analyses.
[a] $P < 0.05$.
[b] $P < 0.001$.
[c] $\beta 1$ refers to estimates from the Model 1 of the regression analyses: only symptoms as independent variables and $\beta 2$ refers to estimates from the Model 2 of the regression analyses: symptoms + selected socio-demographic (man, dissatisfaction with financial situation).

bully victims. Large studies suggest that 20–30% of students are frequently involved in bullying as bully victims (Sadock and Sadock, 2009). A comparison of the prevalence of bullying with other conducted studies showed similar results. However, the bullying concept may be perceived to cover more severe interaction in translation into some national languages than others. The national differences in the school systems and school environment may account for another part of the differences (Forero *et al*., 1999). The frequency of being victims among girls and boys was similar; however, the majority of boys have a role of bully victims in school bullying.

Depression could thus be both a result of being bully victims and a reason for being victims twice in relationships with adolescents who are uninvolved in school bullying. Exposure to bullying in adolescence may influence health in a variety of ways. We found that being a victim of bullying is associated with the following symptoms: feeling of anger, loss of confidence, loss of self-esteem, being frustrated, loss of concentration, headache, being unable to start/finish task, palpitation/sweating, hopeless about the future, nausea, drinking alcohol, low self-esteem, anxiety, and depression, but when significantly mediated and predicted with discontent with financial state. Adolescent males financially sound are usually bullies. They are frustrated, smoke cigarettes, drink alcohol, have the intention to leave school and have suicidal ideation. Health of adolescents exposed to bullying may be affected in a variety of ways. Depression and suicidal ideation are strongly linked to being victims and/or bully victims (Salmon *et al*., 1998; Juvonen *et al*., 2003; Herba *et al*., 2008; Due *et al*., 2005; Klomek *et al*., 2007; 2008; 2009; Sadock and Sadock, 2008; 2009).

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Victims are likely to be discontent with the financial situation, which is predicted as a considerable source of stress and stress-related symptoms. Suicidal ideation among those who were bullied in a school environment might be expected. However, adolescents who are depressed may also attract negative attention from their peers. Klomek *et al*. (2007) have indicated that victims of bullying were more than five times more likely to have seriously considered committing suicide than those who were not bullied. This finding was not supported in our study. Risk of suicide ideation increased about two times among victims in relationships with uninvolved subjects. Our results are in accordance with results in recent studies (Juvonen *et al*., 2003; Herba *et al*., 2008). Victims also tend to be rejected by peers (Spilberger, 1989; Bennet *et al*., 1997; Pranjić *et al*., 2006). Results of previous studies have indicated too that the relationship between being victimized by bullying and suicide ideation may be particularly strong for victims. The results of this research suggest that compared with their peers, those who are victims are more introverted, less assertive, and are over-involved in their families (Rigbi, 1993; 1994; Nunally and Bernstain, 1994; Slee, 1995; Bennet *et al*., 1997; Kaltiala-Heino *et al*., 2000; Nansel *et al*., 2001; Muscari, 2002; Espelage and Swearer, 2003; Malecki, 2003; Fekkes *et al*., 2006; Perren and Alsaker, 2006; Obrdalj and Rumboldt, 2008; Lamb *et al*., 2009). Victims, on the other hand, suffer not only emotional distress but also social marginalization.

Developmental research shows that in early adolescence, social status is one of the strongest predictors of positive self-views and psychological well-being (Kaltiala-Heino *et al*., 2000; Horowitz *et al*., 2004); hence, it is likely that bullies do not feel depressed, anxious, or lonely because they have high social status within their peer collective. However, they have suicide ideation probably as a result of decreased motivation for school and future creative work, as this study shows. Although the prior studies demonstrated the unexpected findings of a fairly uniform psychological and social picture of bullies and victims (Kaltiala-Heino, 2000; Juvonen *et al*., 2003; Keenan *et al*., 2006; Herba *et al*., 2008), we found that despite some common characteristics (eg, poor relationship with close friends, mother, father, and teachers and does not have active participation in sport) and some common psychological symptoms (eg, intention to leave school, feeling frustrated/annoyed, drinking alcohol, and suicidal ideation), these groups are distinct, which has implications for identifying them and intervening. Despite showing a rather uniform picture of these two groups in some studies, other investigations have found differences: compared with victims, bullies are more likely to manifest deviant behavior (Rigbi, 1994; Muscari, 2002) and negative attitudes toward school (Rigbi, 1994; Loeber and Hay, 1997; Bond *et al*., 2001). Victims, in turn, were feeling more insecure and more depressed than bully victims. Understanding the characteristics of these groups is important for identification and intervention (Boulton and Smith, 1994; Patrick *et al*., 2002; Verhulst, 2008). Depressive symptoms, self-perceived health status, and contextual variables are important correlates of poverty as a very power vulnerability factor (Patterson, 2005). Generally, we think that the current Bosnia and Herzegovina environment has a potentially very important influence on the relationships between people and a very high level of impact on the mental health of the whole population, especially children and adolescents. Fathers, who were exhausted in the recent war and who are dissatisfied with low employment opportunities in the post-war period, have little understanding of the 'small problems their children face in schools.' In feedback, adolescents who were involved in bullying express negative feelings towards their fathers.

Strengths and limitations

A major strength of the study is that the evaluation involves specific facts related to early adolescence such as vulnerability factors. Unlike the majority of other studies examining bullying and suicide ideation and mental health (Rigbi, 1993; Perren and Alsaker, 2006), we used peer nominations to establish bully status. This method helps to avoid shared methods variance in which children who report being bullied may also report that they have suicidal thoughts (Juvonen *et al*., 2003; Herba *et al*., 2008).

One of the limitations is that this study was also limited by the diversities arising from the variation in age of adolescents. An analysis by age could be conducted.

Conclusion

Adolescents should be asked if they are involved in bullying either as a victim or as bully victims. It is important to keep in mind that, despite bullies' high social status, classmates would rather not spend time with them. Thus, it may be that the social prestige of bullies is motivated in part by fear. We found that the following factors were significantly associated with being victims: living in single familial structure, being refugees, and particularly discontent with family financial situation. Bully victims were more likely reported to be boys, living with both parents, not liking school, being satisfied with family financial situation, and unsuccessful students in school. Exposure to verbal abuse, pushing, and mockery about religion could predict depression and suicidal ideation in victims. Improving relationships with close friends, mother, father, and teachers may prevent bullying, depression, and suicidal ideation among adolescents.

Future studies are needed to help us see what changes the teachers may make to help prevent and intervene with bullying at school. However, they receive little if any help or training in how to effectively deal with such problems. This is another question for future research. An intervention to treat depression is needed and should be assessed among both bullies and bully victims. The Government of Bosnia and Herzegovina must urgently launch programs against poverty and regard them as tasks of critical importance.

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