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Factors Associated with the Persistence of Bullying Victimization From 10th grade to 13th Grade: A Longitudinal Study

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Abstract: *Background:* Bullying among adolescents represents a major public health challenge. The aim of this study was to map the stability of bullying victimization across the transitional phase from lower to upper secondary school, and to describe the sociodemographic, academic and health-related characteristics of those bullied during the transition.

Method: 3674 Norwegian adolescents were followed longitudinally from the age of 15/16 until the age of 18/19, answering questionnaires about health, academic achievements, life events, lifestyle and sociodemography. The 337 participants reporting exposure to bullying victimization at age 15/16 were the target group, as we made comparisons between those reporting victimization only at the age of 15/16 (n=289) with the participants for whom the bullying had continued into later adolescence (n = 48).

Results: 14% of those victimized at age 15/16, reported continuation of bullying victimization into upper secondary school. These adolescents were significantly more likely to report having divorced parents, low parental educational level, poor self-perceived economy, muscle and skeletal pain, symptoms of mental distress, lower school marks in Norwegian and higher body-mass index (BMI) when group differences at age 18/19 were assessed through basic inferential statistical tests. However, the multivariate logistic regression analyses only revealed statistically significantly increased adjusted odds ratios for the variables mental distress and school-marks in Norwegian.

Conclusion: The persistence of exposure to bullying from 10th grade to 13th grade is associated with mental health complaints and poor school performance. Preventive measures to take care of students being continuously bullied should be in place in secondary schools.

Keywords: Adolescence, Bullying, Lifestyle, Longitudinal, Mental Health, Negative Life Events, Victimization.

INTRODUCTION

Bullying victimization can be defined as repeated physical, emotional or verbal aggressive acts that have hostile intent and involve an imbalance of power between aggressors and their victims [1]. These acts include direct bullying such as intimidations, abusive acts and direct violent assaults, and indirect bullying such as spreading of rumors, manipulation of friendships and social exclusion [2-4]. Bullying victimization differs from maltreatment of children and adolescents by adults, as harm is being inflicted by people in the same age group as the victims [5]. Three important characteristics of bullying – repetition, harm and imbalance of power - also provide a distinction from other types of youth violence [6].

Bullying victimization among children and adolescents is a common phenomenon repeatedly demonstrated to occur across various cultural and country borders [7-9]. Although historically considered a transient and harmless phenomenon without serious consequences for the people being victimized, four decades of scientific investigations has led to a reconceptualization of bullying victimization to a traumatic life event that represents a major public health challenge due to its common occurrence and a myriad of associated social and academic problems and psychological and somatic health complaints [5,10]. Bullying victimization has been established as a unique independent risk factor for the development of both internalizing and externalizing psychopathology [5]. An increased rate of psychotic symptoms, self-harm behaviors and suicidal ideations has been reported among victims [11-20]. Several prior studies have also repeatedly demonstrated a negative association between exposure to bullying and various measures of general health and daily functioning, such as self-reported degree of physical well-being and level of academic performance [10, 21-23].

The epidemiology of bullying victimization has been examined in many studies. Results from a recent large cross-national survey showed that on average 26% of children and adolescents are involved in bullying every year, either as victims, bullies or bully-victims (people who have been bullied and have bullied others) [9]. This study demonstrated

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large variations in estimated involvement in bullying victimization across countries (from 8.6% to 45.2% among boys and from 4.8% to 35.8% among girls), with the highest rates reported in Baltic countries and the lowest rates found in northwestern European countries. Results from several previous studies have indicated that more boys than girls are victimized by bullies, but the reported gender differences have in general been small [7, 8]. Also, findings on gender differences are not entirely consistent across studies. In the aforementioned cross-national study by Craig *et al.*, girls reported the highest rates of exposure to bullying in 29 out of 40 countries [9]. A somewhat clearer gender-related pattern of exposure emerges when subtypes of bullying are taken into account. While boys are most likely to be bully-victims and experience direct bullying, victimized girls tend to be exposed to indirect forms of bullying [2, 9, 12].

The prevalence of victimization gradually decreases by age during the years of adolescence up to the end of secondary school [9, 10, 24]. During this time period, there is also a relative increase in the prevalence of indirect bullying compared to direct physical aggression, possibly due to development of verbal and social skills with age [3, 9].

Although the prevalence of exposure to bullying decreases with age, some people experience persistent victimization throughout adolescence [24, 25]. Individual factors associated with the persistence of bullying victimization over time is an important area of study, as people who are chronically victimized by their peers may be qualitatively different from those who are occasionally victimized, both in terms of risk factors and outcomes [5]. Being bullied does not seem to happen entirely by chance. For example, both internalizing mental health problems in early childhood and poor "theory of mind"-skills is associated with subsequent bullying [5, 26]. In a recent twin study among children, genetic influences accounted for over two-thirds of observed individual differences in exposure to bullying [27]. Also, in another recent report from the same survey, the authors were able to assess the possibility of reverse causation in the production of bullying-victimization. Chronic exposure to bullying during primary school and early secondary school was found to be influenced primarily by genetic and shared environmental factors. Preexistent adjustment difficulties and IQ among the children predicted exposure to chronic as compared to transitory victimization. Socioeconomic disadvantage, low maternal warmth, and maltreatment were identified as family risk factors for chronic victimization [28]. Thus, some phenomena typically assumed to be effects of bullying-victimization in epidemiological surveys, may also act as causes.

In the current study we set out to map the stability of bullying victimization across the transitional phase from lower to upper secondary school in a sample of Norwegian adolescents. We also aimed to investigate whether the subgroup of adolescents reporting bullying victimization in both settings differed significantly on selected sociodemographic, academic and health-related characteristics from adolescents for whom the victimization had stopped. To the authors' knowledge, results from such analyses among adolescents have not been reported in prior population-based non-clinical studies of bullying victimization. We hypothesised that persistent exposure to bullying would be associated with poorer self-reported mental and somatic health, lower academic performance and unfavourable socioeconomic status.

MATERIALS AND METHODOLOGY

Data Sources and Subject Selection

The data presented in the current study were collected in two cross-sectional, population-based surveys among Norwegian 15/16-year old 10th grade students, and corresponding follow-up surveys among 18/19-year old 13th grade students 3 years later. The surveys were carried out through the collaborative efforts of the Norwegian Institute of Public Health, Oslo Municipality, the Centre for Child and Adolescent Mental Health-Eastern and Southern Norway and the University of Oslo.

Data Sources at Baseline

The data for the current study is from the youth part of the Oslo Health Study, UNGHUBRO, and the Hedmark part of the UNGOPPHED study (conducted in the rural area of Hedmark County). In these surveys, the 10th graders in all primary schools in Oslo and Hedmark, respectively, were invited to complete two four-page self-report questionnaires during two school hours. The students completed a consent form before participation, and the parents of the participants received written information about the survey in advance. A project assistant was present in the classroom to inform the students about the survey and to administer the questionnaires. Questionnaires were left at school to be completed by students who were not present on the day of the survey, along with written instructions to the teachers about how to administer the questionnaires. The students that did not respond were sent a copy of the questionnaire by mail to their home address, together with a pre-stamped return envelope. The data collection in both surveys was performed during the last trimester of the school year 2000-2001. As schooling is compulsory in Norway until the completion of the 10th grade, the questionnaire was offered to all 15/16-year olds in the study areas. The UNGHUBRO and the UNGOPPHED surveys have been described in more detail in previous reports [29].

Data Sources at Follow-Up

In 2004 a follow-up study of the 10th graders from Oslo and Hedmark was performed, and the participants were invited to give consent to linkage between the present and the previous surveys. In Oslo all 13th grade students in all secondary high schools were invited to participate in a school-based survey similar to the 2001 baseline survey. The students were given a four-page self-report questionnaire for completion during one school hour. A number of students were not present during the first school visit. Consequently, some schools were visited several times. Those students not reached in school were invited by mail and included in the school-based part of the follow-up study. Participants from the baseline study who were not enrolled in the final year of secondary high school (13th graders) in Oslo and who had consented to participate in a follow-up were invited by mail to participate. The invitation included an invitation letter, an information brochure, a consent form, the questionnaire, and a pre-stamped return envelope. Two reminders were sent to those who did not respond. Similar methods as in the Oslo

postal part were applied for the 3-year follow-up of all participants from the 2001 baseline study in rural Hedmark. The data collection was performed during the last trimester of the school year 2003-2004. A more thorough description of the youth studies is available here: http://www.fhi.no/eway/default.aspx?pid=238&trg=mainArea_5811&mainArea_5811=5895:0:15,4562.

Response Rate

In the studies of 10th graders, the participation rate was similar in the rural Hedmark (88.3%) and the urban Oslo (89.2%). In the 3-year follow-up, the response rate among the 18/19-year olds was considerably lower in the pure postal-based study in Hedmark (55.4%) than in the combined postal-based and school-based study in Oslo (77.0%).

Data Linkage

The samples constituting the present study included data from two cross-sectional surveys of 5,750 15/16-year-old 10th graders from Oslo and Hedmark obtained in 2001, and one cross-sectional survey of 3,308 18/19-year-old 13th graders from Oslo obtained in 2004. Additionally, we had cross-sectional data from the postal surveys in Oslo (n=467) and Hedmark (n=952), giving a total of cross-sectional, questionnaire data on 4,727 18/19-year-olds. Finally, based on the two longitudinal studies from Oslo and Hedmark in 2004, we had 3-year follow-up data for a total of 3,674 (70.1% response) 18/19-year-olds. From this sample, a subsample of participants who reported being bullied in the 10th grade (n=342) was the only one to be included in the performed statistical analyses.

Ethics

At both time points the participants were invited to give consent to linkage between the two studies, and at baseline parental permission was obtained with signature of at least one parent. The study protocol was reviewed by the Regional Committee for Medical Research Ethics and approved by the Norwegian Data Inspectorate. The study has been conducted in accordance with the World Medical Association Declaration of Helsinki.

Exposure Variables

To assess exposure to bullying, the 10th graders responded to the item: "Have you, in the course of the last 12 months experienced bullying at school/on the way to school?", with the response categories "never", "sometimes", "about once a week", and "several times a week". The 13th graders were asked: "Have you since 10th grade experienced bullying?", with the response options "no", "yes", and "yes, during the last 12 months". In the current study, the two last categories were merged into one variable as there were a low number of respondents in our sample.

Mental and Somatic Health Variables

Mental distress was measured by the ten-item version of Hopkins Symptoms Check List (HSCL-10). The reliability was high (Cronbach a: .87), and the correlation with other instruments, including HSCL-90, has been found to range between 0.87 and 0.97 [29]. The 10 items included in the short version are feeling panicky, anxious, dizzy, tense, sleepless, sad, worthless, hopeless, fault within self, and finding everything a burden, all during the past week. Each item is rated on a scale of 1 (not at all) to 4 (extremely). An average score for all 10 items of equal or above 1.85 has shown to be a valid predictor for mental distress among subjects aged 16–24 year of age, corresponding to the 1.75 cut-off of HSCL-25 [30].

Muscle and skeletal pain were measured by the following questions: "Have you in the last 12 months experienced pain several times in: head, neck/shoulder, arms/legs/knees, stomach, back?" with responses being "yes" or "no". On the basis of these answers we grouped the adolescents in three groups; 0 pain sites, 1–2 pain sites and 3 to 5 pain sites, treating all pain sites with equal weight.

The data regarding acne were collected through the following question: "In the last week, have you had pimples?" Response options included (1) No; (2) Yes, a little; (3) Yes, a lot; and (4) Yes, very much. Because the goal was to explore moderate and severe acne, responses 3 and 4 were considered positive for acne for the purpose of this study.

Body mass index was calculated as weight in kilograms divided by height in meters squared and was based on participants' self-reported answer to the following question: "What was your weight and height when last measured?" Body mass index was divided into 3 categories: lower than 18.50; 18.50 to 24.99; and 25 or higher.

Age of menarche is a continuous variable and was used as an indicator for stage of pubertal timing. Menarche was assessed with two questions, the first being: "Have you started to menstruate?" and the second: "How old were you when you had your first menstruation?"

The question: "Do you smoke or have you smoked earlier?" had four response alternatives: never smoked, smoked before but has quit, smokes now and then, and smokes daily. The two first categories were merged into one variable.

Study mark in Norwegian was obtained by self-report by answering the question: What was your study marks in Norwegian?

Sociodemographic Variables

To obtain information on mother's educational level the questionnaire was linked to socio-demographic information collected by Statistics Norway. We used Statistics Norway's register of mothers' highest parental education completed per Oct 1, 2002. The educational level was for the purpose of the analysis grouped into three major groups according to highest attained educational level; university/college, higher secondary and lower secondary education. For more information on the Norwegian standard classification of education see: http://www.ssb.no/english/subjects/04/90/nos_c751_en/-nos_c751_en.pdf

Among the immigrant adolescents, a majority was born in Norway and was second-generation immigrants. Minority status was therefore determined on the basis of their parents' country of birth. In this study, we applied the Statistics Norway's definition of immigrants (or ethnic minorities), namely having both parents born in a country other than Norway.

Table 1. Characteristics of Sample. Figures are Counts (Percent).

	Boys (N=1590)				Girls (N=2084)			
	Age 15-16		Age 18-19		Age 15-16		Age 18-19	
Parents' Country of Birth								
At least one from Norway	1262	(79.4)	1262	(79.4)	1643	(78.8)	1643	(78.8)
Both from other country	240	(15.1)	240	(15.1)	344	(16.5)	344	(16.5)
Missing	88	(5.5)	88	(5.5)	97	(4.7)	97	(4.7)
Living with								
Both parents	1112	(69.9)	1024	(64.4)	1415	(67.9)	1235	(59.3)
One parent	370	(23.3)	415	(26.1)	555	(26.6)	538	(25.8)
Foster parents	10	(0.6)	12	(0.8)	8	(0.4)	7	(0.3)
Other	8	(0.5)	133	(8.4)	13	(0.6)	293	(14.1)
Missing	90	(5.7)	6	(0.4)	93	(4.5)	11	(0.5)
Self-Perceived Socioeconomic Status								
Poor	36	(2.3)	65	(4.1)	51	(2.4)	100	(4.8)
Moderate	411	(25.8)	492	(30.9)	626	(30.0)	689	(33.1)
Good	862	(54.2)	825	(51.9)	1094	(52.5)	1078	(51.7)
Very good	184	(11.6)	195	(12.3)	194	(9.3)	201	(9.6)
Missing	97	(6.1)	13	(0.8)	119	(5.7)	16	(0.8)

Data on family structure was obtained from the participants' response to the item "Who do you live together with at present?". We categorized their responses into ''both parents'' (corresponding to having marked ''mother and father''), ''one parent'' (including the responses ''mother only'', ''father only'', ''about the same time with mother and father'', and ''mother or father and new partner or husband/wife''), ''foster parents'' and "other".

Self-perceived socioeconomic status was obtained from the participants' response to the item ''I think that our family, seen in relation to other families in Norway, has: poor, moderate, good, or very good economy''.

Statistical Methods

Statistical analyses were performed with PASW statistics version 20. Cross-tables were analysed with Persons Chi-square tests and Student's t-tests. Logistic regression models with exposure to bullying as the dependent variable were used to calculate unadjusted odds ratios in bivariate analyses, and subsequently in a multivariate analysis were the statistically significant associations from the bivariate analyses were entered into the model and adjusted for each other. The level of significance was set to $p \leq 0.05$.

RESULTS

The sociodemographic characteristics of the total sample are presented in Table **1**. Among the 337 participants reporting bullying victimisation in the 10th grade, 48 participants (14%) had been exposed at a later time point. As presented in Table **2**, **3** and **4** basic statistical inferential tests revealed several statistically significant differences between the group of adolescents that reported persistence of exposure and the group that did not. The persistently bullied participants were more likely to report poor perceived economy, lower maternal educational level, not living with married parents, smoking daily at age 15, experiencing mental distress at age 18, having a higher body-mass-index at age 18, and having lower marks in Norwegian at both time points. In bivariate logistic regression analyses, being bullied after 10th grade was only found to be positively associated with not living with married parents, self-reported bodily pain, and mental distress, body mass index and marks in Norwegian at age 18 (Table **5**). In the multivariate regression model, adjusted odds ratios were only significant for mental distress and marks in Norwegian. Importantly, we found no gender differences in the risk of being exposed to bullying after 10th grade.

DISCUSSION

The main finding from this study was that the majority of adolescents exposed to bullying during lower secondary school do not continue to be exposed during upper secondary school, and that the subgroup experiencing persistent exposure is characterised by a higher degree of mental distress and poorer school performance in upper secondary school.

One possible explanation for these findings is that the persistence of bullying victimization has a direct, causal and detrimental effect on mental health status and school performance. This interpretation is in accordance with the

Table 2. From the Total Sample Only those Bullied in 10th Grade (n=337) are Included in the Analysis. The Table Compare those Still being Bullied (n=48) with those not Being Bullied (n=289) after 10th Grade on Sociodemografic Factors

			Bullied After 10th Grade			
		Yes		No		
		n	%	n	%	p-value
Gender	Boy	22	45.8	147	50.9	0.5
	Girls	26	54.2	142	49.1	
Family situation	Married	26	54.2	204	70.8	0.02
	All other	22	45.8	84	29.2	
Mothers education	Primary	6	13.3	40	14.1	0.04
	Secondary	26	57.8	110	38.9	
	College	13	28.9	133	47.0	
Ethnicity	Minority	16	33.3	65	22.5	0.1
	Norwegian	32	66.7	224	77.5	
Perceived economy	Poor	22	46.8	94	33.0	0.007
	Good	25	53.2	191	67.0	

Table 3. From the Total Sample Only those Bullied in 10th Grade (n=337) are Included in the Analysis. The Table Compare those Still Being Bullied (n=48) with those not being Bullied (n=289) after 10th Grade on Acne, Smoking and Pain

	Bullied after 10th Grade					
		Yes		No		p-value
		n	%	n	%	
Acne at 18	No	34	45.8	236	50.9	0.06
	Yes	14	29.2	50	17.5	0.007
Pain sites	No	10	8.3	23	22.2	
	1-2	16	30.8	85	35.6	
	3-5	19	60.9	168	42.2	
Smoking at 15	No	17	35.4	173	59.9	0.006
	Sometimes	19	31.6	66	22.8	
	Daily	12	25.0	50	17.3	
Smoking at 18	No	26	54.2	183	63.5	0.5
	Sometimes	16	33.3	77	26.7	
	Daily	6	12.5	28	9.7	

Table 4. From the Total Sample Only those Bullied in 10th grade (n=337) are Included in the Analysis. The Table Compare those still Being Bullied (n=48) with those not being Bullied (n=289) after 10th Grade on Mental Distress BMI, Marks in Norwegian and Time of Menarche

Bullied after 10th Grade			
	Yes mean (CL)	No Mean (CL)	p-value
Mental distress score at 15	1.8 (1.6-2.0)	1.7 (1.6-1.8)	0.22
Mental distress score at 18	2.1 (1.8-2.3)	1.7 (1.6-1.8)	0.001
BMI at 15	21.6 (20.3-22.9)	20.9 (20.5-21.3)	0.26
BMI at 18	23.7 (22.6-24.8)	22.3 (21.9-22.7)	0.001
Marks in Norwegian at 15	3.7 (3.4-3.9)	4.0 (3.9-4.1)	0.04
Marks in Norwegian at 18	3.5 (3.2-3.8)	4.0 (3.8-4.1)	0.001
Mean age of menarche	12.3 (11.5-13.0)	12.5 (12.3-12-7)	0.4

Table 5. From the Total Sample only those Bullied in 10th Grade (n=337) are Included in the Analysis. Logistic Regression Analysis with Dependent Variable being Bullied after 10th Garde Showing OR (CL)

Variable		Unadjusted OR (CL)	Adjusted OR (CL)*
Mothers education	Primary	3.3 (0.7-17.0)	
	Secondary	2.1 (0.5-9.0)	
	College	1	
Perceived economy	Good	1	
	Poor	0.6 (0.3-1.0)	
Family situation	Married	1	1
	All other	2.1 (1.1-3.8)	0.5 (0.3-1.1)
Marks Norwegian at 15	1-3	0.6 (0.3-1.1)	
	4-6	1	
Marks Norwegian at 18	1-3	2.6 (1.4-4.8)	2.1 (1.0-4.3)
	4-6	1	1
Smoking at 15	No	1	
	Sometimes	0.7 (0.3-1.3)	
	Daily	0.7 (0.3-1.8)	
BMI at 18	<18.5	1	1
	18.6-24.9	3.9 (2.0-7.7)	0.8 (0.2-4.0)
	>25.0	5.1 (1.1-24.0)	0.2(0.02-1.1)
Acne at 18	No	1	
	Yes	1.9 (0.9-3.9)	
Mental distress at 18	No	1	1
	Yes	2.8 (1.5-5.3)	2.7 (1.0-4.3)

Table 5. contd….

Variable		Unadjusted OR (CL)	Adjusted OR (CL)*
Nr of Pain sites	0-1	1	1
	2-3	2.3 (0.9-5.8)	2.5 (0.9-7.3)
	4-5	3.8 (1.6-9.3)	2.7 (0.9-7.4)

*In the adjusted column only those statically significant as unadjusted are in the model and are adjusted for each other.

existing research literature were bullying victimization is conceptualised as a major adverse life event [5]. However, in the current study, we were not able to make causal inferences. It is possible that the reported associations reflect common underlying genetic or environmental risk factors that we did not control for in our analyses. Also, in the basic inferential statistical analyses we found a significant difference between the two groups of adolescents on marks in Norwegian already in the 10th grade, suggesting that persistence of bullying after lower secondary school is not the most important difference-maker in this setting. Alternatively, low school performance works as a risk factor for persistent bullying in upper secondary school.

It is important to note that the lack of group differences on many outcome variables in the current study might reflect that the pupils not being bullied since 10th grade have long-lasting problems due to the victimization they experienced earlier. We have previously shown that adolescents suffer significantly compared to non-bullied peers in this sample [10]. In the current study, the level of mental distress remained unchanged from the 10th grade to the 13th grade in the group of adolescents for whom the victimization had stopped, possibly due to the long-term impact of bullying victimization.

The lack of statistically significant group differences on some of the variables of interest in this study might be due to low statistical power. In this relatively small sample it is possible that one or several real and relevant associations went undetected.

LIMITATIONS

In the current study there was a lack of detailed information about the experience of bullying victimization. The participants answered a simple question about exposure, and were not asked for information on type of victimization, intensity or duration. A definition of the term "bullying" was not provided to the participants. It might have been difficult for the participants to comprehend the concept of bullying, leading to misclassification of exposed/not exposed participants. These limitations affect the validity of the current findings, and may have influenced the strength of the associations in the performed statistical analyses.

Various methods are available to estimate exposure to bullying-victimization, and previous studies have found that there are some discrepancies between prevalence estimates based on self-report, teacher-report, peer-report or parental-report, with relatively low inter-rater reliabilities between different informants [31, 32]. The chosen method(s) of assessment in a study will therefore affect the prevalence estimates. There was only one informant in this study, and other informants such as peers, parents or teachers should ideally also have been asked to provide information on bullying victimization in order to capture all instances, as each informant may contribute unique information [33]. However, among adolescents it is likely that self-report alone yields a reasonably accurate estimate, as people in this age group can be assumed to be able to report relatively precisely on their life events and are probably less likely than younger children to report victimization to their parents. Challenges also exist considering the validity of prevalence estimates for the mental and somatic health variables as we did not use diagnostic tools to assess pathology. Another limitation is that the wording of the bullying questions to the 10th graders and the 13th graders were slightly different which might at least distort the prevalence of bullying.

The possibility of reverse causation, i.e. that those children and adolescents experiencing socio-economic disadvantage and pre-existing mental health problems are at greater risk of exposure to bullying victimization, is one important topic that we did not have the opportunity to investigate properly since we did not have information about the participants before the 10th grade.

Possible attrition bias in the second part of the study is also a limitation of the study as those with the least successful life trajectories and poorest psychical and mental health drop out from prospective studies. We did not have data on the important subgroup of bully-victims (both being bullied and bullying others). This group is of interest regarding persistence of bullying-victimization into late adolescence [34].

CONCLUSIONS

Several risk factors were detected like having divorced parents, low parental educational level, poor self-perceived economy, muscle and skeletal pain, symptoms of mental distress, lower school marks in Norwegian and higher body-mass index (BMI). However, in the adjusted analysis the persistence of bullying from the 10th grade to the 13th grade seems to be associated with mental distress and poor school performance. These findings have important implications and should be of interest to school staff, parents and mental health workers, as awareness of this subgroup of persistently exposed victims of bullying is important in order to initiate appropriate preventive measures. We should be aware of possible reverse causation as those with socio-economic and pre-existing mental health problems are at greater risk of exposure to chronic bullying victimization.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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