

# Association between adverse childhood experiences and a later combination of psychosis and interpersonal violence

C4ME SUPPLEMENT

## AUTHOR INFORMATION

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## **Background**

Adverse childhood experiences (ACEs) have been defined as “potentially traumatic events that occur in childhood (0-17 years)”. (1) A large population-based study suggests half of adults in Wales have experienced at least one ACE. (2) Felitti et al. (1998) created the Adverse Childhood Experience Questionnaire for research quality measurement of 10 ACEs. Broadly they can be split into ACEs abusive in nature and environmental adversity. Felitti and colleagues also demonstrated a significant relationship between ACE exposure and long-term negative health outcomes. (3) ACEs have been separately associated with later psychosis (4) and later violence (5). Violence occurs more commonly among people with psychosis than without. (6) Therefore, questions arise about links between ACEs and a psychosis-violence combination.

The primary research question was: is there evidence from published literature that ACEs are associated with a later combination of psychosis and violence, compared to outcomes of psychosis only, violence only, or neither? Secondary research questions considered the nature, quantity and context of ACEs associated with the psychosis and violence combination, exploring pathway analyses.

## **Methods**

A systematic literature review and meta-analysis was completed. A list of terms was generated, informed by current literature, covering the three broad topics: ACEs, psychosis and violence. Terms were entered into five databases (with required syntax adjustments): Medline, EMBASE, PsycINFO, ASSIA and Web of Science.

Reference lists from included papers were checked. Grey literature was searched in the form of reports from the World Health Organisation, public health documentation and theses. Included papers had research quality methods of ACEs, psychosis and unequivocal violence to others in one of the groups studied. Papers were excluded if relying on measures of hostility or aggression rather than actual violence, or if without evidence that onset of the violence-psychosis combination *post-dated* any ACE. Only papers in English were included. Reliability of selection was confirmed by comparing blinded ratings.

Templates for data extraction were developed and completed for each included paper by three researchers extracting blind to each other. Data from studies with comparable methods were pooled and a summary effect size calculated. Transformed effect sizes, lower and upper confidence intervals and standard errors were entered into Stata Statistical Software and meta-analysis run, using a random effects model to allow for study heterogeneity. A narrative analytic approach was used for secondary research questions.

Ethical approval was not required for this project.

## Results

5226 unique papers were identified with 104 papers retained after title and abstract screening. In total, seven studies were eligible for inclusion, three had sufficiently comparable methods for meta-analysis.

Overall, five papers found a significant association between at least one measure of ACE and later violence in the context of psychosis. Two papers did not. Only three papers studied all four comparison groups of interest.

A meta-analysis was only possible to measure the relationship between physical abuse and later outcomes of unequivocal violence to others in the context of psychosis. Studies included in the meta-analysis considered serious violence, including but not limited to homicide. (7-9) It was confirmed that a history of childhood physical abuse in individuals with psychosis increases the likelihood of later serious violence perpetration by three-times (OR 3.09, CI 1.12-8.56).

Two papers included in the meta-analysis found a significant relationship between physical abuse and later violence in the context of psychosis. Although, Kumari et al. actually found that a combination of ACEs was significantly related to later psychosis and violence only in comparison to healthy controls, not groups with psychosis or violence only. (9) However, Engelstad et al. didn't find a significant relationship between physical abuse and later violence among those with psychosis. (8)

Collectively, studies of the relationship between ACEs and later perpetration of actual interpersonal violence in the context of psychosis demonstrate a trend towards a small effect. However, only three studies included all four comparison groups of interest.

The meta-analytic findings of this paper are similar to those of a recent study by Green et al., (10) who found a significant relationship between childhood maltreatment, defined as ACEs of an abusive nature, and later violence among those with psychosis, despite little overlap of included studies. Our study took a more stringent approach to inclusion criteria, focussing on unequivocal violence perpetration during psychosis rather than also including violence prediction.

Future research would be best carried out with contemporaneous measures of ACE exposure and collateral information, with prospective follow-up. A low prevalence of psychosis could be countered by cooperation of multiple research centres. Follow-up over a 10-year window, with comparisons to a control group would allow for sequencing of events and measure of effect. Prospective measure of post-traumatic stress disorder, substance use and subsequent victimisation in adulthood would allow for a more robust measure of pathway analysis that is not yet possible.

## Lessons Learnt

Having never completed a systematic review and meta-analysis before, I was unsure of what to expect. Initially I felt overwhelmed by the number of papers generated from the search strategy. I was concerned about balancing screening papers with the rest of my course and assignments. However, meeting with the healthcare librarian and my supervisors allowed me to ensure my search strategy was comprehensive and develop a system to screening the papers. By setting myself smaller goals within achievable time-frames, I was able to effectively manage my time to screen the papers whilst carrying out other important goals. I initially found learning how to conduct a meta-analysis challenging, but the process highlighted the importance of conducting independent research by taking out relevant books from the library and asking for help from those more qualified.

Learning the process of critically appraising papers was made more manageable by using critical appraisal tools recommended by the librarian. Having a structure to critically appraise papers meant that I didn't miss any potential source of bias. This is a skill that will be useful in my future development as doctors have a responsibility to keep up to date with new developments in research, but also consider the quality of such evidence.

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