Transgenerational Influences

Psychopathology of children of genocide survivors: a systematic review on the impact of genocide on their children’s psychopathology from five countries

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Abstract
Background: The health consequences of genocides on children of survivors are increasingly discussed but conclusions have been conflicting.

Methods: We systematically reviewed studies from five electronic databases (EMBASE, PILOTS, PUBMED, PsycINFO, Web of Science), which used a quantitative study design and included: (i) exposure to the genocides of Armenians in Nazi Germany, Cambodia, Rwanda and Bosnia; (ii) mental health outcomes; (iii) validated instruments; (iv) statistical tests of associations. Study quality was appraised using a quality assessment tool for genocide studies. PRISMA reporting guidelines were followed.

Results: From 3352 retrieved records, 20 studies with a total of 4793 participants involving 2431 children of survivors and 2362 controls met the eligibility criteria. Studies were conducted in seven countries: Australia, Canada, Italy, Israel, Norway, Rwanda and the USAs over the past seven decades, using the Genocide Studies Quality Assessment Tool. Data from the high quality studies provide no consistent evidence that children of genocide survivors are more likely to have mental health problems than comparators who were not children of genocide survivors.

Conclusions: Methodological characteristics were associated with findings: studies investigating random samples of genocide survivors did not find an impact of genocides...
on health of children of survivors. Potential confounders (e.g. recent life events, poverty) need further investigation. Future studies of the impact of genocides on mental health should report using a standardized structure, such as the quality tool used here.

**Key words:** Genocide, quality, offspring, survivors, psychopathologies

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### Key Messages

- Epidemiology studies of genocides can improve global mental health services through improved knowledge, and also identification of at risk genocide survivor groups.
- The literature on genocide and psychopathologies is characterized by low epidemiological rigour (e.g. few random samples, unclear exposure classification, lack of suitable control groups, use of non-validated instruments or lack of control for confounding).
- There is lack of longitudinal studies in the field of genocide and health studies. Future genocide research should include epidemiological methods to ensure that data are robust.

### Background

The health of those who survived genocides in the 20th century, and especially the Holocaust, has stimulated a wealth of research on psychopathology which has documented a wide variety of immediate or late-onset psychopathological symptoms. Early researchers coined the term ‘Konzentrationslager’ (concentration camp) syndrome to capture the diverse psychological symptoms they identified among survivors. They attributed these to the cumulative effects of traumatic adversity on the individual, the family and the community. However these early studies, conducted at a time when psychiatric epidemiology was in its infancy, suffered from a number of weaknesses including selection bias, lack of cultural sensitive measures, unmeasured confounding and lack of comparator groups.

The initial studies looked at those who were adults during the Holocaust, although since then those who were children at the time have been studied. Subsequent research has studied survivors of other genocides, including those in Rwanda, Cambodia and Bosnia. These studies have identified associations between experiences of genocides and a wide range of psychopathological symptoms, including posttraumatic stress disorder, anxiety disorders and depression. Further studies focused not on psychopathology of those who survived genocide but rather their resilience. Resilience is understood as the process of overcoming rather than succumbing to the effects of adverse experiences such as genocides.

With the passage of time, attention has shifted to the growing number of children (and more recently grandchildren) of genocide survivors. Since the earliest studies in the 1970s, the volume of research has increased considerably. However this has yielded conflicting results, with some studies identifying an increased prevalence of psychological symptoms whereas other studies have found no effect or even increased resilience to other stressors. These differences may reflect various factors, including the particular characteristics of the genocides and the subsequent experiences of those studied, related both to the genocide and to demographic, socioeconomic and other factors. However, there have been genocides besides the Holocaust, each generating additional research on the health of survivors and their children; yet, so far, these have not been brought together and reviewed systematically—something we now do in this paper.

We recognize that, tragically, there have been many atrocities and crimes against humanity committed in the 20th and 21st centuries. Genocide is a crime against humanity characterized by the intent to annihilate a group defined by presumed group characteristics, such as ethnicity, religion or class. We choose genocide as the exposure as it differs from other crimes against humanity in that it is a crime both against a group, defined on the basis of group identity, and against its individual members.

Formally, the definition of genocide is set out in the Convention on the Prevention and Punishment of the Crime of Genocide, which drew on the arguments by Raphael Lemkin that genocide should be considered a crime under international law. The Convention defines genocide as ‘any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such: (a) killing members of the group; (b) causing...
seriously bodily or mental harm to members of the group; (c) deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part; (d) imposing measures intended to prevent births within the group; (e) forcibly transferring children of the group to another group.28 It is widely accepted that this definition is not perfect,30 but since 1948 it has been the official, international legal definition of genocide.31 Following this definition, the killing of Armenians by Turkey (1915–17), the Holocaust (1939–45), and the mass atrocities committed in Cambodia (1975–79), former Yugoslavia (1992–95) and Rwanda (1994), were defined as genocides. As noted above, each of these genocides has particular characteristics that may impact upon the health of survivors exposed to them and on their children. These characteristics can be divided into pre-genocide, genocide and post-genocide characteristics. The main characteristics of each of the genocides in the 20th century are shown in Table 1.

Beyond differences in the characteristics of these genocides, another explanation for the heterogeneity of findings from studies of children of survivors may relate to the diversity of study designs (predominance of case reports, small sample sizes, absence of control groups), potential sampling biases (convenience or purposive sampling), unclear exposure definitions, unclear outcome definitions, and lack of standardized instruments.48,49 In addition, subsequent life events situations might influence the health of children of survivors. A further issue, adressed in some studies, is that Holocaust survivors and their children may be eligible to obtain financial restitution if a mental health expert testified that either or both were suffering effects of genocidal acts.50

Given these challenges, we aim to contribute to the understanding of children of survivors’ mental health. Specifically we aimed to: (i) review systematically the impact of genocides on the mental health of children of survivors; (ii) apply a quality assessment tool adapted for reviewing literature on genocide studies; and (iii) investigate the influence of characteristics of genocides, methodological issues and subsequent recent and lifelong stressful life events on the mental health of children of genocide survivors.

Methods
We report this systematic review in accordance with the PRISMA statement.35

Search strategy
Relevant studies were collected systematically according to the PRISMA guidelines.51,52 Articles that examined the transgenerational effects of genocides were sought in: PubMed/MEDLINE (NCBI); Embase (Elsevier); PsycINFO (EBSCO); Sociological Abstracts (ProQuest); Web of Science, including the Science Citation Index, Social Sciences Citation Index and Arts and Humanities Citation Index (Thomson Reuters); and the Published International Literature on Traumatic Stress (PILOTS) Database (ProQuest). The search strategy was designed to retrieve records that contain text related to genocides, war crimes or ethnic cleansing and terms used to describe transgenerational effects such as children, grandchildren, progeny, intergenerational, etc. (Full search strategies for each database are available in Supplementary Material 1, available as Supplementary data at IJE online.) We applied no date or language limits. The final search was carried out during September 2015 (P.A.B.). The bibliographies of included articles, as well as relevant reviews, were inspected to locate additional studies. The PRISMA flow chart is shown in Supplementary Material 2, available as Supplementary data at IJE online.

Study selection
Studies were included in the current review if they met the following inclusion criteria: (i) observational studies; (ii) published in a peer-reviewed journal; (iii) at least one comparison group; and (iv) used standardized instruments to assess mental health outcomes (details of the instruments used are provided in Supplementary Material 3, available as Supplementary data at IJE online). Studies were excluded if they met any of the following criteria: (i) the article was a systematic or narrative review, discussion paper, book section or meta-analysis; (ii) or reported a therapy/treatment-based intervention; (iii) the study was clinical or took the case study format;53–55 (iv) the study had fewer than 50 participants; (v) there was no comparison group; or (vi) there was no validated outcome measurement.

Data extraction
Four investigators (J.L., H.K., M.A., C.M.) double-screened titles and abstracts of all studies to establish eligibility for full-text screening. J.L. and H.K. resolved any disagreement about eligibility for inclusion in this review by discussing until agreement was reached. Two investigators (J.L., C.M.) extracted the data with a data extraction form. Two investigators (M.A M.M.) checked the extracted data for consistency. We extracted the following information from the studies included in the review: first author, study year, country, specific genocide, exposure definition, study design, study population, number of participants (mean age, standard deviation), sample, outcome, instrument, assessment procedure, confounders
Table 1. Characteristics of pre-genocide-, genocide- and post-genocide characteristics in the mass killing of Armenians, the Holocaust, and the genocides in Cambodia, Rwanda, and Bosnia

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<td><strong>Pre-genocide characteristics</strong></td>
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<td>Group</td>
<td>Ethnic-religious group</td>
<td>Ethnic-religious group</td>
<td>Status group</td>
<td>Ethnic group</td>
<td>Ethnic-religious groups</td>
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<tr>
<td>Setting</td>
<td>Mainly rural</td>
<td>Urban and rural</td>
<td>Mainly urban</td>
<td>Mainly rural</td>
<td>Urban and rural</td>
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<tr>
<td>Ideology</td>
<td>Racial ideologies</td>
<td>Racial ideologies</td>
<td>Class ideologies</td>
<td>Racial ideologies</td>
<td>Racial ideologies</td>
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<tr>
<td>Perpetrators</td>
<td>Perpetrators were outside group</td>
<td>Perpetrators were outside group</td>
<td>Perpetrators were inside group</td>
<td>Perpetrators were looked at inside group</td>
<td>Perpetrators were looked at inside group</td>
</tr>
<tr>
<td>Relocation</td>
<td>Forced deportation, separation</td>
<td>Isolation in ghettos, forced deportation</td>
<td>Deportation, execution, collectivization</td>
<td>-</td>
<td>Deportation to labour and concentration camps</td>
</tr>
<tr>
<td>Mode of relocation</td>
<td>Death march</td>
<td>Deportation to labour and concentration camps</td>
<td>Deportation to labour and concentration camps</td>
<td>-</td>
<td>Deportation to labour and concentration camps</td>
</tr>
<tr>
<td>Killings</td>
<td>Systematic mass extermination</td>
<td>Systematic mass extermination</td>
<td>Systematic mass extermination</td>
<td>Systematic mass extermination</td>
<td>Systematic mass extermination</td>
</tr>
<tr>
<td>Communities and identity</td>
<td>Destruction of communities</td>
<td>Destruction of communities</td>
<td>Suppression of culture, language, religion</td>
<td>Destruction of communities</td>
<td>Suppression of culture, language, religion</td>
</tr>
<tr>
<td>Gender based violence</td>
<td>Systematic rape of Armenian women</td>
<td>Rapes happened, extent still unknown</td>
<td>-</td>
<td>Systematic rape of women</td>
<td>Systematic rape of women</td>
</tr>
<tr>
<td>Numbers of victims</td>
<td>700,000–1.5 million</td>
<td>Approximately 6 million</td>
<td>1.671–1.871 million</td>
<td>500,000–1 million</td>
<td>Approximately 200 000</td>
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<tr>
<td><strong>Post-genocide characteristics</strong></td>
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<tr>
<td>Legal and scholarly recognition</td>
<td>Recognised as genocide by 29 countries; Turkish refusal to acknowledge that deaths amounts to genocide</td>
<td>Widely viewed as the archetypal genocide, major stimulus to coming of term &quot;genocide&quot;</td>
<td>Widely accepted as genocide</td>
<td>Recognised as genocide</td>
<td>Widely viewed as genocide but only the killings at Srebrenica formally recognised as such by the International Court of Justice</td>
</tr>
<tr>
<td>Reparations</td>
<td>-</td>
<td>Financial reparations by the perpetrator government</td>
<td>Perpetrators continue in government positions</td>
<td>Extensive social disruption</td>
<td></td>
</tr>
<tr>
<td>Group response</td>
<td>Organisation of within group education</td>
<td>Organisation of within group education</td>
<td>Disruption of education and networks of social support</td>
<td>Disruption of education and networks of social support</td>
<td>Ethic disaggregation</td>
</tr>
<tr>
<td>Migration</td>
<td>Diaspora mainly in the US and in France</td>
<td>New state Israel, those who returned to their homes faced often Anti-Semitism (e.g., in the former Soviet Union)</td>
<td>-</td>
<td>Migration to neighbour countries, especially to the Democratic Re-public of Congo</td>
<td>-</td>
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</tbody>
</table>

Note: Assessing the number of people killed in genocides is a challenging undertaking and no collection effort can aspire to cover all numbers. The numbers provided here are conservative estimates. The Center for Systemic Peace at Kent State University provides up to date data on genocides.47
and results. Relevant information from retrieved articles was extracted for a narrative synthesis using the Genocide Studies Quality Assessment Tool, by two reviewers (J.L., H.K.). Heterogeneity in study designs, methods, risk/protective factors, health outcomes and measurement precluded the conduct of a meta-analysis, so the results are presented as a narrative review.

Assessment of methodological quality

We applied a quality assessment tool (the Genocide Studies Quality Assessment Tool, GeSuQ), developed by a group of epidemiologists, psychiatrists, public health experts, anthropologists, sociologists and statisticians. The GeSuQ is based on: (i) the Quality Assessment Tool for Quantitative Studies (developed by the Effective Public Health Practice Project);56 (ii) guidelines for evaluating prevalence studies in mental health; and (iii) an interdisciplinary consensus process of this paper’s authors. (The tool is presented in Supplementary Material 4, available as Supplementary data at IJE online).

The GeSuQ comprises 18 items in nine key domains: (i) ethical approval (one item); (ii) external validity and selection bias (three items); (iii) misclassification (two items); (iv) study design (two items); (v) potential confounders (three items); (vi) data collection methods (one item); (vii) withdrawal and drop-out (two items); (viii) power and sample size (one item); and (ix) data analyses (three items). Studies can have between two and eight component ratings, with each component score ranging from 1 (low risk of bias; high methodological quality) to 3 (high risk of bias; low methodological quality). An overall rating for each study was determined based on the component ratings. For example, if eight ratings have been given, a rating of ‘strong’ was attributed to those with no weak ratings and at least five strong ratings, ‘moderate’ to those with one weak rating or fewer than five strong ratings and ‘weak’ to those with two or more ‘weak’ ratings. To minimize the risk of bias, assessments were completed independently by two reviewers (J.L. and M.A.). The ratings for each of the eight domains, as well as the total rating, were compared and consensus reached on a final rating for each included article.

Although the GeSuQ draws extensively on existing instruments, it has been adapted where appropriate to account for some of the specificities of genocide studies, for example by including specified relevant confounders and the origin of the samples.

Results

Selected studies

The database search returned 3 352 unique records (Figure 1). Based on the inclusion and exclusion criteria, we identified 104 articles. The full text of these articles was obtained and assessed for eligibility; 22 studies, N = 4793 participants, (n = 2431 children of survivors (CoS) and n = 2362 children of non-survivors (CoN)), met the eligibility criteria and were included in the final review. The main reasons for exclusion were that papers contained no control group or had small sample sizes. One study was conducted in Australia (n = 58575), two in Canada (n = 74258), five in the USA (n = 66713), eight in Israel (n = 22984), one in Italy (n = 12472), one in Norway (n = 6573) and two in Rwanda (n = 31274,75). These studies examined mostly children of Holocaust survivors, but two eligible studies investigated children of the genocide in Rwanda.74,75

Methodological quality assessment based on GeSuQ

All included studies used an observational study design and were cross-sectional. Using the GeSuQ we assessed six studies as having a low risk of bias and eight a moderate risk (Table 2). In terms of representativeness of the wider population, only six of the studies were rated as ‘strong’. The studies evaluated as ‘strong’ provided information about the validity and reliability of their measures, used a random sampling procedure and provided details about exposure.65,76,74,68,69,77 The definition and assessment of exposure varied, in some studies including those whose parents had been incarcerated in a concentration camp and in others including those whose parents had lived, perhaps for a short period of time, in a country occupied by the Nazis. No study reported conducting a sample size calculation before collecting data, so we did not include this category in Table 2.

To better understand how potential confounding was assessed, we examined whether studies examined individual characteristics and/or subsequent recent and/or lifelong stressful life events (Table 3). All studies included in this systematic review included age; gender was included in the majority of studies,26,65,69,72,83 but few took account of education,21,65,66,69,70,72 marital status21,26,61,65–67,69,72 or occupation.72 Three studies investigated recent life events, whether as life events without being further specified,65 war-related events69 or family-violence-related events.73 Full details of the studies are in Supplementary Material 5, available as Supplementary data at IJE online. We found no consistent association between being the child of a genocide survivor and adult psychopathology, with most studies finding no significant difference. Effects differed by: (i) sampling procedures such as random sampling versus convenience sampling; (ii) measures used; and (iii)
4,838 records identified through database searching
PubMed/MEDLINE 450
PsycINFO 1,544
Sociological Abstracts 479
Web of Science 1,317
PILOTS 689
Embase 359
1,486 removed because they were duplicates

3,352 records screened
3,248 records excluded

104 full text articles assessed for eligibility
82 full-text articles excluded

22 studies included in qualitative synthesis

Figure 1. PRISMA flow diagram of studies included in the Review.

Table 2. Assessment of the methodological quality of the 20 included studies according to GeSuQ

<table>
<thead>
<tr>
<th>First author</th>
<th>External Validity</th>
<th>Misclassification bias</th>
<th>Study design</th>
<th>Con-founder</th>
<th>Data collection methods</th>
<th>With-drawals</th>
<th>Analyses</th>
<th>Over-all</th>
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<tr>
<td>Baron, 1993</td>
<td>W***</td>
<td>M**</td>
<td>S*</td>
<td>W</td>
<td>E</td>
<td>W</td>
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<td>Gay, 1978</td>
<td>M</td>
<td>M</td>
<td>W</td>
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<td>M</td>
<td>W</td>
<td>M</td>
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<td>Giladi, 2012</td>
<td>M</td>
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<td>M</td>
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<td>Iliceto, 2012</td>
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<td>Keinan, 1988</td>
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<td>Leon, 1981</td>
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<td>Letzter-Pouw</td>
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<td>Levav, 2007</td>
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<td>Major, 1996</td>
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<td>Roth, 2014</td>
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<td>Schwartz, 1994</td>
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<td>Weinberg, 2013</td>
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<td>Weiss, 1986</td>
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<td>Zlotogorski, 1983</td>
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*S = Strong; **M = Moderate, ***W = Weak or very weak
assessment of recent stressful life events (e.g. family violence) as potential determinants versus no assessment of recent life events. We found 54 different outcome measures in use (Supplementary Material 3). These measures varied by psychometric properties and length. Most studies did not assess recent stressful life events which might increase psychopathological symptoms among children of survivors.

Discussion

We conclude that, from the 20 studies that met our inclusion criteria, no high quality study showed an association between being the child of a genocide survivor and psychopathology. Although we found no consistent effect of being a child of genocide survivors on mental health, given the heterogeneity of the findings, there may be other factors that are relevant in children of survivors, such as those relating to the characteristics of the specific genocide, and the purposive disruption of family bounds. Accordingly, survivors of the Armenian genocide and the Holocaust were less likely to experience rejection or betrayal of their own parents or other family members/friends. In these cases, the genocide may be less likely to undermine basic trust in close relatives. On the other hand, in Cambodia and Rwanda, in many cases children were forced to betray their parents, which might have long-lasting influences on their mental health. This is consistent with the emerging concept of moral injuries. Morally injurious experiences are defined as perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations. Examples such as participating in or witnessing inhumane or cruel actions, failing to prevent the immoral acts of others and engaging the victim in acts of transgression are seen as moral injuries. This concept is related to post-genocide characteristics. In the study from Rwanda, there was an adverse association seen in offspring of survivors where those survivors continued to experience adverse living conditions such as witnessing domestic violence. Furthermore, in Rwanda, high rates of psychopathology in children were associated with poor living conditions after the genocide.

The absence of any consistent finding may also reflect methodological factors. Appropriate sampling procedures are crucial, especially where the sampling method may be associated with the outcome, e.g. purposive sampling or sampling via self-selection might introduce bias. Self-selected persons may be those who experience psychopathological symptoms now, for other reasons, and are looking for causes, such as those that they can attribute to their parents’ experiences. Additionally, we found 54 different instruments being used (Supplementary Material 3) which limits comparability of results.

None of the studies adopted a life course approach, linking genocide exposure of the parents and more recent life events affecting the children. Potential moderating recent life events (occurring after the genocide) were only assessed in three recent studies (Table 3). Among life events studied, family violence was associated with more psychopathologies in the offspring of survivors. Research adopting a life course approach is clearly difficult, given fading memories and recall bias, but is likely to help understand any impact of genocide on the mental health of children of survivors, emphasizing the important role that recent life events play in the development and course of psychopathologies among those whose earlier life renders them either vulnerable or resilient. There may also be selection bias associated with the genocide, with those who had (mental) health problems before genocide having a smaller chance of survival. Thus, genocide survivors may have been protected against mental health conditions through a variety of factors such as genes, personality traits and social and chance factors, some of which may be transmitted to the next generation via either nature or nurture.

This review is subject to certain limitations. The most obvious relates to the original research we identified. Thus, the control groups selected varied greatly. Ideally, they would be comparable to the children of survivors in every way except that of their parents’ experience. However, this is clearly not the case and, given the complex journeys taken through life by many of these affected families, it is not clear how this could be overcome. Hardly any study assessed the mental health of the parents. That by Roth is an exception, but an important one as it found no evidence that posttraumatic stress disorder in Rwandan mothers was associated with the same problem in their 12-year-old children. Instead, the mother’s experience of family violence was important. This provides evidence against transgenerational trauma transmission.

Other limitations relate to the approach taken and the choices made, albeit for what we believe were good reasons. These include the exclusion of ‘grey literature’. The research we included from peer-reviewed literature was, as noted above, often subject to considerable weaknesses; so we believe that most material in such grey literature is unlikely to have been of higher quality. The review also employed narrative analysis, rather than meta-analysis, because of the heterogeneity of study designs, outcomes, exposures, risk and protective factors. Yet, the review opens a new perspective on transmission of exposure to genocide and the health of offspring of survivors, suggesting that there is a need for improved quality of studies, including random samples, agreement on standardized validated assessment tools and suitable control groups, to obtain valid assessments of any potential long-term effects.
Table 3. Summary of included studies

<table>
<thead>
<tr>
<th>First author, year</th>
<th>Children of genocide survivors versus comparators</th>
<th>Setting</th>
<th>Comparators</th>
<th>Quality</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baron, 199378, 199613</td>
<td>Disadvantaged Holocaust</td>
<td>CoS versus children who left Germany after Hitler's rise to power (1933) but who were not in camps.</td>
<td>M</td>
<td>CoS showed less resistance to stress and less Jewish identity than comparators.</td>
<td></td>
</tr>
<tr>
<td>Gay, 197887</td>
<td>Disadvantaged Holocaust</td>
<td>Patients clinic in Tel-Aviv (a) both parents had been in Holocaust, (b) mother in Holocaust, (c) father in Holocaust, (d) neither parent in Holocaust.</td>
<td>M</td>
<td>CoS showed less resistance to stress, more posttraumatic stress symptoms, lower level of communication where mother or both parents in Holocaust.</td>
<td></td>
</tr>
<tr>
<td>Giladi, 201358</td>
<td>Disadvantaged Holocaust</td>
<td>CoS versus Jewish Americans/Canadians of European descent with no direct relatives who were Holocaust survivors</td>
<td>W</td>
<td>CoS had less resistance to stress, more irritability, more anger, more negative perceptions of others, similar in affective temperament.</td>
<td></td>
</tr>
<tr>
<td>Letzter-Pouw, 201465</td>
<td>Disadvantaged Holocaust</td>
<td>CoS versus sample matched on age who were also born in Europe, did not experience the Holocaust, immigrated to Israel as children before the beginning of World War II,</td>
<td>S</td>
<td>CoS had less resistance to stress, more perceived transmission of parental burden.</td>
<td></td>
</tr>
<tr>
<td>Palgi, 201567</td>
<td>Disadvantaged Holocaust</td>
<td>CoS versus Hebrew speaking, Jewish Israelis of European origin from similar socio-economic backgrounds whose parents were not under Nazi or pro-Nazi domination during the war.</td>
<td>M</td>
<td>CoS showed less resistance to stress, more efforts in preventing parents suffering.</td>
<td></td>
</tr>
<tr>
<td>Shrir, 201188</td>
<td>Mixed Holocaust</td>
<td>Children of survivors versus immigrants from Europe before 1933.</td>
<td>S</td>
<td>More physical health problems but more wellbeing and optimism in Children of survivors.</td>
<td></td>
</tr>
<tr>
<td>Ilceto, 201172</td>
<td>Mixed Holocaust</td>
<td>CoS versus age matched individuals with no family experience of the Holocaust.</td>
<td>M</td>
<td>Differences in irritability, anger, negative perception of others; similar in hopelessness, and in affects.</td>
<td></td>
</tr>
<tr>
<td>Rose, 198761</td>
<td>Mixed Holocaust</td>
<td>CoS versus children of Eastern European immigrants, Jewish controls, and non-Jewish controls.</td>
<td>M</td>
<td>No statistically significant differences in psychopathology, differences in family interaction/family environment.</td>
<td></td>
</tr>
<tr>
<td>Weinberg, 201377</td>
<td>Not significant Holocaust</td>
<td>CoS versus general Australian population and Jewish Australians not offspring of Holocaust survivors.</td>
<td>W</td>
<td>No statistical significant difference between between CoS and comparators in case of one survivor parent, significant differences in CoS with two survivor parents.</td>
<td></td>
</tr>
<tr>
<td>Sigal, 197321</td>
<td>Not significant Holocaust</td>
<td>CoS versus offspring of Canadian-born Jews and offspring of other immigrants.</td>
<td>M</td>
<td>No statistical significant differences in aggression between CoS and comparators, statistical significant differences in rigidity.</td>
<td></td>
</tr>
</tbody>
</table>

(Continued)
of genocides on the mental health of children of survivors. Another limitation is that we restricted studies to those linked to mass atrocities defined as genocide, only finding studies of the Holocaust and the genocides in Rwanda and Bosnia and of the Armenians. As noted above, there have been many other mass killings in the 19th, 20th and 21st centuries, such as those by European settler populations of native Americans and Australian aborigines, that have not been termed genocide, for reasons discussed by Moses and Stone, and studies of children of refugees from oppression that falls far short of genocide in other settings, such as Somalia and Bhutan. All of these would benefit from further study. We surmise that our findings are likely to be relevant to those settings too, but this would require a further, much more extensive review to better understand the differences and commonalities of the potential impact on health of survivors and offspring of survivors. In addition, although falling outside the criteria for our review, it is important to note that there is also a growing body of research looking at potential mechanisms for any effects that transcend generations. This research has focused mainly on cortisol responses and epigenetic changes. However, we hope that our approach to the topic, and in particular our use of a specific instrument for assessing study quality, may allow others to determine whether our findings are generalizable to these other settings.

Table 3. Continued

<table>
<thead>
<tr>
<th>First author, year</th>
<th>Children of genocide survivors versus comparators</th>
<th>Setting</th>
<th>Comparators</th>
<th>Quality</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keinan, 1988 (^{71})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS versus offspring of European immigrants who had been in neither concentration nor labor camps, matched for age, years of schooling and birthplace.</td>
<td>M</td>
<td>No statistically significant differences between CoS and comparators in psychopathology.</td>
</tr>
<tr>
<td>Leon, 1981 (^{60})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS versus offspring of European Jews who had emigrated to the USA in the pre-war period.</td>
<td>M</td>
<td>No significant differences in psychopathology between CoS and comparators.</td>
</tr>
<tr>
<td>Levav, 2007 (^{89})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS now residing in Israel versus offspring of Europe-born parents who did not reside in Nazi occupied countries, now living in Israel.</td>
<td>S</td>
<td>No statistical significant differences between CoS and comparators in psychopathology.</td>
</tr>
<tr>
<td>Rieder, 2013 (^{74})</td>
<td>Not significant</td>
<td>Rwanda</td>
<td>Survivors and CoS versus former prisoners and their offspring.</td>
<td>S</td>
<td>No statistically significant differences in psychopathology by exposure of parents status but by gender.</td>
</tr>
<tr>
<td>Roth, 2014 (^{82})</td>
<td>Not significant</td>
<td>Rwanda</td>
<td>All mothers experienced genocide. Analysis by cumulative experience of mothers to acts of violence of all sorts.</td>
<td>M</td>
<td>Maternal PTSD was not associated with child’s, psychopathology.</td>
</tr>
<tr>
<td>Sagi-Schwartz, 2003 (^{92})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>Survivors and CoS versus émigrés to Israel who left Europe as children before the war.</td>
<td>S</td>
<td>No significant differences between CoS and comparators.</td>
</tr>
<tr>
<td>Schwartz, 1994 (^{71})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS versus children of parents, who migrated to Israel from Israel before 1944.</td>
<td>S</td>
<td>No significant differences between CoS and comparators in adulthood.</td>
</tr>
<tr>
<td>Weiss, 1986 (^{82})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS versus children of immigrants, and children of American-born parents.</td>
<td>W</td>
<td>No statistical significant differences between groups.</td>
</tr>
<tr>
<td>Zlotogorski, 1983 (^{63})</td>
<td>Not significant</td>
<td>Holocaust</td>
<td>CoS versus Jewish residents in the USA.</td>
<td>W</td>
<td>No statistical significant differences between CoS and comparators.</td>
</tr>
</tbody>
</table>
risks of poor mental health. This view is based on accounts of the experiences of individuals or small groups. However, these are drawn from highly selected groups, often in clinical settings, and lack control groups. It is important to note that we cannot dismiss the possibility that some children of survivors do experience adverse effects that are attributable to their parents’ or grandparents’ experiences. However, this can only be assessed properly with comparable or the same instruments and in more studies of high quality.

Finally, although interest has entirely appropriately focused on psychopathology of the victims of genocide, there is also a case for examining psychiatric disorders of children of perpetrators. This is likely to be even more difficult, for many reasons, but this should not prevent attempts to do so.

Supplementary Data
Supplementary data are available at IJE online.

Conflict of interest: None declared.

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