

Is bullying equally harmful for rich and poor children?: a study of bullying and depression from age 15 to 27*

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Background: Exposure to bullying in childhood and adolescence is harmful to health, well-being and social competence of the victim. However, little is known about the long-term consequences of bullying victimization. In this paper, we use a longitudinal study from age 15 to 27 to examine whether childhood socioeconomic position (CSP) modifies the association between exposure to bullying in childhood and symptoms of depression in young adulthood. **Methods:** Nationally representative baseline sample in 1990 ($n = 847$), followed up 2002 ($n = 614$). We used multivariate analyses of variance to examine the influence of bullying on symptoms of depression at age 27. **Results:** Analyses showed that exposure to bullying, low CSP and female gender significantly increased the risk of depression in young adulthood. There was a statistically significant interaction between bullying and CSP, so that bullying increased the risk of depression for people from low CSP, while there was only a weak association between bullying victimization and depressive symptoms for people from more affluent childhood socioeconomic backgrounds. The same pattern was found for analyses stratified by sex. **Conclusion:** Our study suggests that the effects of bullying may have more serious long-term implications on health for children from less affluent backgrounds. Our study points at bullying exposure as another pathway through which social adversity in childhood influences social inequalities in adult health. Political efforts are needed to improve norms and legislations about how to treat children and more specific interventions should take place in schools to reduce the exposure to bullying.

Keywords: bullying, childhood socioeconomic factors, depressive symptoms, longitudinal study.

Introduction

Depression is a serious and prevalent disease with profound social and personal consequences for the patient as well as her/his social relations. Lopez and Mathers used DALY measures to estimate depression, the fourth leading contributor to the global burden of disease in 2002, and projected that it would rank second by 2030.¹ A large proportion of patients with major depression experience their first incident of depression in adolescence.² Early onset of major depression, including sub-clinical depression, has been reported to increase the risk of major depression in adulthood 2–3-fold, and is associated with more severe and recurrent forms of major depressive disorders.^{2,3}

Risk factors for depression are many including demanding life events and social relational experiences.⁴ Over the past 20 years a large amount of studies have consistently shown that bullying victimization is highly prevalent among children and adolescents world wide, and that exposure to bullying is strongly associated with depressive symptoms in childhood and adolescence.^{5–19} There are a limited number of longitudinal studies which investigate effects of bullying on later depression. In a study sample of same-sex twins from two consecutive birth cohorts followed-up from age 5 to 7, Arseneault and colleagues found that children who were victimized by others showed elevated internalizing problems and were unhappy at school.²⁰ In a study from the

Netherlands, Fekkes and colleagues found that 9–11-year-old children, who were bullied in the beginning of the school year, had a 4-fold increased risk of depression measured by the Short Depression Inventory for Children 10 months later.²¹ Bond *et al.* found that exposure to bullying among 13-year-olds predicted onset of emotional problems a year later.²² However, in a survey of seven and eight graders from two schools in Chorea, Kim *et al.*²³ were not able to find any association between bullying victimization and depression 10 months later. Rigby performed a 2-year follow-up study of students in their first 2 years of high school in Southern Australia and found that victimization at baseline was not predictive of psychiatric health measured by General Health Questionnaire, when baseline health was taken into account. However, students who reported that they were frequently victimized in the early years of high school experienced relatively poor mental and physical health.²⁴

Other studies with a longer follow-up period have consistently found exposure to bullying to increase risk of later depression. Kumpulainen og Räsänen studied bullying at age 8 and 12 as predictor of depression at age 15 in a cohort of children from the Kuopio area in Eastern Finland.¹⁹ They concluded that in particular bully victims at early elementary school age and victims of bullying later in early adolescence were at risk to develop depressive symptoms later in adolescence. Olweus, 1993, found that among 71 Norwegian youth children exposed to bullying at age 11 had higher tendency of depression in young adulthood compared to unexposed.²⁵ The Epidemiological Multicenter Child Psychiatric Study study, based on a nation-wide Finnish population of boys born in 1981, measured bullying activity among the boys when they were 8-years-old and followed up with registry information on ICD-10 diagnosis at three time points between the ages of 18 and 23.²⁶ They found a 2–3-fold risk of having a diagnosis of depression before the age of 23 among men, who had been involved in bullying, compared to men who were not involved in bullying at age 8. Other analyses

* The study complies with the Helsinki declaration on ethics in science and Danish national legislation on medical ethics

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from the study confirm that childhood bullying involvement at age 8 is a risk factor for depression at age 18, when measuring depressive symptoms by use of Beck's Depression Inventory.^{27,28}

Studies using recall measures of bullying have shown the same association between bullying and depression. Roth *et al.* found that university students, who recalled being teased in childhood showed increased risk of both depression and anxiety.²⁹ Further, a recent study by Lund *et al.*³⁰ shows that among men exposure to bullying in adolescence is associated with prevalence of depressive symptoms >20 years after leaving school.

When considering social inequalities in health outcomes in adult life several mechanisms and pathways have been discussed. Depression in adulthood is socially patterned,³¹ and depression has been proven to follow trajectories over the life course, suggesting that early life factors may be of importance.³² However, the mechanisms behind social inequalities in adult depression are still not well described. Diderichsen and colleagues outline possible mechanisms in the creation of health inequalities, including differential exposure: the fact that risk factors for health outcomes are often socially distributed, and leave individuals from poorer backgrounds at higher risk of exposure, and differential vulnerability: indicating that risk factors may influence health outcomes differently comprising higher health impact among socially disadvantaged.³³

There is socially differential exposure to bullying in adolescence. An international study found that exposure to bullying in adolescence is more common among adolescents from families with lower compared to higher socioeconomic position and that this association was robust across more than 30 countries.³⁴

We have not been able to find studies which investigated, whether there is differential social vulnerability for bullying, that is, whether childhood socioeconomic position (CSP) analytically appears to modify the association between exposure to bullying in childhood and symptoms of major depression in early adulthood. This is the purpose of our study using a representative, longitudinal study from age 15 to 27.

Methods

Population

We used data from The Youth Cohort of the Danish Longitudinal Health Behaviour Study (DLHBS).³⁵ The survey includes a nationally representative sample of 15-year-olds randomly chosen from the National Civic Registration System. The baseline survey was conducted in 1990 ($n=847$), first follow-up in 1994 ($n=729$) and second follow-up in 2002 ($n=614$). Data collection was made by anonymous postal questionnaires. The questionnaire included items concerning: (i) demographic factors and social background, (ii) living conditions, (iii) psychosocial factors, (iv) self-reported health and illness and (v) health behaviours.

To fulfil the ethical demands for participation of under-age children the parents received a letter to inform them of the possibility to withdraw their child from the study. A total of 104 parents of the 1100 selected adolescents did not want their child to participate (9%), leaving 996 adolescents eligible to be invited to participate. The baseline response-rate was 85% ($n=847$) and the response-rate for the follow-up in 2002 was 81% ($n=614$). Because of ethical demands we were not permitted to approach the parents again. Therefore, the primary non-respondents were not examined. The loss to follow-up at age 27 was significantly higher among boys than girls ($P<0.0001$), but loss to follow-up was similar for

children from higher and lower socioeconomic position at baseline and similar for children with and without prevalent self-reported depressive symptoms at age 15 (data not shown).

A total of 25 persons (4.1%) with missing information on bullying, depression or parental social class were excluded from the analyses, leaving 589 to be included in the final analyses.

Variables

Depression

We used Beck's Major Depression Inventory (MDI) as a measure of prevalent depression based on 12 items on depressive symptoms with the following response categories: all the time, most of the time, more than half of the time, less than half of the time, rarely and never. The scale counts 0–50 points.³⁶ The MDI scale has been shown to be valid and the cut-point of ≥ 25 reflects the criteria for the diagnosis of depression listed in the ICD-10 and DSM-IV. We used the log of the continuous measure as outcome in the analyses (table 3).³⁶

Bullying

The question on bullying was: Were you bullied at school? With the following five response categories: (i) No, (ii) a little for a short period of time, (iii) a little for a long period of time, (iv) a lot for a short period of time and (v) a lot for a long period of time. The item was divided into 1 vs. 2 vs. 3 + 4 vs. 5. The question was included in the second follow-up and was developed for the present study based on a measure used in the Health Behaviour in School-aged Children Study and the work of Olweus and colleagues.^{5,37} We performed logistic regression analyses of the association between our recall measure of bullying and a wide range of factors (CSP, and 16 variables on self-rated health, life satisfaction, self-esteem and social relations) measured at age 15, that based on the literature, would be expected to correlate with exposure to bullying at age 15. We found the bullying recall measure to be associated with all factors in the expected direction, so that exposure to bullying was associated with more adverse outcomes. However, only seven of the fifteen associations were significant (table 1).

Childhood socioeconomic position

Childhood socioeconomic position was measured by the parents' occupational social class: standard coding of the highest ranking parental occupation and coded into social class I–V in accordance with the standards of the Danish National Institute of Social Research, a coding scheme which is almost similar to the British Registrar General's Classification I–V. We added social class VI representing economically inactive including people on transfer income, sickness benefits and disability pension. We trichotomized the variable CSP into the levels: high (I–II), middle (III–IV) and low (V–VI). Use of other criteria for CSP, like father's social class or mother's social class, did not alter the conclusions of the study. Also, sensitivity analyses demonstrated that our results are robust to changes in the number and definitions of categories for CSP and bullying (data not shown).

Statistical analyses

Statistically we used contingency tables with χ^2 -tests to examine homogeneity among non-respondents and respondents, (data not shown) and sex differences in the variables.

Table 1 Logistic regression analyses of bullying (recall measure at age 27)^a and the association with various factors measured at age 15

Variables expected to be associated with bullying	N (614)	Percentage of population	Association among total population OR (95% CI)
CSP			
High (Social class I–II)	187	31.3	1
Middle (Social class III–IV)	312	52.2	1.08 (0.66–1.77)
Low (Social class V–VI)	99	16.6	2.35 (1.31–4.22)
Health and well-being			
Self-rated health (poor + fair vs. good + excellent)	75	12.2	1.72 (0.98–3.02)
>5 complaints the past 2 weeks (vs. 0–5 complaints)	103	16.8	1.38 (0.82–2.31)
Worried, nervous, anxious (very + somewhat vs. not at all)	120	20.2	1.69 (1.05–2.73)
Sad, depressed, unhappy (very + somewhat vs. not at all)	122	20.4	1.37 (0.83–2.26)
Irascible and aggressive without particular reason (often + sometimes vs. seldom + never)	228	37.6	1.92 (1.27–2.93)
Sad without particular reason (often + sometimes vs. seldom + never)	186	30.9	1.39 (0.88–2.18)
Relations to friends and school			
≤1 day a week spent with friends (vs. ≥2 days)	97	16.0	1.75 (1.06–2.90)
≤2 evenings spent per week with friends (vs. ≥3 evenings)	105	17.3	1.86 (1.14–3.04)
Friends to talk to about problems (0/1 vs. ≥2)	155	25.6	2.37 (1.53–3.68)
Happy with school (never + seldom vs. sometimes + often + always)	73	12.0	1.37 (0.76–2.47)
Conflict with friends (often + sometimes vs. not at all)	328	53.7	1.50 (0.99–2.27)
Lonely (often + sometimes vs. not at all)	131	21.4	2.54 (1.61–3.99)
Not good enough (often + sometimes vs. not at all)	275	45.2	2.23 (1.45–3.41)
Tired of school (often vs. sometimes + not at all)	102	16.7	1.43 (0.86–2.39)
Have considered suicide (seriously considered + tried vs. not at all + some consideration)	17	2.8	1.31 (0.42–4.11)

a: Bullying dichotomized into not bullied + bullied a little a short period of time versus bullied a little a long period of time + bullied a lot a sort period of time + bullied a lot a long period of time

Table 2 Descriptive information on the DLHBS Youth Cohort variables: mean points on Bech's MDI: mean (standard deviation), and distribution of CSP, and exposure to bullying by sex: percentage

	Women (n = 370)	Men (n = 244)	Total (n = 614)
Depressive symptoms at age 27, Mean (SD)	13.86 (6.75)	12.18 (5.84)	13.20 (6.45)
Exposed to bullying, Percentage (n)			
No	53.9 (199)	58.3 (141)	55.7 (340)
A little a short period of time	26.6 (98)	23.6 (57)	25.4 (155)
A lot a short period/a little a long period	11.1 (41)	12.4 (30)	11.6 (71)
A lot a long period of time	8.4 (31)	5.8 (14)	7.4 (45)
CSP, Percentage (n)			
High	30.6 (112)	32.3 (75)	31.3 (187)
Middle	54.1 (198)	49.1 (114)	52.2 (312)
Low	15.3 (56)	18.5 (43)	16.6 (99)

We used multivariate analyses of variance (MANOVA) to examine the influence of bullying on level of symptoms of depression at age 27 (table 3). We transformed the continuous scale of depression to the logarithmic function of the scale in order to satisfy the criteria of normally distributed data. First, we performed univariate analyses of variance of exposure to bullying in childhood, CSP and sex on depressive symptoms at age 27 (data not shown). Then, we modelled the effect of all variables on depressive symptoms at age 27, including the interaction term of exposure to bullying and CSP (table 3). We used proc GLM, SAS 9.1 for all analyses.

Results

Table 2 shows, that generally women scored higher on the depression scale than men (MDI) (mean_{women} = 13.86 (SD 6.75) vs. mean_{men} = 12.18 (SD 5.83), and 8.1% of women and 4.9% of men had symptoms of prevalent depression at age 27, using the recommended cut-point of ≥25 points (36) (data

not shown). Almost half of the population had been exposed to some form of bullying in school (44.3%), one in five had been exposed to bullying either a lot or a little over a longer period of time (19.5% of women and 18.2% of men, $P=0.6817$) and 7.4% had been exposed to bullying a lot over a long period of time (8.4% of women and 5.8% of men, $P=0.2260$). One in six was classified as having low CSP (15.3% of women and 18.5% of men, $P=0.2998$).

Multivariate analyses of variance showed that exposure to bullying, CSP and sex were all significantly associated with symptoms of depression at age 27 ($P_{\text{bullying}}=0.0016$, $P_{\text{CSP}}=0.0345$, $P_{\text{sex}}=0.0023$), and also the interaction term: bullying and socioeconomic position was significantly associated with symptoms of depression ($P_{\text{bullying} \times \text{CSP}}=0.0155$, table 3). The same pattern was found for analyses stratified by sex, but few of the associations were significant at a 95% confidence level, due to the low population size (data not shown).

Discussion

Our study confirms that depression is prevalent in young adulthood, with higher prevalence among women. Almost one in five recalled experience of severe and/or long-term exposure to bullying during school years, and exposure to bullying was associated with depressive symptoms in young adulthood. However, while the association between bullying in childhood and symptoms of depression in young adulthood was strong for women and men from low childhood socioeconomic backgrounds, the effect of exposure to bullying in childhood was weaker for individuals from more affluent backgrounds.

One of the strengths of this study is the national representative random sample of adolescents followed up 12 years later. In comparison with the Schedule for Clinical Assessment in Neuropsychiatry (SCAN), the MDI scale has shown to be a valid measurement of present depression, with acceptable sensitivity and specificity.³⁶ Loss to follow-up was larger among boys than girls but it was independent of

Table 3 Multivariate analyses of variance of the logarithm of Bech's MDI in young adulthood in relation to exposure to bullying in childhood, CSP, sex and the interaction between bullying and CSP: predicted means and 95% *P*-values

Variables	MANOVA f-test P-value	Predicted means log MDI	P-value*
Exposed to bullying	0.0016		
No		2.41	0.0424
A little a short period of time		2.57	0.4377
A lot a short period/a little a long period of time		2.50	0.0052
A lot a long period of time		2.59	Ref.
CSP	0.0345		
High		2.45	0.0372
Middle		2.49	0.0788
Low		2.61	Ref.
Sex	0.0023		
Women		2.57	0.0023
Men		2.47	Ref.
Interaction of CSP and bullying	0.0155		
High social class—not bullied		2.39	<0.0001
Low social class—bullied a lot a long period of time		2.93	Ref.

**P*-value: significance of difference to ref. group

CSP and prevalence of depressive symptoms in childhood. However, there may have been a higher share of participants with low childhood socioeconomic background among the primary non-respondents of our study, as is the case for most longitudinal studies. Our ethical restriction makes it impossible to confirm this point. However, it is unlikely that this would compromise our results to any important extent.

As exposure to bullying at school was not measured at the time of the baseline study, we had to use a recall measure of bullying exposure. Rivers *et al.* have found memory of bullying to be stable over time,³⁸ and a study conducted among 11-, 13- and 15-year-old Danish school children in 1994, showed prevalence of bullying to be very equal to the prevalence levels found by use of the recall measure in this study.¹² In 1994, 49% of the children had not been bullied at all the current school year, 26% had been bullied one or two times, 17% had been bullied sometimes and 7% had been bullied weekly, and 4 years later, in 1998, the prevalence was almost identical.¹² These numbers are very close to the prevalence level found in this study, with a baseline population aged 15 years in 1990. However, the use of a recall measure for bullying exposure is a limitation of our study, and we are in this study, due to the relatively small sample, not able to answer the key question whether people with depression tend to recall bullying more often than people without depression. However, another study using the same recall measure of bullying had information on parental depression, and was unable to find any association between parental depression and recall of bullying.³⁰

To account for the limitation of using a recall measure, we conducted a series of analyses to investigate how the recall measure of bullying was correlated with a wide range of items on social integration, psychosocial well-being and self-esteem measured at age 15. All of these factors were associated with bullying in the expected direction. The associations were especially strong for the measures of social integration, which is supportive of the validity of the bullying recall measure. The associations were the same among children from different childhood socioeconomic backgrounds, so we believe that we have ruled out the possibility that the answer to our recall measure of bullying is socially biased

with a possible higher over-reporting among people from low socioeconomic backgrounds, and we have not been able to find results from the literature supporting an assumption of a social bias.

Since our measure of bullying did not include an indication of timing of the exposure to bullying, we found that it was not appropriate to adjust for depressive moods at age 15 in our regression analyses. Depressive mood at age 15 would, thus, possibly be an intermediate variable, that is, a consequence of the exposure to bullying that most likely would have occurred at a younger age.²⁴

We find that adolescents from families of lower socioeconomic position are not only at higher risk of being exposed to bullying,³⁴ but also that the exposure to bullying seems to have higher impact on their risk of depression later in life. The differential vulnerability to bullying may be partly explained by the social difference in resources available in the lives of the adolescents. For instance, more adolescents from low socioeconomic backgrounds grow up in lone parent families, where other kinds of social problems may make it harder for the adolescent to ask for help and support needed to tackle exposure to bullying.

Furthermore, many types of personal resources are unequally distributed and it is likely to be harder for young people with, for instance, low self-esteem to overcome bullying victimization without severe psychological injuries. The hereditary trait of depression is another factor that may explain part of the strengthened association between bullying and depression among children from more deprived families. As depression is socially patterned among adults,^{4, 31} we would expect that prevalence of depression was higher among the parents from lower socioeconomic positions in our study, which implies that these adolescents are already at increased risk of depression prior to the exposure to bullying. However, a study of the association between exposure to bullying in childhood and depression in middle age among Danish men was able to account for parental depression, and this did not change the association with depression.³⁰ Therefore, we find it unlikely that this should explain all of the modifying effect of CSP on the association between bullying and depression.

Exposure to bullying leaves children at immediate increased risk of depression.⁹⁻¹¹ Research has shown that the first onset of depression is more often preceded by severe life events, creating vulnerability so that recurrent episodes of depression will be provoked by less severe stimuli.³⁹ Furthermore, cortisol levels have shown to be affected by exposure to bullying with a hypo-secretion among girls and a hyper-secretion among boys,⁴⁰ indicating possible long-term risks of psychopathology and ill health.

Bullying is not only socially patterned,³⁴ but this study suggests that it may also have wider long-term mental health consequences for children from poorer social backgrounds, indicating that social relational strain in the form of bullying may be another mechanism behind adult inequalities. Our findings strengthen the arguments for intervention against bullying, and points at low social class children as an especially important target group.

Acknowledgements

We thank administrative officer Birgit Pallesen at University of Copenhagen for language review. We thank The Health Insurance Foundation, Denmark (Helsefonden), the Danish Cancer society (No. 93-504), the Danish Research Council (No. 9600251) and The Nordea Denmark Foundation for their support for our research.

Funding

The Health Insurance Foundation, Denmark (Helsefonden), the Danish Cancer society (No. 93-504), the Danish Research Council (No. 9600251) and The Nordea Denmark Foundation have contributed to this research.

Conflicts of interest: None declared.

Key points

- Major depression is a prevalent disease in young adulthood and early onset of major depression has been reported to be associated with more severe and recurrent forms of major depressive disorders.
- Exposure to bullying in adolescence is associated with a wide range of health outcomes, including depression and suicidal ideation, and the consequences of victimization seem to track into adulthood.
- There is a socially differential exposure to bullying in childhood, leaving children from low socioeconomic backgrounds at higher risk of being bullied.
- The association between childhood exposure to bullying and depression in young adulthood seems to be stronger for children from low childhood socioeconomic backgrounds.
- Our findings strengthen the arguments for intervention against bullying and points at children from poorer socioeconomic backgrounds as an especially important target group.

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Received 4 December 2008, accepted 18 June 2009