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Child abuse-related homicides precipitated by caregiver use of harsh physical punishment

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Abstract

Background: Physical punishment (PP), which may involve the use of physical force, has been linked to negative effects in children and can escalate to abusive or harsh PP, resulting in injury or death.

Objective: To examine characteristics associated with fatal abuse involving caregiver use of harsh PP.

Methods: Data were from the National Violent Death Reporting System in 40 states, the District of Columbia, and Puerto Rico for years 2012–2018. Qualitative analysis was used to code textual material into categorical data, and logistic regression was used to examine associations between various characteristics and harsh PP.

Results: Approximately 4 % ($n = 87$) of the 2414 abuse-related homicides were known to have been precipitated by caregiver use of harsh PP. In adjusted models, homicides had greater odds of being harsh PP-related when incidents involved mothers' male companions (versus fathers), victims had a previous nonfatal injury (versus no previous nonfatal injury), and another adult participated in the fatal incident or had awareness of prior abuse/neglect (versus those without this characteristic). Two common precipitators of caregivers' use of harsh PP were: 1) child had a

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Conflict of interest

No authors have potential conflicts of interest.

bathroom-related accident/soiled clothes (23.0 %; $n = 20$), and 2) child disobeyed a directive given by the perpetrator (17.2 %; $n = 15$).

Conclusions: This study highlights characteristics associated with fatal abuse precipitated by caregiver use of harsh PP. Children were physically punished for developmentally normative behaviors. Ensuring caregivers are aware of and use effective parenting practices that focus on use of nonphysical discipline and promote healthy child development, may help decrease harsh PP and physical abuse-related homicides among children.

Keywords

Corporal punishment; Harsh physical punishment; Physical child abuse; Child abuse related homicide

1. Introduction

Physical punishment (PP), also called corporal punishment, is often used to try to change undesired child behavior. PP may involve physical force (e.g., hitting, spanking), with or without an implement (e.g., belt), and is intended to cause pain or discomfort without causing injury (United Nations Committee on the Rights of the Child, 2006). PP has been linked to many negative effects (e.g., poor child mental health outcomes, aggression; Afifi, Mota, Sareen, & MacMillan, 2017; Gershoff, 2002; Sege, Siegel, COUNCIL ON CHILD ABUSE AND NEGLECT, & COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH, 2018), leading to a global shift in its support and use; 64 countries now prohibit all forms of PP for children (Global Initiative to End All Corporal Punishment of Children, 2021a).

Although recent evidence shows declining parental support for PP in the United States (U.S.; Sege et al., 2018), the use of PP in the home is lawful in all states (Global Initiative to End All Corporal Punishment of Children, 2021b). Estimates of the rate of parental use of PP in the U.S. fluctuate dramatically (37 %–67 %) across studies due to methodological differences (Finkelhor, Turner, Wormuth, Vanderminden, & Hamby, 2019; The Harris Poll, 2013). Despite differences across studies, these estimates highlight PP as an important public health issue because it involves use of physical force (e.g., hitting), which can escalate to abusive or harsh PP, resulting in child physical abuse (PA; Afifi et al., 2017; Gershoff, 2002) or death (Cavanagh, Dobash, & Dobash, 2007). When examining PP as a risk factor for PA, one study showed 75 % of substantiated child PA resulted from parental use of PP (Trocmé, Fallon, MacLaurin, et al., 2005). Another study found harsh PP was associated with a greater odds of child PA ($aOR = 26.6$; 95 % CI, 21.6 to 32.6; Afifi et al., 2017). Similarly, in a meta-analysis examining spanking and detrimental child outcomes, spanking was significantly associated with risk of PA with mean weighted effect size at ($d = 0.64$; CI, 0.39 to 1.74; Gershoff, 2002).

While PP and PA share similar characteristics, such as hitting and physical pain, and PP can escalate to PA (Afifi et al., 2017; Gershoff, 2002), PP is conceptually distinct from PA, as PA involves acts (e.g., physical assault, kicking) that violate laws and policies designed to protect children (Child Welfare Information Gateway, 2019). The acceptable

use of PP is often determined by cultural and social norms and attitudes (Gelles & Straus, 1979). The lack of systematic tracking of PP-related injuries and deaths in the U.S. and definitional challenges in distinguishing PP from PA, make it difficult to study PP as a risk factor among children who die from PA-related injuries. Due to the lack of research and systematic tracking of child PA involving caregiver use of PP in the U.S., possible parallels can be drawn from studies that examine child PA. For example, studies have shown children who are young; male; Black, non-Hispanic; have a history of abuse or previous non-fatal injury; and reside in households with an unrelated adult, are at greater risk of being victims of non-fatal and fatal PA (Daly & Wilson, 1994; Farrell et al., 2017; Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016; Pierce et al., 2017; Putnam-Hornstein, Cleves, Licht, & Needell, 2013; Schnitzer & Ewigman, 2005). Further, research has linked social and structural inequities (e.g., poverty) with increased risk of fatal PA in children of color (Farrell et al., 2017). Inequities such as poverty can create conditions that might make it hard to parent (Council on Community Pediatrics, 2016), and in turn, increase parental stress (Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000). Parental stress is a factor found to be positively associated with harsh parenting practices (Jackson & Choi, 2018; Pinderhughes et al., 2000).

Data sources for child PA-related homicides precipitated by caregiver use of PP are limited. However, reviewing administrative reports (e.g., police reports) of fatal child PA cases is one way of examining factors associated with PP, as these reports allow for a qualitative review of cases involving caregiver use of PP. One study that is consistently cited as evidence that PP is a risk factor for fatal abuse examined case files in 26 fatal PA cases of children ages 3 weeks to 4 years in the United Kingdom (Cavanagh et al., 2007). In that study, perpetrators' intent to punish child's crying behavior was the main precipitator, with abusive head trauma (more commonly known as shaken baby syndrome; National Center on Shaken Baby Syndrome, 2020) being noted in most of the fatalities (Cavanagh et al., 2007). More research could help to better understand fatal child PA precipitated by caregiver use of PP and across broader age groups. To address the gap in literature, we used data abstracted from administrative reports (e.g., coroner or medical examiner reports) to examine characteristics associated with fatal child PA involving caregiver use of PP. Because children whose deaths were precipitated by caregiver use of PP likely included behaviors considered more severe than "traditional PP," the term harsh PP (Afifi et al., 2017) is used herein. In this study, harsh PP (definition in Table 1) include cases where the child was physically punished by the perpetrator to the point of death, PP was used to correct child "disobedience" or punish child "misbehavior," with or without an implement, and the PP was the primary precipitating circumstance that initiated the chain of events leading directly to the child's death.

2. Methods

Data are from the National Violent Death Reporting System's (NVDRS) Restricted Access Database. NVDRS is an active, state-based surveillance system that captures violent death data (Centers for Disease Control and Prevention, 2020). Although the Centers for Disease Control and Prevention maintains NVDRS, it is managed and implemented by funding recipients, and data are collected and entered into a web-based system by data abstractors. Data from death certificates (DCs), law enforcement (LE) reports, and coroner/medical

examiner (C/ME) records are linked and compiled into one incident. DCs provide an underlying cause and manner of death (e. g., homicide), while LE reports and C/ME records –entered as free text –provide a written account of the fatal event. Extensive details on NVDRS methodology can be found elsewhere (Wilson et al., 2022).

Cases that met the definition of child abuse-related homicide (defined in Procedures section) were included in this analysis. They come from the following funding recipients: Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin (2012–2018); Michigan (2014–2018); Arizona, Connecticut, Kansas, Maine, Minnesota, New Hampshire, New York, and Vermont (2015–2018); Illinois, Indiana, Iowa, Pennsylvania, and Washington (2016–2018); Hawaii (2015–2016); California, Delaware, District of Columbia, Nevada, Puerto Rico, and West Virginia (2017–2018); and Alabama, Louisiana, Missouri, and Nebraska (2018).

2.1. Procedures

To identify cases, we used preliminary search criteria to include homicides involving children aged 0–17 years that occurred during 2012 through 2018, which yielded ($N = 5332$) cases. The search criteria was narrowed to include abuse-related homicides of children ages 0–17 years involving a caregiver. Caregiver refers to someone who is responsible for the care of the child (e.g., biological parent, babysitter). LE and C/ME narratives were reviewed by two independent raters to determine whether circumstances of the homicide met the case definition. Cases missing both LE and C/ME narratives were excluded ($n = 256$). Cases that included either or both LE and C/ME narratives, but circumstances did not meet the case definition (e.g., children killed by a stranger, peer-on-peer teen homicides), were excluded ($n = 2662$). A total of 2414 cases were identified as abuse-related.

2.2. Content analysis

We conducted a content analysis, a qualitative method used to systematically code and analyze textual data, to determine the presence or absence of characteristics in the LE and/or C/ME narratives (Kleinheksel, Rockich-Winston, Tawfik, & Wyatt, 2020). Narratives were manually coded using a priori operational definitions (Table 1) for variables that are neither required nor systematically collected in NVDRS (e.g., harsh PP, event preceding caregiver's use of harsh PP). These definitions were then used to guide predetermined codes for the presence (1 = *Yes*) or absence (0 = *No*) of a characteristic in the narrative(s). Once each rater independently coded each variable, they discussed all cases and reconciled discrepant coding until 100 % consensus was reached. Children who died from abusive head trauma, but had no known evidence of harsh PP precipitating their death, were not coded as harsh PP-related because abusive head trauma is considered as a form of child PA (National Center on Shaken Baby Syndrome, 2020) and violates child-protective laws.

2.3. Measures

Table 1 includes a list of study variables. In addition to harsh PP, variables examined include victim and perpetrator demographics (e.g., age, race and ethnicity) and circumstances surrounding the homicide (see Table 1). Race is a social construct and not a biological

marker for disparities (Braveman & Dominguez, 2021); thus, in this study, child's race and ethnicity were examined as indicators, and not drivers, of inequities and disparities.

2.4. Outcome

The primary study outcome was harsh PP. Harsh PP was coded as *Yes* when caregivers' use of harsh PP was documented in the narrative as the precipitating circumstance that initiated the chain of events leading directly to or contributing to the child's death, and the perpetrator's intent was to punish child "misbehavior" or "disobedience."

2.5. Statistical analysis

We used SAS 9.4 (SAS Institute, Cary NC) for data analyses. Bivariable and multivariable logistic regression analyses were used to estimate crude odds ratios (*OR*) and adjusted odds ratios (*aOR*), with 95 % confidence intervals (CI) of the associations between characteristics and harsh PP. Separate multivariable models tested the associations between harsh PP and perpetrator's sex, age, previous nonfatal injury, primary caregiver at work, and another adult participated in the fatal event or was aware of prior abuse or neglect to the child victim. Each model adjusted for child's sex, age, and race and ethnicity. We used an alpha of 0.05 to determine statistical significance.

3. Results

3.1. Descriptive statistics

From 2012 to 2018, 2414 children, ages 0–17 years were identified as victims of abuse-related homicide in NVDRS. Of them, 3.6 % ($n = 87$) were described as having been precipitated by caregiver use of harsh PP (Table 2). Among children whose deaths were indicated as harsh PP-related, the majority (77.0 %; $n = 67$) were ages 2–5 years; Black, non-Hispanic (55.2 %; $n = 48$); and male (60.9 %; $n = 53$). When perpetrator sex and age were known, perpetrators of fatal PA involving harsh PP were disproportionately male (72.4 %; $n = 63$) and between ages 14–34 years (57.5 %; $n = 50$). One-quarter (27.6 %; $n = 24$) of harsh PP-related homicide victims had a previous nonfatal injury. Roughly one-third (36.8 %; $n = 32$) had an indication that at least one other adult participated in the fatal incident or was aware of prior abuse or neglect to the child. Moreover, when the relationship of the perpetrator to the child victim was known, 41.4 % ($n = 36$) of homicides involving harsh PP were perpetrated by the mother's male companion (i.e., boyfriend, step-father), followed by father (23.0 %; $n = 20$), other perpetrator (20.7 %; $n = 18$), and mother (14.9 %; $n = 13$).

3.2. Bivariable and multivariable logistic regression analysis

Bivariable analyses indicated an association with harsh PP and the perpetrator's relationship to the child, perpetrator's age, child's age and race and ethnicity, child's previous nonfatal injury, and another adult participated in the fatal incident or was aware of prior abuse or neglect to the child (Table 2). After adjustment, mothers' male companions had greater odds of fatal child PA involving harsh PP compared to fathers, *aOR*, 2.4; 95 % CI, 1.3 to 4.3. Children with a previous nonfatal injury had greater odds of their deaths being precipitated by harsh PP compared to children without a previous nonfatal injury, *aOR*, 1.7; 95 % CI, 1.0 to 2.9. Homicides where another adult participated in the fatal event or was aware of prior

abuse/neglect to the child was associated with greater odds of harsh PP (*aOR*, 2.2; 95 % CI, 1.3 to 3.5) compared to homicides without this characteristic.

3.3. Event preceding caregiver's use of harsh PP

Among fatal child PA-related homicides involving harsh PP ($n = 87$), the event preceding caregiver's use of harsh PP was specified in 60 of 87 cases (Table 3). Two common precipitators were: the child had a bathroom-related accident (23.0 %; $n = 20$) and the child "disobeyed" a directive given by the perpetrator (17.2 %; $n = 15$).

4. Discussion

Among 2414 children who died from abuse, we examined characteristics associated with fatal PA precipitated by caregiver use of harsh PP. A total of 87 deaths, as indicated in the LE and/or C/ME narratives, involved harsh PP by the caregiver. Male caregivers were the predominate perpetrators of fatal PA involving harsh PP. The disproportionate number of male perpetrators might be due to fathers and mothers' male companions serving as caregivers while the mother is at work. One study examined fatal and near-fatal child abuse cases and found 70 % of the children were being cared for by a male caregiver at the time of the final event (Pierce et al., 2017). In the current analysis, of the 16.1 % of harsh PP-related homicides involving supervision while the custodial parent (usually the mother) was at work, 92.9 % (data not shown) were perpetrated by males (mother's male companion accounted for [61.5 %]; father [30.8 %]; and other [7.8 %]; data not shown). Research suggests providing access to quality child care or paid maternity leave to enable mothers to care for their children and training parents on how to identify safe and appropriate caregivers for their child(ren) may reduce the number of children being left under the supervision of unsafe caregivers (Klevens, Barnett, Florence, & Moore, 2015; Klevens, Luo, Xu, Peterson, & Latzman, 2016; Prevent Child Abuse Nevada, 2015).

Further, similar to prior studies that found an association between nonbiologically-related adult caregivers and fatal child abuse (Farrell et al., 2017; Schnitzer & Ewigman, 2005), we found mothers' male companions (i.e., boyfriend, stepfather) have 2.4 times the odds of perpetrating fatal PA involving harsh PP compared to fathers, even after adjusting for child demographic characteristics. Elevated risk associated with mothers' male companions may be influenced by attachment or connectedness that might be absent in this nonbiological relationship (Daly & Wilson, 1994). Understanding how victim-perpetrator relationship impacts risk may aid in identifying primary prevention strategies for fatal child PA involving harsh PP. The greater odds of fatal child PA involving harsh PP among mothers' male companions may also help explain why another adult's participation in the fatal incident or awareness of prior abuse or neglect to the child was associated with harsh PP. In this study, another adult was noted as being a participant in the fatal event or aware of prior abuse or neglect to the victim in 36.8 % of harsh PP-related cases. This study did not examine reasons why the child still died despite others' awareness of prior abuse; however, when examining the mothers' culpability in fatal child abuse cases, one study suggested the mother's personal history of abuse and desire or social pressure to be in a relationship may lead to her inaction (Obenson & England, 2015). Another study posited the mother's male companion

may become violent towards the child to legitimize his authority in the household, or the mother may allow her male companion to assume primary responsibility for child discipline (Margolin, 1992). This arrangement between the mother and her male companion may foster conflict between the child and the male companion (Papernow, 2008), especially if the child perceives the mother's male companion as trying to "replace" the biological father or if the male companion does not easily connect with the child. By the same token, caregiver-child conflict may lead to a harsh disciplinary response involving PP (Margolin, 1992), which may increase in frequency and severity, placing the child at risk for injury or death. In this study, children with previous nonfatal injuries had greater odds of their deaths involving harsh PP compared to those without this characteristic, suggesting PP is unlikely a one-time event and may escalate to a level that is fatal. Programs and strategies that promote and create safe, stable, and nurturing relationships and environments for children (Fortson et al., 2016), address conflict within nonbiological caregiver-child dyads (Papernow, 2008), and recognize and intervene in situations where prior or ongoing abuse and/or injuries to the child are suspected or present (Putnam-Hornstein et al., 2013), may help prevent PA and PP-related fatalities.

Consistent with other studies on fatal child abuse (Farrell et al., 2017; Fortson et al., 2016; Schnitzer & Ewigman, 2005), this study found a significant association between harsh PP and Black, non-Hispanic children in fatal PA cases in the bivariable analysis. The racial disparities found in the bivariate analysis might be largely attributed to longstanding racism and social and structural inequities disproportionately experienced by children of color (Acevedo-Garcia, Noelke, & McArdle, 2020; Beech, Ford, Thorpe, Bruce, & Norris, 2021; Trent et al., 2019). For example, shaped by a history of systemic and structural racism, families of color experience higher poverty rates than their White counterparts (Beech et al., 2021). The negative effects of poverty on child outcomes has been examined extensively in the literature (Acevedo-Garcia et al., 2020; Farrell et al., 2017; Sacks, 2018). One study found Black children aged 0–4 years living in communities with the lowest poverty concentration had a rate of fatal child abuse 1.6 times (5.1 per 100,000 children 0–4 years old) that of White children of the same age who were living in communities with the highest poverty concentration (3.2 per 100,000 children 0–4 years old; Farrell et al., 2017). In addition, parents living in poverty are least likely to be able to afford quality childcare (Johnson-Staub, 2017), a resource found to mitigate risk of harm to children (Fortson et al., 2016). The heightened levels of parental stress in families living in poverty might in turn lead to a reliance on harsh and abusive parenting practices (Pinderhughes et al., 2000). Addressing policies and practices that sustain and promote racial and ethnic inequities (e.g., poverty, lack of access to affordable and quality childcare; Beech et al., 2021; Johnson-Staub, 2017; Trent et al., 2019), and addressing violence against children through anti-racism action (Jones, 2021), may serve as critical pathways to eliminating racial and ethnic differences in both fatal child PA and those involving harsh PP.

In the bivariable analysis, perpetrators ages 14–24 years had 2.2 greater adjusted odds of harsh PP-related child homicide compared to perpetrators ages 35 years. Although this association was attenuated in the adjusted model, possible reasons for this difference might include perpetrators' age, attitude towards PP, or lack of training or knowledge of effective nonphysical disciplinary strategies used to correct child misbehavior (Ateah

& Durrant, 2005; Gershoff, 2002). Training aimed at increasing awareness of positive parenting practices and normal child development and shifting caregivers' attitudes towards PP, may aid in preventing fatal child PA involving harsh PP (Ateah & Durrant, 2005; Fortson et al., 2016).

Further, in the bivariable analysis, children ages 2–5 years had greater odds of their deaths involving harsh PP compared to children ages 6–10 years. This finding is consistent with prior research examining parental use of PP (Gershoff, 2002) and fatal child abuse (Farrell et al., 2017; Fortson et al., 2016; Putnam-Hornstein et al., 2013; Schnitzer & Ewigman, 2005). Young children may be especially vulnerable due to their small size and the likely occurrence of parent-child conflict, which may largely be driven by increases in developmentally appropriate externalizing child behaviors (e.g., tantrums; American Academy of Pediatrics, 2021; Weaver, Shaw, Crossan, Dishion, & Wilson, 2015). Consequently, parents may seek to resolve parent-child conflict by employing harsh parenting practices (Weaver et al., 2015). This is supported by two common precipitators of caregiver's use of harsh PP in this study: 1) bathroom-related accidents/soiling clothes and 2) child "disobedience." The average age for toilet training is 27 months, and most children are unable to control their bowels and bladders until about ages 2–2.5 years (Johns Hopkins Medicine, 2020). Moreover, testing limits is a typical behavior among young children, as they learn what behaviors are acceptable by testing out their environment (American Academy of Pediatrics, 2021). Approaches that help caregivers navigate challenging child developmental periods and enhance parenting skills, as well as legislation intended to reduce use of PP, have demonstrated effects in preventing child abuse and use of PP (Fortson et al., 2016). In addition, children ages 0–1 years had a lower odds of their deaths involving harsh PP. This may be explained by abusive head trauma –not examined as harsh PP in this study –being the most common means of fatal injury among this age group (Klevens et al., 2016; National Center on Shaken Baby Syndrome, 2020). Although children ages 0–1 years had a lower odds of harsh PP, they accounted for half of all fatal child abuse-related homicide victims in this study. These findings highlight opportunities for caregiver and parent training programs, which have been previously shown as effective for preventing both child abuse and use of PP (Fortson et al., 2016; Gershoff, Lee, & Durrant, 2017).

4.1. Limitations

While this study contributes to the current literature of risks posed by caregiver use of PP, several limitations should be noted. First, several contextual variables (e.g., harsh PP, event preceding caregiver's use of harsh PP) are not systematically collected in NVDRS and may have been absent from source documents (e.g., LE reports). Consequently, the frequency of occurrence is likely higher, as there may have been incidents wherein these circumstances were present but not captured in NVDRS. The number of fatal child homicides involving harsh PP reported here is not meant to be an estimate of the actual number due to limitations of the data source and challenges in distinguishing harsh PP from PA. Second, physical injury is more closely tied to the determination of PA; thus, narratives often contained extensive details on physical injuries sustained from PA, but inconsistently included the same level of detail for incidents involving harsh PP. Limited documentation of caregiver use of harsh PP as a precipitator of fatal PA, even among children who die from PA-related

injuries, makes it challenging to know the magnitude of PP as a precipitator in PA-related fatalities. Third, funding recipients joined NVDRS in different years, so data are unavailable from all recipients for all years of this study; the subnational data and small sample size limit our ability to generalize findings to the broader population. Fourth, PP is often described as points on a continuum; thus, the range of behaviors (e.g., hitting, spanking, slapping) subsumed under the term PP vary (Gershoff, 2002). Because caregiver use of PP was the primary precipitating circumstance that initiated the chain of events leading directly to the child's death in this study, we felt that it was more appropriate to describe the PP as harsh; this limited our ability to examine PP on a continuum. Nonetheless, this study provides crucial information about incidents where caregiver use of harsh PP was documented and how these fatalities differ from other PA-related homicides.

4.2. Conclusion

Prior studies have established a link between PP and negative outcomes (Afifi et al., 2017; Cavanagh et al., 2007; Gershoff, 2002; Sege et al., 2018; Trocmé et al., 2005). This study provides empirical evidence that caregiver use of PP can escalate and lead to fatal abuse. Findings from earlier research suggest parent training and legislative approaches can change social norms and impact attitudes towards the use of PP, consequently, reducing caregiver use of PP against children (Fortson et al., 2016). Moreover, the preceding events for use of harsh PP most commonly reported in this study relate to disciplining children for developmentally normative behaviors (American Academy of Pediatrics, 2021; Johns Hopkins Medicine, 2020). Given the nature of child development, children may behave in a way that might be perceived as “misbehavior.” Ensuring caregivers are aware of and use effective strategies that focus on use of nonphysical discipline and promote healthy child development, may help decrease harsh PP and abuse-related homicides among children. Further, addressing social and structural inequities (e.g., poverty, inequitable access to quality and affordable childcare) that elevate risk of harm to children of color through multiple pathways (e.g., parental stress), play an important role in mitigating the disproportionate burden of violence victimization experienced by children of color (Beech et al., 2021; Jones, 2021; Trent et al., 2019).

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Data availability

Data will be made available on request.

Abbreviations:

aOR	adjusted odds ratio
CI	confidence interval
C/ME	coroner/medical examiner
DC	death certificate

LE	law enforcement
NVDRS	National Violent Death Reporting System
OR	odds ratio
PA	physical abuse
PP	physical punishment

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Table 1

Characteristics and operational definitions used to examine their association with child abuse-related homicides precipitated by caregiver use of harsh physical punishment–National Violent Death Reporting System.

Characteristics	Categories
Age of child victim, years	0–1
	2–5
	6–10
	11–17
Sex of child victim	Boys
	Girls
Race and ethnicity of child victim	American Indian/Alaska Native, non-Hispanic and Asian/Pacific Islander, non-Hispanic
	Black, non-Hispanic
	Hispanic
	White, non-Hispanic
Perpetrator	Unknown race and ethnicity
	Father
	Mother
	Mother's male companion (i.e., boyfriend, stepfather)
	Other
Age of perpetrator, years	Unknown
	14–24
	25–34
	35
Sex of perpetrator	Unknown
	Male
	Female
Contextual analysis (manually coded circumstance variables)	Unknown
	Male
	Female
Harsh physical punishment	A priori operational definitions
	Harsh physical punishment refer specifically to a form of child discipline (e.g., being hit, pushed, punched, kicked, grabbed, shoved, and/or slapped) by the perpetrator to correct child "disobedience" or punish child "misbehavior," with or without an implement, and the physical punishment was the primary precipitating circumstance that initiated the chain of events leading directly to the child's death.
Perpetrator	Harsh physical punishment was coded as <i>Yes</i> when caregivers' use of harsh physical punishment was documented in the law enforcement and/or coroner or medical examiner narrative(s).
	The perpetrator is the person believed to have committed the child abuse-related homicide and is, therefore, being investigated by the police.
Previous nonfatal injury	Perpetrator was collapsed into five broad categories for ease of interpretation and relative infrequency: 1) biological mother, 2) biological father, 3) mother's male companion (i.e., stepfather and mother's boyfriend), 4) other (i.e., stepmother, father's girlfriend, grandparent, babysitter, foster or adoptive parent, other person known to victim [e.g., uncle]), and 5) perpetrator unknown
	Previous nonfatal injury was coded as <i>Yes</i> if the child victim had signs of nonfatal injury(ies) as evidenced by anatomical evidence of old or healing injuries indicated in law enforcement and/or coroner/medical examiner narrative(s).

Characteristics	Categories
Another adult participated in the fatal event or was aware of prior abuse/neglect to child victim	Another adult participated in the fatal event or was aware of abuse/neglect to child victim was coded as <i>Yes</i> when a family member or another adult (e.g., spouse, nonparent): 1) witnessed the child victim being abused by the perpetrator in an earlier incident not related to the fatal event, 2) was at least aware of abuse to the child victim, 3) participated in abuse of the child victim, 4) was noted as failing to protect the child from abuse and/or neglect, 5) encouraged the abuse and/or neglect, and/or 6) was charged as a secondary perpetrator in the fatal event.
Primary caregiver at work	Primary caregiver at work was coded as <i>Yes</i> when the perpetrator was tasked with supervising the child victim while the primary parent (e.g., mother) was at work and the fatal injury occurred during this time of supervision.
Event preceding caregiver’s use of harsh physical punishment	Precipitating circumstance of harsh physical punishment use was categorized into five broad categories. These include: 1) the child had a bathroom-related accident or soiled his/her clothes, 2) the child disobeyed a directive given by the perpetrator, 3) the child cried/threw a temper tantrum, 4) other (e.g., child hit another child at school), and 5) not specified (i.e., law enforcement and/or coroner/medical examiner narratives indicated physical punishment was used by the perpetrator to correct perceived or real child “disobedience” or punish “misbehavior,” but the law enforcement and/or coroner or medical examiner narrative[s] failed to specify the event preceding caregiver’s use of harsh physical punishment in the fatal event).

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Table 2

Bivariable and multivariable analysis of harsh physical punishment among child abuse-related homicide victims ($N=2414$) in the United States, ages 0–17 years, by characteristics and circumstances—National Violent Death Reporting System, 40 states,^a the District of Columbia, and Puerto Rico, 2012–2018.

Characteristics	Harsh physical punishment ($n = 87$)	No harsh physical punishment ($n = 2327$)	Crude odds ratio (95 % CI) ^b	P-value	Adjusted odds ratio (95 % CI) ^c	P-value
	No. (%)	No. (%)				
Age of child victim, years						
0–1	8 (9.2)	1217 (52.3)	0.2 (0.1–0.4)	<0.01 ^d	N/A	N/A
2–5	67 (77.0)	631 (27.1)	2.5 (1.3–4.8)	<0.01 ^d	N/A	N/A
6–10	11 (12.6)	257 (11.0)	1.00	N/A	N/A	N/A
11–17	1 (1.1)	222 (9.5)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Sex of child victim						
Boys	53 (60.9)	1310 (56.3)	1.2 (0.8–1.9)	0.39	N/A	N/A
Girls	34 (39.1)	1017 (43.7)	1.00	N/A	N/A	N/A
Race and ethnicity of child victim						
American Indian/Alaska Native, non-Hispanic and Asian/Pacific Islander, non-Hispanic	4 (4.6)	87 (3.7)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Black, non-Hispanic	48 (55.2)	772 (33.2)	2.8 (1.7–4.7)	<0.01 ^d	N/A	N/A
Hispanic	10 (11.5)	334 (14.4)	1.4 (0.6–2.9)	0.43	N/A	N/A
White, non-Hispanic	23 (26.4)	1040 (44.7)	1.00	N/A	N/A	N/A
Unknown race and ethnicity	2 (2.3)	94 (4.0)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Perpetrator						
Father	20 (23.0)	765 (32.9)	1.00	N/A	1.00	N/A
Mother's male companion (i.e., boyfriend, stepfather)	36 (41.4)	468 (20.1)	2.9 (1.7–5.1)	<0.01 ^d	2.4 (1.3–4.3)	<0.01 ^d
Mother	13 (14.9)	523 (22.5)	1.0 (0.5–1.9)	0.89	0.9 (0.4–1.8)	0.67
Other	18 (20.7)	317 (13.6)	2.2 (1.1–4.2)	0.02 ^d	1.5 (0.8–3.0)	0.25
Unknown	0 (0.0)	254 (10.9)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Age of perpetrator, years						
14–24	26 (29.9)	540 (23.2)	2.2 (1.1–4.4)	0.03 ^d	2.1 (1.0–4.6)	0.06
25–34	24 (27.6)	692 (29.7)	1.6 (0.8–3.2)	0.23	1.1 (0.5–2.3)	0.90
35	11 (12.6)	496 (21.3)	1.00	N/A	1.00	N/A
Unknown	26 (29.9)	599 (25.7)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Sex of perpetrator						
Males	63 (72.4)	1402 (60.2)	1.3 (0.8–2.1) ^f	0.32	1.3 (0.8–2.1) ^f	0.31
Females	24 (27.6)	681 (29.3)	1.00	N/A	1.00	N/A
Unknown	0 (0.0)	244 (10.5)	<i>e</i>	<i>e</i>	<i>e</i>	<i>e</i>
Previous nonfatal injury ^g						
Yes	24 (27.6)	436 (18.7)	1.7 (1.0–2.7) ^f	0.04 ^d	1.7 (1.0–2.9) ^f	0.03 ^d

Characteristics	Harsh physical punishment (<i>n</i> = 87)	No harsh physical punishment (<i>n</i> = 2327)	Crude odds ratio (95 % CI) ^b	P-value	Adjusted odds ratio (95 % CI) ^c	P-value
	No. (%)	No. (%)				
No	63 (72.4)	1891 (81.3)	1.00	N/A	1.00	N/A
Another adult participated in the fatal incident or was aware of prior abuse or neglect to the child victim ^{g,h}						
Yes	32 (36.8)	477 (20.5)	2.3 (1.4–3.5)	<0.01 ^d	2.2 (1.3–3.5)	<0.01 ^d
No	55 (63.2)	1850 (79.5)	1.00	N/A	1.00	N/A
Primary caregiver at work ^{g,i}						
Yes	14 (16.1)	271 (11.6)	1.5 (0.8–2.6)	0.21	1.4 (0.8–2.7)	0.25
No	73 (83.9)	2056 (88.4)	1.00	N/A	1.00	N/A

Abbreviations: CI-confidence interval, N/A-not applicable.

^aData for this study are from the following: Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin (2012–2018); Michigan (2014–2018); Arizona, Connecticut, Kansas, Maine, Minnesota, New Hampshire, New York, and Vermont (2015–2018); Illinois, Indiana, Iowa, Pennsylvania, and Washington (2016–2018); Hawaii (2015–2016); California, Delaware, District of Columbia, Nevada, Puerto Rico, and West Virginia (2017–2018); and Alabama, Louisiana, Missouri, and Nebraska (2018). California 2017 data for violent deaths included four counties (*n* = 1866; representing 27.8 % of violent deaths that occurred in four California counties [Los Angeles, Sacramento, Shasta, and Siskiyou] in 2017). California 2018 data included 21 counties (*n* = 3659; representing 55.1 % of violent deaths that occurred in California in 2018) Amador, Butte, Fresno, Humboldt, Imperial, Kern, Kings, Lake, Los Angeles, Marin, Mono, Placer, Sacramento, San Benito, San Diego, San Francisco, San Mateo, Shasta, Siskiyou, Ventura, and Yolo.)

^bCrude odds ratios measure the association between each characteristic and harsh physical punishment.

^cModels for adjusted odds ratios for perpetrator, perpetrator's sex, age, previous nonfatal injury, primary caregiver at work, and another adult participated in the fatal event or was aware of prior abuse or neglect to the child victim were adjusted for child's sex, age, and race and ethnicity. Adjusted odd ratios for child victim's age groups, sex, and race and ethnicity are not presented.

^dStatistical significance is at an alpha level of 0.05.

^eCrude odds ratio and adjusted odds ratio are not presented due to cell count of <5 or unknown response. Victim and perpetrator characteristics with missing or unknown data were excluded from bivariable and multivariable analyses.

^fThe crude odds ratio and adjusted odds ratio for both perpetrator sex and previous nonfatal injury appear to be the same due to rounding to the first decimal place. When these estimates are presented in two or three decimal places, they are different: Perpetrator sex (Odds Ratio [1.275; 95 % CI, 0.790 to 2.058] and Adjusted odds ratio [1.299; 95 % CI, 0.788 to 2.140]; Previous nonfatal injury (Odds Ratio [1.652; 95 % CI, 1.021 to 2.674] and Adjusted odds ratio [1.729, 95 % CI, 1.042 to 2.870].

^gCircumstances are not mutually exclusive; thus, child abuse-related homicide victims may have one or more circumstances.

^hAnother adult participated in the fatal incident or was aware of prior abuse or neglect to child victim is defined as a situation where a family member or another adult (e.g., spouse, non-parent): 1) witnessed the child victim being abused by the perpetrator prior to the fatal event, 2) was at least aware of abuse to the child victim, 3) participated in the abuse of the child victim, 4) was noted as failing to protect the child from abuse, 5) encouraged abuse, and/or 6) was charged as a secondary perpetrator in the fatal event.

ⁱPrimary caregiver at work is defined as a situation where the perpetrator was tasked with supervising the child victim while the primary parent (e.g., mother) was at work, and the fatal injury occurred during this time of supervision.

Table 3

Event preceding caregiver use of harsh physical punishment among child abuse-related homicide victims (*N*= 87), in the United States, ages 0–17 years –National Violent Death Reporting System, 40 states,^a the District of Columbia, and Puerto Rico, 2012–2018.

Preceding event ^b	Number (%)
Not specified ^c	27 (31.0)
Child had a bathroom-related accident or soiled his/her clothes	20 (23.0)
Other (e.g., child spilled juice)	17 (19.5)
Child disobeyed a directive given by the perpetrator	15 (17.2)
Child crying/throwing a temper tantrum	8 (9.2)

^aData for this study are from the following: Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin (2012–2018); Michigan (2014–2018); Arizona, Connecticut, Kansas, Maine, Minnesota, New Hampshire, New York, and Vermont (2015–2018); Illinois, Indiana, Iowa, Pennsylvania, and Washington (2016–2018); Hawaii (2015–2016); California, Delaware, District of Columbia, Nevada, Puerto Rico, and West Virginia (2017–2018); and Alabama, Louisiana, Missouri, and Nebraska (2018). California 2017 data for violent deaths included four counties (*n* = 1866; representing 27.8 % of violent deaths that occurred in four California counties [Los Angeles, Sacramento, Shasta, and Siskiyou] in 2017). California 2018 data included 21 counties (*n* = 3659; representing 55.1 % of violent deaths that occurred in California in 2018) Amador, Butte, Fresno, Humboldt, Imperial, Kern, Kings, Lake, Los Angeles, Marin, Mono, Placer, Sacramento, San Benito, San Diego, San Francisco, San Mateo, Shasta, Siskiyou, Ventura, and Yolo.)

^bEvent preceding caregiver use of harsh physical punishment as a form of “discipline” in these deaths are mutually exclusive.

^cNot specified includes the preceding events that were not specified in the coroner or medical examiner or law enforcement narratives.

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