Childhood physical abuse and suicide-related behavior: A systematic review

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(Received 9 May 2010; final version received 18 November 2010)

Childhood physical abuse is associated with suicide-related behavior. We investigate how shared environment with perpetrator(s) identified as a family member or parent/parental figure or an adult at home contribute to this association. This systematic review of school- and population-based studies in children and youth reports on five relevant studies. The association was statistically significant in each study, and when examined the association was independent of childhood sexual abuse and other factors. Childhood physical abuse may translate into suicide-related behavior through mechanisms unique from childhood sexual abuse. Future research is needed to strengthen causal inferences to inform the prevention of suicide-related behavior.

Keywords: childhood physical abuse; suicidal behavior; review

Introduction

Suicide ranks in the top three causes of death among North American 15–24-year-olds (McIntosh, 2009; Public Health Agency of Canada, 2008). A previous suicide attempt is a strong risk factor for youth suicides (Bridge, Goldstein, & Brent, 2006; Gould, Greenberg, Velting, & Shaffer, 2003). Standard nomenclature for “suicide-related behaviors” (SRB) has been proposed (Silverman, Berman, Sanddal, O’Carroll, & Joiner, 2007) and is applied in this review.

In a previous review, childhood sexual abuse (CSA) and suicide attempt(s) were found associated in boys and girls, but stronger in boys. Adjustments did not explain this sex difference fully. However, few controlled for childhood physical abuse (CPA) (Rhodes et al., in press). Therefore, in this review we examine whether CPA acts on SRB independently of CSA and other factors to identify whether there are unique mechanisms that, if acted upon, could prevent SRB.

Potential causal mechanisms underlying a CPA–SRB association relate to shared social and biological environments between the child and perpetrator(s). In social environments, perpetrator(s) may legitimize CPA as disciplinary. This view may, then, be internalized by
the child and modeled with SRB as a form of self-punishment (Brown, 2006; Yates, 2004). Punishment has been identified as one of the top three reasons given by adolescents for SRB (Madge et al., 2008). Further, any acquired brain injury from CPA could play a role in SRB (Hesdorffer, Rauch, & Tamminga, 2010). Shared biology may also contribute to the association. For example, impulsive aggression, a potentially inherited trait related to SRB (Bursztein & Apter, 2008), may be transmitted biologically from parent(s) to offspring increasing the offspring’s SRB risk.

Few reviews have considered CPA outcomes (Gilbert et al., 2009; Malinosky-Rummell & Hansen, 1993). Those examining the CPA–SRB association in children and youth (Beautrais, 2000; Evans, Hawton, & Rodham, 2005) indicate that most studies find an association; however, it is unclear whether it is independent of other factors. Beautrais reviewed 12 studies, finding a relatively strong association [median odds ratio (OR) = 5.7] between exposure to childhood physical abuse and a suicide attempt. However, in one of the few that adjusted for other factors, including CSA, CPA was no longer predictive of a suicide attempt in a hospital-based sample (Beautrais, 2000). A more recent population-based review to December 2000 reported that in four studies, the CPA–SRB association was statistically significant in three and remained so after adjustments, including CSA, in two (Evans et al., 2005).

Thus, the purpose of this systematic review is to update previous reviews of the CPA–SRB association among children and 12 youth towards clarifying potential causal mechanisms. To guide future research, the findings are interpreted in the context of potential biases and plausible causal mechanisms (Elwood, 2007; Rothman & Greenland, 2005).

Methods

Study selection

To be eligible for this review, studies were school- or population-based reporting individual-level empirical results on the CPA–SRB association in children and youth. Perpetrator(s) had to be identified as a family member or a parent/parental figure or an adult at home. Children and youth were defined as those aged 18 years or younger or in grade 12 or less (in school-based samples), as in the previous review. Exclusion criteria are also described there (Rhodes et al., in press).

Measures

CPA was defined as the “intentional use of physical force against a child that results in, or has the potential to result in, physical injury” (Gilbert et al., 2009, p. 69). Where possible, CPA was further defined by: the relationship of the perpetrator(s) to the child, e.g. biological relative(s); the frequency and severity of the CPA; and CPA identified as punishment. SRB was examined, where possible, by: the recall time-frame (lifetime or past 12 months); suicidal intent; and the number of events.

Search strategy

A systematic literature search was performed using multiple databases including publications dating from inception to June, 2009 in the English language (see previous review: Rhodes et al., in press). Of the original 388 school- or population-based papers identified, 57 reported on the CPA–SRB association, with 34 in children and youth. Thirty-one of the 34 were excluded, as the definitions of the perpetrator(s) were either...
ambiguous \((n = 18)\) or referred to other perpetrators than specified \((n = 13)\), leaving three cross-sectional studies (Flisher, Ziervogel, Chaltron, Leger, & Robertson, 1996; Lau, Chan, Lam, Choi, & Lai, 2003; Logan, Leeb, & Barker, 2009). For comparative purposes, two longitudinal studies (excluded initially for including young adults) were reviewed, as the young adults were close in age to the cross-sectional study samples (Brezo et al., 2008; Fergusson & Lynskey, 1997).

**Data analysis**

Relevant data were extracted from the five studies. In one study, it was possible to calculate unadjusted ORs and 95% confidence intervals (CIs) from the information provided (Brezo et al., 2008). All but one (Lau et al., 2003) provided adjusted estimates. Statistically significant associations were identified when the 95% CI did not include one or statistical tests indicated that the association was significant at the \(p < 0.05\) level. To ensure accuracy and completeness, data were extracted and estimates calculated by one reviewer and checked by a second reviewer. Reviewer disagreements were resolved through consensus. Formal quality assessment rules were not applied, given the lack of consensus and evaluation tools to assess observational studies (Sanderson, Tatt, & Higgins, 2007), nor were results pooled meta-analytically, given the small number of studies and methodological heterogeneity.

**Results**

Studies (Table 1) were conducted in five countries, with sample sizes ranging from 489 to 7340. All questions were self-reported, with additional parental report on SRB in one study (Brezo et al., 2008).

The three cross-sectional studies reported on CPA and/or physical injury by perpetrator(s), as specified (Flisher et al., 1996; Lau et al., 2003; Logan et al., 2009). One cross-sectional study examined corporal punishment (Lau et al., 2003). The longitudinal studies made specific reference to CPA by parent(s) (Brezo et al., 2008; Fergusson & Lynskey, 1997); however, it was unclear whether they were biological parents. CPA was investigated in relation to punishment and its frequency and/or severity in one longitudinal study (Fergusson & Lynskey, 1997). In the other, CPA (without CSA), CSA (without CPA) or both types of abuse were investigated (Brezo et al., 2008).

Two studies reported on suicide attempt(s) in the past 12 months (Flisher et al., 1996; Logan et al., 2009); one on a count (Logan et al., 2009). Two others reported on lifetime suicide attempt(s) (Brezo et al., 2008; Fergusson & Lynskey, 1997). In the fifth, lifetime SRB was examined (Lau et al., 2003).

Table 2 shows CPA–SRB unadjusted and adjusted associations along with the adjustment factors. Unadjusted associations were statistically significant in each study. Associations were numerically greater at more severe/harsh levels (Fergusson & Lynskey, 1997; Lau et al., 2003).

The effect of CSA on the CPA–SRB association, along with other factors, was adjusted for in one cross-sectional (Logan et al., 2009) and one longitudinal study (Fergusson & Lynskey, 1997). In each, CPA remained statistically significant. In the other longitudinal study, CPA without CSA and CPA with CSA were both associated with a suicide attempt after adjustments.
Table 1. Study characteristics.

<table>
<thead>
<tr>
<th>Author, year</th>
<th>n</th>
<th>Description</th>
<th>Study design</th>
<th>Child physical abuse</th>
<th>Suicide-related behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flisher et al., 1996</td>
<td>7340</td>
<td>Students from 16 schools in 3 major education departments (cluster sample) Male 44.5%, female 54.2% (South Africa)</td>
<td>Cross-sectional, self-administered questionnaire</td>
<td>Self-report: • Physically injured by adult at home (past 12 months)</td>
<td></td>
</tr>
<tr>
<td>Lau et al., 2003</td>
<td>489</td>
<td>Grade 8 students, selected randomly from 10 schools Male 61.8%, female 38.2% (Hong Kong)</td>
<td>Cross-sectional, structured questionnaires, administered by trained research staff in the absence of teachers (identities kept confidential to research team)</td>
<td>Self-report: • Corporeal punishment by family member (past 6 months): 4.5% • Beaten for no reason (past 6 months): 10.9% • Beaten to injury by family member (lifetime): 10.4%</td>
<td>Self-report: • Self-harm (lifetime)</td>
</tr>
<tr>
<td>Logan et al., 2009</td>
<td>1484</td>
<td>Grade 7 students, from all 10 public schools within a single district Male 48.5%, female 51.5% (USA)</td>
<td>Cross-sectional, self-administered anonymous questionnaire</td>
<td>Self-report: • Early (before age 10) physical abuse, injuries from being spanked, struck, or shoved by parents, guardians or their partner: 18.9%</td>
<td></td>
</tr>
<tr>
<td>Fergusson &amp; Lynskey, 1997</td>
<td>1265</td>
<td>Population-based birth cohort (New Zealand)</td>
<td>Longitudinal, self-report questionnaires, follow-up at 18 years</td>
<td>Self-report: • Physical punishment between 0–16 years, by both parents: never (10.8%), seldom (77.7%) As above, by at least one parent: regular (7.6%), severe/harsh (3.9%)</td>
<td>Self-report: • Suicide attempt(s) (lifetime)</td>
</tr>
<tr>
<td>Brezo et al., 2008</td>
<td>1684</td>
<td>Students from public francophone schools (multi-stage sampling) (Canada)</td>
<td>Longitudinal, personal interview(s), follow-up at wave 1 (6–12 years), wave 2 (15–18 years), and wave 3 (19–24 years)</td>
<td>Self-report, wave 3, (lifetime): • Childhood physical abuse perpetrated by parent(s): 20.6% • Contact sexual abuse &lt; 18 years: 9.9% • Both: 8.2%</td>
<td>Self-report or parental report, wave 2, combined with self-report wave 3 (lifetime): • Suicide attempt(s), &lt;18 years: 6.2% No abuse: 6% CPA: 11.7% CSA: 14.8% Both: 32.2%</td>
</tr>
</tbody>
</table>

Note: CPA, childhood physical abuse; CSA, childhood sexual abuse.
Table 2. Adjusted and unadjusted effect estimates for the association between childhood physical abuse and suicide-related behaviors.

### Cross-sectional samples of children and youths

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Unadjusted</th>
<th>Adjusted</th>
<th>Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flisher et al., 1996</td>
<td>Not shown</td>
<td>Male: OR: 2.4 (1.3–4.5)</td>
<td>Stepwise logistic multivariate regression models in boys and girls, entry criteria, $p=0.01$</td>
</tr>
<tr>
<td></td>
<td>Text stated unadjusted associations were statistically significant in boys and girls</td>
<td>Female: not shown</td>
<td>Factors: having physically injured someone outside home/school; going out at night and walking home alone; suicidal ideation; telling anyone of the intention to attempt suicide</td>
</tr>
<tr>
<td>Lau et al., 2003</td>
<td>Corporal punishment, OR=3.3, $p=0.054$</td>
<td>None</td>
<td>Poisson regression multivariate model</td>
</tr>
<tr>
<td></td>
<td>Beaten for no reason, OR=2.4, $p=0.074$</td>
<td>None</td>
<td>Factors: CSA (&lt;10 years old); sex; CPA–sex interaction; age; race; witnessing neighborhood violence; witnessing family violence</td>
</tr>
<tr>
<td></td>
<td>Beaten to injury, OR=8.5, $p&lt;0.001$</td>
<td>None</td>
<td></td>
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<tr>
<td>Logan et al., 2009</td>
<td>Female: PR=3.7, $p&lt;0.002$</td>
<td>PR=2.5 (1.9–3.3)</td>
<td></td>
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<tr>
<td></td>
<td>Male: PR=2.4, $p&lt;0.05$</td>
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</table>

### Longitudinal samples including young adults

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Rates of suicide attempt by extent of physical punishment:</th>
<th>Rates of suicide attempt by extent of physical punishment:</th>
<th>Multiple logistic multivariate regression model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fergusson &amp; Lynskey, 1997</td>
<td>None: 4.5%</td>
<td>None: 3.3%</td>
<td>Factors: CSA; sex; family history of offending; changes of parents (&lt;15 years old); family life events (11–14 years old); maternal age; parental illicit drug use; average family income (up to 10 years old); childhood disadvantage (3 years); socioeconomic status; family type</td>
</tr>
<tr>
<td></td>
<td>Seldom: 4.2%</td>
<td>Seldom: 5.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regular: 12.8%</td>
<td>Regular: 7.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severe/harsh: 17.5%</td>
<td>Severe/harsh: 10.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p&lt;0.001$</td>
<td>$p&lt;0.05$</td>
<td></td>
</tr>
<tr>
<td>Brezo et al., 2008</td>
<td>CPA (no CSA), OR: 1.8 (1.1–3.0)</td>
<td>CPA, OR: 1.9 (1.0–3.6), $p&lt;0.05$</td>
<td>Multiple logistic multivariate regression model</td>
</tr>
<tr>
<td></td>
<td>CSA (no CPA), OR: 2.0 (1.1–3.9)</td>
<td>CSA, OR: not shown</td>
<td>Factors: sex; disruptive group membership</td>
</tr>
<tr>
<td></td>
<td>CPA and CSA, OR: 4.6 (2.7–8.1), $p&lt;0.001$</td>
<td>CPA and CSA, OR: 4.7 (2.5–8.9), $p&lt;0.001$</td>
<td></td>
</tr>
</tbody>
</table>

Note: CI, confidence interval; CPA, childhood physical abuse; CSA, Childhood sexual abuse; OR: odds ratio; PR, prevalence ratio.
Discussion

This systematic review examined five studies sampling children and youth reporting on the CPA–SRB association where perpetrator(s) were a family member or parent/parental figure or an adult at home. Despite methodological variations, CPA was associated with SRB in each study. After controls including CSA, CPA was associated independently with suicide attempt(s) in one cross-sectional study (Logan et al., 2009) and two longitudinal studies (Brezo et al., 2008; Fergusson & Lynskey, 1997).

There are several limitations. Many studies were excluded due to ambiguous CPA definitions concerning perpetrator(s). Further, among those reviewed, biological relative(s) were not identified; therefore, we cannot comment on shared biology. Given the small number of studies, publication bias may have influenced the results. In all studies, CPA and SRB included self-reports; thus, underreporting may have attenuated the CPA–SRB association. However, systematic bias in recall was not evident in this association in a test–retest study in one longitudinal work (Fergusson, Horwood, & Woodward, 2000). For ethical reasons, CPA cannot be allocated randomly to determine its association with SRB. Thus, there may be unknown and, therefore, uncontrolled confounders. While four of the five studies adjusted for potential confounding, control variables differed across studies.

Given these limitations, it remains uncertain whether the CPA–SRB association is causal; however, an association with suicide attempt(s) persisted after controls for CSA and other factors. This independence may represent a unique mechanism for CPA, such as severe/frequent physical abuse by a family member (Lau et al., 2003) or parent (Fergusson & Lynskey, 1997).

In order to strengthen the inference that CPA is related causally to SRB, future research can be designed to identify and test theories through refinements in study design and methods. CPA definitions and other forms of maltreatment could be tied more closely to social and biological contexts to determine periods of risk. Ideally, future research will generate larger, longitudinal studies that will solidify theories generated regarding the effect of CPA on SRB, as well as provide insight into protective factors, to inform SRB prevention efforts.

Disclaimers

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the affiliated or acknowledged organizations.

Acknowledgements

The authors gratefully acknowledge Carolyn Ziegler MA, MIS, Information Specialist, St Michael’s Hospital, Health Sciences Library in carrying out the electronic literature searches. Funding for this project was provided by an operating grant from the Canadian Institutes of Health Research PCY86888 in conjunction with support and partnership from the Child Welfare League of Canada; The Ontario Association for Children’s Aid Societies; The Provincial Centre of Excellence for Child and Youth Mental Health at the Children’s Hospital in Eastern Ontario; The Injury and Child Maltreatment Section, Health Surveillance and Epidemiology Division, Public Health Agency of Canada; and the Centre of Excellence for Child Welfare.

References


