

# Perceived School Safety is Strongly Associated with Adolescent Mental Health Problems

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**Abstract** School environment is an important determinant of psychosocial function and may also be related to mental health. We therefore investigated whether perceived school safety, a simple measure of this environment, is related to mental health problems. In a population-based sample of 11,130 secondary school students, we analysed the relationship of perceived school safety with mental health problems using multiple logistic regression analyses to adjust for potential confounders. Mental health problems were defined using the clinical cut-off of the self-reported Strengths and Difficulties Questionnaire. School safety showed an exposure–response relationship with mental health problems after adjustment for confounders. Odds ratios increased from 2.48 (“sometimes unsafe”) to 8.05 (“very often unsafe”). The association was strongest in

girls and young and middle-aged adolescents. Irrespective of the causal background of this association, school safety deserves attention either as a risk factor or as an indicator of mental health problems.

**Keywords** School safety · Adolescence · Mental health · SDQ · Prevention

## Introduction

Almost a quarter of Dutch adolescents, approximately 22 %, suffer from a mental illness (Verhulst et al. 1997) and many more have subclinical mental health problems (Gotlib et al. 1995; Johnson et al. 1992). Mental health problems are strongly associated with psychiatric disorders (Burke et al. 1990; Dishion and Andrews 1995), interfere with adolescents’ social life and school functioning (Gotlib et al. 1995; Last et al. 1997; Lewinsohn et al. 2000; Nolen-Hoeksema et al. 1992), and compromise functioning during adulthood (Harrington et al. 1990).

Several school-related factors are associated with mental health problems, such as being victimized as well as bullying behaviour (Janosz et al. 2008; Kaltiala-Heino et al. 2000; Rigby 2000; Woods et al. 2009), school absence (Brook and Heim 1993), truancy (Steinhausen et al. 2008), witnessing school violence (Janosz et al. 2008; O’Keefe 1997), and a low educational attainment level (DeSocio and Hootman 2004; Milam et al. 2010). Recent studies suggest that an unsafe feeling at school may be an important determinant of mental health problems. It is a relevant theme, because adolescents spend a large proportion of their daytime in school and a substantial number of adolescents feel unsafe (Mijanovich and Weitzman 2003; National Center for Education Statistics 1997a). Perceived

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school safety is frequently investigated, mostly in relation to witnessing violence at school (Boxer et al. 2003; Janosz et al. 2008), bullying behaviour (Felix et al. 2009; Glew et al. 2005, 2008), and projects to increase safety in school (Derzon et al. 2011; Patton et al. 2000). Longitudinal studies (National Center for Education Statistics 1997b) indicate that adolescents who feel safer at school have better psychological outcomes like self-concept and locus of control. Koglin and Petermann (2008) showed that low school safety goes along with more internalizing (Janosz et al. 2008; Steinhausen et al. 2008) and externalizing behaviour problems and should be considered a risk factor for deliberate self-harm in young people (Landstedt and Gillander Gadin 2011). Conversely, Ozer and Weinstein (2004) showed that perceived school safety was protective for depressive symptoms. Furthermore, positive school experiences and perceived neighbourhood safety are associated with fewer mental health problems (Garmezy 1991; Meltzer et al. 2007).

Considering the broad range of other risk factors that are associated with mental health problems it is of interest to investigate whether subjectively perceived school safety is independently associated with psychosocial functioning. If school safety is associated with adolescents' psychosocial functioning independent from other risk factors, this may be relevant for detection and prevention of mental health problems in school students. The aim of this study is therefore to investigate the relationship between adolescents' perceived school safety and mental health problems while accounting for an elaborate set of general as well as school-related risk factors.

## Methods

### Sample

In this cross-sectional population-based study of Dutch adolescents attending secondary schools in the Utrecht province, The Netherlands, an unselected sample of 11,130 adolescents between 11 and 19 years of age was included by the Community Health Service Midden-Nederland (GGD Midden-Nederland). In the Netherlands, children make the transition from primary to secondary school at around 12 years of age. Secondary school is compulsory until the age of 16 and comprises different educational attainment levels: pre-vocational secondary education and pre-vocational secondary education with extra support prepares pupils in 4 years for secondary vocational education, general secondary education or high-school prepares students in 5 years for higher professional education, and pre-university education prepares in 6 years for university (Kuhry et al. 2004).

The survey took place during fall 2007 in a region with both urban and rural areas; about 34 % of the study population lived in an urban area. The study population was representative for youth in the Netherlands with respect to age, gender, urbanicity and educational attainment levels.

Participation was determined at school level: forty-five schools (71 % of the total number of schools invited) participated and at student level: 84 % of all students on the participating schools filled in the questionnaire. Most important reasons for schools not to participate were lack of time, change in management, or participation in other research projects. Reasons of nonparticipation among students were school absence due to illness, visit of doctor or dentist or due to truancy, rejection by the adolescent or lack of permission by the parents. Rejection and lack of permission accounted for less than 1 % of the school students. All students were asked to complete an anonymous digital questionnaire in the classroom. Data were collected on psychosocial functioning, lifestyle and social environment including perceived school safety. Communication with parents and students was performed by a contact person at school. Students were provided with contact information of the Youth Health Care and during filling in the questionnaire, students could note their name and contact information on the questionnaire in case they felt the need to talk to someone following the survey. A nurse of the Community Health Service contacted these adolescents.

Institutional Review Board approval was not required for this study under Dutch law since it was an anonymous questionnaire obtained for public health purposes.

### Measures

#### *Mental Health Problems*

Mental health problems were defined by a score in the clinical range of the Strengths and Difficulties Questionnaire (SDQ), self-reported by the adolescents (Goodman et al. 1998). The SDQ is a validated brief screening questionnaire for psychosocial functioning and consists of 25 items on psychological attributes. Each item is scored on a 3-point scale with "not true", "somewhat true", and "certainly true". These 25 items are divided in 5 subscales with each 5 items: emotional symptoms, conduct problems, hyperactivity/inattention, peer problems, and prosocial behaviour. All items added, except the items about prosocial behaviour, generate a total difficulties score, with a range of 0–40. The SDQ total difficulties score can be divided in a normal (0–15), borderline (16–19) and abnormal (clinical) score (20–40) (Goodman et al. 1998).

The Dutch translation of the self-reported SDQ is validated (Muris et al. 2003; van Widenfelt et al. 2003). The internal consistencies of the total difficulties score (Cronbach's

$\alpha = 0.70\text{--}0.78$ ) and separate subscales were found to be reasonable (emotional symptoms scale:  $\alpha = 0.63\text{--}0.71$ ; hyperactivity-inattention:  $\alpha = 0.63\text{--}0.72$ ; prosocial behaviour:  $\alpha = 0.60\text{--}0.68$ ), although the internal consistencies of the conduct ( $\alpha = 0.45\text{--}0.66$ ) and peer problems scale ( $\alpha = 0.39\text{--}0.54$ ) were notably lower (Muris et al. 2003; van Widenfelt et al. 2003).

#### *Perceived Safety at Secondary School*

Perceived school safety was measured by a single question: “Do you ever feel unsafe at school?”. The question was scored on a 4-point scale: “never”, “sometimes”, “often” and “very often”. For the analysis, we investigated “very often”, “often” and “sometimes” in comparison to “never”.

The following variables were considered as potential confounders.

#### *Demographic Variables*

Gender (Merikangas et al. 2010; Verhulst et al. 1997), age (Botticello 2009; Kessler et al. 2007; Mooij et al. 2011; Steinhausen et al. 2008), ethnicity (“Dutch”, “Surinamese/Antillean/Aruban”, “Turkish”, “Moroccan”, or “other ethnicity”) (Mooij et al. 2011; Romero et al. 2007; Schwab-Stone et al. 1995), marital status of parents (“living with father and mother/father or mother and partner”, or “other marital status of parents”) and socioeconomic position (Amone-P’Olak et al. 2011; Mijanovich and Weitzman 2003). Socioeconomic position was measured on a 2-point scale: “no, parents never experienced problems with money and/or income” versus “yes, experienced or experiencing right now”.

#### *Social Environment Variables*

Factors related to the social and familial environment are potential confounders because they can influence both the outcome (mental health problems) as well as perceived safety. Factors that could disrupt family stability and (other) major life events that potentially disrupt the perception of safety have been included. Death of a beloved, long lasting disease or hospitalization of the child or a close family member, divorce of parents (Nair and Murray 2005; Waters 1995), (physical) violence between parents (Martin 2002), parental alcohol or drug addiction, familiar presence of mental illness (Ireland and Pakenham 2010), and sexual abuse and molestation of the child (Mooij et al. 2011) were therefore included in the analysis. All these social environment-related factors were separately scored on a 2-point scale: “no, never experienced” or “yes, experienced or experiencing right now”. Since cannabis use during adolescence is associated with an elevated risk for mental

health problems (e.g. (Galaif et al. 2007; Hall 2006; Rubino et al. 2011; Schubart et al. 2010), also cannabis use of the participants was investigated, using a 2-point scale: “yes, used in the last 4 weeks” or “no, not used in the last 4 weeks”.

#### *School Variables*

School-related factors may also confound the relationship between perceived school safety and psychosocial functioning. An important potential confounder is school victimization (Felix et al. 2009; Kaltiala-Heino et al. 2000). Victimization was measured by “victimized at school in the last 3 months” and scored on a 5-point scale: “never”, “less than 2 times a month”, “2 or 3 times a month”, “on average 1 time a week” or “more times a week”. For analysis we used a dichotomised scale “yes” or “no”. Besides victimization, we investigated: bullying others at school in the last 3 months (Glew et al. 2005, 2008; van der Wal et al. 2003), frequent absence due to illness more than 5 days in the last 4 weeks (Brook and Heim 1993; Centers for Disease Control and Prevention (CDC) 2004) and truancy in the last 4 weeks (Centers for Disease Control and Prevention (CDC) 2004; Janosz et al. 2008; Steinhausen et al. 2008), all analysed on a dichotomous scale: “yes” or “no”. Educational attainment level (DeSocio and Hootman 2004; Mijanovich and Weitzman 2003; Milam et al. 2010; Mooij et al. 2011) was measured by “high” (education preparing for higher professional education and university) or “low level” (education preparing for secondary vocational education); both groups were of approximately the same size.

#### *Data Analysis*

##### *Missing Data*

The SDQ was complete for 11,291 adolescents (247 incomplete cases (2.1 %) were excluded). There were no missing data for other variables, except for victimization, bullying and perceived school safety (1 missing) and for educational attainment level [149 missing (1.3 %)]. Because of the relatively small amount of missing data, and because statistical analysis for missing data patterns did not reveal a significant pattern, listwise exclusion of missing cases was considered acceptable. After exclusion of students aged 10 years or younger and subjects over 20 years of age, we analysed data on 11,130 participants.

##### *Statistical Analysis*

Comparison of general characteristics between the normal/borderline SDQ outcome group and the clinical SDQ

outcome group was performed for significant differences using the nonparametric Mann–Whitney U-test.

Bivariate non-parametric correlations between independent variables were performed to investigate potential multicollinearity (Kendall's  $\tau > 0.8$ ) (Vittinghoff et al. 2005). Subsequently, we performed a set of logistic regression analyses yielding odds ratios (OR) with 95 % confidence intervals (95 % CI). School safety was entered in the model using three dummy variables with the group of “no unsafety” as reference. First, we quantified the crude, i.e. unadjusted univariate, association between school safety and psychosocial dysfunctioning. As a second step, we studied the univariate associations of potential confounders with the outcome variable. Thirdly, we conducted multivariable regression analyses. In these analyses, only those potential confounders that were univariably associated with psychosocial functioning at a significance level of 0.1, and changed the OR for a measure of school safety by more than 10 % when entered as an independent variable, were considered potential confounders and were included in final models (Greenland 1989). We presented three models. Firstly we showed the unadjusted association of school safety with mental health problems. Secondly a model adjusted for school-related confounders only is presented. In the final model, we adjusted for both school- and social environment-related confounders. Proportion of variance explained by the 3 different models were measured with Nagelkerke  $R^2$ . Additionally we analysed the subscales of SDQ, dichotomized in normal/borderline and clinical scores (Goodman et al. 1998).

To obtain insight in gender and age related differences we subsequently performed exploratory analyses stratified for gender and age. For this purpose age was subdivided in three age categories: 11–13, 14–15, and 16 years and older. Differences in associations between strata were not tested for statistical significance.

To investigate whether perceived school safety is a useful detection method for mental health problems, we calculated the positive and negative predictive value and the sensitivity and specificity.

All statistical analyses were carried out using SPSS 18.0 for Windows. Except for selection of confounders, the significance level was set at 0.05, two-sided.

## Results

The sample comprised 5,549 (49.9 %) girls and 5,581 (50.1 %) boys. Mean age was 14.15 years (SD 1.56, range 11–19 years). Gender, age and ethnicity were equally distributed among participants with and without mental health problems. However all risk factors were more prevalent among participants with mental health problems. Few

adolescents with a normal/borderline SDQ outcome felt (very) often unsafe at school (0.8–0.9 %), whereas this percentage increased seven to tenfold for adolescents with a clinical SDQ outcome (6.7–8.0 %). Victimization, in comparison, was increased 2.7-fold in adolescents with a clinical SDQ outcome compared to adolescents with a normal or borderline SDQ outcome (44.9 vs. 16.7 %).

All bivariate correlations between the potential confounders were below 0.8 (Kendall's  $\tau$ ). Univariate analyses showed that the potential confounders: gender, age and ethnicity were not significantly associated with psychosocial functioning. Those variables were therefore not included in the primary multivariate analysis. Stratified analysis for age and gender were conducted to obtain insight in potential differences in these groups.

The association of mental health problems with school safety was adjusted for different sets of confounders. Univariate analysis of the association between psychosocial functioning and school safety (model 1) showed a steeply increasing OR for subsequent levels of unsafety from 3.5 for “sometimes unsafe” to 12.74 (95 % CI 8.40–19.33,  $p < .001$ ) for “often unsafe” to up to more than 17 for “very often unsafe”. Seven variables yielded a more than 10 % change of the unadjusted OR of school safety and were included as possible confounders in the full model. Especially school victimization (being victimized) had substantial influence on model parameters. The other potential confounders were: bullying others at school, low educational attainment level, frequent absence due to illness, molestation by parents, molestation by other adults, and adolescent cannabis use. The relationship between school safety and psychosocial functioning weakened when adjusted for school-related confounders (model 2), but was still strong for each level of unsafety and showed the same incremental effect (“often unsafe”: OR = 6.95, 95 % CI 4.45–10.86,  $p < .001$ ) (data for “sometimes” and “very often unsafe” not shown). The relationship between school safety and psychosocial functioning further attenuated slightly after additional adjustment for social environment-related confounding factors (model 3. The OR for “sometimes unsafe” in this full model was 2.48 (95 % CI 2.00–3.08,  $p < .001$ ), for “often unsafe” 6.40 (95 % CI 4.04–10.12,  $p < .001$ ), and for “very often unsafe” 8.05 (95 % CI 5.07–12.78,  $p < .001$ ). The ORs for the confounding factors were clearly smaller in the full model than the ORs for school safety and ranged between 1.60 (95 % CI 1.06–2.44,  $p < .05$ ) for molestation by other adults and 3.48 (95 % CI 2.65–4.57,  $p < .001$ ) for cannabis use. The OR for school victimization was 2.27 (95 % CI 1.83–2.80,  $p < .001$ ). The proportion of variance explained ( $R^2$ ) is 0.093 for the unadjusted association between school safety and psychosocial functioning (model 1), 0.144 for model 2 and 0.173 for model 3.

As a posthoc analysis we investigated how school safety is related to the different subscales of the SDQ, after adjusting for confounders according to model 3. School safety was strongly associated with three SDQ subscales (results for “often unsafe”; emotional symptoms scale: OR = 5.74, 95 % CI 3.58–9.21,  $p < .001$ ; peer problems scale: OR = 5.23, 95 % CI 2.95–9.29,  $p < .001$ ; conduct problems scale: OR = 2.84, 95 % CI 1.73–4.65,  $p < .001$ ). School safety however was not associated with the hyperactivity/inattention subscale. The association between school safety and prosocial behaviour differed by frequency of perceived unsafety. Adolescents feeling “sometimes unsafe” showed more prosocial behaviour (OR = 1.25, 95 % CI 1.06–1.48,  $p < .01$ ). There was no significant association for “often unsafe”, but adolescents feeling “very often unsafe” showed less prosocial behaviour (OR = 0.51, 95 % CI 0.33–0.80,  $p < .01$ ).

Stratification for age and gender showed that the relationship between psychosocial functioning and school safety is stronger for girls than for boys for all levels of unsafety (respectively: “often unsafe”: OR = 8.92, 95 % CI 4.66–17.11,  $p < .001$ ; OR = 4.92, 95 % CI 2.58–9.40,  $p < .001$ ) (data for “sometimes” and “very often unsafe” not shown). When stratified by age, the results indicated that the relationship is strongest for early adolescents of 11–13 years of age (“often unsafe”: OR = 14.34, 95 % CI 7.46–27.56,  $p < .001$ ), less strong for middle-aged adolescents of 14–15 years (“often unsafe”: OR = 5.07, 95 % CI 2.34–10.96,  $p < .001$ ), and weakest for older adolescents of 16 years of age and older (“often unsafe”: OR = 1.02, 95 % CI 0.21–5.02, not significant) (data for “sometimes” and “very often unsafe” not shown).

Sensitivity of the perceived school safety measure for detection of a clinical score on the SDQ was 15 % for (very) often unsafe versus sometimes and never unsafe, whereas specificity was 98 %. The negative predictive value of sometimes or never unsafe was 96 %, while the positive predictive value for (very) often unsafe at school was 29 %.

## Discussion

In this large cross-sectional sample we found that perceived school safety is strongly and independently associated with self-reported mental health problems in adolescents attending secondary school. This association showed an exposure–response effect: adolescents with more frequent perceived school unsafety also suffered mental health problems more often. Frequent perceived school unsafety as measured with a single simple question was by far the strongest independent indicator for mental health problems compared to other risk factors in our data.

Low perceived school safety was highly prevalent in our study; 22.6 % of the adolescents felt unsafe at school to some extent and 2.3 % felt often to very often unsafe. Other studies reported a 10 % prevalence of adolescents feeling unsafe at school (National Center for Education Statistics 1997a) or prevalences of 10–20 % in adolescents of economical distressed cities, depending on age category (Mijanovich and Weitzman 2003). It is difficult to compare the prevalence rates of these studies with our study, because perceived school safety has been measured in different manners. Nonetheless it is evident that the number of students feeling unsafe at school is substantial. Prevalence rates of other school-related factors we investigated in this study were in a similar range as previously reported by others. Eighteen percent (18 %) of the adolescents reported school victimization which is similar to previous studies [8.5–18.1 % (Forero et al. 1999); 10 % (Ivarsson et al. 2005); 10.9–34.1 % (Rigby 2000); 20–22 % (Woods et al. 2009)], and 27.5 % reported bullying which is also in accordance with previous studies [17.2–34 % (Forero et al. 1999); 18 % (Ivarsson et al. 2005)].

Stratified analyses demonstrated that the relationship between school safety and mental health problems is most pronounced in girls and for young and middle-aged adolescents. In general, boys tend to suffer more often externalizing mental health problems (Angold and Rutter 1992) while girls are more at risk for internalizing problems (Lewinsohn et al. 1993). Since school safety is strongly associated with the peer problems (OR 5.23) and emotional symptoms (OR 5.74) subscales (both internalizing problems) and is weakly associated with the conduct problems scale (OR 2.84) and not associated with the hyperactive/inattention scale (externalizing problems), this may explain some of the gender difference. The dependence of age is in agreement with previous studies which showed that higher age has a positive effect on perceived school safety (Mooij et al. 2011; Steinhausen et al. 2008).

Strengths of the study are the large sample size and adjustment for many potential confounders which contributed to the reliability of the estimate of this association although we can not rule out residual confounding. This study is limited in the respect that it is cross-sectional and we can not infer causality. However the exposure–response relationship between school unsafety and mental health problems is consistent with a causal relationship (Hill 1965). Indeed, prospective studies (Janosz et al. 2008) showed that witnessing school violence was a good predictor of later externalizing problems, suffering school victimization predicted internalizing problems and feelings of insecurity partially explained other problem behaviour, like truancy. As perceived school safety consists of several factors and include fear for victimization and school disorderliness (Mijanovich and Weitzman 2003) the

association we found between school safety and mental health problems may be well causal.

Therefore, it would be worthwhile to investigate whether measures aiming at improving school safety could prevent mental health problems in adolescents. Efforts to establish physical and social environments that prevent violent behaviour, diminish bullying and victimization, and promote actual and perceived safety in schools may be effective. Mijanovich and Weitzman (2003) for instance, found that school disorderliness was the major factor associated with perceived safety at school. Disorderliness may signal a lack of consistent adult concern and oversight to students which can leave them feeling unsafe. To improve a feeling of security, the authors suggest diminishing signs of school disorderliness, like graffiti, smoking, glass cutting and broken lockers. According to Mooij et al. (2011), school safety could be positively influenced by school measures enhancing prosocial behaviour and preventing truancy.

In case the relationship between school safety and psychosocial functioning is non-causal, the association is still relevant as school safety could be part of screening for mental health problems in adolescents. School safety is a strong and simple indicator of subjective mental health problems in adolescents that attend secondary school independent of a range of potential confounders. Although sensitivity of school safety is low, specificity is high. Since school safety was measured by one simple uncontroversial question, it could be used at schools as a starting point for development of better screening in adolescents. In case the safety question is negative [student feels safe (never or sometimes unsafe)], there is a high probability that this specific student has no mental health problems, since the negative predictive value is very high.

Overall perceived school safety is a strong, simple and intuitive risk factor for mental health problems. The large effect size of the association, the ease in which this measure can be obtained and the potential for influencing this risk factor suggests that school safety is useful in efforts to investigate and improve adolescent mental health.

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## References

- Amone-P'Olak, K., Burger, H., Huisman, M., Oldehinkel, A. J., & Ormel, J. (2011). Parental psychopathology and socioeconomic position predict adolescent offspring's mental health independently and do not interact: The TRAILS study. *Journal of Epidemiology and Community Health*, 65(1), 57–63. doi:10.1136/jech.2009.092569.
- Angold, A., & Rutter, M. (1992). The effects of age and pubertal status on depression in a large clinical sample. *Development and Psychopathology*, 4, 5–28.
- Botticello, A. L. (2009). A multilevel analysis of gender differences in psychological distress over time. *Journal of Research on Adolescence*, 19(2), 217–247.
- Boxer, P., Edwards-Leeper, L., Goldstein, S. E., Musher-Eizenman, D., & Dubow, E. F. (2003). Exposure to “low-level” aggression in school: Associations with aggressive behavior, future expectations, and perceived safety. *Violence and Victims*, 18(6), 691–705.
- Brook, U., & Heim, M. (1993). Morbidity and psycho-social reasons for absence among high school students in Holon, Israel. *Journal of Tropical Pediatrics*, 39(3), 188–190.
- Burke, K. C., Burke, J. D., Jr, Regier, D. A., & Rae, D. S. (1990). Age at onset of selected mental disorders in five community populations. *Archives of General Psychiatry*, 47(6), 511–518.
- Centers for Disease Control and Prevention (CDC). (2004). Violence-related behaviors among high school students—United States, 1991–2003. *MMWR. Morbidity and Mortality Weekly Report*, 53(29), 651–655.
- Derzon, J. H., Yu, P., Ellis, B., Xiong, S., Arroyo, C., Hill, G., et al. (2011). A national evaluation of safe Schools/Healthy students: Outcomes and influences. *Evaluation and Program Planning*. doi:10.1016/j.evalprogplan.2011.11.005.
- DeSocio, J., & Hootman, J. (2004). Children's mental health and school success. *The Journal of School Nursing: The Official Publication of the National Association of School Nurses*, 20(4), 189–196.
- Dishion, T. J., & Andrews, D. W. (1995). Preventing escalation in problem behaviors with high-risk young adolescents: Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology*, 63(4), 538–548.
- Felix, E. D., Furlong, M. J., & Austin, G. (2009). A cluster analytic investigation of school violence victimization among diverse students. *Journal of Interpersonal Violence*, 24(10), 1673–1695. doi:10.1177/0886260509331507.
- Forero, R., McLellan, L., Rissel, C., & Bauman, A. (1999). Bullying behaviour and psychosocial health among school students in new south wales, australia: Cross sectional survey. *BMJ (Clinical Research Ed.)*, 319(7206), 344–348.
- Galaif, E. R., Sussman, S., Newcomb, M. D., & Locke, T. F. (2007). Suicidality, depression, and alcohol use among adolescents: A review of empirical findings. *International Journal of Adolescent Medicine and Health*, 19(1), 27–35.
- Garmezy, N. (1991). Resilience in children's adaptation to negative life events and stressed environments. *Pediatric Annals*, 20(9), 459–60, 463–6.
- Glew, G. M., Fan, M. Y., Katon, W., & Rivara, F. P. (2008). Bullying and school safety. *The Journal of Pediatrics*, 152(1), 123–128, 128.e1. doi:10.1016/j.jpeds.2007.05.045.
- Glew, G. M., Fan, M. Y., Katon, W., Rivara, F. P., & Kernic, M. A. (2005). Bullying, psychosocial adjustment, and academic performance in elementary school. *Archives of Pediatrics and Adolescent Medicine*, 159(11), 1026–1031. doi:10.1001/archpedi.159.11.1026.
- Goodman, R., Meltzer, H., & Bailey, V. (1998). The strengths and difficulties questionnaire: A pilot study on the validity of the self-report version. *European Child and Adolescent Psychiatry*, 7(3), 125–130.
- Gotlib, I. H., Lewinsohn, P. M., & Seeley, J. R. (1995). Symptoms versus a diagnosis of depression: Differences in psychosocial functioning. *Journal of Consulting and Clinical Psychology*, 63(1), 90–100.
- Greenland, S. (1989). Modeling and variable selection in epidemiologic analysis. *American Journal of Public Health*, 79(3), 340–349.

- Hall, W. D. (2006). Cannabis use and the mental health of young people. *The Australian and New Zealand Journal of Psychiatry*, 40(2), 105–113. doi:10.1111/j.1440-1614.2006.01756.x.
- Harrington, R., Fudge, H., Rutter, M., Pickles, A., & Hill, J. (1990). Adult outcomes of childhood and adolescent depression. I. psychiatric status. *Archives of General Psychiatry*, 47(5), 465–473.
- Hill, A. B. (1965). The environment and disease: Association or causation? *Proceedings of the Royal Society of Medicine*, 58, 295–300.
- Ireland, M. J., & Pakenham, K. I. (2010). Youth adjustment to parental illness or disability: The role of illness characteristics, caregiving, and attachment. *Psychology, Health & Medicine*, 15(6), 632–645. doi:10.1080/13548506.2010.498891.
- Ivarsson, T., Broberg, A. G., Arvidsson, T., & Gillberg, C. (2005). Bullying in adolescence: Psychiatric problems in victims and bullies as measured by the youth self report (YSR) and the depression self-rating scale (DSRS). *Nordic Journal of Psychiatry*, 59(5), 365–373. doi:10.1080/08039480500227816.
- Janosz, M., Archambault, I., Pagani, L. S., Pascal, S., Morin, A. J., & Bowen, F. (2008). Are there detrimental effects of witnessing school violence in early adolescence? *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 43(6), 600–608. doi:10.1016/j.jadohealth.2008.04.011.
- Johnson, J., Weissman, M. M., & Klerman, G. L. (1992). Service utilization and social morbidity associated with depressive symptoms in the community. *JAMA, the Journal of the American Medical Association*, 267(11), 1478–1483.
- Kaltiala-Heino, R., Rimpela, M., Rantanen, P., & Rimpela, A. (2000). Bullying at school—an indicator of adolescents at risk for mental disorders. *Journal of Adolescence*, 23(6), 661–674. doi:10.1006/jado.2000.0351.
- Kessler, R. C., Angermeyer, M., Anthony, J. C., DE Graaf, R., Demyttenaere, K., Gasquet, I., et al. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the world health organization's world mental health survey initiative. *World Psychiatry: Official Journal of the World Psychiatric Association* (WPA), 6(3), 168–176.
- Koglin, U., & Petermann, F. (2008). Adolescents' experience of violence. *Zeitschrift Fur Psychiatrie, Psychologie Und Psychotherapie*, 56(2), 133–140.
- Kuhry, B., Herweijer, L., & Heesakker, R. (2004). *Education in social and cultural planning office, public sector performance: An international comparison of education, health care, law and order and public administration* (pp. 74–119). The Hague: Social and Cultural Planning Office.
- Landstedt, E., & Gillander Gadin, K. (2011). Deliberate self-harm and associated factors in 17-year-old swedish students. *Scandinavian Journal of Public Health*, 39(1), 17–25. doi:10.1177/1403494810382941.
- Last, C. G., Hansen, C., & Franco, N. (1997). Anxious children in adulthood: A prospective study of adjustment. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(5), 645–652. doi:10.1097/00004583-199705000-00015.
- Lewinsohn, P. M., Hops, H., Roberts, R. E., Seeley, J. R., & Andrews, J. A. (1993). Adolescent psychopathology: I. prevalence and incidence of depression and other DSM-III-R disorders in high school students. *Journal of Abnormal Psychology*, 102(1), 133–144.
- Lewinsohn, P. M., Striegel-Moore, R. H., & Seeley, J. R. (2000). Epidemiology and natural course of eating disorders in young women from adolescence to young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39(10), 1284–1292. doi:10.1097/00004583-200010000-00016.
- Martin, S. G. (2002). Children exposed to domestic violence: Psychological considerations for health care practitioners. *Holistic Nursing Practice*, 16(3), 7–15.
- Meltzer, H., Vostanis, P., Goodman, R., & Ford, T. (2007). Children's perceptions of neighbourhood trustworthiness and safety and their mental health. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 48(12), 1208–1213. doi:10.1111/j.1469-7610.2007.01800.x.
- Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., et al. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication—adolescent supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*, 49(10), 980–989. doi:10.1016/j.jaac.2010.05.017.
- Mijanovich, T., & Weitzman, B. C. (2003). Which “broken windows” matter? School, neighborhood, and family characteristics associated with youths' feelings of unsafety. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 80(3), 400–415. doi:10.1093/jurban/jtg045.
- Milam, J., Furr-Holden, C. D. M., & Leaf, P. J. (2010). Perceived school and neighborhood safety, neighborhood violence and academic achievement in urban school children. *The Urban Review*, 42(5), 458–467. doi:10.1007/s11256-010-0165-7.
- Mooij, T., Smeets, E., & de Wit, W. (2011). Multi-level aspects of social cohesion of secondary schools and pupils' feelings of safety. *The British Journal of Educational Psychology*, 81(Pt 3), 369–390. doi:10.1348/000709910X526614.
- Muris, P., Meesters, C., & van den Berg, F. (2003). The strengths and difficulties questionnaire (SDQ)—further evidence for its reliability and validity in a community sample of dutch children and adolescents. *European Child and Adolescent Psychiatry*, 12(1), 1–8. doi:10.1007/s00787-003-0298-2.
- Nair, H., & Murray, A. D. (2005). Predictors of attachment security in preschool children from intact and divorced families. *The Journal of Genetic Psychology*, 166(3), 245–263. doi:10.3200/GNTP.166.3.245-263.
- National Center for Education Statistics. (1997a). *Digest of education statistics* (No. NCES 97-015). Washington, DC: US. Department of Education.
- National Center for Education Statistics. (1997b). *NELS: 88 survey item report* (No. NCES 97-052). Washington, DC: US. Department of Education.
- Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. (1992). Predictors and consequences of childhood depressive symptoms: A 5-year longitudinal study. *Journal of Abnormal Psychology*, 101(3), 405–422.
- O'Keefe, M. (1997). Adolescents' exposure to community and school violence: Prevalence and behavioral correlates. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 20(5), 368–376. doi:10.1016/S1054-139X(97)80131-0.
- Ozer, E. J., & Weinstein, R. S. (2004). Urban adolescents' exposure to community violence: The role of support, school safety, and social constraints in a school-based sample of boys and girls. *Journal of Clinical Child and Adolescent Psychology: The Official Journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, 33(3), 463–476. doi:10.1207/s15374424jccp3303\_4.
- Patton, G. C., Glover, S., Bond, L., Butler, H., Godfrey, C., Di Pietro, G., et al. (2000). The gatehouse project: A systematic approach to mental health promotion in secondary schools. *The Australian and New Zealand Journal of Psychiatry*, 34(4), 586–593.
- Rigby, K. (2000). Effects of peer victimization in schools and perceived social support on adolescent well-being. *Journal of Adolescence*, 23(1), 57–68. doi:10.1006/jado.1999.0289.
- Romero, A. J., Martinez, D., & Carvajal, S. C. (2007). Bicultural stress and adolescent risk behaviors in a community sample of latinos and non-latino european americans. *Ethnicity & Health*, 12(5), 443–463. doi:10.1080/13557850701616854.

- Rubino, T., Zamberletti, E., & Parolaro, D. (2011). Adolescent exposure to cannabis as a risk factor for psychiatric disorders. *Journal of Psychopharmacology (Oxford, England)*. doi:[10.1177/0269881111405362](https://doi.org/10.1177/0269881111405362).
- Schubart, C. D., van Gastel, W. A., Breetvelt, E. J., Beetz, S. L., Ophoff, R. A., Sommer, I. E., et al. (2010). Cannabis use at a young age is associated with psychotic experiences. *Psychological Medicine*, 1–10. doi:[10.1017/S003329171000187X](https://doi.org/10.1017/S003329171000187X).
- Schwab-Stone, M. E., Ayers, T. S., Kasrow, W., Voyce, C., Barone, C., Shriver, T., et al. (1995). No safe haven: A study of violence exposure in an urban community. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34(10), 1343–1352. doi:[10.1097/00004583-199510000-00020](https://doi.org/10.1097/00004583-199510000-00020).
- Steinhausen, H. C., Muller, N., & Metzke, C. W. (2008). Frequency, stability and differentiation of self-reported school fear and truancy in a community sample. *Child and Adolescent Psychiatry and Mental Health*, 2(1), 17. doi:[10.1186/1753-2000-2-17](https://doi.org/10.1186/1753-2000-2-17).
- van der Wal, M. F., de Wit, C. A., & Hirasing, R. A. (2003). Psychosocial health among young victims and offenders of direct and indirect bullying. *Pediatrics*, 111(6 Pt 1), 1312–1317.
- van Widenfelt, B. M., Goedhart, A. W., Treffers, P. D., & Goodman, R. (2003). Dutch version of the strengths and difficulties questionnaire (SDQ). *European Child and Adolescent Psychiatry*, 12(6), 281–289. doi:[10.1007/s00787-003-0341-3](https://doi.org/10.1007/s00787-003-0341-3).
- Verhulst, F. C., van der Ende, J., Ferdinand, R. F., & Kasius, M. C. (1997). The prevalence of DSM-III-R diagnoses in a national sample of dutch adolescents. *Archives of General Psychiatry*, 54(4), 329–336.
- Vittinghoff, E., Glidden, D., Shiboski, S., & McCulloch, C. E. (2005). *Regression methods in biostatistics: Linear, logistic, survival, and repeated measures models (statistics for biology and health)*. New York: Springer.
- Waters, E. (1995). The attachment q-set (version 3). In E. Waters, B. Vaughn, G. Posada & K. Kondo-Ikemura (Eds.), *Caregiving, cultural and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research. Monographs of the Society for Research in Child Development*, 60(2–3, Serial No. 244), 234–246.
- Woods, S., Done, J., & Kalsi, H. (2009). Peer victimisation and internalising difficulties: The moderating role of friendship quality. *Journal of Adolescence*, 32(2), 293–308. doi:[10.1016/j.adolescence.2008.03.005](https://doi.org/10.1016/j.adolescence.2008.03.005).



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