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BULLYING VICTIMIZATION AND PSYCHOTIC PHENOMENA: ANALYSES OF BRITISH NATIONAL SURVEY DATA

Brief Title: Bullying and Psychosis: Analyses of British National Survey Data

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ABSTRACT

BACKGROUND

Bullying, an aversive experience with both short and long term consequences, is currently incorporated in bio-psychosocial models of psychosis. We used British national survey data to test the hypothesis that bullying is associated with individual psychotic phenomena and with psychosis, and predicts the later emergence of paranoia ideation and hallucinations.

METHODS

Data from the 2000 and the 2007 UK national surveys of psychiatric morbidity were used. Bullying was assessed from a card listing stressful events over the lifespan; our dependent variables included persecutory ideation, hallucinatory experiences and diagnoses of probable psychosis. All analyses were controlled for socio-demographic confounders, IQ and other traumas

OUTCOMES

Bullying was cross-sectionally associated with measures both of persecutory ideation and of hallucinations, remaining so after adjustment for socio-demographics, IQ, other traumas and childhood sexual abuse. Bullying was associated with a diagnosis of probable psychosis and at baseline predicted 18-month inceptions of paranoid ideation and hallucinatory experiences. In the analyses, controlling for other traumas and childhood sexual abuse did not affect the association with psychotic symptoms but reduced the significance with that of probable psychosis. Bullying was most strongly associated with the joint presence of these symptoms.

INTERPRETATION

Bullying victimization increases the risk both of individual psychotic symptoms and of a diagnosis of probable psychosis. Early detection of bullying and treatments oriented towards its psychological consequences may ameliorate the course of psychosis.

INTRODUCTION

Current bio-psychosocial models of psychosis [1, 2] incorporate mechanisms relating to social events, particularly those characterised by abuse, threats, intrusiveness, and intention to harm [3, 4]. There is a growing interest in how social environments impact on neurobiological and neurocognitive structure and functioning [5]. Bullying is an exemplar of a damaging experience with both short and long-term consequences (in this paper we intend the word bullying to mean being a victim of bullying, i.e. "bullying victimization".

It is well established that individuals of low or diminished status are more prone to mental disorder, underpinning the introduction of the concept of social defeat in schizophrenia research [6]. Bullying behaviour is an exaggeration and distortion of power relationships, in which the exercise of power is frequent, repetitive, and (as viewed by the victim) apparently limitless and inescapable. It may overlap in both occurrence and effect with other denigratory events, such as physical and sexual abuse.

People readily understand the concept and behaviour of bullying. It has the intention of eliciting humiliating distress and behaviour in the victim. The primary effect is likely to operate through cognitive-emotional biases: self-focus, an often catastrophic reduction in self-regard, anticipation of further episodes, and a negative interpretation of ambiguous events, all in the context of heightened negative affect. While this state often progresses to the emergence of formal affective disorders, and suicidal ideation [7, 8], it has also been implicated specifically in the development of paranoia [9]. The link with other symptoms, in particular auditory hallucinosis, is less predictable. Sexual abuse, particularly in childhood, seems to be differentially related to hallucinations [10], [11], possibly through a propensity to elicit dissociative processes [12, 13]. Thus bullying might be linked to auditory hallucinosis, but perhaps only if it involves experiences that encourage dissociation.

A number of studies have demonstrated links between bullying and psychosis [14], [15]. Psychotic phenomena are continuously distributed in the general population, and these non-clinical manifestations share features and risk factors with the symptoms seen in psychotic illness [16]. These studies, which include prospective designs, indicate a strong relationship between psychotic symptoms and increased frequency, severity and persistence of bullying [17].

Nevertheless, questions remain about potentially key attributes of bullying, such as the age at exposure, its timing and pattern, and whether it is linked specifically to particular experiences (especially persecutory ideation) and if it is associated with both psychotic experiences that with the clinical diagnosis of psychosis. Accordingly, we used data from the British Adult Psychiatric Morbidity Surveys 2000 and 2007 (APMS) [18, 19] to analyse separately the relationship of bullying victimization with persecutory ideation, hallucinatory experiences and the probable diagnosis of psychosis. The first survey also contained an 18-month follow-up. Our hypotheses were as follows:

persecutory ideation, hallucinatory experiences and diagnoses of probable psychosis would be cross-sectionally associated with lifetime experience of bullying victimization; each psychotic experience independently was associated with bullying; previous bullying would be associated at follow-up with both the emergence and the maintenance of persecutory ideation and hallucinations. These results would persist after controlling for socio-demographic features, IQ, other victimization experiences and childhood sexual abuse (CSA).

METHODS

Setting and design

We used data from the 2000 and 2007 APMS (additional information were included in the supplementary material). There was an 18 month follow up of a subsample (N=2406) of the 2000 survey. The age range was 16–74 in the 2000 survey (N=8580, response rate 70%), and 16+ in 2007 (N=7403, response rate 57%). Adults living in private households were selected using population-based multi-phase probability sampling design. Phase 1 interviews involved detailed questionnaires assessing socio-demographic characteristics and a range of other topics. A second-phase interview was carried out by clinically trained research interviewers using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) [20-22]. We analysed the surveys independently in order to replicate our findings.

Measures

Bullying

In both surveys the history of lifetime bullying was established by asking respondents about stressful events presented on a card. A. The 2007 survey distinguished events occurring in childhood and adulthood, whereas the 2000 survey did not. We have used lifetime bullying in all analyses, experienced from 16-74 in the 2000 and from 16 in the 2007. This allows us to look at both historical, contemporaneous, and chronic bullying. No information was available about the severity of the experiences.

Other Traumas and childhood sexual abuse

The phase 1 interviews established the experience of other potentially victimising traumas: victim of serious illness/injury/assault, violence at work, violence in the home, being expelled from school, running away from home, being homeless, time in a children`s institution, taken into local authority care and CSA. These events were obtained from the stressful life events section of both surveys. The section provides a card listing stressful events and respondents had to select from them. These were analysed as possible confounders

Psychotic phenomena

Psychotic symptoms

The psychotic screening questionnaire (PSQ)[23] allowed the identification of persecutory ideation and hallucinatory experiences. These were used variously as single questions, and as ordinal and multinomial variables in the analyses presented here. The single question for persecutory ideation was the PSQ3 "felt that people were against you in past year?", that for hallucinatory experiences, the PSQ5 "heard/saw things that other people couldn't". The multinomial variable had four levels: 0=no symptoms, 1=hallucinations, 2=persecutory ideation, 3=both symptoms. The ordinal measure of persecutory ideation was a four-level variable (range 0-3) obtained from the three PSQ questions relative to persecutory delusion (PSQ3 "felt that people were against you in past year?", PSQ3a "felt that people were deliberately acting to harm you/your interests?" PSQ3b "felt group of people was plotting to cause you serious harm?"). The ordinal measure of hallucinatory experiences had three levels (range 0-2) derived from the two PSQ question relative to hallucinatory experiences (PSQ5 "heard/saw things that other people couldn't?", PSQ5a "heard voices saying quite a few words or sentences?").

Diagnosis of probable psychosis

In both surveys, the measure of probable psychosis comprised SCAN positive cases in the second phase, and some individuals who were not assessed in phase two, but who met at least two of the phase 1 psychosis screening criteria. These criteria were: current antipsychotic medication; an inpatient stay for a mental or emotional problem in the past three months, or admission to a hospital or ward specialising in mental health problems at any time; a positive response to question 5a in the PSQ; a self-reported diagnosis of psychotic disorder or of symptoms suggestive of it [19].

Statistical Analysis

The data were analysed using the Statistical Package for the Social Sciences (version 20 for Windows) and Stata (version 11.2 for Windows). Data were weighted to allow for design and response rates in order to render the results representative of the national household population [18]. We used ordered logistic regression to assess, in the 2000 and 2007 datasets, the association of lifetime bullying with our ordinal measures of persecutory ideation and AVHs. We used logistic regression to test the association between bullying and 1) a diagnosis of probable psychosis, and 2), in the follow-up analysis, binary variables of psychotic symptoms. The follow-up analysis included both the test of emergence of psychotic symptoms (T_0: no symptoms, T_1: presence of symptoms) and the test of maintenance of psychotic symptoms (T_0: presence of symptoms, T_1: presence of symptoms). Next, we used multinomial logistic regression to test the hypothesis that each psychotic experience

was independently associated with bullying, both in the 2000 and in the 2007 datasets, we intended in this way to assess whether bullying had a preference for association with a different pattern of expression of psychotic symptoms in the population: in particular if the bullying predicted greater the only expression of persecutory ideation, hallucinations, or both symptoms. Each of these categories was compared with a reference category (no symptoms). The method does not allow to have a direct comparison of the different outcomes but can help to verify the different trends of association of bullying with psychotic symptoms. This provided an estimate of the relative risk ratio (RRR) of our three individual psychotic categories in comparison to participants without symptoms (the 'relative risk ratio' is the ratio of two relative risks; the relative risk is the risk relative to the base category and in our case the risk relative to not having any experiences at all).

Regressions were carried out in five stages designed to be maximally informative in relation to our hypotheses. We initially produced unadjusted odds ratios. We next adjusted for socio-demographic characteristics (age, sex, marital status, employment status, and ethnicity) and then for IQ. We then adjusted for other traumas and for CSA.

Finally, in order to validate our bullying variable, we used logistic regression to test its relationship with other events (serious illness, violence at work, violence at home, sexual abuse, being expelled from school, running away from home, being homeless, time in institution and in local authority), on the grounds that bullying tends to cluster with other kinds of adverse experiences.

RESULTS

Cross-sectional analyses

Bullying and psychotic symptoms

In table 1, we present cross-sectional analyses of the relationship between lifetime bullying and our ordinal measure of persecutory ideation in both national surveys. Endorsement of bullying increased the level of persecutory ideation. The corresponding odds ratios (ORs) were positive, significant, and virtually identical in each year, both 2000 and 2007 (2.99 in each year, unadjusted). Adjustment for age, sex, marital status, employment status and ethnicity, and additionally for IQ made little difference. Further control for other traumas and then for CSA reduced the effect, but did not eliminate its significance.

Table 1 about here

In table 2 we show the equivalent cross-sectional analyses relating to our ordinal measure of hallucinatory experiences. Lifetime bullying increases the likelihood of hallucinations in both datasets. Again the odds ratios were positive, significant and consistent in the two years (2.39 and

2.51, respectively), and again they remained so after adjustment for sociodemographic factors and for IQ. Controlling for other traumas and for CSA reduced the associations, but they remained significant.

Table 2 about here

The consistency of these results between the two surveys reflects a very high degree of replication.

The effect of bullying on different psychotic symptom-types

In table 1 and 2 of the supplementary material, we showed results of the 2000 and 2007 surveys analyses to test that each psychotic experience independently was associated with bullying. The unadjusted association of bullying with auditory hallucinosis and with persecutory ideation independently was respectively as follows: (RR 2000 and 2007: 2.8 and 2.5), (RR 2000 and 2007: 1.7 and 2.2). Furthermore bullying was strongly associated with the co-occurrence of both symptoms (RR 2000 and 2007: 4.7 and 4.0, respectively). This effect and level of significance remained after controlling for socio-demographic and IQ, both in the 2000 than in the 2007 dataset, again indicating close replication.

Bullying and diagnosis of probable psychosis

In both surveys, the prevalence of diagnosis of probable psychosis was 0.5%. In detail 135 people endorsed this diagnosis, 63 people identified when two or more psychosis screening criteria were endorsed in the phase one interview, while 72 who had positive SCAN interview. in the 2007 dataset. There were no differences between the groups for sex, age, educational level, employment status, ethnicity, or social class. The cross sectional analyses between bullying victimization and the diagnosis of probable psychosis for the 2000 and 2007 datasets are shown, respectively, in tables 3 and 4 of the supplementary material. The ORs were 3.9 and 3.43, respectively; Controlling progressively for socio-demographics factors, for IQ, for other traumas, and finally for CSA, reduced the association such that it became only a statistical trend in both years after full control.

The follow-up analysis

In the follow up analysis of 2406 respondents, 510 (21.2%) described persecutory ideation, of whom 309 (60.5%) had experienced it previously. Of 101 (4.2%) acknowledging hallucinatory experiences at follow-up, 33 (32.7%) had previous hallucinations. Around a third of people with inceptions of paranoia and hallucinosis had experienced bullying. In table 3 and 4, we summarise the logistic regression analyses of the effect of bullying on the emergence and maintenance of persecutory ideation and hallucinatory experiences. In people who were not paranoid at baseline (no symptoms at T_0), bullying victimization increased two-fold the risk of developing persecutory ideation. In those

who initially endorsed persecutory ideation (presence of symptoms at T_0), bullying predicted the maintenance of the symptom, despite controlling for confounders that reduced the effect. The emergence of hallucinations appeared to be predicted by bullying in the same way, although at a lower level of significance.

Table 3 and 4 about here

Descriptive statistics of the psychotic experiences were included in the supplementary table 7 of the supplementary material.

DISCUSSION

In this paper, we have tested hypotheses about the contribution of inter-personal environmental factors to the emergence of psychotic symptoms and clinical psychosis. The use of data from two different surveys allowed us to replicate findings that were clearly robust. The use of ordinal measures of persecutory ideation and hallucinations and of diagnoses of probable psychosis constitute a form of sensitivity analysis, in fact the use of different outcomes (psychotic symptoms, diagnosis of probable psychosis) allowed us to test the association of bullying with phenomena across the psychotic spectrum.

A history of bullying was associated in cross sectional analyses with both persecutory ideation and hallucinatory experiences, and remained so after adjustment for confounders in both the 2000 and 2007 sample. We must underline that our measure included both childhood and adult bullying. The ORs between bullying victimization and psychotic experiences were very close to those reported by Van Dam et al. in their meta-analysis, which provided adjusted ORs for six population-based studies that assessed the relationship between bullying and psychotic symptoms (2.3, 95% CI 1.5–3.4) [(17)]. Previously, Bentall et al. used the 2007 APMS to carry out a cross-sectional analysis between bullying victimization and psychotic symptoms and he found no significant results. Our study provides different results; this may be explained because Bentall used a variable, which assessed bullying that happened more than 6 months ago and before the age of 16, and used only in the 2007 survey. In our study we used instead a variable assessing at bullying throughout life and even up to point of survey. This allowed us to gain more statistical power in the analysis, given that we included more responders and endorsements of bullying. Bentall and colleagues recognize that their finding was inconsistent with other studies and they state it would be premature concluded that "bullying plays no role in the aetiology of psychosis"[(24)].

Furthermore the design in Bentall et al., 2012 was quite different and they focused on the co-occurrence of the association between childhood sexual abuse and hallucinations and victimization experiences and paranoid beliefs. The authors concluded that different kinds of trauma might be associated with different kind of psychotic symptoms and showed a dose-response effect, with more traumas increasing the psychotic symptoms. In our view we expand upon the findings of Bentall and colleagues, affirming that bullying as well as other kind of trauma, act on psychosis.

Further, our 18-month follow-up analysis from the 2000 survey of the 2406 respondents included in this subsample of the survey suggested that bullying predicted new inceptions and maintenance of both persecutory ideation and hallucinatory experiences in the unadjusted association, although results were less significant after controlling for confounders. Other studies have also found longitudinal associations between bullying and psychotic symptoms [25, 26].

Our results for the diagnosis of probable psychosis became less significant when other traumas and CSA were included, confirming a trend, seen in others studies. This has been the case with most studies attempting to demonstrate such associations [17]. Bullying is one of a number of traumas predicting clinical psychosis, and may form one part of a stressful environment in which events cluster, both in childhood (sexual and physical abuse, domestic violence) and in adulthood (intrusive events, conflicts). Because the effect is likely to be cumulative, controlling for other events may disguise the contribution of individual events.

In the last analysis, we analysed the association of bullying with a four-level variable constructed from replies to the two questions from the PSQ about persecutory ideation and hallucination. This result suggests a quantitative difference in the predictive value of bullying for different symptoms, as others have found [27, 28]. However the method used did not allow a direct comparison between the two psychotic experiences and moreover looking at the ORs and CIs it was not clear that the difference between Persecutory Ideation and Hallucinations was statistically different.

A more marked but reverse difference is seen in childhood sexual abuse, which has particularly strong associations with hallucinations [29]. None of these distinctions is absolute, so the configuration of psychotic symptoms in different people seems likely to be shaped by the pattern of their experiences. The emergence of persecutory beliefs and AVHs may, at least in part, follow distinct trajectories, reflecting different mechanisms. Bentall et al. hypothesize that different psychotic symptoms may have particular underlying cognitive processes, and that different types of trauma may serve as triggers [24]. Gracie and colleagues [30] also postulated two routes to positive symptoms of psychosis, and suggested that bullying might predispose to the onset of paranoia and AVHs in different ways, for instance by triggering affective and cognitive disturbances or by eliciting the re-experiencing typical of PTSD. They found negative schematic beliefs were more strongly associated with paranoia whereas re-experiencing symptoms and perceptual anomalies were more strongly

connected with hallucinations. However, it should be noted that the link between CSA and diagnoses of psychosis is quite strongly mediated by affect [31, 32]. Thus one interpretation of our findings is that trauma induces both persecutory ideation and hallucinosis via an affective route, but that some traumatic experiences are also capable of inducing dissociative PTSD-like re-experiencing of memories.

Our study has several limitations. There are difficulties in obtaining sensitive information from individuals sampled in a national survey. The data on bullying, for example, may be inaccurate, and we had no collateral accounts. Its definition is in part subjective, and there may be over- or under-reporting [33]. People without psychotic symptoms may omit stressful events, and those who suffer from them may engage in an "effort after meaning", and thus be more inclined to remember them. Another limit is the confidence of the retrospective recall of bullying and the self-report of both victimization and psychotic experiences that that may have biased the results. However there is evidence that people with psychosis recall stressful experiences as accurately as the general population [34]. Finally, bullying was evaluated only as present at some point in the lifespan and features such as timing and chronicity may crucially affect its impact.

Despite the assessment of psychotic symptoms and clinical psychosis through semi-structured interviews (PSQ, SCAN), respondents may have misinterpreted the questions or underestimated the effect of their answers, although use of dimensional measures of psychotic symptoms and clear criteria for the diagnosis of probable psychosis, restricted this possible methodological bias.

Against these limitations, it also has strengths. It used separate surveys to corroborate findings, and the follow-up to the 2000 data allowed us to demonstrate that a history of bullying predicted prospectively the inception and maintenance of paranoia and hallucinosis.

This study supports the current emphasis on the detailed evaluation of process during psychological treatments for psychosis and contribute to the ongoing debate of the psychosocial and genetic aspects that develop the psychosis [28].

Panel: research in context

Systematic review

We conducted an electronic search to assess if any systematic reviews and meta-analysis on the topic

had been published. We used the Medline electronic database: (1948- October week 1, 2014) with the combination of bullying/trauma/stressful events and psychosis and systematic review/meta-analysis terms. Several narrative and systematic review on trauma/stressful events and psychosis have been published and one narrative [35] and one systematic review on bullying and psychosis [17]. The latest summarized all the previous relevant contribution on the argument and included fourteen studies that met the inclusion criteria; ten examined the relationship between bullying and psychosis in non-clinical samples and four in clinical samples. Results of the meta-analysis are discussed in our paper.

Interpretation

Our study fits into the current line of the research highlighting the role of psychosocial stress factors in the genesis of psychosis. We found an association between the history of bullying, diagnoses of psychosis, and the specific symptoms paranoia and auditory hallucinations. The longitudinal analysis suggested that a history of bullying predicted both the maintenance of paranoid ideation and hallucinosis. Psychotherapy in individuals with psychosis should embody interventions oriented to make sense of their experiences. CBT for psychosis is one way of finding alternative explanations for experiences, by linking emotions, beliefs and traumatic events with psychotic symptoms.

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