

## The Impact of Domestic Violence on Infant Health

### Factors and Child Maltreatment

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#### Introduction

A recent review conservatively estimated the lifetime prevalence of violence against women by their domestic partners to be between 25% and 30% with over half of female victims living in households with children under the age of 12 (Tjaden & Thoennes, 2000). Research has established that domestic violence not only affects women across their lifespan but has a profound impact on the lives of their children as well. To date, the majority of research has focused on the effect of domestic violence on school age or preschool age children, and it is acknowledged that young children and adolescents exposed to domestic violence are likely to experience many adverse outcomes (Kitzmann, Gaylord, Holt, & Kenny, 2003; Mahony & Campbell, 1998; Wolfe & Korsch, 1994). Similarly, two decades of research provide overwhelming evidence that domestic violence often cooccurs with the abuse and neglect of younger children (Appel & Holden, 1998; McGuigan & Pratt, 2001).

A review of the domestic violence literature reveals a noticeable paucity of empirical studies examining the effects of domestic violence on infants, and particularly the effect of domestic violence on infant health factors and subsequent child maltreatment. More research is needed on the relationship between domestic violence and infant health outcomes, as it is during pregnancy or immediately after childbirth that many women first experience domestic violence (Saltzman, Johnson, Gilbert, & Goodwin, 2003; Tjaden & Thoennes, 2000). During the first years of parenting, couple relationships are the most discordant (Belsky & Rovine, 1990), and the risk of child maltreatment is highest (Leventhal, 1988; National Research Council, 1993). Likewise, it is during the child's first year that domestic violence can have a profound influence on the child's future psychological development (Bogat, DeJonghe, Levendosky, Davidson, & von Eye, 2006) and physical health (Alessi & Hearn, 1984).

Violence within the home interacts with many demographic and social factors that can influence infant health, development, and subsequent maltreatment. For example, a recent study using data from 16 states found that domestic violence was higher around the time of childbirth for women who were younger, unmarried, had fewer than 12 years of education, and who received Medicaid or other state medical assistance (Saltzman et al., 2003). The limited available research shows that mothers who experienced domestic violence were more likely to smoke, abuse drugs, receive late prenatal care, give birth prematurely, have infants with low birth weight or medical problems at birth, and utilize emergency room visits for well-baby check-ups (Campbell, 2001; Dietz et al., 1997; Huth-Bocks, Levendosky, & Bogat, 2002). Recent studies report that domestic violence increased the odds of poor infant nutrition (Kearney, Haggerty, Munro, & Hawkins, 2003) and contributed to poor mother-child bonding (Quinlivan & Evans, 2005). It is understood that many of these same factors have been associated, directly or indirectly, with the risk of child maltreatment.

Two infant health factors that have received little attention in the domestic violence literature are breast feeding and passive smoke

exposure. Research shows that breast feeding reduces the risk of infections and may protect infants against SIDS, diabetes, allergies, asthma, and digestive diseases (American Academy of Pediatrics/Work Group on Breastfeeding, 1997). Passive smoking is associated with higher rates of ear, sinus, and respiratory infections; sore throats; colds; and asthma (Richter & Richter, 2001) as well as higher rates of infant crying (Reijneveld, Brugman, & Hirasing, 2002).

#### Methods

##### Study Design

To examine the relationships between domestic violence, infant health factors, and child maltreatment, the current exploratory study reviewed 4 years of archived data (1997–2000) from the Oregon Healthy Start (OHS) program (see Katzev, Pratt, & McGuigan, 2001). Oregon Healthy Start continues to be a voluntary, home-visiting program designed to assist families at risk of poor family functioning in giving their firstborn infant a “healthy start” in life. The OHS program was modeled after Healthy Families America (HFA), a national initiative adopted in 1992 by the National Committee to Prevent Child Abuse (1996), now known as Prevent Child Abuse America. In addition to addressing child maltreatment, OHS was mandated by the Oregon legislature to improve the health outcomes of the parents and children they served (i.e., increased use of preventive health care and improved immunization rates). At the time of this study, OHS was operating in 21 Oregon counties, overseen by the Oregon Commission on Children and Families. County health departments were active collaborators in the OHS program, and in many counties, the OHS program was physically housed within the public health building.

##### Participants

The current study used archived data obtained from 1,106 ( $n = 1,106$ ) at-risk families who were actively engaged in OHS for 12 consecutive months at some time between January 1, 1997, and January 1, 2001. To identify at-risk families, OHS used an extensive two-stage screening and assessment process. Mothers with firstborn children gave permission to be screened for family risk factors. The screening was initially done in the hospital by hospital nurses or trained Family Assessment Workers (FAWs) shortly before or after the child's birth. Mothers provided yes/no answers to the 15-item Hawaii Risk Indicator (HRI) checklist (Hawaii Family Stress Center, 1994).

Mothers who were unmarried, had inadequate or no prenatal care, or who had any two other risk characteristics (e.g., history of substance abuse, fewer than 12 years of education, inadequate income) were further assessed using the Kempe Family Stress Inventory (KFSI). The KFSI is an in-depth interview that assesses 10 psychosocial factors related to poor family functioning and the risk of child abuse (Korfmacher, 2000; McGuigan & Pratt, 2001). Healthy Start Family Assessment Workers (FAWs) conducted KFSI interviews after receiving extensive training in the interview protocols. Interviews took approximately 1–1/2 hours and were conducted in the hospital or in the family's home shortly after the child's birth as part of a

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“welcome baby” visit. Based on KFSI scores, families considered at risk for poor family functioning were offered weekly home visiting services. Although a majority (92%) of mothers assessed as at risk on the KFSI initially accepted OHS services, high attrition rates during the first year (approximately 60%) followed the well-documented pattern found in most home visiting programs (McCurdy & Daro, 2001; McCurdy, Hurvis, & Clark, 1996; McGuigan, Katzev, & Pratt, 2003).

To improve the health and welfare of Oregon families, OHS Family Support Workers (FSWs) provided weekly visits to participating families for the first few months and gradually reduced to biweekly or monthly visits, depending on the families’ needs. Visits could continue until the child was 5 years of age. All OHS home visitors received at least 96 hours of initial training and over half (58%) had college degrees in health and human service-related fields (e.g., nursing, public health, social work, human services). Home visits focused on infant health, child development, parenting education, and referrals to needed services, such as primary care physicians or mental health counseling.

The FSWs completed intake assessments after visiting the family for 3 months, and a subsequent assessment was completed at 12 months. Only those mothers with complete data at 3 and 12 months were included in the current study ( $n = 1,106$ ). Mothers resided in semi-rural or small metropolitan areas, and the majority (70%) had never been married. Most mothers were white (69%) or Hispanic (26%); 5% were African American, Native American, Asian, or of other ethnicity. This closely matched the ethnic make-up of the Oregon counties being served. On average, mothers were 21.4 years of age ( $SD = 5.0$ ) when their child was born, and most (79%) did not work outside the home. Over half (51%) of the mothers had less than a high school education and 81% were enrolled in the Oregon Health Plan, a state medical plan for low-income families. The majority (56%) lived with their husband or partner; over one third (35%) lived with parents, relatives, or friends (which might include the husband or partner); and the remaining 9% lived alone with their newborn child.

### Measures

All measures of infant health were dichotomous (yes or no, except where indicated). Data were gathered from multiple sources, thus limiting single informant bias. Hospital records confirmed whether or not the child had been born prematurely (gestation  $< 37$  weeks), was of low birth weight ( $\leq 2500$  grams), was drug affected, or had medical problems. Shortly before or after the child’s birth, FAWs used maternal self-reports to establish whether the mother had a history of substance abuse, had smoked tobacco during pregnancy, and was breastfeeding. In addition, the KFSI was used to assess whether the mother was having problems bonding with her infant.

After 3 months of home visitation, FSWs completed an intake assessment of family functioning that included an appraisal of domestic violence. For this study, domestic violence was strictly defined as “any act of physical aggression between partners with the intent to do harm that occurred during the first three months following childbirth.” There is evidence that domestic violence is more common during pregnancy (Saltzman et al., 2003; Tjaden & Thoennes, 2000), and it is likely that many of the mothers assessed as experiencing domestic violence during the first 3 months of child rearing were initially victimized either prior to or during their pregnancy. Research has established that different types of domestic violence

exist, but the majority involves the male partner as the perpetrator or both partners in mutual couple violence (Appel & Holden, 1998; Johnson & Ferraro, 2000). In the current study, no distinctions were made regarding the initial date that domestic violence began or the level, frequency, or typology of the violence. The conceptual basis of this study focused on how any type of physical aggression between partners confirmed during the first 3 months of child rearing would impact infant health factors during the child’s first year.

The FSWs were trained to recognize signs of relationship volatility. The frequent home visits with observations of family interactions increased the likelihood that domestic violence would be detected. If domestic violence was suspected, mothers were asked privately if their mate had been physically aggressive toward them. Questioning the mothers in private insured their safety and promoted open disclosure. Victims were informed of their options regarding shelter services, legal action, and counseling. Of the 1,106 mothers in this study, 114 (10.3%) were assessed as having experienced domestic violence during the first 3 months after the birth of their firstborn child.

After 12 months of OHS services, the FSWs completed another assessment with several items related to infant health. These included whether the mother or others, or both, smoked tobacco inside the home, whether the infant received adequate nutrition (rated by FSWs as poor or fair vs. good), whether the infant was linked to a primary health care physician, whether infant immunization records were up-to-date, whether the infant received regular well-child check-ups, and whether the family relied on hospital emergency rooms for routine services.

Official child maltreatment data were obtained from Oregon’s child protective services agency. These data were available for all children in the study and included any confirmed incident of child maltreatment that occurred from January 1, 1997, to January 1, 2002. In this way, maltreatment data were available for all children up to age 1, and for some children, up to age 5. Of the 1,106 children in this study, 41 (3.7%) had some form of child maltreatment confirmed by the state agency. The majority of cases (68%) were confirmed during the child’s first year with the remainder (32%) confirmed before the child was 3 years of age. Of the 114 families assessed as experiencing domestic violence, 11 (9.6%) had child maltreatment confirmed by the state, specifically 3 cases of neglect and 8 cases of mental injury/threat of harm. Of the 992 families assessed as not experiencing domestic violence during the first 3 months of child-rearing, 30 (3%) had child maltreatment confirmed by the state. These included 2 cases of physical abuse, 15 cases of neglect, and 13 cases of mental injury/threat of harm. There was no confirmation of sexual abuse in any of the study families.

### Statistical Analysis

A sample size of 114 mothers assessed as experiencing domestic violence and 992 assessed as not experiencing domestic violence provided sufficient statistical power to detect any significant differences in outcome variables between the two groups. Since all of the health outcomes were dichotomous, chi-square tests were used to compare mothers who were assessed as experiencing domestic violence during the first 3 months of childrearing with mothers who were not. Comparisons were expressed as the percentage of mothers within each group. Next, the 12 infant health factors found to be significantly associated with domestic violence (see Table 1) were

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combined to create an overall index of infant health, with higher scores indicating the presence of a greater number of poor infant health factors. A logistic regression model examined whether higher scores on the infant health index increased the likelihood of confirmed child maltreatment after controlling for demographic factors and the direct effect of domestic violence (Table 2).

**Table 1.**  
Chi-square tests of associations between domestic violence and infant health factors

	% of DV Families n=114	% of Non-DV fam n=992
<b>Hospital Records</b>		
Infant born prematurely (gestation<37 weeks)	5.3	3.5
Infant born drug affected <sup>ns</sup>	3.5	1.6
Infant born low birth weight(≤2500 grams) <sup>***</sup>	5.3	.08
Infant born with medical problems*	8.8	3.7
<b>FAWS Assessments Following Birth</b>		
Mother has history of substance abuse <sup>ns</sup>	37.1	28.1
Mother smoked during pregnancy**	30.7	17.4
Mother chose not to breastfeed infant <sup>***</sup>	54.4	34.9
Mother had difficulty bonding with infant <sup>***</sup>	25.4	13.2
<b>FSWs Assessments at 12 Months</b>		
Mother smoked at 12 months**	28.1	16.0
Others in home smoked at 12 months <sup>***</sup>	56.1	29.5
Infant received poor or fair nutrition**	24.6	13.4
Infant not linked to primary health care provider**	7.0	2.5
Infant immunizations not up-to-date <sup>***</sup>	16.7	7.0
Infant missing regular well-child check-ups**	14.0	5.9
Family relied on emergency room for care**	31.6	20.2
<b>Child Maltreatment Confirmed by the State</b>		
Child maltreatment	9.6	3.0

<sup>ns</sup>non-significant, \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 2.**  
Odds ratios and confidence intervals for variables predicting confirmed child maltreatment

Variable	Odds Ratio	95% CI	
		Lower	Upper
Mother's age <sup>ns</sup>	.988	.915	1.07
Mother's years of education <sup>ns</sup>	1.06	.895	1.25
Mother has never been married <sup>ns</sup>	.623	.297	1.30
Family receives Oregon Health Plan <sup>ns</sup>	.644	.241	1.72
Domestic Violence*	2.29	1.06	4.97
Index of infant health factors <sup>***</sup>	1.30	1.11	1.53

N=1,106

<sup>ns</sup>non-significant, \* $p < .05$ , \*\*\* $p < .001$

## Results

Chi-square analyses showed significant differences in the majority of infant health factors when comparing the 114 mothers who were assessed as experiencing domestic violence with the 992 mothers who were not (Table 1). Hospital records showed that infants born to mothers who experienced domestic violence were significantly more likely to be born with low birth weight ( $p < .001$ ) and medical problems ( $p < .05$ ). While hospital records showed that a higher percentage of mothers who experienced domestic violence gave birth prematurely and gave birth to infants who were drug affected, these substantive differences were not statistically significant.

The FSW assessments completed shortly following birth showed that mothers who experienced domestic violence were significantly more likely to have smoked during pregnancy ( $p < .01$ ), had chosen not to breastfeed ( $p < .001$ ), and had difficulty bonding with their infant ( $p < .001$ ). There was no significant difference among these mothers in the category mother's self-reported history of substance abuse. (Note: The overall history of substance abuse was high since it was one criterion used for OHS program inclusion).

Family Support Workers' assessments at 12 months showed that the 114 mothers who experienced domestic violence were significantly more likely to smoke tobacco ( $p < .01$ ) and to allow others to smoke in the home ( $p < .001$ ). One-year-olds living in families that experienced domestic violence were more likely to have received only poor or fair nutrition ( $p < .01$ ), were less likely to be linked to a regular primary health care provider ( $p < .01$ ), and were more likely to be behind on childhood immunizations ( $p < .001$ ), to have missed regular well-child check-ups ( $p < .01$ ), and to have been seen in the hospital emergency room ( $p < .01$ ).

The 12 infant health factors that were significantly associated with domestic violence were combined to create an index of infant health factors with higher scores indicating a greater risk for poor infant health. A logistic regression model was used to test the relationship between the index of infant health and confirmed child maltreatment after controlling for maternal demographics and any direct effect of domestic violence. A mother's age and education were entered in years. Marital status was entered as never married or other marital status, and membership in the Oregon Health Plan (yes or no) was used as a proxy for low income.

Results of the logistic regression showed that none of the demographic variables was significantly associated with confirmed child maltreatment. After controlling for the effects of the demographic variables, families assessed as experiencing domestic violence during the first 3 months of child rearing were over 2 times (OR = 2.29) as likely to have child maltreatment confirmed by the state ( $p < .05$ ). Important to this investigation, the logistic regression showed that with the presence of each additional infant health factor, the likelihood of confirmed child maltreatment significantly increased 1.30 times ( $p < .01$ ).

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The sizes of the odds ratios were modest, but it is understood that in logistic regression analysis, the additive log-odds of significant predictors are multiplicative. This means that the addition of each infant health factor “multiplied” the likelihood of child maltreatment. Consequently, a mother who experienced domestic violence (OR = 2.29) and had any 2 of the 12 indices of poor infant health (OR = 1.30) was nearly 4 times ( $2.29 \times 1.30 \times 1.30 = 3.87$ ) more likely to have child maltreatment confirmed by the state than were mothers with none of these conditions present.

### Discussion

This exploratory study investigated the impact of domestic violence on multiple infant health factors and child maltreatment in a large sample of at-risk mothers with firstborn children. Independent sources were used to assess infant health factors, careful observations within the home confirmed the presence of domestic violence, and child maltreatment was documented by official child protection records. Among at-risk mothers with firstborn children, domestic violence during the first 3 months of childrearing was associated with many infant health factors across the infants’ first year. When these health factors were combined, they had a significant effect on confirmed child maltreatment beyond the direct effect of domestic violence.

This suggests that violence within the family system may have an indirect effect on the maltreatment of infants via a higher likelihood of factors that are detrimental to infant health. While the methodological limitations of this exploratory study preclude causal conclusions, the findings provide support for the possible mediational role of infant health factors. Identification of these factors provides researchers, social service workers, health care professionals, and policy makers a better focus for coordinating future research and intervention efforts.

### Implications

The research, social service, and health care communities should act collaboratively to improve our understanding of (1) how domestic violence affects infant health and maltreatment and (2) what prevention efforts may be effective. Researchers should broaden study populations to include at-risk families with infants, perhaps targeting families served by prenatal clinics, pediatricians, and multisite managed health care organizations. Data obtained from these alternate sources could assist researchers in identifying the specific health needs of infants living in homes with domestic violence.

Swift intervention is necessary when families with infant children experience domestic violence. It is essential that practitioners realize that infants raised in a violent household are victimized without being the direct target of the violence. Since women of reproductive age report higher rates of domestic violence than women of other age groups (Greenfeld et al., 1998), protocols for domestic violence screening should be in place at all pediatric and reproductive health care facilities. The American Academy of Pediatrics (1998) has recommended screening for domestic violence, but “best practice” methods of screening have yet to be identified. Some barriers to screening that must be addressed include lack of staff training, large caseloads, lack of time for screening, and absence of supportive staff.

Optimally, all human service practitioners should be trained to identify and respond to domestic violence and to promote safety for the

entire family. Communities should cross-train domestic violence shelter, child welfare, health care, and social service personnel. New joint service models should be developed to address the possible harm to infants and children of all ages, and the effectiveness of such models must be thoroughly evaluated.

Health and social service practitioners serving new parents must realize that violence in the home creates a dysfunctional domestic environment that may reduce the capacity of new parents to care for their infant. Some research has shown that even without resorting to abusive discipline, first-time parents in violent relationships developed a more negative view of their infant (McGuigan, Vuchinich, & Pratt, 2000). These changes in parental cognitions could contribute to neglectful health practices and subsequent child maltreatment. Through cognitive restructuring techniques, such as discussions with concrete examples and role playing, new parents could learn how their behaviors impact their infant’s health. Group treatment and home visitation have been suggested as effective methods of delivery for cognitive restructuring programs (Azar, 1997).

### Study Limitations

The findings of this study are based on an at-risk sample of primarily white, non-Hispanic, and Hispanic families from semi-rural areas in one state. Likewise, all of the mothers were motivated to remain in an intervention program, limiting the ability to generalize the findings. Child maltreatment was limited to only those cases brought to the attention of the public child protective services system, which is likely an underestimation of actual maltreatment. Direct observations were used to assess domestic violence and reduce the social desirability bias of self-report questionnaires. However, formal measures of rater reliability were not possible.

Despite these limitations, this study provides information to better understand the impact of domestic violence on infants. Knowledge of infant health risks can be used to develop and support intervention strategies. Clearly, more research is needed to examine the causal connections between domestic violence, infant health factors, and subsequent maltreatment.



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