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Review of meta-analyses on the association between child sexual abuse and adult mental health
difficulties: A systematic approach

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Review of meta-analyses on the association between child sexual abuse and adult mental health
difficulties: A systematic approach

Abstract

This review evaluates the quality of recent meta-analyses on child sexual abuse and adult psychopathology. Using systematic review methods, seven recently published, English-language meta-analyses met the inclusion criteria of assessing outcome of child sexual abuse. Some methodological weaknesses were identified, such as failure to assess the validity of the primary studies. Child sexual abuse was found to be a non-specific risk factor in the development of adult mental health difficulties, but the effect sizes varied (partly related to sample type and size). No gender difference was consistently found on adult mental health difficulties, but was for victims' perceived mental health consequence. Future meta-analyses need to consider their methods of assessing primary studies to allow for an evidence-based model of adult psychopathology.

Key words: child sexual abuse, adult psychopathology, adult mental health difficulties, moderating variables, mediating variables, review

Key points of the research review

- Extensive research on the link between child sexual abuse (CSA) and adult mental health (AMH).
 - These studies propose that experiences of CSA increase vulnerability to develop mental health difficulties in adulthood.
 - There is uncertainty about whether the association between CSA and AMH is influenced by other factors, such as abuse characteristics, gender and family functioning.
 - Meta-analyses, when properly conducted, may provide an indication of the extent of long-term consequences following CSA through summarizing available evidence.
 - Given the fact that meta-analysis depends greatly on the nature and the quality of the primary studies, a critical review appraising how reliable the evidence-base of existing meta-analyses is needed.
 - Critically appraising the methodological quality of existing meta-analyses, highlighting strengths and weaknesses, can guide and inform future research.
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Extensive literature has shown that childhood experiences of sexual abuse appear to increase an individual's vulnerability to a range of physical, psychological and behavioral impairments (Beitchman et al., 1992; Gladstone et al., 2004; Kendall-Tackett, Williams, & Finkelhor, 1993; Lang, Stein, Kennedy, & Foy, 2004; Spataro, Mullen, Burgess, Wells, & Moss, 2004). For example, childhood sexual abuse (CSA) is a key risk factor in the development of psychiatric disorders in adulthood (Read, 1997; Wurr & Partridge, 1996). However, the same type of violence may have different consequences for different people and research has also considered factors which may influence this outcome.

In terms of identifying abuse characteristics associated with long-term outcome, research has shown the abusive experience may be particularly traumatic when it is perpetrated by the very people whom children expect to help and protect them against frightening and damaging situations (Trickett, Noll, Reiffman, & Putnam, 2001). Other characteristics that may increase the risk for severe forms of adult psychopathology are the child's age, severity of the abuse, number of perpetrator(s), frequency and duration (Browne & Finkelhor, 1986; Hamilton & Browne, 1998; Higgins & McCabe, 2001; Putnam, 2003). Although existing narrative reviews sometimes differ in their conclusions and methodologies, there is consensus that sexually abused children with more adverse adult outcomes commonly had a closer relationship to the perpetrator(s), were abused for a longer period, and endured force or violence (Putnam, 2003; Trickett et al., 2001; Tyler, 2002).

However, the role of other factors still requiring clarification includes gender and family functioning. For example, despite gender difference in the dynamics of exposure to sexual abuse, many narrative reviews have concluded that a similar number of adult male victims of childhood sexual abuse in comparison to adult female victims were at increased risk of developing adult psychopathology and the way in which they respond to traumatic experience have been shown to be relatively similar (Kendall-Tackett et al., 1993; Romano & De Luca, 2001), whereas others state that male victims suffer more severe outcomes compared to female victims (Putnam, 2003; Ullman, 2003).

Incestuous families are characterized by dysfunctional family relations (Mullen, Martin, Anderson, Romans, & Herbison, 1994), yet in cases where the non-abusive caregiver provides emotional support following the child's disclosure of incest there is an ameliorating effect on mental health outcome (Hazzard, Celano, Gould, Lawry & Webb, 1995; Hecht & Hansen, 2001; Putnam, 2003). Furthermore, the presence of family dysfunction and/or lack of emotional support may put a child at risk of experiencing extrafamilial abuse or revictimization (Messman-Moore & Brown, 2004). However, the role of family functioning in non-familial abuse remains open to question (Hecht & Hansen, 2001).

In recent years there has been an increasing demand for evidence based research, which has resulted in a larger number of systematic reviews and meta-analyses being carried out (DeCoster, 2004; Lam & Kennedy, 2005). However, they may vary greatly in quality. For example, meta-analysis depends considerably on the nature and the quality of the included studies. Therefore, a common criticism of meta-analyses among researchers has been that they combine results from a variety of primary studies, in particular if the primary studies are clinically diverse (Deeks, Higgins & Altman, 2005; Cortina, 2003). If primary studies differ substantially from each other it may obscure the results. Recent research has therefore focused on determining the causes of heterogeneity through sub-group analyses or meta-regressions. However, this process may be problematic given that there are often many characteristics that vary across primary studies (Deeks, Higgins & Altman, 2005). As poor evidence-based meta-analyses may be interpreted as having credibility, a critical review of meta-analyses on the links between CSA and adult pathology is warranted to appraise the quality of existing meta-analyses. Therefore, this review aims to outline methodological strengths and weaknesses in existing research and draw recommendations for future research. Specifically:

- To what extent is child sexual abuse linked to increased risk for adult mental health difficulties?
- Can the association between childhood sexual abuse and adult mental health difficulties be explained by other factors, such as gender, family functioning, abuse and study characteristics?
- How reliable is the evidence base of existing meta-analyses?

Method

Search Strategy

Online databases, reference lists and government sites were systematically searched using terms related to the following: child sexual abuse (*child maltreatment, child abuse, incest, etc.*), adult psychopathology (*disorder, mental health difficulties, pathology, etc.*), and study type (*systematic reviews, meta-analysis*). The search terms associating CSA and adult mental health (AMH) difficulties were used in different combinations and truncated where appropriate. The following electronic sources and databases were searched: The Campbell Collaboration (no parameter for time period); The Centre for Reviews and Dissemination (no parameter for time period); The Cochrane Library (no parameter for time period); CINHL (1985 – 2009); Cambridge Scientific Abstracts (1985 – 2009): Applied Social Science Index and Abstracts ((1985 – 2009); ERIC (1985 – 2009); Social Services Abstracts (1985 – 2009); Sociological Abstracts (1985 – 2009); Embase (1985 – 2009); Medline Index (1985 – 2009); Medline Non-Index (1985 – 2009); Science Direct (1985 – 2009); Social Service Information Gateway (1985 – 2009); Swetswise (1985 – 2009); PsycINFO (1985 – 2009); Zetoc (no parameter for time period) and Web of Science (1985 – 2009). In order to evaluate recent developments, only reviews conducted since 1985 were used. Furthermore, the search was restricted to English-language publications. Consequently, relevant reviews may have been missed.

Inclusion/exclusion criteria

Two reviewers independently applied the following criteria to identify appropriate reviews:

Population: Adults (≥ 18 years) with a history of child sexual abuse before the age of 18 years and those without such a history. Child sexual abuse was defined as an act in which the child/ren are used to provide sexual gratification for the perpetrator/s including inappropriate sexual touching, invitations and/or exhibitionism, inappropriate non-penetrative sexual interaction (digital penetration, fondling, and/or masturbation),

attempted or actual anal and/or vaginal penetration, incest, coerced or forced penetration.

Perpetrators may have been familial or non-familial.

Outcome: Adult pathology was defined in accordance to the diagnostic and statistical manual of mental disorders [DSM-IV-TR] (American Psychiatric Association, 2000) or the international classification of diseases and health related problems [ICD-10] (World Health Organization, 2004).

Study type: Systematic reviews and meta-analyses

Quality Assessment

Two reviewers independently assessed each paper by applying internal validity criteria (89.8 % agreement); three meta-analyses were also assessed by a third reviewer (90.5 % agreement between the three reviewers). Any disagreements between reviewers were resolved by consensus. A checklist addressing the 14 key elements of meta-analysis that are most important for internal validity was established prior to the review, by adapting other assessments and/or guidelines for meta-analyses (Oxman, Cook & Guyatt, 1994; Delgado-Rodrigues, 2006; Higgins & Green, 2005; Stroup et al., 2000; West et al., 2002). Table 1 provides details of the variables considered and the outcome for each meta-analysis. Key validity variables assessed were: clarity of aim, search strategy, selection of primary studies, study quality assessment, use of blinded reviewers, clarity of definition of child sexual clarity of outcome measure, clarity and precision of results, investigation of heterogeneity, discussion of results and recommendation firmly based on findings. For example, when scoring 'search', the following issues were taken into account: bibliographic databases searched, contact with author(s), search for unpublished and published research, search for non-English language. A three-point scoring system was applied to each of the 14 variables as follows: a) condition fully met = 2, b) condition partially met = 1; c) condition not met (including unclear / insufficient / missing information) = 0, giving a total score range 0-28. A high score indicated higher methodological quality, whereas low scores indicated lower methodological quality.

The seven meta-analyses used effect sizes as statistical measure to determine the extent to which CSA has an effect on AMH. Six of the meta-analyses used Persons r effect size whereas the remaining meta-analysis used Cohen's d (Neumann et al., 1996). Therefore, the average weight effect size d was

converted into r effect size to facilitate comparison between the meta-analyses (Rosenthal, Rosnow & Rubins, 1999).

Results

Description of meta-analyses selected

The initial electronic search showed 54 published systematic reviews and/or meta-analyses between 1985 and 2009. Of these 54 publications, the reviewers agreed that 48 did not meet the criteria because they focused on treatment outcome, processes surrounding early maltreatment or child populations instead of the long-term mental health outcomes of CSA and were subsequently excluded. Appropriate sources from the reference lists of these articles were also considered. One meta-analysis evaluating 38 primary studies was found to meet the criteria and subsequently added to the sample (Neumann, Housekamp, Polluck, & Briere, 1996). Thus, there were seven meta-analytical publications that fulfilled the inclusion criteria (Fossati, Madeddu, & Maffei, 1999; Jumper, 1995; Neumann et al., 1996; Paolucci, Genuis, & Violato, 2001; Rind & Tromovitch, 1997; Rind, Tromovitch, & Bauserman, 1998; Smolak & Murnen, 2002). Of these meta-analyses, three of the four that included both short- and long-term mental health outcomes as sequelae of child sexual abuse (Fossati et al., 1999; Paolucci et al., 2001; Rind & Tromovitch, 1997), did not separate the effect sizes on mental health outcomes in childhood from adulthood. Nonetheless, they were included in this review because the majority of studies within their reviews used adult samples and they provided information about similarities/differences in effect sizes and study quality between meta-analyses focusing on short- and/or long-term mental health consequences of CSA.

Within the seven identified meta-analyses, 248 published and unpublished papers were included. Of these, 34 papers were used more than once and overlapped 72 times with each other. The most notable overlap was between Jumper (1995) and Neumann et al. (1996) where 17 of the same primary studies were reviewed. Overall, the seven meta-analyses looked at 41 adult mental health difficulties (e.g., dissociation, borderline personality disorder, depression, etc.), categorized into 25 different symptoms or disorders in accordance with DSM-IV-TR (APA, 2000) or ICD-10 (WHO, 1990) criteria. Of the 25 symptoms or disorders, 40% ($n=10$) were examined in more than one review (Jumper, 1995; Neumann et al., 1996; Paolucci et al., 2001; Rind & Tromovitch, 1997; Rind et al., 1998; Smolak & Murnen, 2002), but the

remaining 15 symptoms or disorders were reviewed in only one of the meta-analyses (Fossati et al., 1999; Neumann et al., 1996; Paolucci et al., 2001; Rind et al., 1998).

Methodological quality

The mean methodological quality score was 15.28 ($SD=2.87$; range 11-19). Table 1 provides details of the variables considered and the quality score for each meta-analysis. As Table 1 shows, the seven meta-analyses were characterized by different methodological strengths and weaknesses. Strengths of the meta-analyses included clear inclusion criteria of primary studies selected and details concerning the searches that was undertaken to facilitate replication of search. Other strengths were that all meta-analyses adequately discussed their findings in the context of heterogeneity, limitations and confounding factors. However, a methodological concern was that none of the meta-analyses used any form of quality assessment of the primary studies or blinded reviewers (see Table 1). Other methodological concerns were that most of the meta-analyses failed to provide clear and sufficient information to determine if it was appropriate to combine the data from primary studies using different CSA definitions or outcome measures.

Adult mental health difficulties

Findings in all of the meta-analyses suggested that individuals who have been sexually abused as a child are at an increased risk of developing a variety of mental health difficulties in adult life compared to non-abused individuals (Table 2), but the effect sizes were mixed (Table 3). The discrepancies found in effect size were not related to study quality. However, there appeared to be a trend for those including clinical samples (e.g., Fossati et al., 1999; Jumper, 1995; Neumann et al., 1996) to demonstrate slightly higher effect sizes compared to those with community populations, such as national (Rind & Tromovitch, 1997) or student samples (Rind et al., 1998). Overall, Rind et al. (1998) reported the smallest magnitude of effect for self-esteem impairments ($r=.04$; $CI=.01-.07$) whereas Fossati et al. (1999) demonstrated the largest for borderline personality disorder ($r=.27$; $CI=.20-.32$).

In terms of study variation in overall estimate of effect sizes, six meta-analyses reported significant heterogeneity (Fossati et al., 1999; Jumper, 1995; Neumann et al., 1996; Rind & Tromovitch, 1997; Rind et al., 1998; Smolak & Murnen, 2002), although three removed outliers through sensitivity analysis to gain homogeneity (Neumann et al., 1996; Rind & Tromovitch, 1997; Rind et al., 1998). In contrast, one

meta-analysis looking at gender differences reported a homogenous sample for women but not for men (Rind & Tromovitch, 1997). The remaining meta-analysis did not test for homogeneity (Paolucci et al., 2001). Primary studies included in meta-analyses were conducted in different sample populations using different methods and therefore heterogeneity in a meta-analysis is to be expected. However, statistical evidence of heterogeneity suggested that the variation in results across primary studies could not be explained by chance alone. As such, the sources of heterogeneity in terms of other factors associated with adult MH were explored.

Factors associated with adult mental health difficulties

All seven meta-analyses focused on factors that may moderate the relationship between CSA and AMH. In order to compare the differential effects, CSA correlates have been integrated into a framework based on four categories: a) study characteristics, b) characteristics of CSA, c) family functioning, and d) gender.

Study Characteristics: Five meta-analyses examined whether differences in primary studies' effect sizes were associated with study characteristics (Fossati et al., 1999; Jumper, 1995; Neumann et al., 1996; Rind et al., 1998; Smolak & Murnen, 2002). The most commonly examined characteristics were sample source (i.e. clinical, community or student samples), year of primary study publication, type of publication (i.e. published or unpublished), method of assessment (i.e. face-to-face interviews or questionnaires) and sample size. Other characteristics investigated were definition of CSA, classification of outcome, diagnostic criteria, main focus of study (e.g., CSA and/or AMH), patients' characteristics, study site, type of statistics used and sampling strategy. However, most of the study characteristics were found to have no significant impact on the association between CSA and adult MH difficulties. Only sample size and sample source were consistently found to moderate the relationship between CSA and adult MH difficulties, with larger sample size and clinical samples showing greater effect sizes. Nevertheless, those that demonstrated significant between-group heterogeneity also demonstrated considerable within-group variability (Jumper, 1995; Smolak & Murnen, 2002), did not report within-group statistics (Neumann et al., 1996) or scored at the lower end of the quality scores (Fossati et al., 1999). Consequently, the moderating properties of sample size and source must be taken with caution.

Characteristics of child sexual abuse: Four meta-analyses considered patterns of CSA, such as age of the victim at onset of the abuse, type of sexual abuse, use of force, frequency, severity, length of abuse and number to perpetrators (Fossati et al., 1999; Neumann et al., 1996; Paolucci et al., 2001; Rind et al., 1998), but generally did not investigate their moderating properties. Only the relationship to perpetrator(s) was consistently examined across the four meta-analyses (Fossati et al., 1999; Neumann et al., 1996; Paolucci et al., 2001; Rind et al., 1998). There were mixed results without any relationship to quality. Two of the non-supporting meta-analyses scored at the higher end of the quality scores (Neumann et al., 1996; Paolucci et al., 2001), whereas another higher quality meta-analysis demonstrated a significant moderating effect with intrafamilial CSA increasing the risk for AMH difficulties (Rind et al., 1998).

Family functioning: Only one meta-analysis (of higher quality) evaluated the role of family functioning (Rind et al., 1998). Examining the mean correlation of a subset of included studies, Rind et al. (1998) found that family environment was confounded with CSA ($r=.13$). Rind et al. (1998) further reported that family environment ($r=.29$) was a better predictor of adult MH difficulties than was CSA ($r=.09$). Given the significant within-group heterogeneity reported on the link between family dysfunction and various AMH difficulties, however, this finding must be taken with caution.

Gender: Four of the meta-analyses compared gender in relation to CSA and AMH difficulties, with mixed findings not related to level of methodological quality (Fossati et al., 1999; Jumper, 1995; Rind et al., 1998; Rind & Tromovitch, 1997). All of these meta-analyses found similar levels of AMH difficulties in men and women who were sexually abused as a child (Fossati et al., 1999; Jumper, 1995; Rind & Tromovitch, 1997; Rind et al., 1998). Two showed homogenous within-group statistics (Rind & Tromovitch, 1997; Rind et al., 1998), whereas the remaining two demonstrated heterogeneity (Jumper, 1995) or lack of within-group statistics (Fossati et al., 1999). Contrary to these findings, however, a gender difference existed on how victims' perceived themselves to have been affected, with female victims of CSA perceiving themselves to have suffered greater psychological harm from these experiences than male victims (Rind & Tromovitch, 1997; Rind et al., 1998). Notably, however, the work by Rind and colleagues includes categorization of 'level-of-consent', stating that for some children the abuse was 'consensual', defining 'all types of consent' as including both 'willing' and 'unwanted'

CSA, whereas their ‘unwanted CSA’ group consisted of those with ‘unwanted’ experiences only. These two meta-analyses purported to show that level of ‘consent’ had a mediating effect on male victims of CSA (Rind & Tromovitch, 1997; Rind et al., 1998). It was proposed that male victims’ psychological adjustment is significantly influenced by their perceived level of ‘consent’, where female victims were not. However, both male and female victims who perceived their experience of CSA as unwanted suffered from similar levels of psychological impairment. These definitions are highly controversial and lack both internal validity and empirical support in the primary studies included.

Discussion

1. To what extent is child sexual abuse linked to increased risk for adult mental health difficulties?

This review found a consistent pattern across all seven meta-analyses of CSA as a non-specific risk factor that puts a child at greater vulnerability for the development of various types of psychopathology in adulthood with effect sizes ranging from .04 to .25 (small to moderate). This finding is consistent with previous narrative reviews (Bonanno, Noll, Putnam, O’Neill, & Trickett, 2003; Gladstone et al., 2004; Lang et al., 2004; Nickel et al., 2004; Putnam, 2003; Romano & De Luca, 2001). However, as six of the meta-analyses found evidence to suggest heterogeneity, this finding indicates that there are other factors influencing the relationship between CSA and AMH difficulties. Therefore, all of the meta-analyses examined different types of study and abuse characteristics in an attempt to explain the variability in effect sizes; however, few characteristics were consistently used across the meta-analyses.

2. Role of other factors in the association between CSA and AMH difficulties

Contrary to previous literature, there was no credible and consistent evidence that study and/or abuse characteristics influence the association. However, trends in effect sizes were found for sample size and sample sources with larger and clinical samples being associated with larger effect sizes. However, the analysis of potential moderators across meta-analyses was limited in several ways. Firstly, the threshold criteria of included studies and categorization of moderating variables needed to be more clear and concise. For example, the non-significant impact by relationship to perpetrator found in Neumann et al.’s (1996) meta-analysis may have been due to categorization of intrafamilial perpetrator in one group and mixed intra and extrafamilial perpetrators in the other group. Secondly, the meta-analyses might have failed to reject homogeneity, in particular for abuse characteristics, because the analysis consisted of a

small number of effect sizes, even when there was considerable variance among the effect sizes (Lipsey & Wilson, 2001; Song, Sheldon, Sutton, Abrams, & Jones, 2001). On the other hand, the reported significant heterogeneity may have been due to publication bias and type I error. For example, Fossati et al. (1999) evaluated the fail-safe number in their meta-analysis that estimates the number of studies reporting non-significant result that would be needed to overturn the significant effect of abuse moderators obtained in their meta-analysis. The authors concluded that there was a risk of type I error and subsequently recommended their results to only be considered as provisional. In addition, Rind et al., (1998) found a tendency towards publication bias. Therefore, due to methodological limitations found across reviewed meta-analyses, the impact of study and abuse characteristics still remains an open question.

In terms of the role of family functioning, only one meta-analysis looked at the moderating impact of growing up in a dysfunctional environment on the association between CSA and AMH. Rind et al. (1998) suggested that family environment predicted AMH difficulties better than CSA. However, this must be considered in light of the significant within-group heterogeneity for family dysfunction. Thus, it is important that future meta-analyses include family functioning in their statistical analysis to further evaluate its role on the relationship between CSA and AMH.

The evidence suggests that there is no gender difference between victims' assessed level of AMH difficulties but that a significant gender difference does exist for self-reports of perceived psychological impairment as a sequelae of CSA (Rind & Tromovitch, 1997; Rind et al., 1998). These findings indicate that although the adult victims score within the clinical range of AMH difficulties, they may not perceive themselves to have been psychologically harmed from the traumatic experiences. Future research should investigate the congruence between assessed reports of mental ill-health and perceived psychological impairment following CSA in order to further examine potential gender differences.

In terms of the moderating properties of *assumed* 'level of consent', Rind et al.'s (1998) meta-analysis is highly controversial and has received major criticism. Similar criticism can be made of the earlier meta-analysis by Rind and Tromovitch (1997). In both of the meta-analytical reviews, the authors' description of information regarding conceptualization of child sexual abuse events, in which the victim was considered 'willing', was poor and lacks internal validity as adult victims who reported giving their

'consent' to be sexually abused in childhood were never measured in the primary studies included (Dallam et al., 2001; Dallam, 2002; Ondersma, Chaffin & Berliner, 1999; Ondersma et al., 2001).

3. How reliable is the evidence base of existing meta-analyses?

The seven meta-analyses were characterized by different methodological issues. First, none described any form of quality assessment of the primary studies, thereby making it difficult to assess the reliability of the findings. If bias was present in all or some of the included primary studies, meta-analysis would aggregate the inaccuracies and produce an erroneous result (Higgins & Green, 2005). Second, the results may have been obscured in those meta-analyses that combined short- and long-term outcome (Fossati et al., 1999; Paolucci et al., 2001; Rind & Tromovitch, 1997). However, the one meta-analysis that did report separate results demonstrated no difference between child and adult outcome (Smolak & Murnen, 2002) and similar effect sizes were reported in those that focused on AMH only (Jumper, 1995, Neumann et al., 1996, Rind et al., 1998). Nonetheless, this critical review recommends that future meta-analysis should differentiate between childhood and adulthood outcomes in order to control for potential age related symptomatology.

Third, the inclusion of primary studies using inappropriate control groups must be taken into consideration as it might affect the results in the meta-analyses (e.g., Fossati et al., 1999; Neumann et al., 1995). Fourth, all of the meta-analyses described and discussed different definitions of CSA and AMH difficulties, yet failed to address the issue of performing meta-analyses on primary studies that differed substantially from each other in terms of definitions and/or outcome measures. Finally, the methodological issue of lack of reported within-class variability or significant within-group heterogeneity needs to be addressed. A proposed solution would be to explore which of the effect sizes are outliers and whether the removal of those outliers would lead to within-class homogeneity.

Methodological limitations of this review

Although a number of systematic reviews and/or meta-analyses were retrieved according to the search criteria outlined in the method- and results section, the majority of reviews did not meet the inclusion criteria. In addition, the literature search conducted for the purpose of this review was restricted to post-1985; however, the fact that the earliest meta-analysis identified was 1995 suggests that this time restriction did not affect the results of this review. Third, the quality assessment was developed on the

basis of other assessments and/or guidelines for meta-analyses and subsequently the validation may be criticized. However, the inter-rater reliability was acceptably high between the three independent reviewers. A fourth possible limitation is that insufficient reporting might have influenced the methodological quality assessment. However, the assessment was designed to assess key variables concerning internal validity of meta-analyses likely to be reported in the reviews. Therefore the likelihood of poor reporting significantly influencing the overall quality score is considered low. All of the meta-analyses overlapped to a different degree in terms of reviewed studies as described in the method section. However, there were only two of them with such an overlap to create concerns, namely Jumper (1995) and Neumann et al. (1996) which had an overlap of 17 studies. This considerably large overlap may adequately explain the different patterns found in the impact of study populations. Neumann et al. (1996) found that the effect size differed in magnitude for non-clinical compared to clinical samples, whereas the result of Jumper's meta-analysis (1995) demonstrated a similar effect size. While the former only separated the sample into clinical- and non-clinical, Jumper (1995) divided the sample as clinical, non-clinical and student. Nonetheless, the combination of student with non-clinical samples may explain the larger distinction of effect sizes between these populations.

Implications for practice and future research

Although not all adults who have been sexually abused in their childhood are in need of services, this review found consistent and considerable evidence that adults with a history of CSA exhibit a range of long-term mental health difficulties with a variety of severity, from symptoms of traumatic stress to post-traumatic stress disorder, thus corroborating with prior research (Gladstone et al., 2004; Lang et al., 2004; Nickel et al., 2004; Putnam, 2003). This highlights the importance of early intervention that should be revisited when signs of developmentally salient concerns and symptoms of mental ill-health arise and chronic psychopathology begins to manifest and the need to provide better screening and earlier identification of symptoms of chronic mental ill-health. Factors suggested influencing the relationship between CSA and AMH were sample source, sample size, relationship to perpetrator/s, gender and family functioning. These findings highlight the importance of a detailed mental health evaluation and assessment of each case. Future research should consider how other environmental factors contribute to

differences in outcome. Identifying characteristics associated with long-term consequences may have implications for intervention efforts, not to mention improving the life of that victim and his/her family.

The present findings have implications for the direction of future meta-analyses on the link between CSA and AMH difficulties, but also for meta-analyses conducted on child maltreatment in general. The literature search for this review sought to include systematic reviews and/or meta-analyses on the effect of all types of child maltreatment on adult mental health difficulties. Notably, the search did not reveal any systematic reviews that met the inclusion criteria. Given that recent research has suggested that the experience of multi-type maltreatment in childhood appears to increase the risk for severe forms of pathology in adulthood (Higgins & McCabe, 2000, 2001) and that victims of early maltreatment are likely to be subjected to more than one type of maltreatment (Higgins & McCabe, 1998, 2000; Mancini, van Amerigen & MacMillian, 1995), systematic reviews and/or meta-analyses on the effects of various forms of child maltreatment on mental health outcomes in adulthood are warranted. A more precise understanding of the consequences of different types of maltreatment and co-occurring maltreatment would contribute to a better understanding of long-term mental health difficulties.

Additionally, it is important for future meta-analyses to assess the accuracy of the reported effect sizes of underlying studies through a quality assessment as data from poorly conducted primary studies may contaminate and skew the findings of the meta-analysis (Field, 2001). Assessment about internal validity would decrease the risk of so-called ‘garbage in, garbage out’ (Czieskowski, 2003).

In conclusion, theoretical models of the effect of child sexual abuse and the contribution of moderating and mediating factors to long-term outcomes have become more sophisticated and multi-faceted over the last decade. However, there is a need to ensure that methodological quality of meta-analyses increases and reaches the similar evidence-based standard. Therefore, future meta-analyses need to address the issue of primary study quality. As such, this would allow a comprehensive evidence-based model of adult psychopathology as an outcome of early maltreatment which in turn may be beneficial for intervention.

- Understanding the complex interplay between CSA and other risk factors known to relate to adult mental ill-health that would increase the chances of identifying groups of adults who may be vulnerable to mental health difficulties and consequently inform treatment practices.
 - Individual differences in the family and environmental context, nature and manifestation of their mental health difficulties following CSA and consequently treatment needs highlight the importance of a detailed mental health evaluation and assessment of each case.
 - Prospective, longitudinal studies are needed to capture the practices of mental health services and the extent of recurrent mental health assistance amongst victims of childhood sexual abuse.
 - Systematic reviews and/or meta-analyses on the effects of different forms of child maltreatment and environmental influences on mental health outcomes in adulthood are warranted.
 - Future meta-analyses need to include concise threshold criteria and some form of quality assessment to ensure sufficient validity of primary studies. An evidence-based approach would give an adequate perspective of the extent to which people are in need of gaining access to different mental health services and subsequently aid intervention efforts.
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Table 1: Key methodological quality factors identified

Quality factors	Fossati et al. (1999)	Jumper (1995)	Neumann et al. (1996)	Paolucci et al. (2001)	Rind & Tromovitch (1997)	Rind et al. (1998)	Smolak & Murnen (2002)
Clear aim	1	2	2	1	2	2	1
Extensive and sufficient search	0	1	0	1	1	2	1
Relevant studies included	2	2	2	2	2	2	2
Quality assessed	0	0	0	0	0	0	0
Blinded reviewers	0	0	0	0	0	0	0
Evaluated validity child sexual abuse definition	1	2	1	2	2	2	1
Comparable definition of child sexual abuse	0	0	0	2	0	1	0
Evaluated validity of outcome measures	1	1	1	2	0	1	1
Comparable outcome measures	0	0	1	1	1	1	1
Heterogeneity investigated	1	2	2	1	0	2	2
Clear results	1	2	1	2	1	1	1
Precise result	1	1	2	1	1	1	0
Important results discussed	2	2	2	2	2	2	2
Recommendation firmly based on findings	1	2	1	2	1	1	2
Quality score (maximum score 28)	11	17	15	19	13	18	14

Note: 2 = condition fully met; 1 = condition partially met; 0 = condition not met (unclear/insufficient/missing information)

Table 2: Outline of seven meta-analyses on the effects of child sexual abuse (CSA)

Author(s)	Details (specific outcome variables listed in table 3)	Main Findings	Investigation of heterogeneity.	Score ^a
Paolucci et al. (2001) Canada	37 published studies, 88 samples (1976-1996; 3 databases); Clinical and/or non-clinical samples; Children, adolescents & adults with a history of CSA vs. adults with no history; Short and long-term effects of child sexual abuse	Small to moderate effect size on all six dependent measurements, ranging from .16 (CI=.11-.21) for victim-perpetrator cycle to .44 for both depression (CI=.41-.47) and suicide (CI=.40-48).	No significant mediation effect for gender, SES, type of abuse, age of onset, frequency or relationship to perpetrator	19/28
Rind et al., (1998) USA	23 unpublished and 36 published papers (1966-1995; 5 databases); Student samples; College students with a history of CSA vs. no history; Psychological adjustment (e.g., alcohol difficulties, anxiety, depression)	Small effect size on adult psychological adjustment ($r = .09$; CI= .08). Range from .04 (CI=.10-.07) for self-esteem to .13 (CI=.10-.15) for anxiety. Outliers were removed to gain homogeneity.	No significant effect for: method of assessment, type of institution, sampling strategy, age at assessment, definition of CSA, published study or not. Issues with within-group heterogeneity (e.g., symptom level; family environment). Female victims perceived themselves to suffer more adjustment problems than male victims. Mixed findings for males related to controversial 'level of consent' (not measured in the primary studies).	18/28
Jumper (1995) USA	26 published studies including 30 samples (no search dates; 4 databases); Mixed samples (e.g. clinical, non-clinical and/or student samples); Adults with a history of CSA vs. adults without a history of CSA; Psychological adjustment (e.g. psychological symptoms, depression, self-esteem)	Small to moderate effect on adult psychological impairment in terms of psychological symptoms ($r = .27$; $z=43.44$; $p<.001$), depression ($r=.22$; $z=27.61$; $p<.001$) and self-esteem ($r=.17$; $z=20.02$; $p<.001$). Significant heterogeneity in these effect sizes.	Less psychological impairment and depression in student samples than all other samples. Definition and publication year also demonstrated a significant moderating effect. However, significant heterogeneity for all of the sub-group analyses raises reliability issues. No gender difference was found for level of psychological symptomatology and psychiatric illnesses.	17/28

Neumann et al., (1996) USA	43 published papers (domain meta-analyses) & 38 papers (psychological symptomatology meta-analyses) (1974-1992; 1 database); Mixed samples (clinical-and/or non-clinical); Adult women with a history of contact CSA vs. adults with non-contact CSA, CPA or no history; Mental health difficulties (affective, behavioral, identity/ relational, psychiatric and general symptoms	Small to medium effect size on a range of mental health difficulties in adulthood ($d=.36$; $r=.18$; $CI=.31-.40$). Significant heterogeneity in the effect size. In order to gain homogeneity, one study was removed from the original sample of primary studies.	No significant effect for: year and form of publication, sample size, statistics, method of assessment, age of onset and relation to perpetrator. Sample source was significant with greater psychological distress for women in clinical vs. non-clinical populations. However, the result of within-group variability was not stated.	15/28
Smolak & Murnen (2002) USA	53 studies (no search dates; 4 databases); Mixed samples (clinical and/or non-clinical samples); Adolescents and adults with a history of CSA vs. no history; Eating Disorders	Small association between CSA and eating disorders ($r=.10$, $p<.01$). The effect sizes were heterogeneous.	No effect of victim age. Sample source significant: clinical and non-clinical samples (small effect size), mixed sample (small-moderate effect). Narrower definitions had smaller associations. However, both sample source and definition was characterized by within-group heterogeneity.	14/28
Rind & Tromovitch (1997) USA	7 unpublished and published studies (no search dates; 4 databases); National general population samples; Mixed sample of children, adolescents and adults with CSA history vs. no history; Self-reported effects & psychological/ sexual adjustment	Female victims perceived themselves to suffer significantly more negative psychological outcomes than male victims. Effect size was homogeneous; small-medium ($r=.23$, $z=7.13$, $p=.001$).	No difference in gender on adult adjustment problems. The relationship between CSA and later adjustment influenced by level of 'consent' for both male and female victims compared to those without CSA history. However, questions about 'willing' CSA. Therefore, caution required.	13/28

Fossati et al., (1999) Italy	21 published studies (1980-1995; 2 databases); Mixed samples (clinical and/or non-clinical samples) - mainly clinical; Mixed sample of children, adolescents and adults (predominately adult females) with CSA history vs. none; Borderline Personality Disorder (BPD).	Moderate effect on Borderline Personality Disorder (BPD; $r=.28$; $CI=.24-.33$). The analysis showed significant heterogeneity in the effect size.	No effect: gender, age, assessment, patient characteristics, sample source, site of study. No publication bias. Regarding age at onset, largest effect sizes was for CSA aged 7-12 years, then 13-18 years, then 0-6 years. Genital fondling, penetration, duration and severity significant; frequency, force, fondling, oral sex, disclosure and help did not.	11/28
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Note. Maximum quality score = 28

^aHigh score indicate on a higher methodological quality, whereas a low score indicates lower methodological quality.

Table 3: Meta-analyses of 25 symptoms or disorders associated with child sexual abuse

Symptom	<i>k</i>	<i>r</i>
Alcohol problems ^a	8	.07
Anger ^b	8	.18
Anxiety ^{a b}	16; 11	.13 ; .20
Borderline Personality Disorder ^c	21	.28
Depression ^{a b d e}	22; 24; 20; 25;	.12 ; 20; .22 ; .22 ;
Dissociation ^{a b}	8; 5	.09 ; .19
Eating Disorders ^{a f}	10; 53	.06 ; .10
Hostility ^a	5	.11
Interpersonal sensitivity ^a	7	.10
Interpersonal problems ^b	10	.19
Obsessive-compulsive symptomatology ^{a b}	7; 7	.10 ; .17
Paranoia ^a	9	.11
Phobia ^a	5	.12
Post-traumatic stress disorder ^e	26	.20
Psychological adjustment problems ^{a b d g h}	14; 11; 23; 5; 5	.12 ; .22; .27 ; .07; .10
Psychotic symptoms ^a	10	.11
Self-esteem impairments ^{a b d}	16; 10; 12	.04 ; .16 ; .17
Self-mutilation ^b	3	.20
Sexual adjustment ^{a b}	20; 16	.09 ; .18
Sexual promiscuity ^e	14	.14
Social adjustment ^a	15	.07
Somatization ^{a b}	18; 9	.09 ; .17
Substance use ^b	14	.20
Suicidal ideation and behavior ^{a b e}	9; 10; 8	.09 ; .22 ; .17
Traumatic stress symptoms ^b	4	.25

Note. *k* = number of samples in each meta-analysis; *r* = Pearson's correlations coefficient for effect sizes. Persons's (1977) rule of thumb: *r*= 0.10 small effect, 0.30 medium effect, 0.50 large effect. Effect sizes reported by meta-analyses scoring above the mean for quality are in bold.

^a Rind et al., 1998 (number of samples and effect sizes after the removal of outliers)

^b Neumann et al., 1996

^c Fossati et al., 1999

^d Jumper, 1995

^e Paolucci et al., 2001

^f Smolak & Murnen, 2002

^g Rind & Tromovitch, 1997 (males)

^h Rind & Tromovitch, 1997 (females)