

Associations between depression and specific childhood experiences of abuse and neglect: a meta-analysis

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Abstract

Background: Research documents a strong relationship between childhood maltreatment and depression. However, only few studies have examined the specific effects of various types of childhood abuse/neglect on depression. This meta-analysis estimated the associations between depression and different types of childhood maltreatment (antipathy, neglect, physical abuse, sexual abuse, and psychological abuse) assessed with the same measure, the Childhood Experience of Care and Abuse (CECA) interview.

Method: A systematic search in scientific databases included use of CECA interview and strict clinical assessment for major depression as criteria. Our meta-analysis utilized Cohen's d and relied on a random-effects model.

Results: The literature search yielded 12 primary studies (reduced from 44), with a total of 4372 participants and 34 coefficients. Separate meta-analyses for each type of maltreatment revealed that psychological abuse and neglect were most strongly associated with the outcome of depression. Sexual abuse, although significant, was less strongly related. Furthermore, the effects of specific types of childhood maltreatment differed across adult and adolescent samples.

Limitations: Our strict criteria for selecting the primary studies resulted in a small numbers of available studies. It restricted the analyses for various potential moderators.

Conclusion: This meta-analysis addressed the differential effects of type of childhood maltreatment on major depression, partially explaining between-study variance. The findings clearly highlight the potential impact of the more "silent" types of childhood maltreatment (other than physical and sexual abuse) on the development of depression.

Key words: depression; CECA; abuse; neglect; maltreatment; meta-analysis

Introduction

The association between childhood adversity and the development of depression has been widely studied. Substantial evidence from both cross-sectional and prospective studies indicates that childhood abuse and neglect are strongly associated with the development of clinical depression in both adolescence and adulthood (Abela and Skitch, 2007; Bifulco et al., 1998; Gibb et al., 2001; MacMillan et al., 2001; Widom et al., 2007).

Most research has so far focused on physical and sexual abuse (Cutajar et al., 2010; Dube et al., 2005; Fergusson et al., 2008; Kendler et al., 2000; Molnar et al., 2001); whereas fewer studies have examined the effects of other types of abuse or neglect (Alloy et al., 2006; Bifulco et al., 2002; Chen et al., 2014; Liu et al., 2009; Musliner and Singer, 2014). Nonetheless, several authors have argued that emotional abuse in childhood, which typically includes experiences of being rejected, degraded, terrorized, isolated, or teased, might be more strongly related to internalizing symptoms and the development of depression than physical abuse or sexual abuse (Alloy et al., 2006; Gibb et al., 2003; Lumley and Harkness, 2007; Shapero et al., 2014).

Unfortunately, high levels of heterogeneity can be observed across the published studies, which limits the comparability of previous research. This could be due to the use of different sampling procedures and methods of assessment. Indeed, different measurement methods (self-reports, interviews, hospital records, and official records) have been used to investigate childhood maltreatment and, more importantly, many different definitions of childhood adversity have been applied (Nanni et al., 2012).

A recent meta-analysis has examined whether physical and sexual abuse in childhood were associated with depression and anxiety in later life (Lindert et al., 2014). Although the results of this analysis showed strong associations between sexual and physical abuse in childhood and depression, the measures used to assess both childhood abuse and depression varied greatly. Moreover, neither emotional abuse nor neglect were taken into account. Another recent meta-analysis showed that maltreated individuals were twice as likely as those without a history of

childhood maltreatment to develop both recurrent and persistent depressive episodes (Nanni et al., 2012). Again, the available data did not permit an examination of the specific contribution of different maltreatment subtypes.

Indeed, although research has consistently documented a strong and significant relationship between childhood maltreatment, in general, and depression, studies that have examined the relationship between specific forms of adversity and depression development are sparse. Currently, no review or meta-analysis has attempted to elucidate the association between a broad variety of specific childhood experiences of abuse and neglect and depression among the scientific publications in this field.

In contrast, current theories propose specific pathways from childhood adversities to psychopathology, and propose that distinct types of events may cause specific symptoms in individuals with specific vulnerabilities. For instance, the schema-based cognitive model of depression and anxiety states that the type of emotion experienced depends on the thought and belief content activated by life experiences (Beck, 2008). A recent study investigated three dimensions of depression and anxiety symptomatology (general distress, anhedonic depression and anxious arousal) and reported that only emotional neglect was associated with all the three symptom dimensions, whilst sexual abuse was associated with general distress and anxious arousal, and physical abuse with anxious arousal only (van Veen et al., 2013). Likewise, attachment theory (Bowlby, 1982) postulates that caregiving figures are fundamental for the development of the child's representational or internal working models of the world. Thus, experiences of early emotional abuse may be particularly maladaptive because negative evaluation is supplied directly by the primary attachment figures, which may be more potent in activating a more negative model of the self and the others (Shapiro et al., 2014).

Ultimately, we propose that different types of childhood adversities, with a particular emphasis on psychological types of maltreatment, may influence the development of distinct etiological pathways in depression that would benefit from individually tailored interventions.

This is supported by recent findings suggesting that different types of caregiver-child interactions were related to different emotion regulation pathways associated with depression (O'Mahen et al., 2015). For example, in the study by O'Mahen and colleagues (2015), childhood emotional neglect and childhood emotional abuse were associated with the emotion regulation strategies that were most strongly related to depression (rumination and behavioural avoidance). Further clarification of the specific role of psychological maltreatment may help inform parents, teachers, health care workers and the general public in recognising such maltreatment, but also the likely detrimental impact on the developing child. This may help to overcome the underestimation of the impact of emotional abuse/neglect, leading to better recognition and more adequate interventions to prevent long-term disorders (Schimmenti and Bifulco, 2015).

Thus, the present meta-analysis aimed to estimate the specific association between depression (recurrent or persistent) and different types of childhood maltreatment (antipathy, neglect, physical abuse, sexual abuse, and psychological abuse) assessed with the same measure. Specifically, we chose the *Childhood Experience of Care and Abuse* interview (CECA) (Bifulco et al., 1994), a measure with a 20-year standing and considered the 'gold standard' in this area of international research (Thabrew et al., 2012).

According to findings from the literature, forms of maltreatment centering on themes of parents' rejection, and their perception of failure, or unworthiness in the child seem to be associated with a high vulnerability for developing depression (Gibb et al., 2003). Thus, we hypothesized that antipathy (involving parental criticism and hostility), neglect (withholding material care), and psychological abuse (coercive sadistic control) as defined by Bifulco and colleagues (Bifulco et al., 1994; Moran et al., 2002) would present a stronger association with depression than other forms of maltreatment (physical and sexual abuse).

Additionally, evidence has consistently demonstrated that adolescents with a history of childhood maltreatment have a greater vulnerability for becoming depressed or suicidal than individuals without such a history (Bifulco et al., 2014; Dunn et al., 2013; Lumley and Harkness,

2007; Moretti and Craig, 2013; Ystgaard et al., 2004). Furthermore, the risk of depression and suicide attempts in maltreated individuals seem to be higher in adolescence than in adulthood (Brown et al., 1999; Dunn et al., 2013). Thus, this meta-analysis further aimed to find specific associations between childhood maltreatment types and depression, distinguishing adult from adolescent samples.

Method

Search strategies

A systematic search strategy was used to identify relevant studies. A three-step literature search was conducted. First, a search of PubMed, PsycINFO, ISI Web of Knowledge, and Scopus (Elsevier) was performed to identify studies putatively reporting childhood maltreatment assessed with the *Childhood Experience of Care and Abuse* (CECA) interview. The search was conducted between 1st and 28th November 2013 with an update on 5th August 2015, specifying as the start date of publication the year 1994 (the publication year of the CECA interview). The following search terms were used: “CECA”, “childhood experience of care and abuse”, and “childhood abuse”, along with “depression”. Secondly, a database search was performed using the authors’ names of all articles that were identified within the first step. Thirdly, reference lists of articles included within the review were manually checked for any studies not retrieved by the computerized literature search.

Selection criteria

To achieve a high standard of reporting, the PRISMA guidelines were adopted (Moher et al., 2009). The PRISMA checklist is presented as Appendix 1. Studies were selected for inclusion in the meta-analysis only when reported as an original research paper in a peer-reviewed journal. Studies were included independent of the language in which they were published; however, all proved to have been published in English.

As regard to depression assessment, only studies that assessed depression as a diagnostic category (rather than depressive symptoms) were included. In addition, the use of interview-based diagnoses was utilized as a selection criterion. We also included studies independent of the type of depression assessed (persistent or recurrent) or time of onset. Most studies had assessed major depressive disorder (MDD), recurrent or persistent; only one study had related childhood maltreatment with the first onset of depression.

As regards the measurement of childhood adversities, the gold standard criterion in this area of international research has previously been considered the *Childhood Experience of Care and Abuse* (CECA; Bifulco et al., 1994) interview. The CECA is a retrospective semi-structured interview that uses an investigator-based approach to rating. Behavioral indicators of parent/perpetrator actions instead of the subject's own feelings or reports of incident severity are taken into account. All scales have 4 points (marked, moderate, some, and little/none), with repeated incidents of abuse recorded and repeated neglect or antipathy in different household arrangements, as determined by new parent figures. For certain analyses the scales are dichotomized, with 'marked or moderate' denoting severe abuse or neglect. In most analyses the 'peak' severe rating of the neglect or abuse is utilised where there are repeat occurrences.

The core domains are defined as follows:

Antipathy: parental hostility, coldness or rejection shown toward the child, including scapegoating the child in contrast to treatment of siblings.

Neglect: the failure of parents to provide for the child's basic material needs (food, clothing, shelter, and protection) and developmental needs (interest in school, friends, child's happiness, health, and well-being).

Physical Abuse: violence directed towards the child by a household member (including parents, surrogate parents, siblings, or relatives in the household); inclusion criteria involve hitting about the head or being hit hard around the body with the hands/fists, being hit with an

implement, kicked, bitten, or burned, or threats or use of a gun or knife, with severity determined by the intensity of the attack and its frequency.

Sexual Abuse: age-inappropriate sexual contact by any adult or older peer is included, whether related or not, acquainted or not. Sexual abuse includes a range of sexual contact including intercourse, violation or penetration with an object, oral sex, touching of breasts/genitals, as well as requiring the child to watch sexual activity or pornography, and verbal solicitations for sex or age-inappropriate verbal content. Severity is determined by the extent of sexual contact as well as relationship to perpetrator, with higher ratings given for family members and trusted authority figures or family friends.

Psychological abuse: episodes of humiliation, terrorization, cognitive disorientation, exploitation, or corruption of the child or intentional deprivation of needs or valued objects, from parents usually in the context of a parental, highly controlling and domineering relationship with the child. Severity is determined by the range of such experiences and their frequency.

The CECA is a reliable measure of childhood experience in both adults and adolescents. CECA interviewers receive extensive training (see www.cecainterview.com) and ratings have been demonstrated to have excellent psychometric properties, with satisfactory interrater reliability and convergent validity between siblings (Bifulco et al., 2002; Bifulco et al., 1997).

Coded variables

Variables for each article included in the meta-analysis were: rates of antipathy, neglect, physical abuse, sexual abuse, psychological abuse, and a composite index of childhood maltreatment (defined in most of the included studies as the presence of at least one type of maltreatment rated as 'marked' or 'moderate'); year of publication; mean age of participants; gender (% of females); characteristics of sample (whether clinical or community based, adolescents or adults), and depression assessment.

Database

The literature search yielded a total of 44 potential studies. Of these, 15 were omitted because of complete or partial sample overlap; in these cases we included the study that offered the larger subsample or, alternatively, the full report of relevant information. Another 13 studies conducted the research only with a depressed sample; thus, they were excluded due to a lack of a comparison group. Finally, three studies were omitted because they did not use a depression assessment consistent with our selection criteria and one because it was only theoretical. In the end, our search resulted in 12 primary studies with 34 coefficients and a total of 4372 participants (2918 women and 1454 men) (see the PRISMA flow chart in Fig. 1).

Unfortunately, some of the proposed variables were not assessed or reported in various studies. All studies did provide information about the origin of the sample, prevalence of female participants, mean age, procedure for depression assessment, and type of sample. However, concerning childhood experiences of abuse and neglect, most of the studies assessed different scales of the CECA interview; thus, different meta-analyses were conducted including different studies (see Table 1).

Insert Figure 1 and Table 1 about here

Coding of variables

All studies were coded by the first author. Moreover, a student assistant independently extracted data from the same eligible articles. Inconsistencies were resolved in consensus meetings and confirmed with the authors of the primary studies when necessary. The coding process was standardized by employing detailed coding rules. We coded (a) characteristics of publication (year of publication), (b) sample information (sample size; country of origin; percentage of females; mean age, adult or adolescent samples, and clinical or population-based samples), (c) effect sizes, and (d) the type of abuse. The interrater agreement ranged from 0.89 (for type and characteristics of the samples) to 1.00 (for most of the other variables).

Within the 12 studies included, nine of them used samples from the United Kingdom, one from Canada, one from the United States of America, and one a culturally mixed sample. Within

the 12 studies included in this meta-analysis, eight studies were conducted with adult samples and four with adolescent samples. Additionally, eight studies used high-risk or clinical samples and four studies population-based samples.

Effect sizes were coded for different types of abuse and neglect assessed by the CECA or a composite index of childhood maltreatment. Specifically, nine studies reported information about the composite index, whereas eight studies reported specific information about the different CECA scales: five studies reported the effects size for antipathy, six for neglect, six for physical abuse, six for sexual abuse, and only two for psychological abuse. A detailed list of coded characteristics, percentage of missing data, and interrater agreement is provided in the Supplemental Material.

Analytic strategy

The standardized mean difference (Cohen's d) effect size statistic was used in this meta-analysis. Cohen's d is particularly useful when comparing the effects of two nonexperimentally defined groups on an outcome that is not uniformly operationalized across studies (Cohen, 1988; Lipsey and Wilson, 2000). When a study reported a dichotomous outcome in terms of an odds ratio, the odds ratio was transformed using the appropriate calculations to make it directly comparable to the d statistic (Borenstein et al., 2009). Mean effect sizes were estimated by the meta-analytic procedure, using the techniques outlined by Hunter and Schmidt (Hunter and Schmidt, 2004) and the associated software package (Schmidt and Lee, 2004).

Subgroups for different types of abuse and neglect and the composite index of maltreatment were created, therefore enabling us to examine the relationship between different types of maltreatment and depression. Separate analyses were conducted to determine the specific effects.

In addition to the number of studies included (k), the total sample size (n), and the mean effect sizes (Means d), the effect sizes' standard deviations (SDd) of the mean effect size, the 95% confidence intervals (95%CI) and 80% credibility intervals (80%CV) were calculated to determine whether the mean effect size was significantly different from zero. We decided to

report also credibility intervals because they express the distribution of effect sizes in a random-effects model, indicating whether results can be generalized or should be further differentiated by investigating potential moderators (Hunter and Schmidt, 2004, p. 205). We corrected for variance due to artifacts, specifically by sampling error, predictor, and criterion unreliability, and we reported the percentage of variance accounted for by artifacts (%Var). Finally, we reported the *fail-safe N* statistic that addressed the problem of publication and availability bias. It estimates the number of nonidentified studies with null effects that would be necessary to reduce the effect size to a nonsignificant value, defined in this study as an effect size of .05 (Hunter and Schmidt, 2004, p. 500). According to Rosenthal (Rosenthal, 1991), a file-drawer effect exists when the *fail-safe N* is less than five times the number of published studies plus ten. Thus, a low *fail-safe N* indicates publication bias.

Additionally, since Hunter and Schmidt have argued that if the percentage of variance is less than 75%, the search for moderators is recommended (2004; p. 401), we followed this guideline to determine whether moderator variables existed.

Results

A summary of estimated mean effect sizes and the related statistics is given in Table 2 and Figure 2. For the relationship between the composite index of childhood maltreatment and depression ($k=9$; $n=3591$), the mean effect size across studies was $d=.431$ (95%CI=-.316–1.178). This effect size indicates that there was a small-to-medium association between the composite index of childhood abuse and depression. However, the confidence intervals for this estimated associations included zero, so this result could be interpreted as non-significant.

When looking at individual experiences, the mean effect size for the association between antipathy and depression across studies ($k=5$; $n=842$) was $d=.513$ (95%CI=.201–.829), indicating that there was a medium association between antipathy and depression. The mean effect sizes for a relationship between neglect ($k=6$; $n=1040$) and physical abuse ($k=6$; $n=1045$) and depression

were large, respectively $d=.813$ (95%CI=.609–1.017) and $d=.810$ (95%CI=.690–.930). The mean effect sizes for the association of psychological abuse with depression were significantly stronger ($d=.932$; 95%CI=.930–.934) than for the other kind of maltreatment and the composite index. For the relation between sexual abuse and depression ($k=6$, $n=3120$) the mean effect size across studies was $d=.500$ (95%CI=.224–.776), indicating that there was a medium association between sexual abuse and depression. None of the confidence intervals for the estimated associations presented in Figure 2 included zero, so all results could be interpreted as reaching significance.

Furthermore, file-drawer analyses yielded values for the *fail-safe N* that largely exceeded the number of studies included in the meta-analysis (ranging from 35 to 92), indicating that many unpublished studies would need to exist in order to reduce the mean effect size below the level of significance ($p>.05$). Using Rosenthal's standards, these *N* indicate that the relationships found were likely not attributable to publication bias.

Insert Table 2 and Figure 2 about here

Potential moderators

Table 3 presents the results of the analysis addressing whether the association between specific childhood adversities and depression outcome varied as a function of adult or adolescent samples. A total of 26 effect sizes were included in this analysis.

By utilizing the composite childhood abuse/neglect index, a stronger association with depression was found in adolescent samples ($d=.766$) than in adult samples ($d=.399$). The *fail-safe N* were 43 and 42 respectively for adolescent and adult samples, indicating that the relationships between adolescents/adults and depression were not attributable to publication bias. In terms of specific types of maltreatment, antipathy was more strongly related to depression within adult samples ($d=.688$) than within adolescent samples ($d=.345$). However, file-drawer analyses for adolescent samples yielded a value for the *fail-safe N* of 12. According to Rosenthal's standards, this *N* indicates that the association found may be attributable to a bias in

the literature toward publishing significant findings. No differences were found for the association between neglect and depression in adolescent or adult samples, in which d was large within both kinds of samples ($d=.868$ and $d=.732$ respectively). The file-drawer analyses confirm the validity of these results. With the available data we could not conduct an analysis for sexual abuse (only one study analyzed sexual abuse in an adolescent sample) or psychological abuse.

Additionally, as shown in Table 4, we tested whether the type of sample (clinical/high risk community *vs* nonclinical) might be a potential moderator of the relationship between childhood maltreatment and depression. The results showed that the mean effect size for the composite index of maltreatment in childhood was larger in clinical/high-risk samples ($d=.712$) than in population-based samples ($d=.322$). However, as showed by the file-drawer analyses, the result on population-based samples may be affected by a bias in the literature toward publishing significant findings. Unfortunately, with the available data we could not test whether the type of sample (clinical/high risk *vs* nonclinical) moderates the relationships between the specific forms of maltreatment and depression. Similarly, gender could not be tested as potential moderator because data were lacking.

Insert Table 3 and Table 4 about here

Discussion

Experiences of abuse and neglect in childhood have been consistently associated with higher rates of adult depression. However, a full understanding of the relationship between childhood maltreatment and depression cannot be achieved until different types of abuse and neglect are differentiated or considered in combination. The present meta-analysis addressed the heterogeneity in the results of previous studies concerning a relationship between childhood maltreatment and depression and thereby allowed a differential investigation of different types of maltreatment experiences.

The association between the composite index of abuse/neglect and depression was moderate, ($d=.43$) and, although it failed to reach statistical significance, nearly equal to the overall effect

sizes reported in previous meta-analyses of child abuse and depression ($d=.45$) (Nanni et al., 2012). The results are also comparable with a previous meta-analysis on childhood abuse/neglect and physical health problems ($d=.42$) (Wegman and Stetler, 2009). Compared to Nanni and colleagues' (2012) study, where the association between childhood maltreatment and depressive disorder was tested in 16 studies with 23,544 participants, our strict selection criteria including the choice of a clinical interview (CECA) resulted in nine studies with a reduced sample size of 3591 participants for the composite index of abuse/neglect. This may have contributed to non-significant findings despite similar effect sizes. Further, the effects of the nine studies included in the present analysis showed great heterogeneity, which might also have contributed to non-significance.

Our findings on specific types of childhood maltreatment revealed that some types were particularly strongly associated with depression outcome. In particular, and consistent with our hypothesis, psychological abuse presented a stronger association with depression than other forms of maltreatment. Psychological abuse as defined by Bifulco and colleagues (2002) is concerned with cruelty demonstrated by verbal and nonverbal acts from a close other in a position of power or responsibility for the child and it was associated with feelings of shame in childhood and depression in adulthood (Bifulco et al., 2002; Moran et al., 2002). This result confirms an emerging body of literature suggesting a significant relationship between emotional maltreatment and depression (e.g., Gibb et al., 2001; Kim and Cicchetti, 2006; Liu et al., 2009). Furthermore, findings from this meta-analysis extend the evidence of prior studies demonstrating the influence not only of psychological abuse but also of neglect on depressive disorders, here defined as the degree to which the caretaker does not provide for the child's basic emotional and material needs. We should highlight here that neglect and psychological abuse likely represent the two extreme polarities of maltreatment in a child. On the one hand, neglect is the most relevant form of maltreatment "by omission", in which the child is deprived of basic responses to his or her needs of protection, care, and love from caregivers; on the other, psychological abuse

is a perfect representative of maltreatment “by commission”, in which caretakers voluntarily degrade, humiliate, and terrorize their young in order to have power and control over them. In both instances this may result in a child’s feeling of powerlessness and reduced self-esteem, which may easily foster depression in later life. According to attachment theory (Bowlby, 1983), attachment figures help develop representational models of the relational world. Thus, those who have lived with neglect and/or psychological abuse may be at risk of developing a more negative self-model, becoming prone to internalizing symptoms (Shapero et al., 2014).

As regards physical and sexual abuse, findings from this meta-analysis may help to clarify the earlier debate about the specific influence of these forms of abuse on depression. In particular, the stronger association found between physical abuse and depression confirms the results of a recent meta-analysis, in which all studies of childhood physical abuse and depression found increased odd ratios of depression among those reporting physical abuse (Lindert et al., 2014). In contrast, the association between sexual abuse and depression was not as strong as that with others forms of maltreatment. This result, although not in contradiction to previous findings (Cutajar et al., 2010; Dube et al., 2005; Kendler et al., 2000; Molnar et al., 2001), highlights the importance of not focusing on one form of abuse alone, e.g. sexual abuse, but rather on a broad variety of adverse childhood experiences, which might better explain the potential early pathways that lead to depression later in life.

The effects of specific childhood maltreatments were not equally large across adult and adolescent samples. The types of samples (adult or adolescent) moderated the effect sizes between the composite index of maltreatment and depression (larger in adolescent samples) and between antipathy and depression (larger in adult samples). The effect of neglect and physical abuse was similarly large in both kinds of samples.

These findings of the composite index suggest that adolescence may be a sensitive developmental period during which several experiences of maltreatment need to be assessed, given the profound influences on the risk for depression (Lumley and Harkness, 2007). It also

points to the greater recency of the experience of maltreatment for adolescents, in whom subsequent protective factors have not yet emerged as in adult samples. One possible explanation for the stronger association between antipathy and depression observed in adult samples than in adolescents might be related to the nature of this maltreatment. Indeed, according to Bifulco and colleagues' definition (1994), antipathy reflects criticism, dislike, coldness, rejection, or hostility shown by a parent in the household towards the child; thus, it regards the daily parent-child interaction and not single or specific episodes of abuse. One could argue that during adolescence, in which the parent-child relationship is still ongoing, individuals struggle to adequately reflect on the idea of parental antipathy and have difficulties realizing the pernicious nature of this kind of experience. Another hypothesis could be that antipathy may be more prone to recall-bias than other types of maltreatment and therefore shows larger effects among adults. However, these data resulted from a small number of studies and the findings of the moderator analyses concerning sample characteristic need to be interpreted with caution. Indeed, regarding the specific association between antipathy and depression in adolescent samples, there was a low *fail-safe N*, that indicates that this finding may be affected by publication bias. Thus, it may limit the conclusion that can be drawn from this moderator.

Using a type of sample (clinical/high risk vs nonclinical) variable as moderator resulted in a higher association between the composite index of childhood maltreatment and depression for clinical/high risk than for nonclinical samples. This result is in contrast to the results of a previous meta-analysis (Nanni et al., 2012), in which studies in population samples showed a stronger association between childhood maltreatment and depression than studies in clinical samples (odds ratio=2.75 versus odds ratio=1.78). This may occur because a different distinction was made in this analysis – both clinical samples and high risk community samples selected for vulnerability factors were included. The latter may vary from clinical samples in terms of aspects of disorder (comorbidity, personality disorder), but also factors associated with service-

utilisation. Thus, further studies are needed to allow further interpretations about this result in terms of risk and clinical selection criteria.

The *fail-safe N* was high for most of the other meta-analytic results, indicating that the relationships between abuse/maltreatment and depression detected are not attributable to a bias in the literature toward publishing significant findings.

Our meta-analysis revealed that the association between the composite index of maltreatment and depression was lower than all associations of specific experiences of maltreatment and depression. Additionally, this association was the only one in which the CI included zero. This finding is a likely subject to bias and might be caused by the greater heterogeneity (adolescent or adult, clinical or nonclinical) of the nine studies included in the analysis of the composite index. Indeed, as discussed above, the moderation analyses showed that associations with depression were higher in adolescent samples than in adults. Additionally, using a type of sample (clinical/high risk vs nonclinical) variable as moderator resulted in a higher association for clinical/high risk than for nonclinical samples, and indicated potential publication-bias for non-clinical samples. In addition, studies with weak effect sizes tended to only report the composite index, which may lead to a selective underestimation of this effect.

Limitations and Strengths

The results of this meta-analysis should be evaluated in the context of several potential limitations. First, assessing the type of abuse and neglect presents numerous problems. Several authors have suggested that multiple forms of abuse are likely to occur together (Finkelhor et al., 2007; Wolfe and McGee, 1994). Since it was not known whether the studies included individuals who exclusively experienced one form of abuse or individuals who experienced multiple forms of abuse, conclusions about the unique contributions of each type of abuse from these results would be hasty.

Furthermore, some studies included in our meta-analysis did not report detailed data on important aspects of abuse, such as frequency, duration, or severity. However, the CECA's

ranking rules take into account several characteristics of abuse (e.g., severity, frequency, duration, and people involved) to determine the rates, and the CECA is only used after prior training for reliability. Thus, we can suppose that the experiences of maltreatment reported in the studies included in the present meta-analysis should be comparable in regard to the severity of childhood adversity experienced by the participants. Indeed, although it limited the studies eligible for the present meta-analysis, our strict criteria for selecting the primary studies should guarantee a reliable comparison of childhood abuse and neglect among different studies, thus increasing the validity of our results.

Finally, the problem of small numbers of available studies restricted the analyses for various potential moderators. It is likely that the search for other potential moderators, such as clinical versus population-based samples or gender differences, might produce more detailed findings. Unfortunately, with the available data we could not examine the effect of other potential confounders. These results should therefore be interpreted as preliminary insights into what could be promising directions for future research.

Research and clinical implications

Overall, the results of this meta-analysis point to the importance of considering several types of maltreatment experiences as risk factors for an outcome of depression with a particular focus on the more “silent” forms of maltreatment such as psychological abuse and neglect. This meta-analysis adds information to the relationship between child maltreatment and depression, but it also highlights potential gaps in the literature that need to be addressed. Future research should focus on experiences of emotional or psychological abuse and neglect since the number of studies were still small for detailed analyses. Further research should also include a more representative sample of the population, including larger numbers of males and older adults. Additionally, more information on other potential moderators, such as age at time of maltreatment, duration of maltreatment, and severity of abuse/neglect, should be included. This

would help better characterize the circumstances under which and the individuals for whom a greater vulnerability for developing depression as an effect of childhood maltreatment exists.

Finally, a number of clinical implications of these findings should be highlighted. Information about the specific history of childhood maltreatment may help to identify individuals who are at high risk of developing depression. Clinicians may consider that a routine inquiry concerning childhood maltreatment could add important prognostic information to their assessment, and this enquiry needs to go beyond the assessment of physical and sexual abuse. These results suggest that a history of psychological maltreatment may be an important marker in targeting depression prevention efforts in populations.

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