

Understanding the Roles of Context, Frequency, and Quantity of Alcohol Consumption in Child Physical Abuse: Risks for Mothers and Fathers

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Abstract Alcohol use is related to child physical abuse, although little is known about gender-specific risks factors. This study examines the relationships between alcohol outlets, context-specific drinking, dose–response drinking and child physical abuse for mothers and fathers. Telephone interviews were conducted with 1973 female and 1050 male respondents in 50 California cities. Weighted negative binomial models were used to calculate the frequency of physical abuse in the past year. Drinking more often at restaurants was related to higher frequency of physical abuse for fathers, while mothers who drank more frequently at bars and parties used physical abuse more often. There were no significant dose–response drinking relationships for fathers. Drinking higher amounts at bars, parties, and restaurants was associated with less frequent physical abuse for mothers. Our findings suggest that a focus on drinking contexts may reveal heightened risk for many mothers who do not consume large amounts of alcohol.

Keywords Alcohol · Drinking contexts · Physical abuse · Gender · Alcohol outlets

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Approximately 476,600 children are victims of physical abuse (i.e., intentional injury) each year in the United States (Sedlak et al. 2010). The effects of physical abuse last throughout the life course as victims are more likely to be depressed or anxious (Springer et al. 2007), have health problems such as cardiovascular disease (Fuller-Thomson et al. 2011), arthritis, or obesity (Affifi et al. 2013), and become dependent on alcohol and nicotine (Elliott et al. 2014). Just 1 year of confirmed cases of child maltreatment (including physical abuse) results in approximately 124 billion dollars of costs to society (Fang et al. 2012).

Literature has established that alcohol use is related to physical abuse. However, most studies have focused on heavy drinking (e.g., frequency of drunkenness) (Berger 2005), or clinical alcohol use disorders (i.e., abuse or dependence) (Ammerman et al. 1999; Famularo et al. 1986; Kelleher et al. 1994; Miller et al. 1999; Jones 2004; Laslett et al. 2012). As a result, less is known about the role of parental drinking contexts (e.g., the location where drinking occurs or the type of drinking companion) and risk for physical abuse (Freisthler 2011; Freisthler and Gruenewald 2013). Furthermore, the focus on heavy drinking or alcohol use disorders in existing literature has also led to little understanding about relationships between physical abuse and lower levels of alcohol consumption, which are more common in the general population (SAMHSA 2012) and among parents compared to non-parents (Paradis et al. 2011). More recent work has begun to disentangle the drinking context from the amount of alcohol consumed, finding that where a parent drinks is associated with physical abuse (Freisthler 2011; Freisthler and Gruenewald 2013). These findings suggest that drinking contexts have varying levels of risk and are associated with physical abuse outside of how much alcohol is consumed there. Additionally, studies that take into account dose–response relationships (i.e., the additive effect of each additional

drink over the first drink consumed) could better tease out problematic quantities of alcohol (Freisthler and Gruenewald 2013). However, there is little understanding of gender-specific risk in these relationships, even though men and women spend different amounts of time with their children (Parker and Wang 2013), have varying levels of exposure to features of their local neighborhood environment (alcohol outlets) (Kwan 2000) and differ in the frequency, quantity, and context of alcohol consumption (Kairouz and Greenfield 2007; Trillo et al. 2012).

Gender and Parenting

Although fathers are spending more time with their children than in the past, women continue to spend more time overall with their children (Parker and Wang 2013). In addition to absolute quantity, the quality of this time spent with children may vary between fathers and mothers. Mothers spend more time caring for their child's physical needs (e.g., bathing, dressing) and transporting their children than fathers, even at comparable hours of employment (Craig 2006; Wells and Sarkadi 2012). Mothers and fathers also differ in the proportion of child-care time spent interacting with children (e.g., teaching, playing, talking, and disciplining), with fathers spending a greater proportion of their child-care time interacting with their children than mothers (Craig 2006; McBride and Mills 1993). Furthermore, mothers are more likely than fathers to be multi-tasking (e.g., engaging in multiple activities at once) and on a time schedule while interacting with children (Craig 2006). However, little is unknown about how these gender-based differences in the quantity and quality of parent-child interactions relate to physical abuse. Research examining gender-specific risk factors for child physical abuse is limited (Shapiro and Krysiak 2010), and has primarily focused on psychological factors, with mixed results (Asia et al. 2011; Perez-Albeniz and de Paul 2004; Walsh et al. 2002). Initial evidence suggests that the relationship between alcohol use and physical abuse may be gender-specific. A national survey found that mothers who reported greater frequency of being drunk in the past year were more likely to commit physical abuse; there was no effect for fathers (Berger 2005). As mothers spend larger amounts of time taking care of children and meeting their needs, children could have relatively greater exposure to possible physical abuse from mothers' drinking behaviors than fathers'. However, while this finding suggests that alcohol may not be related to physical abuse for fathers, it does not take into account either drinking contexts or dose-response relationships, both of which could have gender-specific effects.

Gender, Drinking Contexts, and Physical Abuse

Women and men differ in how frequently they drink in various contexts (Kairouz and Greenfield 2007; Treno et al. 2000). Men drink more frequently than women at bars (Kairouz and Greenfield 2007) and at restaurants, parties, and special events (Treno et al. 2000). However, most studies examining gender-specific use of drinking contexts have not focused on mothers or fathers and therefore may have missed differences related to parenting. Literature suggests that parenthood is associated with lower consumption of alcohol for both mothers (Cho and Crittenden 2006) and fathers (Paradis et al. 1999). These declines may be related to drinking contexts. A recent study found that both mothers and fathers report less frequent heavy drinking than non-parents, and that drinking contexts have gender-specific mediating effects (Paradis et al. 2011). For example, both mothers and fathers had a lower ratio of drinking at bars than non-parents, which was in turn associated with lower frequency of heavy drinking. This is unsurprising given that people drink more alcohol at bars than other contexts (Herd and Grube 1993; Kairouz and Greenfield 2007), and bars often have cultural practices such as "rounds" and "last calls" that might encourage higher levels of consumption (Clark 1981). This suggests that parenting may limit the extent to which a person is able to frequent bars, resulting in fewer episodes of heavy drinking. However, Paradis et al. (2011) also found that mothers had a lower ratio of drinking events at restaurants than non-mothers, which was surprisingly associated with greater frequency of drunkenness. Mothers may drink less often at restaurants than non-mothers because their children are with them or they are dining at "family friendly" venues that discourage alcohol consumption. However, since individuals tend to drink less at restaurants than other contexts (Kairouz and Greenfield 2007), this could mean that mothers who drink less often at restaurants are instead drinking at special events contexts like weddings, where excessive consumption may be likely to occur. These findings suggest that drinking contexts, alcohol consumption, and parenting may have gender specific relationships.

Initial evidence suggests that drinking contexts are associated with child physical abuse. Freisthler (2011) and Freisthler and Gruenewald (2013) both found that more frequent drinking in some contexts is associated with frequency of physical abuse. Specifically, drinking more often at bars (Freisthler 2011; Freisthler and Gruenewald 2013), at home or parties outside the home (Freisthler and Gruenewald 2013), or at parties at their own home or a friend's house (Freisthler 2011) are associated with physical abuse. These studies, however, did not examine whether these relationships are gender-specific. Variation in the quality and quantity of parenting duties could lead to different effects for mothers and fathers. For example, spending more time with children might mean

that women are more likely to have their children with them when they drink. Mothers, who often are viewed as in charge of children and their behavior (Correl et al. 2007), might experience agitation when their children misbehave at public places such as restaurants or parties, and use physically abusive behaviors as a punishment, either there or upon returning home. Conversely, fathers may drink less often in public with their children, or be less likely to be “on-duty” for disciplining practices. Instead, fathers might drink more often at bars that are not welcoming to children and may potentially promote aggressive social norms (Bahler et al. 2014; Gruenewald et al. 2014). Analyses that fail to account for gender-specific risks may mask the ways that these relationships differ for mothers and fathers.

Gender, Dose–Response Drinking, and Physical Abuse

Increased consumption of alcohol increases disinhibition (Weafer and Fillmore 2012) and aggression (Bushman 1997), both of which could increase physical abuse. For example, each additional drink of alcohol could increase the amount of anger a parent feels when a child misbehaves, as well as how well they are able to control their own behavior by refraining from hitting their children. Consequently, there may be a dose–response relationship between alcohol use and physical abuse, with additional drinks increasing the frequency of physical abuse. However, one recent study did not find a dose–response relationship between drinking at bars or restaurants and physical abuse (Freisthler and Gruenewald 2013). Instead, the authors found that drinking more drinks at home or parties outside the home was associated with less frequent physical abuse. While this suggests there is not a dose–response relationship between alcohol use and physical abuse, this study did not examine gender differences and consequently may have masked gender-specific relationships. For example, women generally have less lean muscle and body mass than men, and due to these and other metabolic differences experience intoxicating effects of alcohol at lower doses (Baraona et al. 2001). As a result, women could be less likely to have a dose–response relationship between alcohol and child abuse than men, as additional drinks might make them too inebriated or sedated to abuse instead of increasing risk. This could be particularly true at restaurants and bars, where drinks might be consumed in more rapid succession than at longer events such as day-long parties or barbecues. Dose–response relationships could be more likely for men, who experience less control of their behaviors (Fillmore and Weafer 2004; Weafer and Fillmore 2012) and more aggression after alcohol consumption than women (Scott et al. 1999; Gussler-Burkhardt and Giancola 2005). These effects could be more pronounced in drinking contexts like bars, which

might attract more aggressive people and promote aggressive social norms (Gruenewald et al. 2014).

Gender, Alcohol Outlets, and Physical Abuse

Earlier studies have found that living in a neighborhood with a higher number of off-premise outlets within 0.5 miles is associated with more frequent physical abuse (Freisthler and Gruenewald 2013). However, little is known about whether these effects differ for men and women, who may have varying levels of exposure to alcohol outlets near where they live. Women travel around their own neighborhoods more than men (Kwan 2000) and as a result may have greater exposure to negative elements in their local environment. For example, neighborhoods with more bars may attract violent individuals (Gruenewald et al. 2014). Mothers in these neighborhoods may have greater exposure to violent behavior, possibly normalizing aggressive behaviors like physical abuse.

Understanding gender-specific risks for child physical abuse is important given the differential amount of time mothers and fathers spend with children. More importantly, context-specific risks by gender may provide useful information on how to prevent child physical abuse. This study advances the literature by examining gender-specific relationships between context-specific drinking, dose–response drinking, alcohol outlets and child physical abuse. It was hypothesized that there would be gender-based differences in the tested relationships, with the frequency of alcohol consumption associated with physical abuse for mothers, and the amount of alcohol consumed associated with physical abuse for fathers. In particular, it was hypothesized that greater frequency of drinking in all contexts (home, bars, parties, and restaurants) would be associated with physical abuse for mothers while greater amounts of alcohol consumed at each context would be associated with greater frequency of physical abuse for fathers.

Methods

Study Sample and Data Collection

A general-population sample of parents or legal guardians aged 18 years or older living in 50 mid-sized cities in California (population size between 50,000 and 500,000) were interviewed. To recruit participants, households were randomly selected from a sample list obtained from credit card companies or other sources and sent a promotional letter providing information about the study. These listed sampling procedures are relatively unbiased and efficient for targeting samples in specific areas (Brick et al. 1995; Gruenewald et al. 2014; Kempf and Remington 2007; Tucker et al. 2002). In

order to be eligible for the study, participants had to speak English or Spanish and have 1 or more children aged 12 years or younger live with them at least 50 % of the time. After being contacted by a trained interviewer, one participant was randomly selected from those eligible in each household and interviewed via computer assisted telephone survey. The interviews lasted approximately 30 min and participants were provided a \$25 incentive fee. The study response rate of the potential participants contacted was 47.4 %.

Descriptive statistics for the final sample ($n=3023$; women = 1973; men = 1050) are presented in Table 1. To improve the generalizability of results, post-stratification weights were used for all analyses to account for gender-specific race/ethnicity in each of the 50 cities.

Measures

Outcome The Parent–child Conflict Tactics Scale (Straus et al. 1998) was used to assess the frequency of child physical abuse for a focal child. In order to minimize social desirability bias, Interactive Voice Technology (IVR) was used to capture responses to the four physical abuse questions (e.g., the frequency that the parent hit with a fist or knocked down a focal child). Focal children were aged 12 or younger and selected by the most recent birthday. To create the past-year physical abuse frequency scale, the middle ranges of the four response option categories (ranging from never in the past year to 10 or more times in the past year) were summed, as recommended by Straus et al. (1998).

Alcohol Outlets California Department of Alcoholic Beverage Control data were used to identify the location of two types of licensed alcohol establishments: 1) off-premise outlets (e.g., liquor stores); and 2) on-premise alcohol outlets where alcohol is consumed at the site of the purchase. To assess the relationship of bars separate from all on-premise outlets an additional variable was created that looks at the percentage of those on-premise outlets that were bars. Approximately 99 % of outlets were successfully geocoded and the number of each type of outlet within 2 miles of each respondent's home was calculated.

Drinking Context and Dose–Response Drinking Measures

All respondents were asked a series of questions about their drinking behaviors. First, respondents were asked to estimate how many days they had 1 or more, 2 or more, 3 or more, 6 or more, and 9 or more alcoholic drinks during the past 28 days. Less frequent drinkers (those that did not drink in the past 28 days but did drink in the past year) were asked the same series of questions for a 365 day time frame. Respondents were also asked the greatest number of drinks that had on any 1 day for either the 28 or 365 day time frame. Next, respondents

were asked about the number of days they had at least one drink of alcohol in a specific context, including (1) in a bar; (2) at home; (3) at a restaurant; and (4) at a party/fiesta or other social gathering outside of the home. These questions were either asked for the past 28 or past 365 days. The answers to these questions were used to determine (1) the frequency of having at least one drink of alcohol in any given context and (2) the additive effect of additional drinks beyond the first drink consumed. These measures consequently assess the effects of frequency and quantity of alcohol consumption in a given context in relation to child physical abuse (Freisthler and Gruenewald 2013). Because information on the amount a respondent drank in any given context was not available, these estimates represent an average continued volume for all contexts.

Control Variables

Social Cohesion and Social Control Perceived social cohesion ($\alpha=0.772$) and informal social control ($\alpha=0.699$) was assessed using seven items adapted from the Project on Human Development in Chicago Neighborhoods survey (Sampson et al. 1997). The social cohesion items asked participants how often people in their neighborhood did favors for each other, had parties or other social events together, and visited with each other in homes or in the street. Responses were on 4-point scale ranging from “often” to “never”. The social control items asked respondents how likely it would be for neighbors to step in if they knew children were skipping school, spray-painting buildings, or showing disrespect to adults. They were also asked if neighbors were likely to intervene if someone was being beaten up or threatened in front of their house. These responses were scored on a 5-point scale ranging from “very likely” to “very unlikely”. For both social cohesion and social control, high scores indicate lower levels.

Depression Past month depressive symptoms were assessed using two items from the PRIME-MD-5 ($\alpha=0.676$). These items assessed how bothered respondents had been in the past month by 1) little interest or pleasure in doing things, or 2) feeling down, depressed, or hopeless.

Parenting Stress Two items from the Dimensions of Discipline Inventory (Straus and Fauchier 2011) were used to measure parental stress, including how often respondents had felt angry or stressed out in the past year after their child misbehaved.

Social Support The Interpersonal Support Evaluation List (Cohen and Hoberman 1983) was used to assess social support.

Table 1 Descriptive Statistics for Women ($n = 1973$) and Men ($n = 1050$)

Variable name	Women Weighted % or (sd)	Men Weighted % or (sd)
Average frequency of physical abuse	1.2 (2.9)	1.4 (3.9)
Gender (focal child)		
Male	49.7	47.9
Age, in years (focal child)	6.5 (3.6)	6.9 (3.5)
Age, in years	38.2 (7.7)	41.4 (7.7)
Number of children	2.2 (1.0)	2.2 (0.9)
Marital Status		
Single, divorced, widowed	15.7	5.4
Married or cohabiting	84.3	94.6
Race/ethnicity		
Non-Hispanic White	59.7	52.0
Non-Hispanic Black	4.0	2.8
Hispanic	24.9	30.3
Asian	5.5	9.3
Multi-racial	2.9	2.7
Other	2.9	1.8
Income		
≤\$20,000	9.9	3.4
\$20,001–\$40,000	12.7	10.6
\$40,001–\$60,000	12.4	12.8
\$60,001–\$80,000	14.6	17.2
\$80,001–\$100,000	13.8	13.5
\$100,001–\$150,000	21.1	23.5
\$150,001 +	11.5	18.8
Parenting stress	4.1 (1.3)	3.8 (1.2)
Impulsivity level	0.7 (1.3)	0.7 (1.4)
Symptoms of depression	17.3	17.0
Social support	43.25 (5.2)	43.14 (5.5)
Perceived neighborhood effects		
Informal social control	7.6 (3.0)	7.7 (3.0)
Social cohesion	6.6 (2.5)	6.5 (2.2)
City-level alcohol environment		
On premise outlets	66.8 (49.8)	61.3 (46.8)
Off premise outlets	44.2 (30.6)	39.7 (26.9)
Percent bars	12.1	12
Drinking context: frequency		
Home	2.2 (4.5)	3.9 (6.0)
Bars	0.1 (0.6)	0.2 (0.9)
Restaurants	0.4 (1.1)	0.6 (1.6)
Parties	0.2 (0.8)	0.3 (0.8)
Drinking context: continued volumes		
Home	1.4 (5.0)	5.0 (17)
Bars	0.1 (1.1)	0.5 (3.9)
Restaurants	0.3 (1.0)	0.6 (2.6)
Parties	0.2 (0.9)	0.5 (2.6)

Demographic Characteristics Several demographic measures known to be associated with child physical abuse were

controlled for including the age and gender of the focal child, number of children in the household, and parental marital status

(married or cohabitating vs. single, divorced, or widowed), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Asian, Multi-racial, or Other), income, and age.

Analysis Procedures

The outcome variable is the number of times a person used physically abusive parenting practices against a particular focal child. Data were analyzed using random effects negative binomial models that relax the traditional Poisson model requirement that the variance equal the mean. In essence, negative binomial models provide a flexible approach to modeling count data that allows for over-dispersion relative to the Poisson distribution. Random effects at the city-level were included in the model to address issues related to clustering of respondents within cities (e.g., intraclass correlation). These models also include adjustments for heteroskedasticity of the distribution of drinking frequencies.

Results

Weighted descriptive statistics for women and men are presented in Table 1. Bi-variate analyses (chi-squares or independent samples t-tests) were used to examine differences between men and women on the study variables. Men were more likely to be married, were older, and reported lower levels of neighborhood-level social control and less parenting stress than women. Men also drank more often at bars and restaurants, with friends, and more alcohol per occasion at all contexts compared with women.

Multivariate Results

Results of the gender-specific negative binomial models are shown in Table 2. There were no significant relationships between number of any type of alcohol outlet and physical abuse by men. For women, fewer on-premise outlets, more off-premise outlets, and a higher percentage of bars within 2 miles were related to higher frequency of physical abuse.

Drinking Contexts Only one drinking context was significantly related to frequency of physical abuse for men. Drinking more often at restaurants was positively associated with frequency of physical abuse. Other drinking contexts were associated with greater frequency of physical abuse for women, including drinking more often at bars and parties. Frequency of drinking at home was not associated with frequency of physical abuse for mothers or fathers.

Dose–Response Drinking Contrary to the study hypothesis, there were no associations between the number of drinks consumed at a context and frequency of physical abuse for men. For

Table 2 Weighted negative binomial regression models predicting child physical abuse, by gender

Variable name	Women		Men	
	β (SE)	p	β (SE)	p
Intercept	−4.4576 (0.5492)	***	−2.9377 (6.21068)	
Alcohol environment				
On premise outlets	−0.0039 (0.0012)	***	0.0055 (0.0122)	
Off premise outlets	0.0067 (0.0023)	**	−0.0387 (0.0280)	
Percent bars	0.0140 (0.0065)	*	−0.0215 (0.0424)	
Drinking context: frequency				
Home	−0.0036 (0.0107)		0.0480 (0.0587)	
Bars	1.2803 (0.2179)	***	0.1690 (0.7319)	
Restaurants	−0.0474 (0.0816)		0.7832 (0.3104)	*
Parties	0.7027 (0.0826)	***	−1.1145 (0.8131)	
Drinking context: continued volumes				
Home	−0.0305 (0.0237)		−0.0132 (0.0333)	
Bars	−0.2832 (0.1155)	*	0.0704 (0.1988)	
Restaurants	−0.3437 (0.1164)	**	−0.4915 (0.3706)	
Parties	−0.5574 (0.1077)	***	0.4040 (0.2370)	

Models adjust for age, race/ethnicity, marital status, income level, number of children, impulsivity, depression, parental stress, total support, reciprocal exchange, social control, and age and gender of focal child

* $p < .05$, ** $p < .01$, *** $p < .001$

women, drinking more alcohol at bars, restaurants, and parties was inversely associated with frequency of physical abuse. There was no association between the number of drinks consumed at home and physical abuse for either mothers or fathers.

Discussion

The relationship of gender-specific risks between drinking contexts, dose–response drinking, alcohol outlets and child physical abuse were examined in a population of California parents. As hypothesized, the results suggest that these relationships differ for mothers and fathers. Specifically, while the number of alcohol outlets (more off-premise outlets and a higher percentage of bars), drinking-contexts, and dose–response variables were all associated with increased frequency of physical abuse for mothers, only one drinking context variable was significant for fathers. Studies that examine the role of alcohol in child abuse without taking into account gender-specific risks may misidentify relationships and fail to provide nuanced understanding.

Drinking Contexts

Similar to previous research, it was found that drinking more frequently at bars and restaurants was associated with more frequent physical abuse (Freisthler and Gruenewald 2013). In

contrast to previous research, however, these findings appear to be gender-specific. For example, more frequent drinking at bars was positively related to physical abuse for women, while there was no effect for men. As men drink at bars more often than women (Kairouz and Greenfield 2007; Treno et al. 2000), it could be that women who often drink at bars are demonstrating more extreme behaviors overall and lack the parenting skills to discipline children without physical abuse. Alternatively, women who physically abuse their children often could also go out to bars to escape their home life or relieve stress after hitting or kicking their children. Additionally, women who drank more frequently at parties were more likely to use physical abuse more often. Since women usually spend more time with their children, it could be that women are more likely to bring children along when they are drinking at parties. This might increase children's exposure to disinhibited mothers. In addition, mothers who have their children with them at parties might expect better behavior from their children than if they are at home (e.g., not to run through someone else's home), and use physical abuse to discipline them.

While more drinking contexts were related to physical abuse for mothers, there was one context associated with risk for fathers. Men who drank more frequently at restaurants were more likely to use physical abuse more often. It could be that men frequent different types of restaurants than women. For example, alcohol licensing distinctions between "restaurants" and "bars" are becoming increasingly imprecise in California, as more and more restaurants that serve meals during the day "morph" into bars or nightclubs in the evening (Wittman 2012; Ponicki et al. 2013). Since men usually have fewer childcare duties, they may go to restaurants that are less family friendly and consequently enhance both "party-like" atmospheres and aggressive behaviors (Bahler et al. 2014). Alternatively, fathers may be more likely to be disciplinarians when families go to a nice restaurant, letting the mother "off the hook." If going out to a restaurant without children, fathers might be more prone to use physical discipline to ensure children behave for the babysitter or use physical discipline after if the report from the babysitter is that the children misbehaved.

These results provide preliminary evidence that drinking contexts have gender-specific effects. However, much remains unknown about the social relationships or influences that parents encounter at these various drinking contexts, as well as the mechanisms by which they are related to physical abuse. Future research could help explore what aspects of these environments place children at higher risk of physical abuse, particularly for mothers.

Dose–Response Drinking

Previous studies have not found positive associations between dose–response drinking and physical abuse

(Freisthler and Gruenewald 2013). Gender-specific associations in these relationships were examined, with findings suggesting that there were no relationships between context-specific dose–response drinking and physical abuse in any context for fathers. Fathers tend to spend less time with children than mothers, so children might have less exposure to them while drinking.

While dose–response drinking was associated with physical abuse at bars, parties, and with family and friends for mothers, increased consumption was associated with lower frequency of physical abuse. It could be that increased drinks make mothers too inebriated to abuse their children, due to the enhanced intoxicating effects of alcohol on females (Baraona et al. 2001). These findings suggest that for mothers the frequency of drinking in particular contexts may be more problematic than the quantity consumed.

Alcohol Outlets

The number of alcohol outlets within two miles of a respondent's home appeared to be related to physical abuse for women but not men. For mothers, more off-premise outlets, a higher proportion of bars, and fewer on-premise outlets were associated with more frequent physically abusive behaviors. The presence of off-premise outlets and bars could attract more aggressive people to the neighborhood (Gruenewald et al. 2014), potentially promoting physical abuse. Alternatively, the disinhibiting effects of alcohol could have more people in the neighborhood acting more aggressively than they would under non-drinking conditions, and these effects could be particularly influential to women, who spend more time in their local neighborhoods (Kwan 2000). Other studies have similarly found that having more bars, pubs, or restaurants in a neighborhood is associated with more frequent physical abuse (Freisthler and Gruenewald 2013). These findings suggest that these effects may be present for women only and that the presence of alcohol outlets may have an influence on child physical abuse above and beyond a mother's actual drinking behaviors.

In contrast, none of the alcohol outlet variables were significant for men. As fathers typically have fewer childcare duties, they may travel further outside of their neighborhoods than mothers (Dijst 1999). Alcohol outlet measures that examine only the number of outlets near a father's home may consequently be problematic for assessing a father's level of exposure to risk factors such as alcohol outlets. Measures that capture an individual's unique activity space (i.e., the places that a person typically goes; Jones and Pebley 2014) might be better at establishing how the presence of different types of outlets is related to physical abuse, for both mothers and fathers.

Limitations

A general population survey was used to investigate context-specific dose response drinking and child physical abuse in a sample of individuals who may not be known to social service or public health systems. However, these models were only able to assess the role of drinking contexts among current drinkers. As a result, it is unknown where the theorized social influences experienced at different drinking contexts would be the same for parents who do not drink. These findings are similar to those of Freisthler (2011), who examined relationships between attending specific contexts and physical abuse for both drinkers and non-drinkers.

The underlying assumption in these models that drinking is uniform across contexts may not be accurate (Paradis et al. 2011). Thus, understanding how drinking quantities differ at these contexts might provide a more nuanced understanding of this relationship. In particular, men, who drink greater quantities than women (Kairouz and Greenfield 2007), may have a larger range of drinks consumed depending on the particular context. Additionally, since these data are correlational, causal relationships cannot be established. Finally, the response rate for the survey was 47.4 %, which could affect the generalizability of results. However, this rate is similar to other recent telephone surveys (Curtin et al. 2005; Kohut et al. 2012), and the data were weighted by race/ethnicity to better represent the 50 mid-sized California cities.

Implications

These findings challenge the substantial body of literature suggesting that heavy drinkers or those with alcohol use disorders are more likely to commit physical abuse (Berger 2005; Kelleher et al. 1994), and suggest that a focus on drinking contexts may reveal heightened risk for many mothers who do not consume large amounts of alcohol. These mothers may be missed by social services workers focusing on drinking quantity as a risk factor for physical abuse. If these results are supported by future studies, they suggest that alcohol-related interventions to decrease child abuse should not target heavy drinkers exclusively, and should instead focus on the general population of parents (particularly mothers) who consume alcohol in specific contexts. For example, social service workers or clinicians could focus on the frequency of drinking at bars or parties for mothers to assess for increased risk. Workers and clinicians could also interview mothers about the contexts where they drink alcohol and investigate connections between drinking in these contexts and parenting behaviors. Additionally, community-based respite programs could provide overnight or short-term care for children when mothers plan to attend parties or bars.

This study suggests that there are fewer relationships between drinking contexts, context-specific dose–response

drinking, alcohol outlets, and physical abuse for fathers than mothers. Similarly, Berger (2005) found no association between frequency of drunkenness and physical abuse for fathers (although there was a relationship for mothers). It could be that alcohol has less of a role in determining risk for fathers than mothers, due to less overall time spent with children or other unknown factors. However, these findings do suggest drinking more frequently at restaurants is associated with more frequent physical abuse for fathers. Social service providers or clinicians may consequently examine the specific use of drinking contexts among fathers, with a particular focus on restaurants. While these findings present an initial exploration of this topic, more gender-specific research should be conducted to assess whether alcohol is really less of a risk factor for fathers compared to mothers and if screening or intervention resources should focus on other areas for fathers.

Conclusion

These results suggest that drinking contexts and their relationship to child physical abuse differ for mothers and fathers. The increased amount of time women spend with children may be driving this relationship as they could use all types of discipline more often. Combined with lower tolerance levels for alcohol and quicker time to intoxication, frequency in a variety of contexts appears to place children at greater risk for child physical abuse by mothers.

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