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Psychopathology in a large cohort of sexually abused children followed up to 43 years[☆]

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ABSTRACT

Objective: To determine the rate and risk of clinical and personality disorders diagnosed in childhood and adulthood in those known to have been sexually abused during childhood.
Methods: Forensic medical records of 2,759 sexually abused children assessed between 1964 and 1995 were linked with a public psychiatric database between 12 and 43 years later. Cases were compared to control subjects matched on gender and age groupings drawn from the general population through a random sample of the national electoral database.

Results: A lifetime record of contact with public mental health services was found in 23.3% of cases compared to 7.7% of controls. The rate of contact among child sexual abuse victims was 3.65 times higher (95% CI, 3.09–4.32, $p < 0.001$). It was estimated that child sexual abuse accounted for approximately 7.83% of mental health contact. Exposure to sexual abuse increased risks for the majority of outcomes including psychosis, affective, anxiety, substance abuse, and personality disorders. Rates of clinical disorders diagnosed in adulthood and childhood remained significantly higher among child sexual abuse cases. Older age at sexual abuse and those exposed to severe abuse involving penetration or multiple offenders were associated with greater risk for psychopathology.

Conclusions: This study confirms that child sexual abuse is a substantial risk factor for a range of mental disorders in both childhood and adulthood.

Practice implications: Those treating victims of sexual abuse must assess not only disorders commonly associated with trauma, but also low prevalence disorders such as psychosis.

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Introduction

Research over the last 30 years has established a significant relationship between giving a history of being sexually abused in childhood and a range of mental health and behavioral problems in adult life. The methodologies employed to establish this association in the early years used predominately cross-sectional studies on either patient groups or convenience samples. More sophisticated studies utilizing large random community samples, birth cohorts, and twin cohorts have provided evidence arguably of greater reliability and generalizability.

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An exhaustive review of all mental health outcomes following child sexual abuse (CSA) in the short- and long-term is beyond the scope of this paper (see reviews by Andrews, Corry, Slade, Issakidis, & Swanston, 2004; Beitchman, Zucker, Hood, DaCosta, & Akman, 1991; Beitchman et al., 1992; Browne & Finkelhor, 1986; Fergusson & Mullen, 1999; Finkelhor, 1990; Gilbert et al., 2009; Kendall-Tackett, Williams, & Finkelhor, 1993; Paolucci, Genuis, & Violato, 2001; Putnam, 2003). Community based studies on children, youth, and adult populations have consistently found a moderate to strong relationship between depressive symptoms and reported history of CSA (Andrews et al., 2004; Calam, Horne, Glasgow, & Cox, 1998; Dube et al., 2005; Fergusson, Boden, & Horwood, 2008; Fergusson, Horwood, & Lynskey, 1996; Gilbert et al., 2009; Molnar, Berkman, & Buka, 2001a), with meta-analyses revealing odds ratios for reported CSA history ranging from 2.1 to 7.0 times greater among those with depression (Fergusson & Mullen, 1999). Although many population and clinical studies on youth and adults support a strong relationship between retrospectively reported CSA and posttraumatic stress disorder (PTSD), few community studies have examined the relationship to other anxiety disorders (Andrews et al., 2004). Meta-analysis has shown reported CSA was 1.3–4.3 times greater in those with an anxiety disorder (Fergusson & Mullen, 1999). Population based studies have also demonstrated higher frequencies of reported history of CSA among adolescents and adults with alcohol and/or drug related disorders compared to non-abused counterparts, with odds ratios ranging from 1.01 to 8.9 (Dube et al., 2005; Fergusson et al., 2008; Fergusson et al., 1996; Fleming, Mullen, Sibthorpe, Attewell, & Bammer, 1998; Molnar, Buka, & Kessler, 2001b; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Silverman, Reinherz, & Giaconia, 1996). While the association between reported CSA and borderline and antisocial personality disorders has received the most research attention relative to other personality types, findings largely from clinical studies have yielded inconclusive results. Several recent population based studies on youth and adult samples have demonstrated an association between sexual trauma and psychotic symptoms in general (Bebbington et al., 2004; Janssen et al., 2004; Lataster et al., 2006; Scott, Chant, Andrews, Martin, & McGrath, 2007; Shelvin, Dorahy, & Adamson, 2007a, Shelvin, Dorahy, & Adamson, 2007b; Spauwen, Krabbendam, Lieb, Wittchen, & van Os, 2006; Whitfield, Dube, Felitti, & Anda, 2005); however, the variables of sexual abuse in childhood or schizophrenic spectrum disorders specifically were not examined.

Despite the elevation in scientific rigour over the past 10 years, a number of recurring methodological problems remain in the field of child abuse. A primary limitation relates to the retrospective design adopted in most studies whereby the assumption is made that there is a close correspondence between the history of abuse given in adult life and the actual events in childhood. Recognition of this problem is often couched in terms of introducing a bias in favour of finding an association because disordered adults may spuriously appeal to the now culturally sanctioned explanation of childhood sexual abuse to account for their current distress. Failures of ascertainment due to subjects' unwillingness or inability to recall sexual abuse (Fergusson, Horwood, & Woodward, 2000; Hardt & Rutter, 2004; Widom & Morris, 1997; Williams, 1994) may, however, be a greater problem as it not only reduces those identified as abused among those designated cases, but increases the number of actually abused among controls. Studies also face the hurdle of how to obtain follow-up data on the abused children. To approach adults to request their cooperation with an evaluation would entail the potentially ethically questionable alternatives of either confronting them with their abuse history or misleading them, but still risking accidentally reactivating the trauma.

Prospective studies that ascertain the contemporaneous occurrence of CSA and associated familial and social correlates and follow-up these children over time to determine a range of outcomes offer numerous methodological advantages. These include establishing temporal order, causal priority, control of confounding variables, and avoidance of recall and sampling bias (Fergusson & Mullen, 1999; Gilbert et al., 2009). Although methodologically superior, implementing a prospective design imposes insurmountable ethical (e.g., researcher reporting abuse) and practical (e.g., excessive costs, long time and associated attrition) challenges seldom met. The historical cohort design through linking official records of CSA with public records such as psychiatric, criminal, and coronial databases is an alternative method that overcomes many ethical and practical limitations while maintaining some of the features of a prospective study. However, only some jurisdictions have adequate databases of contact with health services to potentially obtain information about the victims' subsequent mental health.

The extant literature contains only several study groups that have implemented a prospective-type design involving the ascertainment of child abuse without relying on retrospective recall. Prospective studies have also demonstrated an association between CSA and a range of mental health outcomes, however, a number of key issues remain uncertain. For example, few prospective studies have examined PTSD alone, or a range of personality disorders as an outcome, and prospective studies do not appear to support the association between CSA and problematic drug and alcohol use, or a schizophrenic disorder. Moreover, general limitations in prospective studies pertain to combining CSA with other forms of child abuse, non-related diagnostic categories, or diagnoses made in childhood with those made during adulthood, in an attempt to compensate for the small samples typically employed.

This study attempts to fill the gap in the literature created by the absence of adequate prospective studies which examine the relationship between CSA established at the time and later mental health outcomes. The large size of the sample of victims employed also allows investigation of low as well as high prevalence disorders without combining heterogeneous diagnostic groups together. Access to contemporaneous accounts of the abuse potentially offers a more precise examination of the importance of abuse variables and later disorder. The study offers a rigorous test of the assumption that studies based on histories of CSA provide reliable data on the associations to actual CSA. The hypothesis is not that the current consensus that CSA is associated with increased levels of later psychopathology will be overturned. The hypothesis is that the evidence for such associations will be strengthened and extended to inconclusive or uncertain conditions because of the limitations surrounding methodological designs and the measurement of CSA.

Almost 3,000 children whose sexual abuse was investigated at the time by forensic medical examinations had subsequent psychopathology established using a database which provides comprehensive coverage of all contacts and treatment episodes with the public mental health services. This study extends an earlier study by [Spataro, Mullen, Burgess, Wells, and Moss \(2004\)](#). This sample is considerably larger, more complete, and followed up for a longer period. Perhaps most importantly, this study adopts a case control methodology whereby rates of disorders in both cases and controls were established using identical methodologies.

Methods

Child sexual abuse cohort

Child sexual abuse cases were identified using the records of the Victorian Institute of Forensic Medicine (VIFM), which since 1957 has provided medical examinations in cases of suspected CSA. This included referrals from the police and child protection services in Victoria, Australia. All cases of children aged 16 years and younger sexually assaulted between 1964 and 1995 were identified and reviewed. The physicians' conclusion on whether penetration of an orifice had occurred was based upon physical examination and tests, as well as the history provided by the victim and/or parent/carer which may have been augmented by available documentation from either the police or child protection services. While the medical procedure has remained largely unchanged, the methods of documentation and interpretation have changed significantly over the last few decades to a more systematic and cautious standard. Identifying information of child's name, date of birth, date of exam, and medical opinion on evidence of penetration was extracted for all cases. Data on abuse characteristics was available for many of the cases, particularly in the later years of the study period. Information was collected on the alleged offender(s), relationship of offender(s) to victim, and frequency of sexual abuse. Abuse variables were dichotomously categorized as follows: penetration versus non-penetration, one offender versus more than one offender, offender related versus offender not related, and one assault versus more than one assault.

Comparison group

The comparison group was drawn from a random sample of 4,938 Victorian residents (total population approximately 5 million) on the electoral role. Voting is mandatory in Australia and registration on the electoral role is compulsory for those 18 years and over. Ninety three percent of those aged 18 and above are on the roles (Victorian Electoral Commission, 2008). Only limited information on the comparison group from the electoral role was available and consisted of name, surname, and age range within 2-year bandings. Abuse victims were matched on gender and age band to subjects in the comparison group drawn from the general population, to constitute 2,677 matched controls.

Ethics

This study involved accessing information without the consent from a large number of people who had been sexually abused during childhood as well as random citizens from the general population. Gaining informed consent from almost 5,500 subjects is impractical, particularly for the CSA cohort when there are no current contact details. Anonymity was ensured by breaking the connection between all identifiers and the subject as soon as linkage of records was complete. This methodology was considered appropriate and approved by three independent ethical committees: the Monash University Standing Committee on Ethics in Research involving Humans, the Human Research Ethics Committees of the Department of Human Services, and the Victorian Institute of Forensic Medicine.

Mental health histories

The Victorian Psychiatric Case Register (VPCR) has existed in various forms since 1961. It was originally established as a research tool, but over the last 25 years has functioned primarily as a resource management tool. The Victorian public mental health database contains approximately 637,000 recorded cases, making it one of the oldest and most comprehensive psychiatric case registers in the world. All contacts with the public mental health services are recorded, including contacts in in-patient, out-patient, community, dormicialiary, emergency room, and general hospital facilities. There are substantial inducements for public mental health services to record contacts promptly and fully as their funding may be influenced by the returns to the register. Contacts are not recorded with the private health sector for in-patient admissions (approximately 29% of total beds), or out-patient services, such as private practicing mental health professionals and general practitioners. The VPCR contains information on the number and timing of contacts, the treatment received, and diagnosis. The diagnosis is generated by the treating or responsible psychiatrist. Psychiatrists in Victoria almost all use the Diagnostic and Statistical Manual of mental disorders system, but the register codes disorders using the World Health Organization International Classification of Disease (ICD). The transformation is performed either by the psychiatrist or the records staff.

The data linkage procedure involved first a deterministic then probabilistic approach using Structured Query Language scripts, extracting exact and potential matches based on identifying information (e.g., surname, first name, date of birth or

age range, gender) of study and control cohorts to the psychiatric database. De-identified psychiatric record details for the matches were obtained for all contact made prior to 15 January 2008.

Psychiatric comorbidity tends to be the norm rather than the exception. To reflect this, lifetime ICD diagnoses for all primary Axis I clinical and Axis II personality disorders were analyzed for each extracted case. However, given the large number of specific disorders, primary diagnoses were collapsed into their related major diagnostic category. The low prevalence disorders including the schizophrenias, schizoaffective, delusional, as well as manic and depressive psychotic states were combined to form a psychotic group. The category “other disorders” included the diagnoses of general psychiatric examination not otherwise specified, other causes of morbidity and mortality, pervasive developmental disorders, and other childhood-related disorders such as attachment disorder and enuresis. Cases that accessed psychiatric services for medical or social reasons and did not receive a psychiatric diagnosis were categorized as “non-psychiatric complaint.” Axis I clinical disorders were further categorized according to age, whereby diagnoses made prior to age 18 years were classified as disorders in childhood, and diagnoses made after 18 years regarded as diagnoses in adulthood.

Statistical analyses

The rate of psychiatric contact and diagnoses subsequent to CSA among the study cohort was compared to the comparison group. All variables, with the exception of age, were dichotomously categorized. Groups were initially compared using *t*-tests and Chi-squared tests of association, with univariately significant differences converted into odds ratios and 95% confidence intervals, considering a standard significance of $p=0.05$ to facilitate interpretation. Within groups analyses were conducted to determine which abuse variables were associated with mental health outcomes. To further explore the factors associated with whether or not victims were exposed to outcomes (1, contact with mental health services; 2, received an Axis I clinical diagnosis) logistic regression was conducted, reporting adjusted odds ratios controlling for potential confounding variables. Analyses on time to outcomes from time of reported CSA were also conducted using Cox regression. Population attributable risk (PAR) was calculated to estimate the excess rates of psychiatric outcomes in the population with and without known CSA; thus allowing to estimate the degree to which psychiatric morbidity could be prevented if CSA was eliminated. Data analyses were undertaken using Statistical Package for the Social Sciences version 16, for Windows (SPSS, Chicago, 2008).

Results

Description of CSA cohort

The sample comprised of 2,759 CSA cases, however 71 (49 females and 22 males) cases had psychiatric contact prior to their reported CSA and were eliminated from analyses. Although the eliminated cases were significantly older at abuse compared to the CSA victims that had psychiatric contact subsequent to their abuse ($M=12.04$, $SD=10.84$ vs. $M=10.85$, $SD=4.27$; $t=2.27$; $p=0.024$), there were no differences in the distribution of gender ($p=0.77$) and rate of penetration ($p=0.89$). The age of the 2,688 CSA subjects (2,153, 80.1% females) when examined following sexual abuse allegations was 10.17 years ($SD=4.46$; range = 0.27–16.99 years). Mean age at abuse was significantly younger for males ($M=9.33$, $SD=4.22$) than females ($M=10.38$, $SD=4.49$; $t=-4.90$; $p<0.001$). Almost two-thirds (1,698, 63.2%) involved completed, partial, or attempted penetration of an orifice by a penis, finger, or object; the remainder (36.8%) reported non-penetrative sexual contact. The rate of abuse involving penetration was significantly higher for females than for males (65.1% vs. 55.5%; $\chi^2=16.83$; $p<0.001$). Overall, almost half (722 out of 1,502, 48.1%) of CSA victims were abused by a relative; however, males were significantly more likely to experience extrafamilial sexual abuse than females (63.8% vs. 48.5%; $\chi^2=24.90$; $p<0.001$). The majority (1,796 out of 1,902, 94.4%) were sexually abused by 1 offender, and on more than 1 occasion (571 out of 923, 61.9%), with no gender differences observed. The mean age of the CSA group at follow-up was 33.82 years ($SD=11.03$), with males being 30.77 years ($SD=9.18$), and females 34.67 years ($SD=11.32$). The follow-up period ranged from 12.24 to 43.04 years ($M=23.65$ years, $SD=8.12$).

Associations between CSA and psychiatric disorder

Tables 1 and 2 show the associations between CSA and Axis I clinical and Axis II personality disorders compared to controls for all cases (Table 1) and by gender (Table 2). A lifetime record of contact with the public mental health services was found in 627 (23.3%, 485 females and 142 males) CSA cases, compared to 206 (7.7%, 151 females and 55 males) control subjects. CSA victims were 3.65 times more likely to have had contact with public mental health services than the general population (95% CI, 3.09–4.32, $p<0.001$). This difference held true for both male (OR=3.73, 95% CI, 2.66–5.22, $p<0.001$) and female (OR=3.67, 95% CI 3.02–4.45, $p<0.001$) victims. With the exception of eating disorders, the overall rate of all Axis I clinical and Axis II personality disorders, as well as non-psychiatric complaint, were significantly higher for CSA cases compared to controls. Those with the most marked elevation compared to controls were posttraumatic stress disorder (PTSD), known drug and alcohol abuse, and personality disorders. The excess rate of contact with public mental health services attributable to CSA in the community (PAR%) was 7.83%. The PAR% for Axis I clinical disorders were 5.73% and for Axis II personality disorders 1.45%.

Table 1

Comparison between the rates for various mental disorders in all the child sexual abuse and the control subjects.

Diagnostic group	Controls (n=2677)		Cases (n=2688)		OR	95% CI	p
	n	%	n	%			
<i>Mental health contact</i>	206	7.7	627	23.3	3.65	3.09–4.32	<0.001
<i>Axis I clinical disorders</i>	187	7.0	495	18.4	3.01	2.52–3.59	<0.001
Psychotic disorders	37	1.4	78	2.9	2.13	1.44–3.17	<0.001
Affective disorders	86	3.2	173	6.4	2.07	1.59–2.70	<0.001
Organic disorders	0	0.0	9	0.3	–	–	–
Posttraumatic stress disorder	20	0.7	108	4.0	5.56	3.44–8.99	<0.001
Other anxiety disorders	60	2.2	155	5.8	2.67	1.97–3.61	<0.001
Eating disorders	6	0.2	7	0.3	1.16	0.39–3.46	0.79
Paedophilia	0	0.0	3	0.1	–	–	–
Known alcohol abuse	13	0.5	75	2.8	5.88	3.26–10.63	<0.001
Known drug abuse	20	0.7	115	4.3	5.94	3.68–9.58	<0.001
Other disorders	17	0.6	60	2.2	3.57	2.08–6.14	<0.001
<i>Axis II personality disorders</i>	18	0.7	96	3.6	5.47	3.30–9.08	<0.001
Non-cluster B PD	7	0.3	31	1.2	4.45	1.96–10.13	<0.001
Cluster B PD	12	0.4	65	2.4	5.51	2.97–10.22	<0.001
Borderline PD	8	0.3	48	1.8	6.07	2.87–12.85	<0.001
Antisocial PD	4	0.1	17	0.6	4.26	1.43–12.66	0.007 ^a
<i>Non-psychiatric complaint</i>	18	0.7	92	3.4	5.24	3.15–8.70	<0.001

^a Fisher's exact test.

When examining disorders by gender (Table 2), all disorders (except eating disorders) remained significantly higher for female CSA victims; however, affective disorders, PTSD, non-cluster B personality disorders, and borderline personality disorder ceased to be significant among male victims. For female cases, known drug and alcohol abuse, PTSD, and personality disorders were most strongly associated with CSA. Non-psychiatric complaint was more strongly associated with CSA in male victims. Of note, three male CSA victims had a recorded diagnosis of pedophilia, and although higher than the nil cases in the controls, odds ratios could not be calculated. The PAR% for contact with public mental health services was higher for female CSA victims (6.21%) than male victims (1.62%).

Associations between CSA and psychiatric disorder diagnosed in adulthood and childhood

The rates of Axis I clinical disorders diagnosed in adulthood (Table 3) and childhood (Table 4) also remained significantly higher among CSA cases. Disorders more strongly associated with CSA in adulthood were other disorders and known substance abuse, whereas PTSD, known drug abuse, and conduct disorder diagnosed in childhood had stronger associations.

Comparisons of psychiatric disorder in male and female victims of CSA

Table 2 shows the comparisons of Axis I clinical and Axis II personality disorders between male and female CSA cases. Sexually abused males were significantly more likely than their abused female counterparts to have had contact with public mental health services (26.5% vs. 22.5%, $\chi^2 = 3.86$, $p = 0.049$). No significant differences were found between female and male cases for the rates of the majority of Axis I and II disorders. However, females were significantly more likely to be diagnosed with an affective disorder, PTSD, and borderline personality disorder, whereas males were significantly more likely to be diagnosed with other disorders and antisocial personality disorder.

Child sexual abuse characteristics associated with psychiatric disorder

The mean age at sexual abuse for those who subsequently had mental health contact ($M = 10.83$ years, $SD = 4.27$ vs. $M = 9.97$ years, $SD = 4.49$; $t = 4.28$; $p < 0.001$) or diagnosed with an Axis I clinical ($M = 10.79$ years, $SD = 4.33$ vs. $M = 10.03$ years, $SD = 4.47$; $t = 3.47$; $p = 0.001$) or Axis II personality ($M = 11.81$ years, $SD = 4.15$ vs. $M = 10.11$ years, $SD = 4.46$; $t = 3.69$; $p = 0.001$) disorder was significantly older than those victims who did not have a record for contact with public mental health services. However, all Axis I disorders, except PTSD, diagnosed in childhood were significantly associated with younger age at abuse.

Victims in which penetrative abuse was established were significantly more likely than those exposed to less invasive abuse to have contact with mental health services (OR = 1.28; 95% CI, 1.06–1.55; $p = 0.01$), or be diagnosed with psychosis (OR = 1.98; 95% CI, 1.16–3.37; $p = 0.01$), or known alcohol abuse (OR = 2.02; 95% CI, 1.17–3.50; $p = 0.01$). Those assaulted by more than one offender compared to a single abuser were more likely to have mental health contact (OR = 1.81; 95% CI, 1.19–2.75; $p = 0.005$), or be diagnosed with an Axis I clinical disorder (OR = 2.05; 95% CI, 1.33–3.165; $p = 0.001$), psychosis (OR = 4.72; 95% CI, 2.36–9.45; $p < 0.001$), other anxiety disorder (OR = 1.92; 95% CI, 1.02–3.61; $p = 0.04$), known alcohol

Table 2
Comparison of various mental disorders between all child sexual abuse and control subjects by gender.

Diagnostic group	Males						Females						Abused males vs. females <i>p</i>
	Controls (n = 622)		Cases (n = 535)				Controls (n = 2055)		Cases (n = 2153)				
	<i>n</i>	%	<i>n</i>	%	OR	95%CI	<i>n</i>	%	<i>n</i>	%	OR	95%CI	
<i>Mental health contact</i>	55	8.8	142	26.5	3.73 ^{***}	2.66–5.22	151	7.3	485	22.5	3.67 ^{***}	3.02–4.45	0.049
<i>Axis I clinical disorders</i>	54	8.7	108	20.2	2.66 ^{***}	1.88–3.78	133	6.5	387	18.0	3.17 ^{***}	2.57–3.90	0.237
Psychotic disorders	10	1.6	21	3.9	2.50 [*]	1.17–5.36	27	1.3	57	2.6	2.04 ^{**}	1.29–3.24	0.115
Affective disorders	23	3.7	19	3.6	0.96	0.52–1.78	63	3.1	154	7.2	2.44 ^{***}	1.81–3.29	0.002
Organic disorders	0	0.0	1	0.2	–	–	0	0.0	8	0.4	–	–	1.00 ^a
Posttraumatic stress disorder	7	1.1	13	2.4	2.19	0.87–5.53	13	0.6	95	4.4	7.25 ^{***}	4.05–12.99	0.037
Other anxiety disorders	12	1.9	29	5.4	2.91 ^{***}	1.47–5.77	48	2.3	126	5.9	2.60 ^{***}	1.85–3.65	0.701
Eating disorders	0	0.0	0	0.0	–	–	6	0.3	7	0.3	1.11	0.37–3.32	–
Paedophilia	0	0.0	3	0.6	–	–	0	0.0	0	0.0	–	–	–
Known alcohol abuse	7	1.1	20	3.7	3.41 ^{**}	1.43–8.13	6	0.3	55	2.6	8.96 ^{***}	3.85–20.84	0.137
Known drug abuse	10	1.6	26	4.9	3.13 ^{***}	1.49–6.54	10	0.5	89	4.1	8.82 ^{***}	4.58–17.00	0.458
Other disorders	7	1.1	24	4.5	4.13 ^{***}	1.76–9.66	10	0.5	36	1.7	3.48 ^{***}	1.72–7.03	<0.001
<i>Axis II personality disorders</i>	8	1.3	16	3.0	2.37 [*]	1.00–5.57	10	0.5	80	3.7	7.89 ^{***}	4.43–15.55	0.419
Non-cluster B PD	2	0.3	4	0.7	2.34	0.43–12.80	5	0.2	27	1.3	5.21 ^{***,a}	2.00–13.55	0.496 ^a
Cluster B PD	6	1.9	13	2.4	2.56 [*]	0.97–6.77	6	0.3	52	2.4	8.45 ^{***}	3.62–19.72	0.984
Borderline PD	2	0.3	1	0.2	0.58	0.52–6.42	6	0.3	47	2.2	7.62 ^{***}	3.25–17.86	<0.001 ^a
Antisocial PD	4	0.6	13	2.4	3.84 ^{**} , ^a	1.25–11.87	0	0.0	4	0.2	–	–	<0.001 ^a
<i>Non-psychiatric complaint</i>	1	0.2	14	2.6	16.69 ^{***,a}	2.19–127.32	17	0.8	78	3.6	4.51 ^{***}	2.66–7.65	0.252

^a Fisher's exact test.^{*} *p* < 0.05.^{**} *p* < 0.01.^{***} *p* < 0.001.

Table 3

Comparison of Axis I clinical diagnoses in adulthood between child sexual abuse and control subjects.

Diagnostic group	Controls (n = 2677)		Cases (n = 2688)		OR	95% CI	p
	n	%	n	%			
Psychotic disorders	36	1.3	68	2.5	1.90	1.27–2.86	0.002
Affective disorders	73	2.7	146	5.4	2.05	1.54–2.73	<0.001
Organic disorders	0	0.0	8	0.3	–	–	–
Posttraumatic stress disorder	18	0.7	76	2.8	4.30	2.56–7.21	<0.001
Other anxiety disorders	37	1.4	95	3.5	2.61	1.78–3.82	<0.001
Eating disorders	3	0.1	5	0.2	1.66	0.40–6.96	0.726 ^a
Known alcohol abuse	13	0.5	71	2.6	5.56	3.07–10.07	<0.001
Known drug abuse	18	0.7	105	3.9	6.01	3.63–9.93	<0.001
Other disorders	2	0.1	15	0.6	7.51	1.72–32.85	0.002 ^a

^a Fisher's exact test.**Table 4**

Comparison of Axis I clinical diagnoses in childhood between child sexual abuse and control subjects.

Diagnostic group	Controls (n = 2677)		Cases (n = 2688)		OR	95% CI	p
	n	%	n	%			
Psychotic disorders	2	0.1	10	0.4	5.00	1.09–22.82	0.038 ^a
Affective disorders	13	0.5	37	1.4	2.86	1.52–5.40	0.001
Organic disorders	0	0.0	1	0.0	–	–	–
Posttraumatic stress disorder	2	0.1	36	1.3	18.16	4.36–75.51	<0.001 ^a
Other anxiety disorders	23	0.9	65	2.4	2.86	1.77–4.62	<0.001
Conduct disorder	8	0.3	50	1.9	6.32	2.99–13.36	<0.001
Eating disorders	3	0.1	2	0.1	0.66	0.11–3.98	0.69 ^a
Known alcohol abuse	0	0.0	4	0.1	–	–	–
Known drug abuse	1	0.0	16	0.6	16.03	2.12–120.96	<0.001 ^a
Other disorders	15	0.6	46	1.7	3.09	1.72–5.56	<0.001

^a Fisher's exact test.

abuse (OR = 3.45; 95% CI, 1.64–7.25; $p = 0.001$), an Axis II personality disorder (OR = 2.40; 95% CI, 1.12–5.17; $p = 0.021$), and non-cluster B personality disorder (OR = 4.99; 95% CI, 1.61–15.44; $p = 0.002$). Psychosis was the only mental health outcome associated with the victim's relationship with offender, where victims abused by a non-relative were more likely to develop a psychotic illness (OR = 1.88; 95% CI, 0.98–3.61; $p = 0.05$). Frequency of abuse was not significantly associated with any disorders.

Controlling for penetration, age at abuse, and gender of victim, multivariate analyses revealed that those sexually abused by more than 1 perpetrator were 1.661 (95% CI, 1.087–2.538; $p = 0.019$) times more likely to have contact with public mental health services. The strength of this association increased to almost 2-fold (OR = 1.894; 95% CI, 1.220–2.940; $p = 0.004$) when the outcome was receiving an Axis I clinical diagnosis. Sexual abuse involving penetration was the only significant abuse variable associated to time of contact with mental health services (adj HR = 1.385; 95% CI, 1.049–1.829; $p = 0.021$) and to time of receiving a clinical diagnosis (adj HR = 1.452; 95% CI, 1.073–1.965; $p = 0.016$) after controlling for age and gender of victim.

Discussion

Although the extensive body of literature suggests a significant association between childhood sexual abuse and psychopathology, the majority of studies have been weakened, in part, by relying on the retrospective reporting of sexual abuse during childhood (Fergusson et al., 2000; Fergusson & Mullen, 1999; Gilbert et al., 2009; Widom, Raphael, & DuMont, 2004). Overcoming many of the limitations of previous studies, this study confirms that sexual abuse in childhood increases the risk for subsequent psychiatric disorders in both childhood and adulthood. In general, the victims of CSA suffered three times the burden of mental health problems compared to members of the general community. The population attributable risk of 7.83% is substantial, but this figure does not partial out the possible effects of other co-occurring childhood disadvantage. This is consistent with the recent estimate by Fergusson et al. (2008) that CSA independently contributed to 13.1% of later psychopathology. As such, childhood sexual abuse is a substantial risk factor for the development of subsequent mental health problems.

The sample of victims was of a sufficient size to examine the so-called "low prevalence" disorders which include severe mental illnesses characterized by psychotic features such as hallucinations and delusions. These disorders are often disabling and can be associated with life long invalidism. The possible relationship of CSA to schizophrenic disorders in particular has been the subject of considerable speculation based on studies often of limited methodological sophistication (Bendall, Jackson, Hulbert, & McGorry, 2008; Gilbert et al., 2009; Morgan & Fisher, 2007). Although an earlier study (Spataro et al., 2004) using a similar cohort found more individuals with schizophrenic disorders among CSA victims, this did not reach

significance possibly due to the smaller size of the sample and its relative youth. The present study, however, was able to demonstrate an association with a doubling of the odds. The increased rate of psychotic disorders is largely accounted for by schizophrenic disorders among female victims (Cutajar et al., in press).

Relying on contact with public mental health services as a measure of psychopathology creates both a high threshold and a somewhat variable selection process. The absolute number of cases identified by this method is likely to be reliable only for the severe low prevalence psychotic disorders, almost all of whom will in Victoria have contact with public services at some point. All other disorders will be underrepresented to a greater or lesser extent since they receive general mental health care from general practitioners or private psychiatrists and psychologists, or seek more intensive treatment in a private psychiatric facility. This may account for the non-significant association between CSA and eating disorders. The odds ratios can however provide a reliable guide to the level of association between the CSA and later psychopathology. The confidence that this measure can command depends on the cases and controls having been subject to identical methods of ascertainment using a method independent of the primary variable CSA. This was the situation in the present study.

The use of a matched comparison sample from the general population is a real strength of this study; however, in doing so there was no way of excluding approximately 5% of cases among this group who may have experienced severe CSA involving penetration (Fergusson & Mullen, 1999). While this introduces a bias against finding differences between cases and controls, that significant differences were found strengthens such associations. This study was also limited to the extent of available information collected on cases and controls for purposes other than intended for this study. Pertinent information on potentially confounding covariates such as familial history of mental illness and social background factors therefore could not be taken into account and controlled for. Furthermore, caution should be taken when interpreting results on sexual abuse variables, as not all cases had such information collected and recorded by forensic medical examiners. Finally, a major criticism of using documented cases of CSA who have attracted the official attention of police or child welfare agencies relates to the representativeness of the sample. The distribution of demographic variables of the CSA cohort used in this study is remarkably consistent with the wider literature (see Fergusson & Mullen, 1999), and therefore, arguable that the present sample may be representative of the sexually abused population in the general community.

This study adds further support to a number of well accepted associations based on retrospective histories of CSA given later in life. The affective disorders made up predominately of major depression were found twice as often as expected, which falls at the lower level of reported ratios (Dinwiddie et al., 2000; Fergusson et al., 1996; Fergusson & Mullen, 1999; Mullen, Martin, Anderson, Romans, & Herbison, 1993; Silverman et al., 1996). When, however, male and female victims were examined separately the significant relationship between CSA and being diagnosed with an affective disorder was found only for female victims. This could be explained by a true gender difference in response to abuse, or by a greater tendency of females to express their distress in terms of recognizable depression by clinicians. Anxiety disorders also at twice the expected level are similar to that previously reported (Fergusson & Mullen, 1999). Rates of drug and alcohol abuse were higher than might have been expected from the literature (Dinwiddie et al., 2000; Fergusson et al., 1996; Fergusson & Mullen, 1999; Kendler et al., 2000; Molnar et al., 2001b; Nelson et al., 2002; Widom, Marmorstein, & White, 2006). The relatively high level of ascertainment of drug and alcohol abuse reflects the methodology used in the present study which included both those with a primary and comorbid diagnoses. The rates largely reflect therefore the chances of those in the CSA cohort having mental disorders complicated by coexisting substance abuse. A linking which confirms a widely held clinical view that those with histories of serious sexual abuse in childhood not only have higher rates of disorders such as depression, but are more prone to have multiple problems (Katerndahl, Burge, & Kellogg, 2005; Owens & Chard, 2003) including substance abuse.

The study provides strong confirmatory evidence for CSA being a risk factor for developing severe personality disorders. Borderline personality disorder was found seven times more often among female victims, confirming the purported association found in previous studies (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; van der Kolk, Hostetler, Herron, & Fisler, 1994). Male victims did not show an excess of borderline diagnosis but instead acquired the label of antisocial personality disorder significantly more often. This difference may reflect the observation of males tendency to externalize their distress (Romano & De Luca, 2001; Spataro, Moss, & Wells, 2001; Watkins & Bentovim, 1992), or perhaps the diagnostic prejudices of mental health professionals.

This study did not support the commonly held view that traumatization in the early developmental stages leads to psychiatric disability of a more severe or pervasive nature (Cicchetti, 1989; Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005; Wolfe, 1987). While victims who received a clinical diagnosis during childhood were younger at abuse, overall, victims who had psychiatric contact were abused at an older age than their non-disordered counterparts. Younger age at abuse would allow for greater time for a disorder to develop during the brief period of childhood. Our findings, therefore, generally supports studies that report greater dysfunction in those abused during adolescent years (Adams-Tucker, 1982; Sedney & Brooks, 1984; Sirls, Smith, & Kusama, 1989; Thornberry, Ireland, & Smith, 2001). Accordingly, older victims, especially those undergoing sexual development, will have greater awareness of the gross violations of sexual boundaries. Subsequent distorted cognitive appraisals and maladaptive affective and behavioral coping strategies may mediate a negative trajectory (Bal, Van Oost, De Bourdeaudhuij, & Crombez, 2003; Finkelhor, 1995; Noll, 2008). Moreover, puberty is characterized by a host of hormonal changes that affects neurodevelopment (Patton & Viner, 2007). The combination of abnormal neurodevelopmental processes and psychological factors may explain why children sexually abused at an older age are at a greater risk for poor mental health in the long-term.

Severe sexual abuse involving penetration or more than one offender was found to contribute to poor mental health outcomes after controlling for age and gender. Specifically, while being victimized by multiple offenders was most strongly

associated with the victim having contact with public mental health services and receiving a clinical diagnosis, penetrative abuse was associated with a shorter time period between exposure to CSA and contact with mental health services and receiving a clinical diagnosis. This adds further support to the dose–response effect (Andrews et al., 2004; Fergusson et al., 2008; Fergusson & Mullen, 1999). However, consistent with Ruggiero, McLeer, and Dixon's (2000) study on children whose sexual abuse was substantiated, other abuse variables were not found to be of great predictive utility for subsequent psychopathology.

The children who were the subjects of this study were all recognized as having been sexually abused at or about the time of the victimization. The victims in this cohort were mostly abused at a time when support and treatment services were available to a minority. The contact with public mental health services precipitated by the abuse coming to light could have contributed to more victims receiving a diagnosis during childhood, particularly posttraumatic stress disorder. This would not, however, explain the huge differences observed among diagnoses made in adulthood between the CSA and non-CSA groups.

These findings have a number of clinical implications for the assessment and treatment of psychopathology on those known to have been a victim of CSA. In particular, CSA increases the risk for the majority of clinical and personality disorders. Assessments that focus on the commonly accepted disorders associated to CSA, such as depression and PTSD, may not consider and identify other treatment needs, particularly for low prevalence disorders like psychosis. Similarly, findings from the present research have also identified substantial risks among CSA victims for other low base rate events like fatal self-harm (Cutajar et al., 2010). Accordingly, a comprehensive assessment for a range of both high and low prevalence clinical disorders and their correlates in those who have been exposed to CSA is needed to develop appropriately tailored treatment interventions. Conversely, this study underscores the importance of a thorough developmental history to establish the possibility of CSA in those receiving psychiatric or psychological treatment, irrespective of their presenting psychopathology. Now that clear conclusions on the increased risks CSA poses for a range of psychiatric disorders in both childhood and adulthood has been established, research must advance to identify vulnerability and resiliency factors that mediate these adverse relationships.

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