Paucity of intervention research in childhood maltreatment contrasts with the long known relation with mental health disorders: Is trauma research translational enough?

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Abstract

The damaging consequences of child abuse and neglect for child development and psychiatric disorders have been known for decades. However, there would be a relative paucity of translational research on childhood maltreatment in comparison to the numerous correlational studies in the field. To assess the extent to which previous research on childhood maltreatment addressed intervention, we reviewed all articles on child abuse and neglect published in 2016 and evaluated the main objective of each study. References were identified through PsycINFO (ƙ = 2139) and Medline (ƙ = 2955). Of the 3792 studies retained after removal of overlapping references, 1157 met inclusion criteria. The main objective of each study was coded according to one of the following categories: *Consequences*, *Mechanisms, Intervention*, *Prevention* and *Others.* The review showed that half of the studies (ƙ = 572; 50%) described the damaging consequences of child abuse and neglect. A mere 19% of the studies (ƙ = 225) aimed to identify mediators or moderators of the association between childhood maltreatment and outcome. Only 6% (ƙ = 66) of studies reported on treatments and 2% (ƙ = 29) on preventive interventions. The remaining articles (23%, ƙ = 265) focused on other topics, such as the assessment of childhood trauma (ƙ = 33), epidemiology (ƙ = 118) and legal or organizational issues (ƙ = 114). Our results revealed an unquestionable paucity of research published on interventions and a relatively scarce number of mechanistic studies that nonetheless may provide meaningful practical orientations for clinical practice and future research.

Keywords: abuse; mechanism; consequence; mediator; prevention; intervention

1. INTRODUCTION

A quarter to a third of the adult population in high-income countries (Afifi et al., 2014; Gilbert et al., 2009; Radford, Corral, Bradley, & Fisher, 2013) and more than half of the population in other parts of the world (Gilbert et al., 2009) report having experienced abuse or neglect during childhood or adolescence. Besides, the majority of patients with severe psychiatric disorders (Larsson et al., 2013; Post et al., 2013) and close to half of their offspring (Berthelot, Paccalet, et al., 2015) were exposed to abuse or neglect. This is not surprising considering that childhood adversity accounts for 45% of the population attributable risk for childhood onset psychiatric disorders and up to 32% of later-onset disorders (Green et al., 2010). Childhood maltreatment is therefore considered by some as the most important preventable cause of psychopathology (Constantino, 2016; Teicher & Samson, 2016; Teicher, Samson, Anderson, & Ohashi, 2016). Moreover, as for major psychiatric disorders such as schizophrenia, bipolar disorder or major depressive disorder (Maziade, 2017), child abuse and neglect is transmitted across generations. Children born to a parent having been exposed to childhood maltreatment are three times more likely than offspring of non-exposed parents to be maltreated themselves (Assink, Spruit, Schuts, Lindauer, & Stams, 2018) and, even in the absence of repetition of abuse or neglect, they are at increased risk of neurobiological (Buss et al., 2017), development (Racine, Plamondon, Madigan, McDonald, & Tough, 2018), interpersonal (Berthelot, Ensink, et al., 2015), affective and behavioral (Rijlaarsdam et al., 2014) problems early in their development.

Yet, the association between childhood maltreatment and complex psychological symptoms has been reported since the beginning of the 20th century (Bleuler, 1912) and confirmed by scientific research by the mid-60s (Galdston, 1965; Morse, Sahler, & Friedman, 1970). The familial transmission of abuse and neglect has also been documented for a long time (J. E. Oliver, 1985). Despite the extensive amount of knowledge accumulated on maltreatment, neglected or abused children would still receive little help (O'Dowd, 2018). Only a few early interventions for children exposed to childhood maltreatment have enough empirical support to be considered well supported and efficacious (Macmillan et al., 2009; van der Put, Assink, Gubbels, & van Solinge, 2018) and it remains challenging for a clinician to decide which interventions should be used with different populations in different contexts (Shonkoff, 2016). In addition, many preventive programs exist, but scientific data to confirm their effectiveness are lacking (Macmillan et al., 2009). Indeed, recent systematic reviews and meta-analyses reported that preventive interventions were not leading to significant improvements in terms of

important outcomes, such as reducing child maltreatment or enhancing child development (Euser, Alink, Stoltenborgh, Bakermans-Kranenburg, & van IJzendoorn, 2015; Viswanathan et al., 2018). In addition, despite the demonstrated intergenerational transmission, there is hardly any prenatal intervention designed for pregnant women previously exposed to childhood maltreatment (Chamberlain et al., 2019) and it remains to be determined whether the intergenerational risk trajectories associated with maternal history of abuse or neglect can be interrupted (Heim, Entringer, & Buss, 2018). Accordingly, it was recently suggested that scientific journal editors and academic researchers have the duty to foster therapeutic studies to counterbalance the potentially exceeding number of studies reporting the same correlations between childhood maltreatment and diverse difficulties (Berthelot, Lemieux, & Maziade, 2019). The objective of the present paper was to quantify this translational gap by providing a synthesis of the main objectives of all the research on child abuse and neglect published in a recent year. Given that thousands of articles on child abuse and neglect are published annually, the entire literature on trauma could not be reviewed and we decided to analyze the articles published in a given year, i.e. the year 2016. It was hypothesized that most studies would focus on identifying the negative consequences of childhood maltreatment and that few would address the mechanisms of risk and resilience or the pharmacological, psychological and preventive interventions.

2. METHODS

Search Strategy

We conducted a systematic review of all articles on childhood abuse or neglect published in 2016 and evaluated the main objective of the 5094 articles retrieved. References were identified through PsycINFO (ƙ = 2139) and Medline (ƙ = 2955) using the terms “child* abuse”, “neglect”, “child* trauma”, “child* maltreatment”, “child* adversity”, “child* victimization”, “early life stress”, and “adverse life events”. A total of 3792 articles remained after removal of overlapping references (26% overlap). The second author of this paper (JGB) screened all 3792 articles for eligibility based on abstracts. Of the 3792 studies, 1157 were retained based on the following criteria: (a) empirical study or literature review, (b) published in English or French in a peer-reviewed journal, (c) the research involved child abuse or neglect between 0 and 18 years old. The review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Data Extraction and Analysis

The main objective of each study was coded according to one of these categories: *Consequences* (including studies on the association between childhood maltreatment and an outcome), *Mechanisms* (including studies evaluating mediators or moderators of the association between childhood maltreatment and an outcome), *Intervention* (including studies evaluating the effect of an intervention in individuals exposed to childhood maltreatment), *Prevention* (including studies on preventive interventions at the individual, family or society level) and *Others* (including studies on assessment measures, epidemiological studies and research on legal or organizational issues). Categories were mutually exclusive. When studies had multiple objectives, the later categories superseded the first ones. The codification of articles was performed in three steps. In step 1, a subset of 100 articles was coded by three coders (authors 1-3; NB, JGB, RL) to determine interrater reliability. Two-way random intraclass correlations revealed good interrater reliability, with an average ICC of .962 [95% CI from .948 to .974, $F(98,196) = 26.657$, $p<.001$]. In step 2, the second author classified the 1157 included articles. In step 3, the first author (NB) reviewed the classification for all articles, and discrepancies were discussed to obtain consensus.

To appraise the possibility that the proportions reported here are specific to the year 2016 and do not reflect the state of recent research on childhood maltreatment, we extracted the first 100 studies on childhood maltreatment published in 2020 and classified them using the same strategy. We next conducted *z*-tests for two independent proportions to compare the proportion of articles in each category for the year 2016 (k = 1157) and the beginning of the year 2020 (k = 100).

3. RESULTS

Results are presented in Figure 1 and in Tables S1 to S7 (available online). Our review first showed that half of the studies (k = 572; 50%) described the damaging consequences of childhood maltreatment. Nineteen percent of the studies (k = 225) aimed to identify mediators or moderators of the association between childhood maltreatment and outcome. Only a paucity of research reported on treatments (k = 66; 6% of all research in 2016) or preventive interventions (k = 29; 2%). The remaining articles (k = 265; 23%) focused on other topics, such as

assessment of trauma (ƙ = 33), epidemiology (ƙ = 118) and legal or organizational issues (ƙ = 114).

Approximately a third (32%, ƙ = 185) of the research on the consequences of childhood maltreatment evaluated the association between child abuse and neglect and internalized or externalized symptoms (Figure S1, available online). Other consequences that were frequently reported included neurobiological and epigenetic alterations (14%, ƙ = 79), physical health problems (11%, ƙ = 65), major psychiatric disorders (10%, ƙ = 59), reoccurrence of traumatic events (8%, ƙ = 45) and cognitive problems (7%, ƙ = 38) (Figure S1, available online). Most research on the mechanisms of risk and resilience focused primarily on cognitive and psychological factors (31%, ƙ = 70), followed by neurobiological/epigenetic factors (21%, ƙ = 47), psychological symptoms (20%, ƙ = 44), interpersonal factors (13%, ƙ = 30) and family functioning/parenting (10%, ƙ = 22) (Figure S2, available online).

We conducted *z*-tests for two independent proportions to verify whether different distributions were observed when looking at the first 100 articles on child abuse and neglect published in 2020. Results showed that the proportions of articles published on the consequences of childhood maltreatment ($z = 1.70$, $p = 0.08$), on treatment ($z = 0.50$, $p = 0.59$), and on preventive intervention ($z = 0.90$, $p = 0.37$) were similar for both periods. However, the analysis suggests that a greater proportion of research was published in 2016 on the mediators or moderators of the association between childhood maltreatment and outcome ($z = 2.5$, $p = 0.01$).

4. DISCUSSION

Our present findings first show that half of the studies published in 2016 on childhood abuse and neglect concentrated on the negative consequences of childhood maltreatment. These studies mainly documented well-known repercussions of child abuse and neglect, such as a higher likelihood that people having been exposed to childhood maltreatment develop internalized and externalized problems. This raises important questions. Why, for example, does the negative consequences of child abuse and neglect remain the focus of interest, when the association between childhood maltreatment and numerous negative outcomes is already well known? One possibility is that the accumulation of such studies reporting on the devastating impact of child abuse and neglect may represent the best approach for alerting populations, academics, clinicians, decision makers and funding agencies about the relevance of addressing the

phenomenon of child abuse and neglect through massive public health measures and research investments. Another possibility, however, would be that research on the negatives consequences of childhood maltreatment may be much simpler to carry out than mechanistic or intervention research, which generally requires important resources and longitudinal designs. Overall, research on the negative consequences of childhood maltreatment is definitely insufficient for orienting clinicians toward the appropriate action but may be useful in prompting future studies aiming to understand the developmental mechanisms by which trauma affects functioning or aiming to evaluate ways to mitigate these consequences.

A second finding was that only 19% of the reviewed studies reported on the mediators or moderators of the association between childhood maltreatment and outcome. Most of these studies reported on psychological and neurobiological mechanisms. Studies on the mechanisms of risk and resilience might be seen to be closer to translational research since they may foster prevention research designed to tackle these mechanisms. For instance, some publications reported that child abuse and neglect affects brain functioning and circuitry, which in turn increase the risk of psychiatric disorders (Shonkoff, 2016; Teicher & Samson, 2016). Such data can, in our view, stimulate the research in precision medicine in children at risk and inspire new research protocols on ways to normalize brain development trajectories in the most at risk populations to prevent the anticipated emergence of mental health disorders. Despite its definite relevance, however, the research on the mechanisms of risk and resilience cannot be transferred to the clinic and to preventive means until it is incorporated in the design of novel preventive or therapeutic interventions evaluated through adequate research protocols.

A third finding was that a mere 8% of studies on childhood maltreatment focused on preventive (2%) or therapeutic (6%) interventions. This contrasts with the fact that the World Health Organization (Organization), the Institute of Medicine and the National Research Council (National Research Council, 2014) consider that intervention research should be a priority in the field of child abuse and neglect (Berthelot, Lemieux, & Maziade, 2019). Translational research refers to the process of turning research observations into interventions that improve the health of individuals and the public (Littman, Di Mario, Plebani, & Marincola, 2007). The translational research spectrum has been divided into five phases (Surkis et al., 2016). The first phase (T0, basic biomedical research), refers to studies aiming to understand the biological, social and behavioral mechanisms underlying health or disease. The remaining 4 phases aim to move discoveries into health applications at the level of individuals (T1), patients (T2), practices (T3) and communities

(T4). Studies on the consequences of childhood maltreatment, mechanisms, epidemiology, assessment measures and legal/organizational issues, which, according to our review, represented 92% of all research on child abuse and neglect published in 2016, would be at the T0 level. In other words, the vast majority of these studies would not be translational, at least according to Littman et al. criteria (Littman et al., 2007).

Research on therapeutic interventions in the field of childhood maltreatment, which represented only 6% of all studies in 2016, have a highly informative potential. For instance, it was shown that pharmacological (Quilty et al., 2016; Williams, Debattista, Duchemin, Schatzberg, & Nemeroff, 2016) and psychological treatments (Ammerman, Peugh, Teeters, Putnam, & Van Ginkel, 2016) for depression were significantly less effective for patients with a history of childhood maltreatment than for patients without trauma, suggesting that each group would benefit from different treatments. Similar results were observed for other psychiatric disorders, including schizophrenia (Misiak & Frydecka, 2016) and bipolar disorder (Cakir, Tasdelen Durak, Ozyildirim, Ince, & Sar, 2016). Furthermore, studies on abused children indicated that the implementation of trauma-informed (Bartlett et al., 2016) and trauma-focused (Deblinger, Pollio, & Dorsey, 2016) approaches have led to significant improvements, notably in terms of PTSD symptoms and externalizing behaviors. Such results suggest that trauma should be incorporated into psychological evaluations and should subsequently orient the therapeutic strategies. Future clinical studies on child abuse and neglect will have to address such issues.

Only 2% of studies published in 2016 reported on ways to prevent childhood maltreatment. We could have expected a higher proportion of research on this issue considering that the prevention of child abuse and neglect is considered a priority across the globe (World Health Organization, 2018) and that the effectiveness of most of the preventive programs is unknown or limited (Macmillan et al., 2009; Viswanathan et al., 2018). Indeed, a recent systematic review reported that preventive interventions provided in primary care have not led to significant improvements when considering reports to child protective services, removal of the child from the home, emergency department visits, hospitalizations, child development, school performance, prevention of death, injuries, failure to thrive, failure to immunize, school attendance, and other measures of abuse or neglect (Viswanathan et al., 2018).

It would typically take an average of 17 years to translate discoveries from basic science or developmental science into clinical practices (Morris, Wooding, & Grant, 2011). However, child abuse and neglect has historically been considered mainly a social phenomenon, and the

humanities and social sciences have traditionally been less concerned about translating empirical evidence into practices than health sciences (van der Laan & Boenink, 2015), which may partly explain the disproportionate inclination of academics in the field toward correlational research. Let us take an example to illustrate how long it may take to move from basic or developmental science to translational research in the field of abuse and neglect. Around the mid-70s, Selma Fraiberg, a renowned child psychoanalyst and social worker, alerted clinicians and researchers that abuse and neglect had intergenerational repercussions (Fraiberg, Adelson, & Shapiro, 1975). She efficiently reported that past trauma frequently re-emerged during pregnancy and interfered with early mother-infant relationships. This observation was disturbing but also hopeful since it implied that early interventions with trauma-exposed mothers could contribute to interrupting the risk trajectories. This was clearly heard by researchers who responded with a surge of studies on the familial transmission of childhood maltreatment. For instance, Oliver reported in 1985 on the portrait of 147 families with a pattern of child maltreatment over two generations (J. Oliver, 1985). We now have accumulated an impressive amount of knowledge on the intergenerational repercussions of child abuse and neglect. For instance, we know that mothers having been exposed to childhood maltreatment are likely to present significant distress during pregnancy (Berthelot, Lemieux, Garon-Bissonnette, & Muzik, 2019) and after delivery (De Venter et al., 2016) and that their offspring are more likely than offspring of non-exposed mothers to present early brain anomalies (Moog et al., 2017), disorganized attachment behaviors (Berthelot, Ensink, et al., 2015), affective and behavioral problems (Rijlaarsdam et al., 2014) and neurodevelopmental disorders (Roberts, Liew, Lyall, Ascherio, & Weisskopf, 2018; Roberts, Lyall, Rich-Edwards, Ascherio, & Weisskopf, 2013). A recent meta-analysis has also suggested that these children are three times more likely than offspring of non-exposed mothers to be exposed to abuse or neglect (Assink et al., 2018), prompting a vicious cycle of maltreatment and adverse health outcomes across generations. Encouragingly, in response to these data confirming the intergenerational impact of childhood maltreatment, discoveries were made about the mechanisms of risk that could inform the design of innovative interventions. These mechanisms include, for instance, poor reflective functions (Berthelot, Ensink, et al., 2015; Berthelot, Lemieux, Garon-Bissonnette, Lacharité, & Muzik, 2019), disturbed mother-infant interactions (Li et al., 2016) and maternal psychopathology (Muzik et al., 2017). Yet, there would currently be no evidence-based prenatal intervention designed for pregnant women exposed to childhood maltreatment (Chamberlain et al., 2019; Heim et al., 2018), a very limited number of empirically supported postnatal programs,

such as Mom Power (Rosenblum et al., 2017), were specifically designed for mothers exposed to abuse or neglect, and no study has yet attempted to counteract or reverse the intergenerational transmission of the neurobiological consequences of childhood maltreatment (Heim et al., 2018). In addition, no studies have evaluated the efficacy of perinatal interventions with fathers having been exposed to childhood maltreatment (Stephenson et al., 2018), although men are most probably not less involved than women in the intergenerational transmission of child abuse and neglect. Hence, the very first objective of Selma Fraiberg, which was to reinforce trauma-informed clinical practices during the perinatal period, has still received little attention after four decades of research. This absence of evidence-based practices has definite implications for approximately 2.4 million children among the G7 nations who are born each year to a mother exposed to childhood abuse or neglect. Researchers from multiple disciplines, including developmental psychology (Shonkoff, 2016), clinical psychology (Berthelot, Lemieux, & Lacharité, 2018), neuroscience and molecular biology (Heim et al., 2018) have advocated that developing and evaluating such prenatal interventions with expecting parents having been exposed to childhood maltreatment are challenging priorities to meet in the 21st century.

Our review has several strengths, including the use of standardized procedures for the literature search and data extraction. We followed most of the items of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. However, given the extensive amount of studies on child abuse and neglect, only articles published in a specific year, i.e. the year 2016, were evaluated, and different findings could have been obtained if we had reviewed publications from another year. Interestingly however, we observed similar proportions of studies in three categories (consequences; treatment; prevention) and even fewer publications on the mechanisms of risk and resilience when comparing our data of 2016 to the first 100 studies on childhood maltreatment published in 2020.

5. CONCLUSIONS

Overall, our findings have confirmed the opinion (Berthelot, Lemieux, & Maziade, 2019) that research in the field of childhood maltreatment is relatively inundated with correlational studies reporting on the countless consequences of exposure to extreme life events during critical periods of brain development. Our present review also shows that studies on the mechanisms of risk and resilience, and on preventive and therapeutic strategies, are not often published whereas they would provide the type of information that is now highly needed. Based on the data of the

last 50 years, academic researchers should prioritize innovative research partnerships with health institutions, policymakers and people who have experienced abuse or neglect. The next decade of clinical research in the field of childhood maltreatment should clearly send the message that abused and neglected children are “seen and heard” (Bloomfield, Lancet, 2019).

References

Afifi, T. O., MacMillan, H. L., Boyle, M., Taillieu, T., Cheung, K., & Sareen, J. (2014). Child abuse and mental disorders in Canada. *Canadian Medical Association Journal, 186*(9), E324-332.

Ammerman, R. T., Peugh, J. L., Teeters, A. R., Putnam, F. W., & Van Ginkel, J. B. (2016). Child maltreatment history and response to CBT treatment in depressed mothers participating in home visiting. *Journal of Interpersonal Violence, 31*(5), 774-791.

Assink, M., Spruit, A., Schuts, M., Lindauer, R., & Stams, G. J. M. (2018). The intergenerational transmission of child maltreatment: A three-level meta-analysis. *Child Abuse and Neglect, 84*, 131-145. doi:10.1016/j.chiabu.2018.07.037

Bartlett, J. D., Barto, B., Griffin, J. L., Fraser, J. G., Hodgdon, H., & Bodian, R. (2016). Trauma-informed care in the Massachusetts child trauma project. *Child Maltreatment, 21*(2), 101-112.

Berthelot, N., Ensink, K., Bernazzani, O., Normandin, L., Luyten, P., & Fonagy, P. (2015). Intergenerational transmission of attachment in abused and neglected mothers: the role of trauma-specific reflective functioning. *Infant Ment Health Journal, 36*(2), 200-212. doi:10.1002/imhj.21499

Berthelot, N., Lemieux, R., Garon-Bissonnette, J., Lacharité, C., & Muzik, M. (2019). The protective role of mentalizing: Reflective functioning as a mediator between child maltreatment, psychopathology and parental attitude in expecting parents. *Child Abuse and Neglect, 95*, 104065.

Berthelot, N., Lemieux, R., Garon-Bissonnette, J., & Muzik, M. (2019). Prenatal Attachment, Parental Confidence, and Mental Health in Expecting Parents: The Role of Childhood Trauma. *Journal of Midwifery and Women's Health, 65*(1), 85-95. doi:10.1111/jmwh.13034

Berthelot, N., Lemieux, R., & Lacharité, C. (2018). Development of a prenatal program for adults with personal histories of childhood abuse or neglect: a Delphi consensus consultation study. *Health Promotion and Chronic Disease Prevevention in Canada, 38*(11), 393-403. doi:10.24095/hpcdp.38.11.01

Berthelot, N., Lemieux, R., & Maziade, M. (2019). Shortfall of intervention research over correlational research in childhood maltreatment: an impasse to be overcome. *JAMA Pediatriacs, 173*(11), 1009-1010. doi:doi: 10.1001/jamapediatrics.2019.1684

Berthelot, N., Paccalet, T., Gilbert, E., Moreau, I., Merette, C., Gingras, N., . . . Maziade, M. (2015). Childhood abuse and neglect may induce deficits in cognitive precursors of psychosis in high-risk children. *Journal of Psychiatry and Neuroscience, 40*(3), 140211. doi:10.1503/jpn.140211

Bleuler, E. A. (1912). *Affectivity, Suggestibility, Paranoia*. New York, NY: State Hospitals Press.

Buss, C., Entringer, S., Moog, N. K., Toepfer, P., Fair, D. A., Simhan, H. N., . . . Wadhwa, P. D. (2017). Intergenerational Transmission of Maternal Childhood Maltreatment Exposure: Implications for Fetal Brain Development. *Journal of the American Academy of Child and Adolescent Psychiatry, 56*(5), 373-382. doi:10.1016/j.jaac.2017.03.001

Cakir, S., Tasdelen Durak, R., Ozyildirim, I., Ince, E., & Sar, V. (2016). Childhood trauma and treatment outcome in bipolar disorder. *Journal of Trauma & Dissociation, 17*(4), 397-409.

Chamberlain, C., Gee, G., Harfield, S., Campbell, S., Brennan, S., Clark, Y., . . . Healing the Past by Nurturing the Future, g. (2019). Parenting after a history of childhood maltreatment: A

scoping review and map of evidence in the perinatal period. *PLoS One, 14*(3), e0213460. doi:10.1371/journal.pone.0213460

Constantino, J. N. (2016). Child Maltreatment Prevention and the Scope of Child and Adolescent Psychiatry. *Child and Adolescent Psychiatric Clinics of North America, 25*(2), 157-165. doi:10.1016/j.chc.2015.11.003

De Venter, M., Smets, J., Raes, F., Wouters, K., Franck, E., Hanssens, M., . . . Van Den Eede, F. (2016). Impact of childhood trauma on postpartum depression: a prospective study. *Archives of Women's Mental Health, 19*(2), 337-342.

Deblinger, E., Pollio, E., & Dorsey, S. (2016). Applying trauma-focused cognitive–behavioral therapy in group format. *Child Maltreatment, 21*(1), 59-73.

Euser, S., Alink, L. R., Stoltenborgh, M., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2015). A gloomy picture: a meta-analysis of randomized controlled trials reveals disappointing effectiveness of programs aiming at preventing child maltreatment. *BMC Public Health, 15*(1), 1068.

Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the nursery. A psychoanalytic approach to the problems of impaired infant-mother relationships. *Journal of the American Academy of Child and Adolescent Psychiatry, 14*(3), 387-421.

Galdston, R. (1965). Observations on children who have been physically abused and their parents. *American Journal of Psychiatry, 122*(4), 440-443. doi:10.1176/ajp.122.4.440

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet, 373*(9657), 68-81. doi:10.1016/S0140-6736(08)61706-7

Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: associations with first onset of DSM-IV disorders. *Archives of General Psychiatry, 67*(2), 113-123. doi:10.1001/archgenpsychiatry.2009.186

Heim, C. M., Entringer, S., & Buss, C. (2018). Translating basic research knowledge on the biological embedding of early-life stress into novel approaches for the developmental programming of lifelong health. *Psychoneuroendocrinology, 105*, 123-137. doi:10.1016/j.psyneuen.2018.12.011

Larsson, S., Andreassen, O. A., Aas, M., Rossberg, J. I., Mork, E., Steen, N. E., . . . Lorentzen, S. (2013). High prevalence of childhood trauma in patients with schizophrenia spectrum and affective disorder. *Comprehensive Psychiatry, 54*(2), 123-127. doi:10.1016/j.comppsych.2012.06.009

Li, L., Lin, X., Chi, P., Heath, M. A., Fang, X., Du, H., & Wang, Z. (2016). Maltreatment and emotional and behavioral problems in Chinese children with and without oppositional defiant disorder: The mediating role of the parent–child relationship. *Journal of Interpersonal Violence, 31*(18), 2915-2939.

Littman, B. H., Di Mario, L., Plebani, M., & Marincola, F. M. (2007). What's next in translational medicine? *Clinical Science, 112*(4), 217-227.

Macmillan, H. L., Wathen, C. N., Barlow, J., Fergusson, D. M., Leventhal, J. M., & Taussig, H. N. (2009). Interventions to prevent child maltreatment and associated impairment. *Lancet, 373*(9659), 250-266. doi:10.1016/S0140-6736(08)61708-0

Maziade, M. (2017). At Risk for Serious Mental Illness - Screening Children of Patients with Mood Disorders or Schizophrenia. *New England Journal of Medicine, 376*(10), 910-912. doi:10.1056/NEJMp1612520

Misiak, B., & Frydecka, D. (2016). A history of childhood trauma and response to treatment with antipsychotics in first-episode schizophrenia patients: preliminary results. *Journal of Nervous & Mental Disease, 204*(10), 787-792.

Moog, N. K., Entringer, S., Rasmussen, J. M., Styner, M., Gilmore, J. H., Kathmann, N., . . . Buss, C. (2017). Intergenerational Effect of Maternal Exposure to Childhood Maltreatment on Newborn Brain Anatomy. *Biological Psychiatry, 83*(2), 120-127. doi:10.1016/j.biopsych.2017.07.009

Morris, Z. S., Wooding, S., & Grant, J. (2011). The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine, 104*(12), 510-520. doi:10.1258/jrsm.2011.110180

Morse, C. W., Sahler, O. J., & Friedman, S. B. (1970). A three-year follow-up study of abused and neglected children. *American Journal of Diseases of Children, 120*(5), 439-446. doi:10.1001/archpedi.1970.02100100103011

Muzik, M., Morelen, D., Hruschak, J., Rosenblum, K. L., Bocknek, E., & Beeghly, M. (2017). Psychopathology and parenting: An examination of perceived and observed parenting in mothers with depression and PTSD. *Journal of Affective Disorders, 207*, 242-250.

National Research Council, I. o. M., Board on Children, Youth, and Families, Committee on Law and Justice, Committee on Child Maltreatment Research, Policy, and Practice for the Next Decade: Phase II (2014). New directions in child abuse and neglect research. Retrieved from https://www.nap.edu/catalog/18331/new-directions-in-child-abuse-and-neglect-research

O'Dowd, A. (2018). Neglected or abused children still receive little help, causing problems in adulthood. *BMJ, 360*.

Oliver, J. (1985). Successive generations of child maltreatment: social and medical disorders in the parents. *British Journal of Psychiatry, 147*(5), 484-490.

Oliver, J. E. (1985). Successive generations of child maltreatment: social and medical disorders in the parents. *British Journal of Psychiatry, 147*, 484-490. doi:10.1192/bjp.147.5.484

Organization, W. H. European status report on preventing child maltreatment. Retrieved from http://www.euro.who.int/en/publications/abstracts/european-status-report-on-preventing-child-maltreatment-2018

Post, R. M., Altshuler, L., Leverich, G., Nolen, W., Kupka, R., Grunze, H., . . . Rowe, M. (2013). More stressors prior to and during the course of bipolar illness in patients from the United States compared with the Netherlands and Germany. *Psychiatry Research, 210*(3), 880-886. doi:10.1016/j.psychres.2013.08.007

Quilty, L. C., Marshe, V., Lobo, D. S., Harkness, K. L., Müller, D. J., & Bagby, R. M. (2016). Childhood abuse history in depression predicts better response to antidepressants with higher serotonin transporter affinity: a pilot investigation. *Neuropsychobiology, 74*(2), 78-83.

Racine, N., Plamondon, A., Madigan, S., McDonald, S., & Tough, S. (2018). Maternal Adverse Childhood Experiences and Infant Development. *Pediatrics, 141*(4). doi:10.1542/peds.2017-2495

Radford, L., Corral, S., Bradley, C., & Fisher, H. L. (2013). The prevalence and impact of child maltreatment and other types of victimization in the UK: findings from a population survey of caregivers, children and young people and young adults. *Child Abuse and Neglect, 37*(10), 801-813. doi:10.1016/j.chiabu.2013.02.004

Rijlaarsdam, J., Stevens, G. W., Jansen, P. W., Ringoot, A. P., Jaddoe, V. W., Hofman, A., . . . Tiemeier, H. (2014). Maternal Childhood Maltreatment and Offspring Emotional and

Behavioral Problems: Maternal and Paternal Mechanisms of Risk Transmission. *Child Maltreatment, 19*(2), 67-78. doi:10.1177/1077559514527639

Roberts, A. L., Liew, Z., Lyall, K., Ascherio, A., & Weisskopf, M. G. (2018). Association of maternal exposure to childhood abuse with elevated risk for attention deficit hyperactivity disorder in offspring. *American Journal of Epidemiology, 187*(9), 1896-1906.

Roberts, A. L., Lyall, K., Rich-Edwards, J. W., Ascherio, A., & Weisskopf, M. G. (2013). Association of maternal exposure to childhood abuse with elevated risk for autism in offspring. *JAMA psychiatry, 70*(5), 508-515.

Rosenblum, K., Muzik, M., Morelen, D. M., Alfafara, E. A., Miller, N. M., Waddell, R. M., . . . Ribaudo, J. (2017). A community-based randomized controlled trial of Mom Power parenting intervention for mothers with interpersonal trauma histories and their young children. *Archives of Women's Mental Health, 20*(5), 673-686. doi:10.1007/s00737-017-0734-9

Shonkoff, J. P. (2016). Capitalizing on Advances in Science to Reduce the Health Consequences of Early Childhood Adversity. *JAMA Pediatrics, 170*(10), 1003-1007. doi:10.1001/jamapediatrics.2016.1559

Stephenson, L. A., Beck, K., Busuulwa, P., Rosan, C., Pariante, C. M., Pawlby, S., & Sethna, V. (2018). Perinatal interventions for mothers and fathers who are survivors of childhood sexual abuse. *Child Abuse and Neglect, 80*, 9-31.

Surkis, A., Hogle, J. A., DiazGranados, D., Hunt, J. D., Mazmanian, P. E., Connors, E., . . . Aphinyanaphongs, Y. (2016). Classifying publications from the clinical and translational science award program along the translational research spectrum: a machine learning approach. *Journal of Translational Medicine, 14*(1), 235. doi:10.1186/s12967-016-0992-8

Teicher, M. H., & Samson, J. A. (2016). Annual Research Review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psycholy and Psychiatry, 57*(3), 241-266. doi:10.1111/jcpp.12507

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Review Neuroscience, 17*(10), 652-666. doi:10.1038/nrn.2016.111

van der Laan, A. L., & Boenink, M. (2015). Beyond bench and bedside: disentangling the concept of translational research. *Health Care Analysis, 23*(1), 32-49. doi:10.1007/s10728-012-0236-x

van der Put, C. E., Assink, M., Gubbels, J., & van Solinge, N. F. B. (2018). Identifying effective components of child maltreatment interventions: a meta-analysis. *Clinical Child and Family Psycholy Review, 21*(2), 171-202.

Viswanathan, M., Fraser, J. G., Pan, H., Morgenlander, M., McKeeman, J. L., Forman-Hoffman, V. L., . . . Jonas, D. E. (2018). Primary Care Interventions to Prevent Child Maltreatment: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA, 320*(20), 2129-2140. doi:10.1001/jama.2018.17647

Williams, L. M., Debattista, C., Duchemin, A., Schatzberg, A., & Nemeroff, C. (2016). Childhood trauma predicts antidepressant response in adults with major depression: data from the randomized international study to predict optimized treatment for depression. *Translational Psychiatry, 6*(5), e799.

World Health Organization. (2018). European status report on preventing child maltreatment. http://www.euro.who.int/en/publications/abstracts/european-status-report-on-preventing-child-maltreatment-2018. Accessed May 21, 2019.

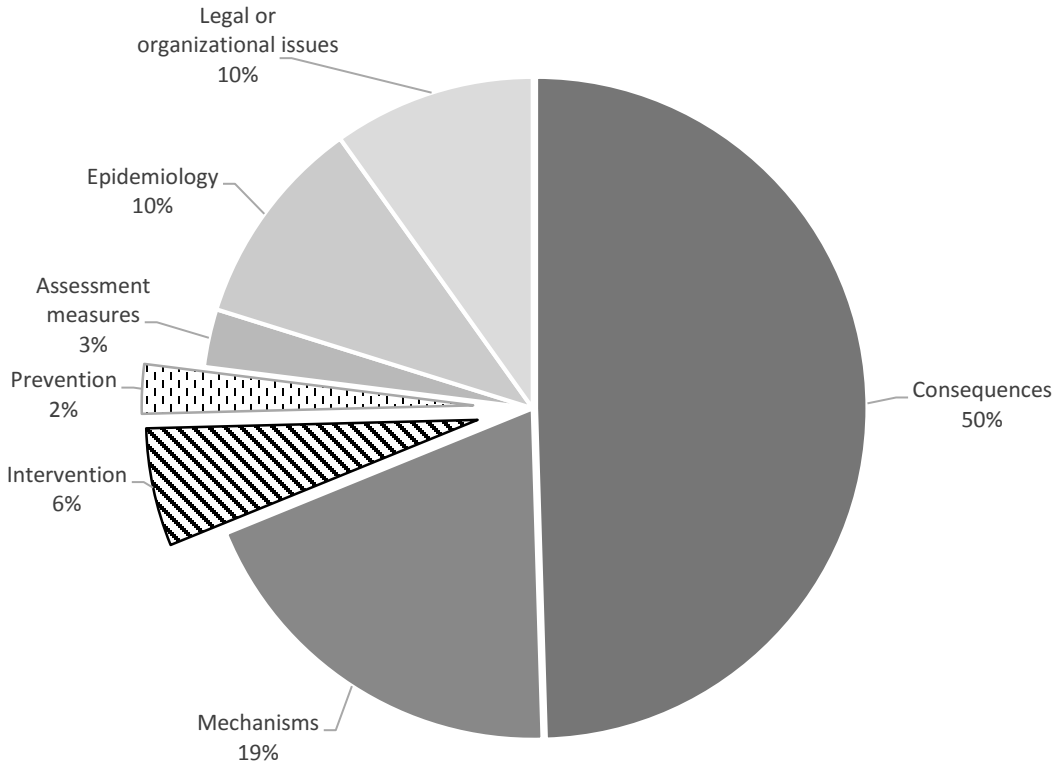

Fig 1. Breakdown of the reviewed articles published on child abuse and neglect in 2016 (k = 1157) according to each article objective

Note. Definitions of the objectives: *Consequences*: studies on the association between childhood trauma and an outcome. *Mechanisms*: studies evaluating mediators or moderators of the association between childhood trauma and an outcome. *Intervention*: studies evaluating the effect of an intervention or a medication in individuals exposed to childhood trauma. *Prevention*: studies on preventive interventions at the individual, family or society level. *Assessment measures*: studies on the psychometric properties of trauma-related instruments. *Epidemiology*: studies on the prevalence of trauma in different populations and studies on risk factors. *Legal or organizational issues*: studies on policies and social response to trauma such as studies evaluating decision making processes in child protection agencies.