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Research Article

Bullying Victimization and Adverse Health Events among Adolescents in the U.S.

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Keywords

• Adverse health events; Adolescents; Bullying

Abstract

Objective: To investigate the correlation between adverse physical health events and bullying victimization among adolescents, using as independent variables bullying victimization, parental awareness, parental support, close friends, and classmates in school.

Methods: Data for the present study are cross-sectional and were derived from the 2009–2010 Health Behavior in School-Aged Children (HBSC) study in the United States (US). A total of 12,642 adolescents, between 10 and 17 years, are included in the study sample. The outcome, the independent variables, and the confounders were transformed into dichotomous variables. Bullying victimization, adolescent's perception of parental awareness about his/her life (parental awareness), parental support, close friends, and classmates in school were the independent variables studied. All analyses were conducted at the software Stata 13.0. Results are presented with odds ratios and coefficient values and the 95% confidence interval.

Results: The majority of the study population consisted of men (53.1%), with a mean age of 12.94 (SD 1.78). The linear regression model presented significance for the variables: bullying victimization (OR: 2.80; 95% CI: 2.35-3.33), parental awareness (OR: 2.14; 95% CI: 1.34-1.80), parental support (OR: 3.18; 95% CI: 1.98-2.68) and classmates in school (OR: 1.99; 95% CI 1.07-1.44). Close friends were not statistically significant. (OR:1.21; 95% CI 0.73-1.28).

Conclusions: Bullying victimization, no parental awareness, no parental support, and no classmates in school is correlated with adverse physical health events, such as headache, backaches, feeling low, irritability, feeling nervous, feeling dizzy, difficulties sleeping and stomachache.

INTRODUCTION

Bullying victimization is recognized as one of the most severe childhood adversities worldwide [1,2]. It is defined as being exposed repeatedly, and overtime to hostile and aggressive actions of one or a group of students [3], and is characterized as physical abuse, verbal abuse, and social exclusion [4]. A large body of empirical studies has documented that bullying victimization in childhood and adolescence is correlated with a broad spectrum of mental and physical health problems [5]. Children who are bullied are at an elevated risk of psychiatric disorders, substance use, fibromyalgia, low self-esteem, anxiety, depression, suicidal ideation, antisocial behavior, low school engagement, chronic absenteeism, and fear of attending school [6-14].

Recent research has correlated bullying victimization and adverse health events [5,15]. Adverse physical health events are defined as any physical symptom, such as pain, headache, and stomachache, presented by an individual. In another study, Williams and cols. analyzed a sample of 2,962 fourth-grade elementary school students in the United Kingdom and found that children who had been bullied commonly had physical symptoms such as not sleeping well, bed-wetting, occasional headaches, and stomachaches [16]. Lohre [15], found that bullying victimization was positively correlated with stomachache and headache in 419 Norwegian school children in grades 1st to 10th. Politis and cols. analyzed a sample of 2427 adolescents aged 16–18 years old, found that victims of bullying are more likely to report backache and fatigue independently of the presence of psychiatric morbidity [17]. Another study, conducted among 2006 schoolchildren across South Korea aged 9–17 years, also found that physical symptoms (headache, stomachache, dizziness, and sleep difficulties) as potential indicators of victimization through bullying [18].

The impact of bullying victimization on adolescents' general health seems to be influenced by their family environment and his/her social support. Concerning family environment, families' social structure is considered determinant factors for students' involvement in bullying and the impact of bullying on their health [19]. Marital status of parents [20,21], socioeconomic status [22], and parental educational level [21,23], seem to play a significant role in this scenario. An unfavorable social context, marked by single parenting, low parental education, and parents' low socioeconomic status, leads to difficulties in the interpersonal relationships in the family context. These factors predict children´s behavioral problems, such as bullying, both perpetration and victimization [19], and adverse health events as a consequence. As for social support, a recent study found that poor social relationships, whether with parents or classmates, could be associated with bullying behavior and adverse health events, such as headaches and abdominal pain. Besides that, good parental support and a high number of classmates and close

friends are correlated with a better bullying outcome among adolescents [24].

Identifying variables associated with the impact of bullying victimization on general health could be essential to perform preventive actions to minimize its impact. The present study aims to investigate the association between bullying victimization and adverse physical health events from a large sample of US adolescents. More specifically, the study examines whether variables, such as parental awareness, parental support, close friends, and classmates in school, might moderate the association between bullying victimization and adverse health events among adolescents.

METHODS

Sample

Data for the present study were derived from the 2009–2010 Health Behavior in School-Aged Children (HBSC) study [25. The HBSC study is a standardized, international World Health Organization study, this is a publicly available dataset, and all Institutional Review Board oversights were exempted, which comprises repeated cross-sectional surveys in the 43 participating countries through school-based surveys using random sampling to select adolescents, 10- to over 17-years-of-age [26]. This study uses data from the United States, which comprised a nationally representative sample of adolescents randomly selected. The school-based survey consists of a self-report questionnaire completed by students in the classroom and includes a range of questions related to health indicators, health-related behaviors, and life circumstances of the students [27]. The survey results consist of information on socio-demographic factors, social background, social context, health outcomes, health behaviors, and risk behaviors [27]. Data for the study are cross-sectional, and all subjects with missing data on any of the variables of interest of this study were deleted, resulting in a sample of 12,642 students.

Ethical Practice

The World Health Organization (WHO) states that "all research involving human participants must be conducted in an ethical manner that respects the dignity, safety, and rights of research participants and that recognizes the responsibilities of researchers" (World Health Organization guidance on research ethics) [28]. HBSC recognizes and adheres to these recommendations in each survey process stage [25]. Because the Health Behavior of School-aged Children (HBSC) is a publicly available dataset, which does not allow for identifying the participants, the present study was exempted from Institutional Review Board oversight.

Measures

The variables for the present study were dichotomized. The objective of dichotomizing the variables was to interpret the data more intuitively.

Adverse health events, the outcome variable, consisted of eight somatic symptoms, such as headache, backaches, feeling low, irritability, feeling nervous, feeling dizzy, difficulties sleeping, and stomachache. Response options are based on a Likert scale ranging from 1 (every day) to 5 (rarely or never). The score went from 8 (all eight somatic symptoms scored as 1 – every day) to 40 (all eight somatic symptoms scored as 5 – rarely or never). The higher the score, the less frequent the adverse health events. The range of 8 to 32 was considered as "the presence of adverse health event" and the range of 33 to 40 as "no adverse health event".

Although there is undoubtedly no uniform definition of bullying, common themes in the literature suggest that it occurs over time, in a repeated fashion [3,4]. Many researchers use Olweus' tripartite definition (i.e., repetitive, imbalance of power, and intent to harm) to define bullying and identify two or three times a month as a minimum occurrence to qualify as bullying. As these data were derived from a large screening study, with several self-report questions regarding many different aspects of adolescents' health, a broader definition of bullying was used. There was a short definition of what the students should consider bullying when answering the following questions on the questionnaire. It read as follows: "Here are some questions about bullying. We say a student is BEING BULLIED when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like or when he or she is deliberately left out of things. However, it is NOT BULLYING when two students of about the same strength or power argue or fight. It is also not bullying when a student is teased in a friendly and playful way." The questions that followed this definition were used to build up the measure of *bullying victimization*, which consisted of five items, such as "How often are you bullied at school?", "How often got bullied: called names?" and "How often got bullied: using a cell phone?". Response options ranged from 0 (I haven't been bullied) to 4 (several times a week). The score ranged from 5 (all five questions scored as 1) to 25 (all five questions scored as 5 – several times a week). A higher score indicated a greater degree of severity. The range of 5 to 10 was regarded as "no bullying victimization", whereas 11 to 25, was indicated as "the presence of bullying victimization".

Adolescent's perception of parental awareness of his or her life (parental awareness) consisted of ten questions, such as "Father knows: Who your friends are?", "Mother knows: how you spend your money?", and "Mother knows: where you are after school?". Response options ranged from 0 (a lot) to 3 (don´t have/see mother/father/guardian). The score ranged from 10 (all ten questions scored as 1) to 40 (all ten questions scored 4). A higher score indicated less parental awareness. The range of 10 to 20 was regarded as "the presence of parental awareness," and the range of 21 to 40 was regarded as "no parental awareness."

Parental support consisted of six questions, such as "Parent: Helps me as much as I need?", "Parent understand my problems?", and "Parent: makes me feel better when upset?". Response options ranged from 1 (almost always) to 4 (don´t have/see mother/father/guardian). The score ranged from 6 (all six questions scored as 1) to 24 (all six questions scored 4). A higher score indicated less parental support. The range of 6 to 12 was regarded as "the presence of parental support" and the range of 13 to 24 was regarded as "no parental support."

Close friends consisted of two questions "Number of close

friends: males?" and "Number of close friends: females?". Response options ranged from 0 (none) to 3 (three or more close friends). The score ranged from 2 (all two questions scored as 1) to 8 (two ten questions scored 4). The range of 2 to 4 was scored as "no close friends," and the range 5 to 8 was scored as "the presence of close friends."

Classmates in school consisted of three questions, such as "Students in my class: enjoy being together?", "Students in my class: are kind and helpful?", and "Students in my class: accept me as I am?". Response options ranged from 1 (strongly agree) to 5 (strongly disagree). The score ranged from 3 (all three questions scored as 1) to 15 (all three questions scored 5). A higher score indicated less presence of classmates in school. The range of 3 to 9 was regarded as "the presence of classmates," and the range 10 to 15 was considered as "no classmates in school."

Gender (boys or girls), age (measured in years, ranging from 10- to over 17-years-of-age), family cohesion (determined by the question "How well off do you think your family is?", which could be answered in a 5-option Likert scale ranging from "very well off" to "not at all well off"), and overall health rating (determined by the question "Would you say your health is…", which could be answered with the following options: "excellent," "good," "fair" or "poor") were used as control variables. We included overall health rating as a control variable because we think that someone who perceives that their health is impaired could have more somatic symptoms, not necessarily associated with bullying behavior.

Analyses

Logistic regression was conducted to examine the direct effect of bullying victimization on adverse health events. Three proposed interactions were included in the model, once we found collinearity between them: bullying victimization × classmates in school; bullying victimization × parental support, and bullying victimization × parental awareness. Finally, gender, age, family cohesion, and overall health rating were used as control variables. Series of analyses were conducted using only one variable at a time. Afterward, the logistic regression was performed, including all the independent variables, the three interactions, and the control variables. All analyses were performed using Stata 13.0.

RESULTS

The results for the descriptive statistics are presented in Table 1. The majority of the study sample consisted of males (53.1%), with a mean age of 12.94 (SD = 1.78), mostly White (46.6%), followed by Hispanics (18.9%) and African Americans (17.1%). Of the total sample, 50.9% reported good overall health rating, and 46.3% said their family cohesion to be average.

Results from the logistic regression analyses are presented in Table 2. History of bullying victimization (OR: 2.80; 95% CI: 2.35-3.33), parental unawareness (OR: 2.14; 95% CI: 1.34-1.80), no parental support (OR: 3.18; 95% CI: 1.98-2.68) and little classmates in school (OR: 1.99; 95% CI 1.07-1.44) were all found to be statistically significant. Close friends were not statistically significant (OR:1.21; 95% CI 0.73-1.28).

As for the adjusted regression model, bullying victimization (OR: 3.61, 95% CI: 2.79-4.66), parental unawareness (OR: 1.55, 95% CI: 1.34-1.79), no parental support (OR: 2.70; 95% CI: 2.28-3.20) and little classmates in school (OR: 1.24; 95% CI 1.05-1.47) were found to be significant, along with the interaction, bullying victimization × no parental support (OR 0.48, 95% CI 0.33-0.70).

Table 1: Descriptive Statistics.

Variables	n(%)	M(SD)
Adverse health		30.86(6.14)
Peer victimization		
Bullied at school		
No	3,487(66.7)	
Yes	1,520(29.2)	
Called names/teased		
No	3,218(61.6)	
Yes	1,623(27.94)	
Left out of things		
No	3,446(65.9)	
Yes	1,348(25.8)	
Hit/kicked/pushed		
No	3,923(75.1)	
Yes	860(16.4)	
Parental awareness		3.36(1.34)
Parental support		7.99(2.76)
Close friends		7.02(1.41)
Classmate		6.95(2.69)
Gender		
Boys	2,771(53)	
Girls	2,453(46.9)	
Age		12.94(1.78)
Family well off		
Not well off	154(2.9)	
Not very well off	463(8.9)	
Average	2,280(43.6)	
Well off	2,023(38.7)	
Overall health rating		
Excellent	1,324(25.3)	
Good	2,641(50.5)	
Fair	1,023(19.6)	
Poor	197(3.8)	

DISCUSSION

The present study aimed to investigate the association between bullying victimization and adverse physical health events in a large nationally representative US adolescent sample. One substantive finding emerged from this study. Bullying victimization was directly and positively associated with adverse health events such as headaches, backaches, feeling low, irritability, feeling nervous, feeling dizzy, difficulties sleeping, and stomachache. More specifically, we found that parental awareness, parental support, and classmates in school were other

Table 2: Hierarchical Logistic Regression Analysis of Factors Associated with Adverse Health Events.

		Model 1								Model 2						
	cOR	aOR	SE	95%CI	B	SE	95% CI	*p*		aOR	SE	95%CI	B	SE	95%CI	*p*
Peer victim	3.30	2.80	.24	2.35–3.33	1.03	.08	.85–1.20	.01		3.61	.47	2.79–4.66	1.28	.13	1.02–1.53	.01
Parent unaware	2.14	1.55	.11	1.34–1.80	.44	.07	.30–.58	.01		1.55	.11	1.34–1.79	0.44	.07	.29–.58	.01
No parent support	3.18	2.31	.17	1.98–2.68	.83	.07	.68–.98	.01		2.70	.23	2.28–3.20	.99	.08	.82–1.16	.01
No close friends	1.21	.97	.13	.73–1.28	-.02	.14	-.30-.25	.84		.99	.14	.75–1.31	-.00	.14	-.28–.27	.96
Little classmates	1.99	1.24	.09	1.07–1.44	.22	.07	.07–.36	.01		1.24	.10	1.05–1.47	.22	.08	.05 –.38	.01
Gender	1.46	2.25	.15	1.95–2.58	.81	.07	.67–.94	.01		2.25	.15	1.95–2.58	.81	.07	.67–.95	.01
Age	0.98	1.10	.02	1.05–1.16	.10	.02	.05–.15	.01		1.10	.02	1.05–1.16	.10	.02	.05–.15	.01
Family well	1.00	1.05	.01	1.02–1.09	.05	.01	.02–.09	.01		1.06	.01	1.02–1.09	.05	.01	.02–.09	.01
Poor health	.95	1.78	.08	1.63–1.95	.58	.04	.49–.66	.01		1.77	.08	1.62–1.94	.57	.04	.48–.66	.01
Peer × No Parent Support	4.38									.48	.08	.33–0.70	-.71	.17	-1.07–-.35	.01
Peer X Parent Unaware										1.00	.18	.70 – 1.43	.00	.17	-.34 - .35	.96
Peer × Little Classmates	3.32									1.00	.17	.71–1.40	.00	.17	-.34–.34	.99

COR = crude odds ratio, AOR = adjusted odds ratio, CI = confidence interval, SE = standard error

factors that independently influence the presence of adverse health events among bullied adolescents. Our findings are aligned with several meta-analyses on the health consequences of bullying. Victims, bullies, and bully-victims had a significantly higher risk of psychosomatic problems than their peers who were not involved in bullying [29. Because of the possible consequences of bullying for adolescents' physical and mental health, such behavior should be considered a public health issue, and interventions must be established to reduce it [29,30].

Srabstein, 2006 found that frequent participation in bullying behaviors, as a bully, a victim, or both, was associated with poor physical health [31]. Physical pain and bullying victimization are linked with one another [32], suggesting a bidirectional relationship [33]. These corroborate the findings of our study. Gini [29], found that bullied youth are about twice more likely than non-bullied youth to suffer from headaches [29]. A review study found that headaches are becoming more common among children and adolescents. They are often associated with emotional complaints and bullying victimization [34].

Furthermore, Garmy [35], found a high frequency of pain medication use among non-bullied and bullied students. However, analgesics' use was significantly higher among bullied students, even when controlling for pain intensity, age, gender, and socioeconomic status [35]. Bullied students tended to experience more pain than non-bullied students, and they were twice as likely to use pain medication even when controlling for experienced pain [35,36]. These findings need to be taken seriously because analgesics' increased use is a risk marker for chronic pain during adulthood [37]. Bullied children are also more likely to turn to alcohol and substances to relieve their physical pain, which is a public health problem [38].

Rothom et al [39], showed that social support protects against the occurrence of bullying and its consequences [39]. Parental support and high levels of social support from friends are essential for developing resilience in adolescents. In this scenario, close friends may intervene rather than standing by; it has been shown that if bystanders become involved in preventing their friends from being bullied, they are usually successful, which can reduce the occurrence of bullying and its consequences for the physical health of the adolescents [39-43].

LIMITATIONS

Some limitations of the present study should be mentioned. Although careful procedures were used to select the sample, we used a population-based representative sample of US students. Therefore, our findings should be extrapolated with caution. It is plausible that those with the most severe symptoms may have been more likely to agree among all the children invited to participate. Also, this study relied on a cross-sectional survey, and it would be impossible to establish causation. One more limitation is that the variables had limitations as they were derived from youth surveys subjected to a sample bias. Future studies need to test these variables with a longitudinal research design. Excluding subjects with missing data from the analyses and dichotomizing variables are also limitations of our study.

IMPLICATIONS FOR PRACTITIONERS

Our research supports that bullied children have more frequent adverse physical health problems than non-bullied children in a large, representative sample of US adolescents. Altogether, these results have significant implications for pediatricians, child psychiatrists, psychologists, and other health care professionals. These professionals must be ready to identify children at risk of being bullied. When facing an adolescent victim of bullying, they should be attentive to potential health issues and make a thorough clinical evaluation or refer to a general practitioner. Using the same rationale, clinicians and pediatricians should investigate bullying victimization among adolescents who present sudden and apparently unexplained clinical symptoms, as they may be psychosomatic consequences

of the adolescent's victimization. When there is a suspicion of the symptoms' psychosomatic origin, the adolescent should be referred for mental health monitoring, and doctors should be extra-cautionary on prescribing medication for treating them. Families and teachers should also be warned that clinical symptoms should not be neglected, as they may be a red flag that unnoticed bullying may be happening. Both parents and teachers should be aware of socially isolated adolescents and neglectful or uninvolved parents in their children's lives, as this may be risk factors for adverse health events in adolescents involved in bulying. Developing strategies to improve adolescents' socialization and peer-support groups might be possible paths to improve this protective aspect os the youths life.

CONCLUSION

This study extends the body of literature on school bullying in several ways. It demonstrates the association of parents' awareness, parental support, number of classmates in school, and adverse physical health events, such as headache, backaches, feeling low, irritability, feeling nervous, feeling dizzy, difficulties sleeping, and stomachache, among bullied adolescents. It is imperative to identify groups of students at greater risk of school bullying, be aware of the consequences of bullying, and intervene to support bullying victims, reducing adverse physical health events. It is also essential to investigate bullying among adolescents who present unexplained clinical symptoms.

SUMMARY

This study investigated the correlation between adverse physical health events and bullying victimization among adolescents, using as independent variables bullying victimization, parental awareness, parental support, close friends, and classmates in school. We found that linear regression model presented significance for the variables: bullying victimization (OR: 2.80; 95% CI: 2.35-3.33), parental awareness (OR: 2.14; 95% CI: 1.34-1.80), parental support (OR: 3.18; 95% CI: 1.98-2.68) and classmates in school (OR: 1.99; 95% CI 1.07-1.44). Close friends were not statistically significant. (OR:1.21; 95% CI 0.73-1.28). Bullying victimization, no parental awareness, no parental support, and no classmates in school is correlated with adverse physical health events, such as headache, backaches, feeling low, irritability, feeling nervous, feeling dizzy, difficulties sleeping and stomachache. Our results have significant implications for pediatricians, child psychiatrists and psychologists, and other health care professionals. These professionals must be ready to identify children who are at risk of being bullied because of the potential adverse health, psychological, and educational consequences of bullying experiences. In addition to that, when facing an adolescent victim of bullying, they should be attentive to potential health issues and make a thorough clinical evaluation or to refer to a general practitioner. Families and teachers should also be warned that clinical symptoms should not be neglected, as they may be a red flag that unnoticed bullying may be happening. Finally, clinicians and pediatricians should also investigate bullying among adolescents who present unexplained clinical symptoms.

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