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Bullying involvement and self-reported mental health in elementary school children across Europe

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Abstract

Background:

Bullying behavior is recognized internationally as a serious issue associated with mental health and functioning problems among children.

Objective:

The present study sought to determine the associations between bullying involvement and self-reported mental health among elementary school children across seven European countries.

Participants and setting: The School Children Mental Health in Europe study was conducted in Bulgaria, Germany, Italy, Lithuania, the Netherlands, Romania and Turkey in 2010 using similar methodology to collect cross-sectional data from children, parents, and teachers.

Methods: The study focused on children who had completed the Dominic Interactive and whose mother and/or teacher had completed the Strengths and Difficulties Questionnaire (n=5,183).

Results: Overall 14.3% of children were identified as bullies, 18.2% as victims and, 19.0% as both bullies and victims. Despite the low threshold for defining bullying status, children identified as being involved were highly likely to present with self-reported mental health problems: 31.6% of bully-victims reported any disorder, while 25.4% of bullies and 23.1% of victims did. Adjusting for key factors, bullies and bully-victims were significantly more likely to present with any externalizing disorder, while victims were not. Additionally, bully-victim status was associated with significantly greater odds of presenting with each internalizing disorder: phobia (AOR=1.48, 95%CI=1.01-2.19), GAD (AOR=2.54, 95%CI=1.67-3.87), separation anxiety (AOR=1.88, 95%CI=1.43-2.47) and depression (AOR=2.52, 95%CI=1.61-

3.93). However, victim status was only associated with GAD (AOR=1.63, 95%CI=1.07-2.48) and bully status with separation anxiety (AOR=1.44, 95%CI=1.07-1.93).

Conclusions: The results highlight the association of bullying involvement and child mental health in elementary school children across Europe.

Keywords : Bullying; cross-national; mental health; children; elementary school

Introduction

School bullying is a problem that affects young children around the world (Juvonen & Graham, 2014; Menesini & Salmivalli, 2017). National estimates of the prevalence of bullying involvement in European elementary schools (typically covering children between the ages of 6 and 10 to 11 years old) range from 10 to 50% of youth: 15% in Norway (Olweus, 1997), 34% in the U.K. (Boulton & Smith, 1994), 38 to 46% in Italy (Genta, Menesini, Fonzi, Costabile and Smith, 1996), 34% in the Netherlands (Jansen et al., 2012). While the prevalence of bullying varies substantially depending on samples, age cohorts, methodology and operationalization of bullying behavior and its frequency however, the recognition of the problem and of its consequences on current and future mental health is present internationally (Copeland, Wolke, Angold, & Costello, 2013; Takizawa, Maughan, & Arseneault, 2014).

Bullying is defined as repeated acts of physical, relational, or verbal violence with the intent to harm or humiliate another person. Bullying includes acts of deliberate physical aggression, verbal aggression (name calling and threats), and relational aggression (social isolation, spreading rumors). Beyond the repetition and intent to harm, its definition involves a certain level of power imbalance whereby the victim perceives the bully as having more power than him/her (Olweus, 1994). Research on bullying had originally focused on bullies (youth who engage in bullying behavior towards another person) and victims (youth who are targeted by bullying behavior), only to uncover the importance of a third group of bully-victims, i.e. youth who *both* bully others and are bullied themselves (e.g., (Haynie et al., 2001; Veenstra et al., 2005). This distinction is particularly relevant in terms of associations with mental health as these groups appear to have differential associations with specific mental health problems. Studies have consistently shown that being a victim of bullying in elementary school confers risk of mental health problems including depression and anxiety

(Arseneault et al., 2006; Klomek et al., 2009; Løhre, Lydersen, Paulsen, Mæhle, & Vatten, 2011; Zwierynska, Wolke, & Lereya, 2013). Children who are both victims and bullies themselves have been shown to display both externalizing and internalizing problems. Specifically, bully-victims in elementary school were more likely to report feeling sad and worried as compared to non-involved youth (O'Brennan, Bradshaw, & Sawyer, 2009). Furthermore, being a bully-victim is associated with a number of negative mental health-related outcomes such as poor self-esteem (Boulton & Smith, 1994), internalizing disorders including depression and anxiety (Arseneault et al., 2006; Hodges & Perry, 1999; Kumpulainen et al., 1998; Shojaei, Wazana, Pitrou, Gilbert, & Kovess, 2009), externalizing problems (Arseneault et al., 2006), later suicidal behavior and completed suicide especially among girls (Klomek et al., 2009). Bullying others has been linked to externalizing disorders and aggressive behaviors (Cook, Williams, Guerra, Kim, & Sadek, 2010; Olweus, 1997). In adolescence, bullies and bully-victims are more likely to engage in substance use (Nansel, Craig, Overpeck, Saluja, & Ruan, 2004). Taken together, research in this area underlines the importance of considering bullies, victims, and bully-victims separately when examining associations with child mental health. Additionally, a key element to consider when examining associations between bullying involvement and child mental health is the fact that additional factors often associated with bullying on one hand and with mental health problems on the other should be taken into account. Childhood adversities including family dysfunction such as having a parent with chronic mental illness, parental divorce, child abuse or neglect or chronic economic difficulties are known to be common, to frequently co-occur, and to contribute to numerous medical and mental health problems (Felitti et al., 1998; Kessler et al., 2010). In turn, childhood adversities such as exposure to domestic violence, physical abuse, parental mental illness have been linked to an increased likelihood of being involved in bullying either as a bully, a bully-victim or as a victim (Bowes et al., 2009; Nocentini,

Fiorentini, Di Paola, & Menesini, 2019; Shields & Cicchetti, 2001). Considering the importance of familial characteristics including parental psychological distress on child mental health and its association with the risk of involvement in bullying, it is important to study the associations of bullying and mental health taking this factor into consideration.

The objectives of the present study are to examine bullying involvement and self-reported mental health in a large sample of elementary school children across seven European countries including Bulgaria, Germany, Italy, Lithuania, the Netherlands, Romania and Turkey using the Dominic Interactive and controlling for key familial factors including maternal psychological distress. Applying the same methodology in each country, the present study examines the association between specific self-reported internalizing and externalizing problems and being identified as a bully, a victim or a bully-victim.

Methods

Sample and procedure

The School Children Mental Health in Europe (SCMHE) study is a cross-sectional survey conducted in Bulgaria, Germany, Italy, Lithuania, the Netherlands, Romania and Turkey in 2010 using similar methodology to collect data from children, parents, and teachers. In each country, a three-stage probability sampling method (school-level, class-level and child-level) was used (Kovess et al., 2015). Parents received a packet containing socio-demographic questions to complete and to return anonymously to the school. Passive consent was used: parents of selected children received a written informed consent form to be signed and returned to the school should they refuse to participate or for their child to participate. As a consequence, parents were informed that not returning the consent form was equivalent to consenting to participate, as only parents who did not consent indicated so on the form and returned the form to the research team. Children who were present on the day of the study and whose parents had not opted out were asked to complete a computerized questionnaire to

evaluate their self-reported mental health. All countries received approval from appropriate local ethical review boards. Overall, SCMHE gathered data on 10,245 children between 6 and 11 years old. In the present study, only children whose mother had completed the questionnaires were included (n=6,245). This restriction was applied due to the fact that the majority of parent respondents were female (88.3%), and that psychological distress is known to vary as a function of sex, with women more likely to report higher levels of psychological distress as compared to men (Eaton et al., 2012). The sample was further restricted to those for whom either the mother or the teacher had completed the Strength and Difficulties Questionnaire (n=5,298) as this instrument was used to assess bullying.

Involvement in bullying

Child involvement in bullying was assessed using items of the parent and teacher versions of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997, 2001). Each of the 25 items is scored on a three-level scale as 'Not true', 'Somewhat true' or 'Certainly true' by the parent and/or the teacher on their respective version. Informants are asked to respond regarding the previous six months. For the purpose of the present study, two items were used. The first item « Often fights with other children or bullies them», was extracted from the Conduct problems subscale and was used to determine whether or not a child was considered as a bully. The second item « Picked on or bullied by other children» was taken from the Peer problems subscale and was used to determine whether or not a child was considered as a victim of bullying. In order to categorize children based on their bullying status, were considered bullies or victims only those for whom either the mother or the teacher had answered 'Somewhat true' or "Certainly true" on either of these items.

Children were then categorized into four mutually exclusive groups: bullies (n=740), victims (n=945), bully-victims (n=984) and those not involved in bullying (n=2,514).

Child self-reported mental health

Self-reported mental health was measured using the Dominic Interactive (DI) (Shojaei et al., 2009; Valla, Bergeron, Bidaut-Russell, St-Georges ans Gaudet, 1997). The DI is a self-administered computerized questionnaire relevant for children aged between 6 and 11 years old. The child is invited to follow a cartoon-like character, Dominic, and is asked whether he or she feels the same as Dominic (who can be adapted to match the child's gender and ethnicity). The emotional and behavioral symptoms of seven DSM-IV (American Psychiatric Association, 1994) childhood mental disorders are assessed through 91 items. The DI determines the probable presence of internalizing disorders (including separation anxiety disorder, generalized anxiety disorder, major depressive disorder, and phobia) and externalizing disorders (including attention deficit/hyperactivity disorder (ADHD), conduct disorder (CD) and oppositional defiant disorder (ODD)). Probable cases of each disorder are determined based on established cut-points. The DI is available in all languages used in each participating country (Kuijpers et al., 2014; Shojaei et al., 2009).

Sociodemographic and parental variables

Sociodemographic and parental variables were reported by the mother and included child's gender and age, maternal education level (high school or less, graduated high school, college or more), marital status (single versus in a relationship), mother's age (34 or younger, 35 to 40, and over 40), maternal employment status (active or seeking employment and inactive, defined as being a homemaker, student, or unemployed) and number of children in the household (one, two or three, four or more).

Maternal psychological distress

Maternal psychological distress in the previous four weeks was measured using the five-item Mental Health subscale (MH-5) of the SF-36 Short Form (Ware and Sherbourne,

1992), which has good psychometric properties (McCabe, Thomas, Brazier and Coleman, 1996; Ware, Kosinski and Keller, 1994) and is available in the languages required by the present study (Leplège, Ecosse, Verdier and Perneger, 1998). A cut point to detect the presence of psychological distress has been established at 52 for European countries (Kovess, 2004).

Data analysis

First, between-group comparisons of bullying groups were performed (bully, victim, bully-victim, or not involved in bullying) regarding sociodemographic characteristics of the child (age and sex) and mother (highest level of education, age, marital status, employment status, number of children in the household, country of residence) and maternal psychological distress using chi-square tests (Table 1). Second, chi-square tests were used to compare the prevalence of self-reported mental disorders by bullying status, logistic regressions were used to compute unadjusted odds of presenting each disorder by bully or victim status using children not involved in bullying as the reference (Table 2). Multivariate logistic regressions adjusting for all child and mother sociodemographic variables were used to determine the adjusted odds ratios associated with bullying status in predicting any disorder, any externalizing disorder as well as specific externalizing disorders (Table 3) and any internalizing disorder as well as specific internalizing disorders (Table 4). Significance was set at a $p < 0.05$. Analyses were conducted using SPSS v.23.

Results

Child and maternal sociodemographic characteristics by bullying status

Overall, across countries, 14.3% of children were identified as bullies, 18.2% as victims and, 19.0% as both bullies and victims while 48.5% of children were not involved in

bullying (Table 1). Between-group comparisons showed significant differences regarding child and mother sociodemographic characteristics.

Prevalence and unadjusted odds ratios of self-reported mental health problems by bullying status.

The prevalence of self-reported mental health problems differed significantly in between-group comparisons (Table 2). Overall, 31.6% of bully-victims reported any disorder, while 25.4% of bullies and 23.1% of victims did so. Externalizing disorders were significantly more frequent among bully-victims (13.5%) and bullies (11.4%) as compared to victims (5.7%), while the differences in the prevalence of internalizing disorders were not as marked with 25.2%, 19.2%, and 21.3%, respectively.

As compared to children not involved in bullying, bully-victims had significantly greater odds of reporting any disorder (OR=2.30, 95%CI=1.94-2.72). Bully-victims had significantly greater odds of each internalizing disorder ranging from separation anxiety (OR=1.80, 95%CI=1.46-2.25) to depression (OR=2.62, 95%CI=1.83 -3.74) and of each externalizing disorder from ODD (OR=3.27, 95%CI=2.31-4.63) to conduct disorder (OR=6.40, 95%CI=4.20-9.75). Bullies, on the other hand were three times more likely to report externalizing disorders (OR=3.00, 95%CI=2.22-4.05), while the association with internalizing disorders was weaker (OR=1.37, 95%CI=1.10-1.69) with non-significant odds regarding phobia, separation anxiety, and depression. Victims were also more likely to report any disorder though the odds of presenting with any externalizing disorder (OR=1.42, 95%CI=1.01-1.99) were significantly lower than what was observed in bullies or bully-victims. Victims were also more likely than children not involved in bullying to present with each of the internalizing disorders.

Adjusted odd ratios associated with presenting externalizing problems

In models adjusting for each child and mother sociodemographic variable, bullying status was significantly associated with the odds of presenting with any disorders (Table 3). Bullies and bully-victims were significantly more likely to present with any externalizing disorder and each of the specific externalizing disorders, while victims were not. Bully status was associated with increased odds of ADHD (AOR=2.85, 95%CI=1.74-4.67), conduct disorder (AOR=4.12, 95%CI=2.36-7.21) and ODD (AOR=2.49, 95%CI=1.58-3.92). Bully-victim status was also associated with increased odds of ADHD (AOR=3.50, 95%CI=2.18-5.63), conduct disorder (AOR=4.58, 95%CI=2.67-7.85) and ODD (AOR=3.20, 95%CI=2.07-4.94).

Adjusted odd ratios associated with presenting internalizing problems

In models adjusting for each sociodemographic variable, bullying status was also significantly associated with the odds of presenting with any internalizing problem (Table 4). Specifically, bully-victim status was associated with significantly greater odds of reporting each internalizing disorder: phobia (AOR=1.48, 95%CI=1.01-2.19), GAD (AOR=2.54, 95%CI=1.67-3.87), separation anxiety (AOR=1.88, 95%CI=1.43-2.47) and depression (AOR=2.52, 95%CI=1.61-3.93). However, victim status was only associated with increased odds of GAD (AOR=1.63, 95%CI=1.07-2.48) and bully status with increased odds of separation anxiety (AOR=1.44, 95%CI=1.07-1.93).

Discussion

The present study examined self-reported mental health by bullying status to include bullies, victims and bully-victims in a large sample of elementary school children across Europe. Overall, 14.3% of children were identified as bullies, 18.2% as victims and, 19.0% as

both bullies and victims while 48.5% of children were not involved in bullying. Importantly, estimates of bullying involvement in the present study were based on the mother or teacher endorsing a moderately low threshold of involvement in bullying covering the previous six months. Studies indeed suggest that there is informant-based discrepancy in reports of bullying behavior and victimization estimates (Cornell & Brockenbrough, 2004). Parents and teachers generally tend to report less victimization as compared to children themselves (Demaray, Malecki, Secord, & Lyell, 2013) although some studies have observed little differences with a tendency for children to report less victimization (Løhre et al., 2011). In a large study of Finnish elementary school children, when occasional bullying was considered, 19.6% of children, 15.9% of teachers and 17.1% of parents reported such behavior, and occasionally being bullied was reported by 29.2% of children, 10.4% of teachers and 21.6% of parents (Kumpulainen et al., 1998). However, prevalence estimates were lower when the authors operationalized bullying involvement to represent cases in which bullying was identified as being frequent by at least one informant or if two or more informants reported occasional involvement. Based on these criteria, the Finnish study identified 15.7% of children as bullies and 18.9% as victims, broken down into bullies (8.1%), bully-victims (7.6%), and victims (11.3%). Similarly, studies that have relied on bullying questionnaires to provide estimates of the prevalence of these behaviors have typically yielded lower estimates of involvement (Solberg & Olweus, 2003).

In line with prior studies conducted in school-aged children, boys were more likely to be identified as bullies or bully-victims as compared to girls (Kumpulainen et al., 1998), while girls were more likely to be identified as victims (Veenstra et al., 2005). In addition, low level of maternal education, younger maternal age, unemployment, single-parent status, the presence of four or more children in the household and maternal psychological distress were each associated with bullying involvement which is consistent with existing evidence of an

association between socioeconomic status and bullying involvement and underscores the importance of controlling for such variables (Shetgiri, Lin, Avila, & Flores, 2012; Wolke, Woods, Stanford, & Schulz, 2001).

Consistent with existing data, bully-victims were found to present with the highest prevalence of mental health problems (Kumpulainen et al., 1998). This finding is important as being a bully-victim has been associated with greater risk of experiencing further psychiatric symptoms during adolescence (Kumpulainen & Räsänen, 2000). Indeed, bully-victims have been shown to function more poorly than either bullies or victims (Arseneault et al., 2006; Haynie et al., 2001). In the present study, one third of bully-victims reported a mental health problem, 25.2% an internalizing disorder and 13.5% an externalizing disorder. In contrast, one in four children either victims or bullies reported a mental health problem. While approximately 20% of both groups reported an internalizing disorder, the prevalence of externalizing disorders was significantly lower among victims (5.7%) as compared to bullies (11.4%). When compared to children who are not involved in bullying, unadjusted analyses revealed that each group involved in bullying either as a perpetrator and/or a victim was significantly more likely to experience both internalizing and externalizing disorders, and those involved in bullying more likely than pure victims to suffer from externalizing disorders. The association of internalizing disorders and victimization and the association of externalizing disorders and bullying behavior is consistent with several studies (e.g., (Cook et al., 2010; Saarento, Kärnä, Hodges, & Salmivalli, 2013).

Importantly, the present study examined the association of bullying involvement taking into account key sociodemographic factors associated with child mental health problems including maternal education, age, unemployment, single-mother status, having four or more children in the household and maternal psychological distress. Addressing these variables was important because of the clustering of childhood adversities, their role in the

likelihood of being involved in bullying (Bowes et al., 2009; Nocentini et al., 2019; Shields & Cicchetti, 2001) and of their impact on well-being (Felitti et al., 1998; Kessler et al., 2010). Furthermore, taking these variables into account limits the risk of overestimating the bivariate association of bullying involvement and child mental health problems. Adjusting for these variables, the odds of reporting externalizing or internalizing problems remained strongly associated with bullying status. In these analyses, bullying others was significantly associated with greater odds of presenting with any externalizing disorder including ADHD, conduct disorder and oppositional defiant disorder. Interestingly, when adjusting for key factors, bullying status remained associated with increased odds of internalizing disorders not only for victims but also for bullies and bully-victims. In fact, the latter group displayed greater risk for each disorder including phobia, GAD, separation anxiety and depression, while victims only had greater odds of GAD and bullies, greater odds of separation anxiety. The present findings are consistent with prior evidence showing depressive symptoms and externalizing among bully-victims (e.g., (Cook et al., 2010; Hawker & Boulton, 2000; Haynie et al., 2001).

The present findings also show that being involved in bullying is not associated with mental health problems for all children as the majority of children exposed do not report such difficulties. Rather, the findings point to the fact that while exposure to such adversities increases the risk of experiencing mental health problems, protective factors both intrinsic and environmental intervene to moderate the impact of exposure. The role of factors such as emotional regulation, coping skills and social support as well as broader environmental factors have been shown to mitigate the effects of bullying involvement and represent targets for intervention (Baldry & Farrington, 2005; Davidson & Demaray, 2007; Smith & Shu, 2000).

The present study holds several limitations. First, participation rates in the SCMHE study were relatively modest and varied by country. Apart from the Lithuanian sample, none

of the samples were designed to be representative of their country's population of school-aged children. As such the study was not designed to provide country-specific rates of bullying involvement. Second, bullying involvement was assessed solely based on two items of the mother- and teacher-SDQ, and did not assess relational bullying despite the importance of this aspect of bullying behavior (Hawker & Boulton, 2000), and as such should not be equated to estimates of bullying prevalence based on the use of validated questionnaires designed to assess the full range of bullying involvement. Specifically, instances of bullying may have been underestimated in cases in which the child has not told anyone what he/she is experiencing. In contrast, mothers may have overestimated bullying in instances where the child would not have described his/her experience as bullying per se. In addition, the cross-sectional nature of the study did not allow us to examine causal and bidirectional effects though there is evidence of such an association. Lastly, the study was conducted in 2010 and relies on estimates of probable DSM-IV disorders. Future research in this area should upgrade to DSM-5 criteria and include more thorough assessments of psychiatric disorders and related impairment.

Conclusion

Despite these limitations, the present study conducted in a large cross-national sample of elementary school children showed that some form of bullying involvement was present in half of the children who were identified either as a bully (14.3%), a victim (18.2%) or a bully-victim (19.0%). Importantly, despite the low threshold for defining bullying status, children involved in bullying were at significantly greater risk of presenting with self-reported mental disorders, a result which held true when controlling for key familial factors known to be associated with child mental health such as maternal psychological distress. Bullying in school has been recognized as an issue internationally, and several primary prevention efforts have been designed and implemented in an attempt to limit its occurrence. For instance, the

Olweus Bullying Prevention Program developed in Norway and also used in other regions of the world including the U.S. has shown its ability to reduce bullying behaviors over time (Olweus & Limber, 2010). Beyond increasing awareness in schools and implementing anti-bullying programs, the present findings underline the importance of screening for mental health problems if not universally (Husky, Sheridan, McGuire, & Olfson, 2011) at least among youth who are identified as being involved in bullying. Such efforts may contribute to help at risk children access the specialized mental health services they need. Furthermore, the clustering of childhood adversities combined with the fact that children exposed to such adversities are at greater risk for being involved in bullying either as a bully, a victim, or both suggests that primary prevention efforts within the family unit may be helpful. In order to support such efforts, additional research is needed regarding the potential sensitization effects of childhood adversities on the impact of subsequent bullying. Specifically, it would be important to study the unique and cumulative contribution of specific childhood adversities to the effects of bullying involvement on child mental health and to identify modifiable protective factors that may identify additional prevention targets.

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Table 1. Child and maternal sociodemographic characteristics by bullying status

| | Bully | | Victim | | Bully-Victim | | Not involved in bullying | | Chi 2 | |
|--|------------|------|------------|------|--------------|------|--------------------------|------|---------|--------------|
| | N = 740 | | N = 945 | | N = 984 | | N = 2514 | | Test | p |
| | n | % | n | % | n | % | n | % | | |
| Overall prevalence* | 740 | 14.3 | 945 | 18.2 | 984 | 19.0 | 2514 | 48.5 | | |
| Child's gender (N=5,183) | | | | | | | | | | |
| Boy | 470 | 63.5 | 407 | 43.1 | 683 | 69.4 | 1048 | 41.7 | 289.813 | < 0.001 |
| Girl | 270 | 36.5 | 538 | 56.9 | 301 | 30.6 | 1466 | 58.3 | | |
| Child's age (N=5,097) | | | | | | | | | | |
| 6-7 | 179 | 24.8 | 178 | 19.1 | 208 | 21.5 | 597 | 24.1 | 17.542 | 0.007 |
| 8-9 | 336 | 46.5 | 462 | 49.5 | 489 | 50.5 | 1120 | 45.3 | | |
| 10-11 | 207 | 28.7 | 293 | 31.4 | 271 | 28.0 | 757 | 30.6 | | |
| Mother's highest level of education (N=4,495) | | | | | | | | | | |
| High school or less | 103 | 16.0 | 116 | 14.3 | 152 | 17.8 | 226 | 10.3 | 119.092 | < 0.001 |
| Graduated high school | 235 | 36.5 | 332 | 40.9 | 386 | 45.1 | 709 | 32.4 | | |
| Some college or more | 305 | 47.4 | 364 | 44.8 | 317 | 37.1 | 1250 | 57.2 | | |
| Mother's age (N=5,149) | | | | | | | | | | |
| ≤ 35 | 321 | 43.6 | 424 | 45.4 | 530 | 54.3 | 907 | 36.2 | 103.329 | < 0.001 |
| > 35 - ≤ 40 | 226 | 30.7 | 268 | 28.7 | 249 | 25.5 | 813 | 32.5 | | |
| > 40 | 190 | 25.8 | 241 | 25.8 | 197 | 20.2 | 783 | 31.3 | | |
| Mother's employment status (N=4,743) | | | | | | | | | | |
| Active | 468 | 69.2 | 579 | 66.7 | 561 | 63.2 | 1709 | 74.0 | 41.486 | < 0.001 |

| | | | | | | | | | | |
|--|------------|------|------------|------|------------|------|-------------|------|---------|-------------------|
| Inactive | 208 | 30.8 | 289 | 33.3 | 327 | 36.8 | 602 | 26.0 | | |
| Mother's marital status (N=4,928) | | | | | | | | | | |
| Couple | 592 | 84.5 | 754 | 83.6 | 705 | 76.4 | 2145 | 89.3 | 90.833 | < 0.001 |
| Single | 109 | 15.5 | 148 | 16.4 | 218 | 23.6 | 257 | 10.7 | | |
| Number of children in the household (N=5,177) | | | | | | | | | | |
| 1 | 218 | 29.5 | 267 | 28.3 | 247 | 25.1 | 730 | 29.1 | 79.523 | < 0.001 |
| 2-3 | 411 | 55.7 | 549 | 58.1 | 545 | 55.4 | 1558 | 62.0 | | |
| 4 or more | 109 | 14.8 | 129 | 13.7 | 191 | 19.4 | 223 | 8.9 | | |
| Maternal psychological distress (N=4,898) | | | | | | | | | | |
| Presence | 126 | 18.1 | 189 | 21.0 | 276 | 29.6 | 271 | 11.4 | 162.470 | < 0.001 |
| Absence | 571 | 81.9 | 709 | 79.0 | 656 | 70.4 | 2100 | 88.6 | | |
| Country (N=5,183) | | | | | | | | | | |
| Bulgaria | 112 | 15.1 | 249 | 26.3 | 178 | 18.1 | 414 | 16.5 | 424.338 | < 0.001 |
| Germany | 83 | 11.2 | 51 | 5.4 | 79 | 8.0 | 206 | 8.2 | | |
| Italy | 111 | 15.0 | 80 | 8.5 | 59 | 6.0 | 437 | 17.4 | | |
| Lithuania | 147 | 19.9 | 210 | 22.2 | 237 | 24.1 | 422 | 16.8 | | |
| Netherlands | 65 | 8.8 | 84 | 8.9 | 57 | 5.8 | 429 | 17.1 | | |
| Romania | 126 | 17.0 | 199 | 21.1 | 314 | 31.9 | 344 | 13.7 | | |
| Turkey | 96 | 13.0 | 72 | 7.6 | 60 | 6.1 | 262 | 10.4 | | |

Bold represents statistically significant intergroup differences among a factor.

*overall sample: n=5,183

Table 2. Prevalence and unadjusted odds ratios of self-reported mental health problems by bullying status.

| | Bully | | | | Victim | | | | Bully-Victim | | | | Not involved in bullying | | Chi 2 | |
|-----------------------------------|---------|------|-------------|----------------------|---------|------|-------------|----------------------|--------------|------|-------------|----------------------|--------------------------|------|---------|----------------|
| | N = 740 | | | | N = 945 | | | | N = 984 | | | | N = 2,514 | | Test | p |
| | n | % | OR* | 95% CI | n | % | OR* | 95% CI | n | % | OR* | 95% CI | n | % | | |
| Any disorder | 188 | 25.4 | 1.70 | [1.39 ; 2.06] | 218 | 23.1 | 1.49 | [1.24 ; 1.79] | 311 | 31.6 | 2.30 | [1.94 ; 2.72] | 421 | 16.7 | 99.113 | < 0.001 |
| Any internalizing disorder | 142 | 19.2 | 1.37 | [1.10 ; 1.69] | 201 | 21.3 | 1.56 | [1.29 ; 1.88] | 248 | 25.2 | 1.94 | [1.62 ; 2.33] | 372 | 14.8 | 57.016 | < 0.001 |
| Phobia | 48 | 6.5 | 1.26 | [0.90 ; 1.78] | 69 | 7.3 | 1.43 | [1.06 ; 1.94] | 83 | 8.4 | 1.68 | [1.26 ; 2.23] | 131 | 5.2 | 14.055 | 0.003 |
| Generalized anxiety disorder | 36 | 4.9 | 1.60 | [1.07 ; 2.39] | 56 | 5.9 | 1.97 | [1.38 ; 2.80] | 67 | 6.8 | 2.28 | [1.63 ; 3.19] | 78 | 3.1 | 27.839 | < 0.001 |
| Separation anxiety disorder | 90 | 12.2 | 1.28 | [0.99 ; 1.66] | 126 | 13.3 | 1.43 | [1.13 ; 1.79] | 161 | 16.4 | 1.81 | [1.46 ; 2.25] | 245 | 9.7 | 31.437 | < 0.001 |
| Depression | 24 | 3.2 | 1.28 | [0.80 ; 2.07] | 40 | 4.2 | 1.69 | [1.13 ; 2.53] | 63 | 6.4 | 2.62 | [1.83 ; 3.74] | 64 | 2.5 | 30.871 | < 0.001 |
| Any externalizing disorder | 84 | 11.4 | 3.00 | [2.22 ; 4.05] | 54 | 5.7 | 1.42 | [1.01 ; 1.99] | 133 | 13.5 | 3.66 | [2.80 ; 4.79] | 103 | 4.1 | 116.949 | < 0.001 |
| ADHD | 40 | 5.4 | 2.94 | [1.91 ; 4.50] | 29 | 3.1 | 1.63 | [1.02 ; 2.60] | 64 | 6.5 | 3.57 | [2.44 ; 5.24] | 48 | 1.9 | 53.715 | < 0.001 |
| Conduct disorder | 40 | 5.4 | 4.43 | [2.76 ; 7.11] | 24 | 2.5 | 2.02 | [1.18 ; 3.45] | 75 | 7.6 | 6.40 | [4.20 ; 9.75] | 32 | 1.3 | 101.986 | < 0.001 |
| Oppositional-defiant disorder | 45 | 6.1 | 2.60 | [1.76 ; 3.86] | 27 | 2.9 | 1.18 | [0.75 ; 1.87] | 74 | 7.5 | 3.27 | [2.31 ; 4.63] | 61 | 2.4 | 59.615 | < 0.001 |

Bold represents statistically significant intergroup differences among a factor.

*the reference group is children who are not involved in bullying

Table 3. Adjusted odd ratios associated with presenting externalizing disorders

| | Any disorder | | Any externalizing disorder | | ADHD | | Conduct disorder | | Oppositional-defiant disorder | |
|--|--------------|----------------------|----------------------------|----------------------|-------------|----------------------|------------------|----------------------|-------------------------------|----------------------|
| | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI |
| Socio-demographic factors | | | | | | | | | | |
| Child's gender | | | | | | | | | | |
| Girl | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Boy | 0.71 | [0.60 ; 0.83] | 1.71 | [1.31 ; 2.24] | 1.25 | [0.87 ; 1.81] | 2.92 | [1.84 ; 4.62] | 1.72 | [1.20 ; 2.46] |
| Bullying status | | | | | | | | | | |
| Not involved | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Bully | 1.77 | [1.41 ; 2.22] | 2.67 | [1.88 ; 3.79] | 2.85 | [1.74 ; 4.67] | 4.12 | [2.36 ; 7.21] | 2.49 | [1.58 ; 3.92] |
| Victim | 1.32 | [1.06 ; 1.64] | 1.09 | [0.72 ; 1.65] | 1.31 | [0.75 ; 2.32] | 1.41 | [0.70 ; 2.83] | 0.98 | [0.56 ; 1.73] |
| Bully-victim | 2.31 | [1.86 ; 2.87] | 3.14 | [2.25 ; 4.40] | 3.50 | [2.18 ; 5.63] | 4.58 | [2.67 ; 7.85] | 3.20 | [2.07 ; 4.94] |
| Mother's highest level of education | | | | | | | | | | |
| Some college or more | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Graduated high school | 0.98 | [0.82 ; 1.17] | 0.93 | [0.70 ; 1.25] | 1.02 | [0.69 ; 1.52] | 0.92 | [0.59 ; 1.42] | 0.69 | [0.47 ; 1.02] |
| High school or less | 1.29 | [0.98 ; 1.70] | 1.44 | [0.91 ; 2.26] | 1.17 | [0.61 ; 2.23] | 2.07 | [1.13 ; 3.80] | 1.49 | [0.83 ; 2.66] |
| Mother's age | | | | | | | | | | |
| > 40 | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| > 35 - ≤ 40 | 1.06 | [0.86 ; 1.32] | 1.19 | [0.84 ; 1.69] | 1.05 | [0.64 ; 1.72] | 1.31 | [0.76 ; 2.27] | 1.12 | [0.72 ; 1.76] |
| ≤ 35 | 1.31 | [1.06 ; 1.63] | 1.49 | [1.04 ; 2.11] | 1.40 | [0.86 ; 2.27] | 1.59 | [0.93 ; 2.73] | 1.30 | [0.82 ; 2.06] |
| Mother's marital status | | | | | | | | | | |
| Couple | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |

| | | | | | | | | | | |
|--|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|
| Single | 1.22 | [0.99 ; 1.50] | 1.01 | [0.71 ; 1.41] | 1.10 | [0.69 ; 1.74] | 0.64 | [0.37 ; 1.10] | 0.91 | [0.57 ; 1.45] |
| Mother's employment status | | | | | | | | | | |
| Active | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Inactive | 0.97 | [0.81 ; 1.17] | 1.00 | [0.74 ; 1.35] | 1.07 | [0.71 ; 1.61] | 0.91 | [0.58 ; 1.41] | 1.01 | [0.68 ; 1.51] |
| Number of children in the household | | | | | | | | | | |
| 1 | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| 2-3 | 1.05 | [0.87 ; 1.28] | 1.20 | [0.87 ; 1.65] | 0.94 | [0.62 ; 1.45] | 1.14 | [0.70 ; 1.86] | 1.14 | [0.76 ; 1.73] |
| 4 or more | 1.26 | [0.95 ; 1.66] | 1.35 | [0.85 ; 2.15] | 1.47 | [0.79 ; 2.71] | 1.96 | [1.04 ; 3.71] | 1.19 | [0.64 ; 2.21] |
| Maternal psychological distress | | | | | | | | | | |
| Absence | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Presence | 1.08 | [0.88 ; 1.32] | 1.32 | [0.97 ; 1.80] | 1.11 | [0.72 ; 1.72] | 1.46 | [0.94 ; 2.26] | 1.08 | [0.71 ; 1.65] |
| Country | | | | | | | | | | |
| Bulgaria | 1.34 | [1.13 ; 1.59] | 1.65 | [1.27 ; 2.14] | 1.79 | [1.25 ; 2.57] | 1.44 | [0.96 ; 2.17] | 1.65 | [1.18 ; 2.32] |
| Germany | 0.80 | [0.62 ; 1.03] | 1.02 | [0.69 ; 1.52] | 0.75 | [0.40 ; 1.42] | 1.23 | [0.70 ; 2.19] | 1.29 | [0.80 ; 2.07] |
| Italy | 1.19 | [0.95 ; 1.50] | 2.18 | [1.56 ; 3.05] | 2.73 | [1.76 ; 4.24] | 1.53 | [0.85 ; 2.77] | 2.19 | [1.44 ; 3.32] |
| Lithuania | 0.87 | [0.73 ; 1.04] | 0.74 | [0.55 ; 1.01] | 0.71 | [0.46 ; 1.11] | 0.83 | [0.53 ; 1.30] | 0.62 | [0.40 ; 0.95] |
| Netherlands | 0.99 | [0.80 ; 1.23] | 1.45 | [1.03 ; 2.05] | 1.41 | [0.86 ; 2.31] | 1.69 | [1.00 ; 2.85] | 1.34 | [0.85 ; 2.10] |
| Romania | 0.84 | [0.70 ; 1.01] | 0.66 | [0.48 ; 0.91] | 0.65 | [0.41 ; 1.02] | 1.02 | [0.67 ; 1.55] | 0.65 | [0.42 ; 0.99] |
| Turkey | 1.08 | [0.84 ; 1.39] | 0.38 | [0.22 ; 0.66] | 0.42 | [0.20 ; 0.90] | 0.26 | [0.10 ; 0.65] | 0.40 | [0.20 ; 0.83] |

Bold represents statistically significant odds ratios at $p < 0.05$.

* Adjusted odds ratios (AOR) are adjusted for all variables present in the table.

Table 4. Adjusted odd ratios associated with presenting internalizing disorders

| | Any internalizing disorder | | Phobia | | Generalized anxiety disorder | | Separation anxiety disorder | | Depression | |
|--|----------------------------|----------------------|-------------|----------------------|------------------------------|----------------------|-----------------------------|----------------------|-------------|----------------------|
| | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI | AOR* | 95% CI |
| Socio-demographic factors | | | | | | | | | | |
| Child's gender | | | | | | | | | | |
| Girl | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Boy | 0.55 | [0.46 ; 0.65] | 0.39 | [0.29 ; 0.53] | 0.56 | [0.41 ; 0.77] | 0.63 | [0.51 ; 0.77] | 0.80 | [0.56 ; 1.14] |
| Bullying status | | | | | | | | | | |
| Not involved | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Bully | 1.46 | [1.13 ; 1.87] | 1.22 | [0.81 ; 1.85] | 1.50 | [0.93 ; 2.42] | 1.44 | [1.07 ; 1.93] | 1.03 | [0.58 ; 1.82] |
| Victim | 1.36 | [1.08 ; 1.70] | 1.19 | [0.83 ; 1.71] | 1.63 | [1.07 ; 2.48] | 1.26 | [0.96 ; 1.65] | 1.36 | [0.85 ; 2.17] |
| Bully-victim | 1.96 | [1.55 ; 2.47] | 1.48 | [1.01 ; 2.19] | 2.54 | [1.67 ; 3.87] | 1.88 | [1.43 ; 2.47] | 2.52 | [1.61 ; 3.93] |
| Mother's highest level of education | | | | | | | | | | |
| Some college or more | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Graduated high school | 1.00 | [0.82 ; 1.21] | 1.10 | [0.79 ; 1.52] | 1.16 | [0.81 ; 1.65] | 0.99 | [0.79 ; 1.24] | 1.10 | [0.75 ; 1.63] |
| High school or less | 1.39 | [1.05 ; 1.85] | 2.41 | [1.58 ; 3.67] | 1.77 | [1.06 ; 2.97] | 1.28 | [0.91 ; 1.80] | 1.14 | [0.64 ; 2.02] |
| Mother's age | | | | | | | | | | |
| > 40 | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| > 35 - ≤ 40 | 1.14 | [0.90 ; 1.45] | 1.09 | [0.74 ; 1.62] | 1.15 | [0.73 ; 1.79] | 0.99 | [0.75 ; 1.32] | 1.10 | [0.68 ; 1.78] |
| ≤ 35 | 1.32 | [1.05 ; 1.67] | 1.03 | [0.71 ; 1.51] | 1.36 | [0.88 ; 2.10] | 1.28 | [0.98 ; 1.69] | 0.91 | [0.57 ; 1.45] |
| Mother's marital status | | | | | | | | | | |
| Couple | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |

| | | | | | | | | | | |
|--|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|
| Single | 1.24 | [0.99 ; 1.55] | 1.23 | [0.85 ; 1.76] | 1.00 | [0.66 ; 1.51] | 1.26 | [0.97 ; 1.63] | 1.33 | [0.87 ; 2.02] |
| Mother's employment status | | | | | | | | | | |
| Active | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Inactive | 1.01 | [0.83 ; 1.23] | 1.01 | [0.74 ; 1.39] | 0.91 | [0.63 ; 1.31] | 1.06 | [0.84 ; 1.34] | 1.12 | [0.75 ; 1.66] |
| Number of children in the household | | | | | | | | | | |
| 1 | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| 2-3 | 1.01 | [0.82 ; 1.24] | 0.96 | [0.69 ; 1.34] | 1.08 | [0.73 ; 1.59] | 1.01 | [0.80 ; 1.29] | 0.99 | [0.65 ; 1.51] |
| 4 or more | 1.18 | [0.88 ; 1.59] | 0.97 | [0.61 ; 1.56] | 1.33 | [0.78 ; 2.27] | 0.98 | [0.69 ; 1.41] | 1.01 | [0.56 ; 1.81] |
| Maternal psychological distress | | | | | | | | | | |
| Absence | Ref. | | Ref. | | Ref. | | Ref. | | Ref. | |
| Presence | 1.02 | [0.83 ; 1.27] | 1.15 | [0.83 ; 1.61] | 1.31 | [0.91 ; 1.90] | 0.94 | [0.72 ; 1.21] | 1.33 | [0.90 ; 1.98] |
| Country | | | | | | | | | | |
| Bulgaria | 1.35 | [1.12 ; 1.61] | 1.21 | [0.88 ; 1.67] | 1.53 | [1.12 ; 2.09] | 1.43 | [1.16 ; 1.77] | 2.24 | [1.57 ; 3.19] |
| Germany | 0.74 | [0.56 ; 0.99] | 0.43 | [0.22 ; 0.83] | 1.43 | [0.93 ; 2.22] | 0.79 | [0.56 ; 1.11] | 0.80 | [0.42 ; 1.52] |
| Italy | 0.97 | [0.75 ; 1.26] | 0.93 | [0.59 ; 1.48] | 1.36 | [0.86 ; 2.16] | 0.98 | [0.72 ; 1.33] | 0.75 | [0.39 ; 1.43] |
| Lithuania | 0.93 | [0.77 ; 1.12] | 1.03 | [0.74 ; 1.44] | 0.95 | [0.67 ; 1.35] | 0.85 | [0.67 ; 1.07] | 1.47 | [1.00 ; 2.15] |
| Netherlands | 0.87 | [0.68 ; 1.11] | 0.74 | [0.46 ; 1.17] | 0.83 | [0.51 ; 1.36] | 1.00 | [0.75 ; 1.32] | 0.36 | [0.16 ; 0.80] |
| Romania | 0.98 | [0.81 ; 1.19] | 1.53 | [1.14 ; 2.06] | 0.42 | [0.27 ; 0.66] | 1.09 | [0.87 ; 1.35] | 0.67 | [0.41 ; 1.08] |
| Turkey | 1.31 | [1.01 ; 1.69] | 1.78 | [1.21 ; 2.61] | 1.01 | [0.62 ; 1.65] | 0.99 | [0.72 ; 1.37] | 2.10 | [1.28 ; 3.44] |

Bold represents statistically significant odds ratios at $p < 0.05$.

* Adjusted odds ratios (AOR) are adjusted for all variables present in the table.