The Role of Alcohol Policies in Preventing Intimate Partner Violence: A Review of the Literature

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ABSTRACT. Objective: This article summarizes existing research on the relationship between alcohol policies and intimate partner violence (IPV). Because alcohol use represents an important risk factor for IPV, interventions and policies aimed at decreasing problem drinking may also lead to reductions in IPV. **Method:** Electronic databases were searched to identify relevant peer-reviewed journal articles on alcohol policies and IPV, as well as reference sections of appropriate articles. Only policies that have been studied specifically for their impact on IPV were included. **Results:** Three alcohol policy areas (outlet density, hours and days of sale, and pricing/taxation) have been studied in relation to IPV outcomes. Research on outlet density has the most consistent findings, with most studies indicating that higher densities of alcohol outlets are associated with higher rates of IPV. Fewer studies have been conducted on pricing policies and policies restricting hours/days of sale, with most studies suggesting no impact on IPV rates. **Conclusions:** A higher density of alcohol outlets appears to be associated with greater rates of IPV. However, there is limited evidence suggesting that alcohol pricing policies and restrictions on hours and days of sale are associated with IPV outcomes. Knowledge about the impact of alcohol-related policies on IPV and violence in general is limited by several significant research gaps. Additional research is needed to assess the impact of alcohol policies on IPV and other forms of violence. (*J. Stud. Alcohol Drugs, 76,* 21–30, 2015)

APPROXIMATELY 80,000 DEATHS EACH YEAR in the United States are directly or indirectly attributable to alcohol consumption, with global deaths attributable to alcohol estimated at 3.8% (Centers for Disease Control and Prevention, 2008; Rehm et al., 2009). In 2006, the economic costs of excessive alcohol consumption (attributable to health care, productivity losses, criminal justice costs, etc.) were estimated at $223.5 billion (Bouchery et al., 2011). To protect the health and safety of all citizens, the United States has identified reduction of alcohol misuse as a major component of its public health agenda for 2020 (U.S. Department of Health and Human Services, 2014). The World Health Organization (2010) has also formally adopted a global strategy to reduce harmful alcohol use because of the resultant health and economic burden worldwide. Many alcohol-related policies and programs have been implemented at the state and local level to improve public health (Truman et al., 2000). By examining the public health impact of alcohol-related policies, researchers and policy makers can more readily assess the value of implementing these policies and their utility in preventing harmful outcomes associated with alcohol consumption, including alcohol-related diseases, unintentional injuries, and violence.

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Intimate partner violence (IPV) is another significant public health issue, with approximately 35% of women and 28% of men in the United States experiencing rape, physical violence, or stalking by an intimate partner in their lifetime (Black et al., 2011). The annual medical and lost productivity costs alone of IPV against women have been estimated at $5.8 billion (National Center for Injury Prevention and Control, 2003). Global estimates suggest that the lifetime prevalence of physical and/or sexual IPV against women is approximately 30% (World Health Organization, 2013). Alcohol use has been consistently linked to IPV through an abundance of evidence, including meta-analyses confirming a positive association (Devries et al., 2014; Foran & O'Leary, 2008). Approximately two thirds of IPV victims report that their assailant was drinking at the time of the incident (Greenfield, 1998), and longitudinal data indicate that alcohol use and problem drinking are predictors of IPV perpetration and victimization for men and women (White & Chen, 2002; Widom et al., 2006). Prospective studies of alcoholic patients have indicated that number of days spent drinking predicted partner aggression (Murphy & Ting, 2010).

Because alcohol use represents an important risk factor for IPV, interventions and policies aimed at problem drinking may also lead to reductions in IPV. For example, couples-based treatment for substance use disorders produced clinically significant reductions in violence for patients whose alcohol use remitted after treatment (Murphy & Ting, 2010; Ruff et al., 2010). These findings suggest the potential for using alcohol-focused interventions to prevent IPV. At the broader community and societal level, numerous public policies have been implemented in the United States and abroad

Table 1. Summary of studies examining alcohol policies and intimate partner violence outcomes

Study	Policy area	Location	IPV outcome	Results
Cunradi et al. (2011)	Alcohol outlet density	Sacramento, California	IPV-related police calls and crime reports	Each additional off-premise outlet was associated with a 4% increase in IPV-related police calls and 3% increase in IPV-related crime reports. Bar and restaurant density was not associated with IPV outcomes.
Iritani et al. (2013)	Alcohol outlet density	Population-based national U.S. survey	Self-reported IPV perpetration among young heterosexual females	Higher off-premise alcohol outlet density was found to be associated with self-reported perpetration of physical-only IPV.
Livingston (2010)	Alcohol outlet density	Melbourne, Australia	Police-reported domestic violence	General license outlet density (pubs, taverns; alcohol is sold for both off-premise and on-premise consumption) was associated with increased IPV rates. Bar/restaurant density and packaged liquor outlet density were not associated with IPV rates.
Livingston (2011a)	Alcohol outlet density	Melbourne, Australia	Police-reported domestic violence	Longitudinal analysis indicated that all types of alcohol outlets (general/pubs, on-premise, and packaged liquor licenses) were associated with increased IPV rates. Largest effect was for packaged liquor licenses for off-premise consumption.
McKinney et al. (2009)	Alcohol outlet density	Population-based survey of U.S. couples	Self-reported IPV by U.S. couples	An increase of 10 alcohol outlets per 10,000 persons was associated with 34% increase in male-to-female partner violence. Relationship between outlet density and IPV was stronger for on-premise outlet density and for couples reporting alcohol-related problems.
Cunradi et al. (2012a)	Alcohol outlet density	California	IPV-related ED visits	Bar density was positively associated with IPV-related ED visits. Off-premise outlets were negatively associated with IPV ED visits. Restaurant density showed no significant association with IPV ED visits.
Gorman et al. (1998)	Alcohol outlet density	223 municipalities in New Jersey	Police-reported domestic violence	Alcohol outlet density failed to predict rates of domestic violence and was unrelated to any sociodemographic predictors of domestic violence.
Waller et al. (2012a)	Alcohol outlet density	Population-based national U.S. survey	Self-reported IPV victimization among young heterosexual females	Alcohol outlet density failed to predict IPV victimization or drinking behaviors.
Waller et al. (2012b)	Alcohol outlet density	Population-based national U.S. survey	Self-reported IPV victimization among young heterosexual males	Alcohol outlet density increased risk for physical IPV only.

Table continued

to reduce excess alcohol consumption and related harm. However, whether broader alcohol-related policies would similarly lead to IPV prevention is unclear. Thus, the purpose of this review is to summarize existing research on alcohol-related policies' impact on IPV. Only alcohol policies that have been studied specifically for their impact on IPV outcomes (i.e., alcohol prices and taxation, restrictions on hours and days of alcohol sales, and alcohol outlet density restrictions) were included. However, studies describing these policies and other violent outcomes (e.g., general assaults) were reviewed where limited research specifically examining IPV has been conducted, because this research may provide theoretical and empirical support to inform IPV prevention. Extensive searches were undertaken using PsycINFO and Google Scholar to identify relevant peer-reviewed journal articles on alcohol policies and IPV, with no restrictions on year of publication. In addition, reference sections of appropriate articles were examined to detect additional studies not identified in the initial database search. For each policy, research examining policy impact on IPV was first reviewed (see Table 1), followed by an overview of studies examining impact on other violence-related outcomes.

Review of policies

Alcohol outlet density. Alcohol outlet density refers to the number of locations where alcohol can be purchased (calculated per area or per population) and can be differentiated into on-premise settings (e.g., bars, restaurants, ballparks) or off-premise settings (e.g., packaged liquor stores, grocery

Table 1. *Continued*

Study	Policy area	Location	IPV outcome	Results
Waller et al. (2013)	Alcohol outlet density	Population-based national U.S. survey	Self-reported IPV perpetration by young heterosexual males	High alcohol outlet density increased risk for perpetration of physical IPV only.
Duailibi et al. (2007)	Hours/days of sale	Brazil	Police-recorded assaults against women	No significant impact on assaults against women was detected after on-premise alcohol sales were restricted after 11 p.m. General homicide rates significantly decreased by 44% after the law was enacted.
Olsson & Wikström (1982)	Hours/days of sale	Sweden	Police-recorded domestic disturbances	Domestic disturbances decreased in all 24 counties during an experimental period evaluating the effects of closing liquor retail stores on Saturdays.
Norström et al. (2003)	Hours/days of sale	Sweden	Police-recorded domestic violence assaults	Liquor stores in an experimental area (six counties) were reopened on Saturdays, with a control area (seven counties) remaining closed. Alcohol sales significantly increased by 3.3% in the experimental areas. No differences in domestic violence rates were detected in the experimental areas after alcohol sales were allowed on Saturdays.
Markowitz (2000b)	Alcohol price/ taxation	Population-based national survey	Self-reported IPV	Increases in the pure price of alcohol (weighted average across beer, wine, and distilled spirit prices) was associated with decreases in severe violence aimed at wives. Alcohol price did not predict violence aimed at husbands unless individual-level characteristics were controlled, which revealed a negative relationship between price and violence.
Herttua et al. (2008)	Alcohol price/ taxation	Helsinki, Finland	Police-reported interpersonal violence	An average alcohol tax decrease of 33% resulted in increased alcohol consumption, but interpersonal violence rates did not increase. Data on domestic violence-related emergency call-outs by police decreased by approximately 7% after the policy change.
Sabia (2004)	Alcohol price/ taxation	Population-based U.S. survey of pregnant women	Self-reported domestic violence	No significant association was found between state liquor taxes and domestic violence.
Zeoli & Webster (2010)	Alcohol price/ taxation	46 large U.S. cities	Intimate partner homicide rates	Beer excise taxes did not significantly predict intimate partner homicide rates.
Durrance et al. (2011)	Alcohol price/ taxation	46 U.S. states and District of Columbia	Female homicide rates and intimate partner homicide rates	No significant relationship was identified between alcohol tax policy and female homicide or intimate partner homicide rates.

Notes: IPV = intimate partner violence; ED = emergency department.

stores, convenience stores; Campbell et al., 2009). Campbell et al. outlined a theoretical model suggesting that decreases in alcohol outlets essentially decrease accessibility through increased distances to outlets, increased prices, reduced exposure to alcohol-related marketing and promotions, and decreased social aggregation in and around alcohol outlets. Gruenewald (2007) proposed that as the number of alcohol outlets in a community increases, so does the amount of competition and "niche marketing" to attract specific subgroups of patrons. Niche marketing leads to a dynamic process wherein drinkers frequent bars where they find others with similar social norms and behaviors, which can explain why problems such as aggression intensify in certain outlets more than in others. Greater alcohol outlet density may also represent a sign of neighborhood disorder and limited social control, which could decrease concern for the consequences associated with IPV perpetration and discourage neighbors from intervening in IPV incidents (Cunradi, 2010). In addition, outlet density may increase the physical availability and excessive alcohol consumption among at-risk couples (Cunradi, 2010).

To reduce alcohol sales and consumption, many laws and local ordinances regulate alcohol outlet density through zoning and licensing rules. In California, for example, many communities have implemented zoning and conditional use permit regulations that limit the number and concentration of outlets and restrict their proximity to schools and playgrounds (Ashe et al., 2003). There has been no research on the direct impact of policies restricting outlet density on indicators of alcohol-related problems

(Campbell et al., 2009). However, several studies addressing the relationship between outlet density and violence, including IPV, have been conducted. In Sacramento, California, Cunradi et al. (2011) found that after neighborhood characteristics (i.e., poverty rate, unemployment rate, racial/ethnic composition) were controlled for, each additional off-premise alcohol outlet increased IPV-related police calls by 4% and increased IPV crime reports by 3%. Interestingly, on-premise outlet density (i.e., bars and restaurants) was not associated with IPV outcomes. Livingston (2010) found that after sociodemographic variables were controlled for, outlet density was significantly related to police-reported domestic violence in Melbourne, Australia. Similar to Cunradi et al. (2011), findings varied based on outlet type, with general licenses (e.g., pubs that sell alcohol for on- or off-premise consumption) showing a positive association, on-premise license density showing a negative association, and packaged liquor license density showing no relationship (Livingston, 2010). A 10-year longitudinal analysis conducted in Melbourne, Australia, indicated that all types of alcohol outlet density were associated with increases in police-recorded domestic violence over time (Livingston, 2011a). When outlet type was analyzed separately, a particularly large effect was observed for packaged liquor licenses on rates of domestic violence.

In contrast, other studies have found on-premise outlets to be more relevant to IPV. McKinney et al. (2009) examined survey data from couples across 48 states and found that self-reported male-to-female IPV increased by 34% for every increase of 10 alcohol outlets (on- and off-premise) per 10,000 people. An even stronger relationship was found for couples reporting alcohol-related problems. However, when outlet types were analyzed separately, only on-premise outlet density (e.g., bars, restaurants) predicted IPV rates (McKinney et al., 2009). Cunradi et al. (2012a) similarly found that on-premise outlet density was positively associated with IPV-related emergency department (ED) visits in California between 2005 and 2008. In contrast, off-premise outlets were negatively associated with IPV-related ED visits, although this relationship was weaker than that observed for bar density (Cunradi et al., 2012a). Both of these studies directly contradict the previous findings by pointing to on-premise outlets as more relevant to IPV risk.

Still other studies have identified no relationship between alcohol outlet density and IPV, regardless of outlet type. Gorman et al. (1998a) examined data from 223 New Jersey municipalities and found that after sociodemographic variables were controlled for, outlet density showed no significant relationship to police-reported IPV. Similarly, using a nationally representative sample of young, heterosexual women (ages 18–26 years), Waller et al. (2012a) found that there was no direct relationship between outlet density and self-reported IPV victimization and no direct relationship with outlet density and drinking behaviors when controlling for individual and neighborhood characteristics. However, using the same nationally representative data set, another study found that off-premise outlet density was related to young women's self-reported perpetration of physical IPV (Iritani et al., 2013). Two additional studies using the same data set but focusing on a sample of young, heterosexual males also confirmed that outlet density was associated with both self-reported physical IPV victimization by a female partner (Waller et al., 2012b) and perpetration of physical-only IPV toward a female partner (Waller et al., 2013). Thus, within this nationally representative sample of young people, only self-reported IPV victimization among women was not significantly associated with outlet density.

The results from these various studies suggest that alcohol outlet density appears to be associated with IPV rates. However, findings on outlet type appear inconsistent, with some studies suggesting that a higher density of on-premise outlets predicts IPV (Cunradi et al., 2012a; McKinney et al., 2009) and others suggesting that off-premise outlets are more directly related to IPV (Cunradi et al., 2011; Livingston, 2010). Although no specific patterns are evident, the inconsistent findings may result from differences in IPV data sources or different types of licenses and definitions used for off-premise versus on-premise outlets.

Looking beyond IPV-specific outcomes, studies conducted across the United States have identified that greater alcohol outlet density is associated with higher violent crime rates, even when controlling for sociodemographic variables (Freisthler et al., 2005; Gorman et al., 2001; Gruenewald et al., 2006; Gruenewald & Remer, 2006; Lipton & Gruenewald, 2002; Parker et al., 2011; Reid et al., 2003; Scribner et al., 1995, 1999; Toomey et al., 2012; Zhu et al., 2004). International research conducted in Australia and Norway has also produced consistent findings on the relationship between alcohol outlet density and general violence (Livingston, 2008, 2011b; Norström, 2000). Importantly, Resko et al. (2010) found that alcohol outlet density was significantly related to violent behavior among urban adolescents, even after controlling for individual alcohol use and demographic characteristics, suggesting that excess consumption alone does not adequately explain the relationship between density and violence. Only one study produced contradictory findings. Gorman et al. (1998b) found that in New Jersey, sociodemographic variables accounted for 70% of the variance in assaultive violence, but no association with alcohol outlet density and violence was found. The authors suggest that their findings may be inconsistent because of methodological differences and suggest that future studies use statistical approaches (i.e., spatial autocorrelation) that account for the impact of outlet density across geographic units (Gorman et al., 1998b).

Graham (2006) noted that research that identifies potential mechanisms (i.e., what is actually occurring in and

around alcohol outlets and outlet characteristics) accounting for the relationship between alcohol outlet density and violent crime is greatly needed. For example, Liang and Chikritzhs (2011) found that beyond alcohol outlet density, the actual volume of alcohol sales sold from off-premise outlets was also significantly associated with higher violence rates at both licensed outlets and residential settings. Treno et al. (2008) found that greater alcohol outlet densities were associated with self-reported norms that were more accepting and forgiving of alcohol-related aggression and other "foolish" behaviors. Self-reported hostility and norms for alcohol-related aggression were also directly related to drinking at bars, pubs, and private homes (Treno et al., 2008). Although these findings provide a useful start, more research addressing possible mechanisms is needed.

Policies restricting day and time of alcohol sales. The United States has a long tradition of placing restrictions on the days and hours of alcohol sales. Currently, 14 states actively ban alcohol sales on Sunday. These bans vary in restrictiveness and whether they allow exceptions, such as local option laws permitting local governments to establish their own policy for sales under special circumstances (e.g., sales at wineries or on Super Bowl Sunday; Alcohol Policy Information System, "Retail sales: Bans on off-premises Sunday sales," n.d.). In addition, different jurisdictions vary widely on restrictions placed on the hours of sale for both off-premise and on-premise purchase of alcohol. Middleton et al. (2010) theorized that altering alcohol availability on specific days or times would potentially modify purchasing habits and decrease alcohol consumption and related harm.

Little research has examined the impact on violence of restricting the hours of alcohol sales, with only one study looking at IPV-relevant data. In Brazil, limiting the hours of alcohol sales in bars (i.e., closing at 11 P.M. instead of previous policy allowing sales 24 hours) led to a 44% decline in general homicide rates, but there was no significant impact on assaults against women (Duailibi et al., 2007). Other studies have looked at changes in the hours of sale and general violent assault rates. In Perth, Australia, Chikritzhs and Stockwell (2002) found that extending alcohol sales (typically 1 additional hour past the standard midnight closing time) resulted in a significant increase in police-recorded assaults at establishments with extended hours. Kypri et al. (2011) showed that after changing pub closing times from 5 A.M. to 3 A.M. in Australia, rates of police-recorded assaults fell 37% compared with a control locality that had no closing time restrictions. Briscoe and Donnelly (2003) found that hotels and bars with extended alcohol sales hours were disproportionately associated with violent assaults in Sydney, Australia. Rossow and Norström (2012) studied small changes in bar closing hours (e.g., less than 2 hours) across 18 Norwegian cities and found that each 1-hour extension of closing hours led to a 16% increase in police-reported assaults. In the United Kingdom, trends in multiple alcohol-related problems, including nonsexual violent crimes, increased following the Licensing Act of 1988, which extended hours of alcohol sales (Duffy & Pinot De Moira, 1996). However, following a new Licensing Act in 2003, which eliminated standard closing times for pubs and clubs in the United Kingdom (allowing sales 24 hours per day), data from crime statistics, victim surveys, and ED injuries suggested no impact on violent crimes 1 year after implementation, in part because of only short extensions of licensed establishments' opening hours (Hough & Hunter, 2008).

Even fewer studies have examined the impact of policies expanding or decreasing the days of alcohol sales on IPV and other crime-related outcomes, with varied results. Olsson and Wikström (1982) examined the effect of prohibiting Saturday sales by liquor retail stores in Sweden. The results suggested a 15% decrease in "domestic disturbances," with the largest declines observed on Saturdays and Sundays. However, Norström and Skog (2003) explored the effect of alcohol retail outlets reopening on Saturdays in limited parts of Sweden during a 1-year trial period. Alcohol sales increased by 3.3%, yet assaults increased in only one test area where alcohol sales did not dramatically change after Saturday sales were reinstated. When domestic violence assaults were examined separately, there was no indication of increases after Saturday sales were permitted (Norström & Skog, 2003). In a follow-up study examining lifting the Saturday ban countrywide, Norström and Skog (2005) concluded that expanding the days of alcohol sales increased consumption but did not appear to increase police-recorded assaults, positive breath-alcohol analysis tests, or drunken driving, although there may have been insufficient power to detect smaller effects.

In summary, prior reviews have concluded that policies maintaining limits on the days and hours of sale of alcoholic beverages are promising strategies for reducing excessive alcohol consumption (Hahn et al., 2010; Middleton et al., 2010; Popova et al., 2009; Stockwell & Chikritzhs, 2009). However, research examining the impact of these policies on IPV, or violence in general, is scarce. In fact, experts warn that restricting the hours of sale at public locations may increase the risk of off-premise consumption and displacement of problem drinking behaviors, which may limit the expected public health benefits of these policies (Graham, 2012). Recent findings suggest that drinking context (e.g., bars, parties, private homes) does predict IPV, but no study has established a temporal relationship between specific drinking contexts and actual IPV incidents (Cunradi et al., 2012b; Mair et al., 2013). Whether closing bars early leads to an increase in off-premise consumption in private homes is a question that requires empirical investigation, as well as whether drinking in private homes would then directly increase the risk for IPV and family violence. In addition,

most research on these policies has been conducted internationally, which limits the ability to draw conclusions about policy impacts in the United States. Thus, it remains unclear how effective these policies may be in preventing IPV.

Alcohol pricing policies. The impact of alcohol pricing policies, namely tax rates, on violence has also been examined. Alcohol taxes are typically set by the federal and state governments, with different tax rates for beer, wine, and distilled spirits (Alcohol Policy Information System, "Alcohol Beverage Taxes: Beer," n.d.). Most research on the impact of tax policies has focused on state excise taxes as an index measure of alcohol price and economic availability, but it has been argued that a more accurate index would also incorporate ad valorem and sales tax data, which can significantly alter the total cost (Klitzner, 2012).

Increased alcohol prices have been hypothesized to decrease demand, which would reduce rates of excessive alcohol consumption and related harm (Elder et al., 2010). Wagenaar et al. (2009) conducted a meta-analysis of 112 studies and identified a large effect between higher alcohol prices and reduced alcohol consumption across all types of beverages for both light and heavy drinkers. Specifically, a 10% increase in alcohol prices resulted in a 5% reduction in adverse drinking outcomes (Wagenaar et al., 2009). A similar systematic review of 50 articles supports the impact of alcohol prices on indicators of alcohol-related harm, including violence (Wagenaar et al., 2010). However, despite the apparent benefit of alcohol taxation on consumption, the proportion of overall cost accounted for by alcohol taxes has notably decreased over time, with the average state beer tax in 2000 representing approximately one third of the beer tax in 1968 after adjusting for inflation (Alcohol Epidemiology Program, 2000). Since 1968, only six states have adjusted tax rates to keep up with inflation, whereas 35 states have tax rates that have lost more than 50% of their value since that time (Alcohol Epidemiology Program, 2000).

Five studies were identified that examined the impact of changes in alcohol prices on IPV. Using data from a nationally representative survey, Markowitz (2000b) found that severe male-to-female violence (e.g., kicking, hitting with a fist, beating, choking, threatening with a weapon) was significantly lower when alcohol prices were higher. However, the relationship of higher alcohol prices to lower levels of female-to-male violence was only evident when demographic characteristics were added to the model, suggesting an indirect or interactional effect that was not evident from the analyses conducted.

Other research fails to support a relationship between alcohol price and IPV outcomes. For example, researchers in Finland examined the impact of reducing alcohol taxes by an average of 33% after policies were enacted allowing unlimited importation of alcohol (Herttua et al., 2008). Interestingly, police-reported incidents of interpersonal violence in Helsinki did not increase, and rates of domestic violence actually decreased. The authors suggested that these findings might be attributable to the policy's impact primarily on heavy drinkers, which would mean that any impact on IPV would be confined to a small, limited sample (Herttua et al., 2008). Results of a U.S. survey using a stratified random sample of new parents suggested that although higher state liquor taxes are associated with decreased alcohol consumption generally, there was no evidence of impact on self-reported rates of domestic violence against pregnant mothers (Sabia, 2004).

Zeoli and Webster (2010) found no impact of beer taxes on intimate partner homicide while controlling for the effect of several other IPV-relevant policies, but the authors suggested that the small tax increases involved would have had limited impact on purchasing behavior. Durrance et al. (2011) assessed the impact of federal and state alcohol taxes on rates of female homicide over a 15-year period in 46 states and the District of Columbia. Results suggested that although taxes reduced rates of alcohol consumption, there was no significant reduction in intimate partner homicide or female homicides in general. The authors noted that their findings were consistent with prior research identifying an effect of alcohol prices on other violent crimes but not homicide. This may suggest that the severity of violence moderates the relationship between alcohol prices and violence (Durrance et al., 2011).

Data are also available on the relationship between alcohol prices and other forms of violence. Longitudinal data from a nationally representative crime survey suggested that higher beer taxes were associated with lower rates of assault (especially alcohol and other drug-involved assault) but did not affect rates of rape or robbery (Markowitz, 2005). Incidents of rape and robbery may possibly be influenced by other motives not dependent on alcohol. In a nationally representative survey of college students, rates of arguments, fights, sexual perpetration, and sexual victimization increased as the price of beer decreased (Grossman & Markowitz, 1999). Using national police-reported crime statistics and state excise taxes on beer, Cook and Moore (1993) estimated that a 10% increase in beer tax would reduce homicides by 0.3%, rapes by 1.32%, assaults by 0.3%, and robberies by 0.9%. In addition, research using international survey data from 16 countries also indicated that higher alcohol prices were associated with reduced rates of sexual assault, physical assault, and robbery, although the effects were small in magnitude (Markowitz, 2000a). Matthews et al. (2006) found that lower rates of violent injuries in EDs in England and Wales were related to higher beer prices. Two studies also reported results suggesting that increased beer taxes were associated with lower rates of child abuse perpetrated by females (Markowitz & Grossman, 1998, 2000).

In summary, of the five studies that specifically evaluated IPV outcomes, only one found higher alcohol prices to be associated with lower IPV rates (Markowitz, 2000b).

At present, there is limited evidence to support the use of alcohol pricing policies to affect rates of IPV, suggesting the need for more research. Elder et al. (2010) emphasize that several gaps in the literature exist, including research that assesses whether alcohol prices differentially affect specific subgroups (e.g., underage drinkers), the impact of increasing taxes on different beverage types (e.g., beer vs. wine), and different approaches to taxing beverages (e.g., excise taxes vs. sales taxes, standardizing alcohol taxes across beverage types based on alcohol content). It will be important to identify the magnitude of each effect on violence and examine the mechanisms (e.g., effects on drinking behaviors and alcohol consumption) by which effects are achieved. For example, the focus on state excise taxes may not adequately represent the total beverage cost to consumers (Klitzner, 2012), and the conclusions that may be drawn from alcohol tax research may be limited by evidence suggesting that most states have not adjusted tax rates at a rate consistent with inflation (Alcohol Epidemiology Program, 2000). Nevertheless, based on a wealth of research suggesting that increased prices reduce harmful alcohol consumption, policies increasing alcohol excise taxes are recommended as a public health intervention by numerous sources, including the Institute of Medicine (2004), the World Health Organization (Babor et al., 2003), and the Community Guide (Task Force on Community Preventive Services, 2010).

Summary

Alcohol-related policies may prove to be valuable population-based strategies to reduce both problem drinking and associated IPV perpetration, but only three alcohol-related policy areas have been studied in relation to IPV. Research results on alcohol outlet density have been most consistent and suggest that higher densities of alcohol outlets are associated with higher rates of IPV and other forms of violence. However, two studies found no association between outlet density and IPV, and importantly, no studies to date have directly evaluated policies that regulate outlet density and the resultant impact on violence. In addition, results on off-premise versus on-premise outlet density and the relationship with IPV are inconsistent. In contrast, although there has been extensive research suggesting that alcohol pricing policies (namely tax rates) are associated with decreased alcohol consumption and related harms, including other violence outcomes (Elder et al., 2010; Wagenaar et al., 2009), the limited research does not demonstrate an impact on IPV rates.

Policies addressing changes in restrictions on hours of sale, particularly changes greater than 2 hours, generally appear effective in reducing excessive alcohol consumption and related harm (Hahn et al., 2010; Popova et al., 2009; Stockwell & Chikritzhs, 2009), including preliminary support for general violence outcomes (e.g., Chikritzhs & Stockwell, 2002; Duailibi et al., 2007; Kypri et al., 2011). However, research on policies restricting days of sale and related impact on violence outcomes is scarce and proffers inconsistent findings. Only a small handful of studies have examined outcomes related to IPV, and most of these findings suggest no relationship between hours and days of sale and IPV rates. Consequently, there is limited evidence to determine whether changes in restrictions on hours and days of sale would have any impact on IPV prevention.

Knowledge about the impact of alcohol-related policies on IPV is limited by several significant research gaps. Although some policies (e.g., alcohol pricing policies) have been extensively studied in relationship to other health and violence-related outcomes of interest, they have not been studied in relationship to IPV outcomes. In addition, there are many other alcohol-related policies (e.g., advertising/marketing, responsible beverage service) that may have relevance for IPV and may benefit from further research but currently have no existing evidence on IPV outcomes. Furthermore, much of the published literature has relied on police-reported incidents of IPV, making it difficult to fully assess the impact of these policies on IPV. Surveys suggest that only 17.2% of sexual assaults and 26.7% of physical assaults perpetrated against women by an intimate partner are reported to police, with an even smaller percentage of male IPV victims contacting law enforcement (Tjaden & Thoennes, 2000). It will be important to use alternative sources of data (e.g., victimization surveys) to avoid relying on police-reported IPV. Identifying or developing surveillance systems on IPV would allow for measurement at the level at which the policy is implemented (e.g., city, county) in order to accurately assess impact. There are also methodological variations involved in measuring alcohol consumption (e.g., length of reference period, beverage-specific vs. open-ended, standard vs. actual drink size) that influence survey results and should be factored into any interpretation of findings (Dawson, 2003).

Also, many of the studies were conducted outside the United States. Although these studies provide valuable information, replicating the findings within the sociocultural and economic constraints of the United States would enhance our knowledge about the impact of alcohol-related policies on IPV outcomes. Different study designs (e.g., cross-sectional vs. longitudinal) also influence the interpretation of findings, as cross-sectional studies are more limited in their ability to establish causal relationships and are unable to capture varying frequencies in alcohol consumption and IPV rates over time as well as the immediate and long-term effects of a particular policy's implementation. Moreover, economic analysis of the costs and benefits of implementing these policies is important in determining their utility as IPV prevention strategies and could inform discussions by policy makers about alcohol policies as potential strategies to reduce IPV. Last, additional research examining proposed theoretical links between alcohol-related policies and vari-

ous public health outcomes (e.g., purchasing habits, alcohol availability, neighborhood disorder) is needed. Research directly testing these links would provide valuable information in determining how these policies may affect a variety of outcomes, including IPV.

In addition, there are several challenges related to measuring the effects of alcohol-related policies on various public health outcomes such as IPV. A particular policy can only be effective if it is routinely enforced. For example, research indicates that 5 out of every 100,000 instances of underage drinking lead to an administrative action or fine against an alcohol outlet, with penalties generally appearing too lenient to act as effective deterrents for illegal sales (Wagenaar & Wolfson, 1994). When relying on police-recorded incidents of violence, it may be equally true that increased police surveillance and enforcement can make a policy appear ineffective because of increased documentation of rates of violence. Research exploring the impact of alcohol-related policies on public health outcomes could be strengthened by controlling for other simultaneous policy changes or interventions relevant to the outcome of interest. More rigorous policy evaluations that can incorporate measures of other related policy changes, response by law enforcement, and degree of public awareness and support for these policies would allow greater interpretation of the findings.

In addition, research focusing specifically on mechanisms underlying the relationship between a given alcohol policy and rates of IPV would help elucidate how these policies ultimately affect problems associated with alcohol use. Determining whether a policy is creating the desired effect or leading to substitution or displacement effects would strengthen policies and improve public health outcomes. For example, Graham (2012) notes that to understand when bars should close, research is needed to determine whether individuals will adjust their drinking patterns (e.g., if bars close earlier, patrons may start drinking earlier) or if they will merely shift their drinking location to private residences. In both cases, the effect of hours of sale restrictions on problem drinking may be lessened substantially, with displacement of drinking behavior to private homes potentially increasing the risk for IPV. For alcohol pricing policies, research indicates that consumers may adjust to price increases by substituting lower-cost beverage options rather than decreasing alcohol consumption (Gruenewald et al., 2006). Research directly examining the proposed mechanisms on which these policies are based is important, as seemingly beneficial policies may have iatrogenic effects.

In conclusion, additional research is needed to assess the impact of alcohol-related policies on IPV and other forms of violence. Although empirical data are lacking, many of these policies are being enacted in a majority of states, making the field ripe for further evaluation. Although many of these policies were designed to limit excessive alcohol consumption, there is reason to believe that they may have the potential to affect a number of problems associated with alcohol use (e.g., violence, accidental injuries, alcohol-impaired driving, alcohol-related diseases, sexual risk-taking). These research efforts can greatly enhance our current knowledge base and lead to the development of novel population-based strategies for improving a range of public health outcomes.

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