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ORIGINAL ARTICLE



Children's experience of physical harms and exposure to family violence from others' drinking in nine societies

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ABSTRACT

Aim: To study caregiver reports of children's experience of physical harm and exposure to family violence due to others' drinking in nine societies, assess the relationship of harm with household drinking pattern and evaluate whether gender and education of caregiver affect these relationships.

Method: Using data on adult caregivers from the Gender and Alcohol's Harm to Others (GENAHTO) project, child alcohol-related injuries and exposure of children to alcohol-related violence (CAIV) rates are estimated by country and pooled using meta-analysis and stratified by gender of the caregiver. Households with and without heavy or harmful drinker(s) (HHDs) are compared to assess the interaction of caregiver gender on the relationship between reporting HHD and CAIV, adjusting for caregiver education and age. Additionally, the relationship between caregiver education and CAIV is analyzed with meta-regression.

Results: The prevalence of CAIV varied across societies, with an overall pooled mean of 4% reported by caregivers. HHD was a consistent correlate of CAIV in all countries. Men and women in the sample reported similar levels of CAIV overall, but the relationship between HHD and CAIV was greater for women than for men, especially if the HHD was the most harmful drinker (MHD). Education was not significantly associated with CAIV.

Conclusions: One in 25 caregivers with children report physical or family violence harms to children because of others' drinking. The adjusted odds of harm are significantly greater (more than four-fold) in households with an HHD, with men most likely to be defined as this drinker in the household.

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Introduction

Heavy drinking by adults who care for children can result in reduced supervision of children, verbal and emotional abuse, increased risk of injury and child maltreatment (Chaffin et al. 1996; Velleman and Templeton 2007; Velleman et al. 2008; Raitasalo et al. 2015; Kaplan et al. 2017; Laslett et al. 2017). There is increased risk of more severe intimate partner violence (IPV) when couples drink heavily (Graham et al. 2011; Leonard and Quigley 2017), and children who experience abuse and witness family violence can suffer short and long term consequences (Felitti et al. 1998; Edleson 1999; Harwin et al. 2010; Hooker et al. 2016; Tamutiené and Laslett 2016). This article's focus is on

the risk to children of being physically injured and/or exposed to family violence due to others' drinking in nine countries (Australia, Chile, Ireland, Lao People's Democratic Republic (PDR), Nigeria, Sri Lanka, Thailand, United States of America (USA) and Viet Nam).

Exposure of children to physical harm and family violence has been reported in many countries (Gilbert et al. 2009; Larraín and Bascuñán 2009; UNICEF 2014; Kaplan et al. 2017), and studies have identified alcohol, along with socioeconomic disadvantage and caregiver mental health problems, as predictors of child maltreatment (Mathews and Kenny 2008; Gilbert et al. 2009; Holzer and Lamont 2010). For example, in the USA, caregivers living with heavy

drinkers were more likely to report harm to their children than those without a heavy drinker in the home (Kaplan et al. 2017). Fewer studies have been undertaken in low- and middle-income countries (LMICs). In Zimbabwe, the majority of children (aged 15–17 years) reported being physically punished in their lifetime, with this most commonly involving being hit or beaten (78.9%), threatened (55.2%) and chased (47.2%). In this study alcohol misuse, economic hardship, abuse of power by adults and lack of education were identified as risk factors (Gwirayi and Shumba 2009). In India, men who were episodic drinkers were more likely to report alcohol-related physical abuse, psychological harm and neglect of children than current abstainers (Esser et al. 2017). Qualitative research has also described how a father's alcohol use was identified as a cause of children running away and using inhalants in India (Praharaj et al. 2008), and paternal drinking was linked to children living on the streets of Izmir, Turkey (Yilmaz and Dulgerler 2011). In Ghana, the care of children was compromised by the heavy drinking of both male and female caregivers (Yarney et al. 2015).

In terms of gender differences, cross-nationally, men self-report heavier drinking (Chaiyasong et al. 2018; Wilsnack and Wilsnack 2013) and more problems associated with their own drinking than do women (Grittner et al. 2012). Meta-analyses also indicate a stronger association of alcohol consumption with IPV perpetration for men than for women (Cafferky et al. 2018). Our previous multi-country research indicated that a heavy drinker in the family was consistently associated with significantly greater odds of one or more alcohol-related harm to children (Laslett et al. 2017). However, these analyses focused on a range of child harms (including more minor harms), and not on the occurrence of more severe harms to children such as physical harm and family violence and did not examine the relationship with the gender of the caregiver.

Education has also been found to be related to alcohol consumption and alcohol-related problems. In both high-income countries and LMIC, women and men who were less educated were more likely to self-report problems associated with drinking (Grittner et al. 2012). In terms of harms to children, the education of women who are caregivers may be of particular importance in whether a child is injured by a drinker or is exposed to alcohol-related violence. Previous research suggests that women's education is linked at a

cross-national level to greater gender equity (Heise and Kotsadam 2015), protective against family violence (Fulu et al. 2013), and associated with increased health and well-being for women (Heise and Kotsadam 2015) and their children (Desai and Alva 1998; Carneiro et al. 2013).

Study aims

The first study aim is to estimate the prevalence of physical harm to children and exposure of children to family violence due to others' drinking as reported by caregivers (men and women) in nine countries. Second, we assess the relationship of the presence of a heavy drinker in the household with these serious child harms across and within countries and examine this relationship by gender of the caregiver respondent. Finally, we examine the association between education and serious child harm for men and women across and within countries.

Materials and methods

Datasets and samples

The analyses include data from the WHO/Thai Health Harm from Others' Drinking project (Callinan et al. 2016; World Health Organization and ThaiHealth 2016), the Australian Alcohol's Harm to Others study (Wilkinson et al. 2009; Laslett et al. 2010, 2011), the Irish National Alcohol and Drug Survey (Hope 2011) and the US National Alcohol's Harm to Others Survey (Kaplan et al. 2017). These datasets are archived as part of the Gender and Alcohol's Harm to Others (GENAHTO) project (Wilsnack et al. 2018). The country studies and final subsamples included in the analysis are summarized in Table 1, with countries ordered by decreasing gross national income. Details of the methodology and data for each country's survey can be found elsewhere (Hope 2011; Callinan et al. 2016; Kaplan et al. 2017; Wilsnack et al. 2018). The response rates varied from 35% to 99%. Only respondents who: (a) reported living with children under age 18; or (b) reported having parent-like caregiver responsibility but not living with the child (e.g. in separated relationships) for children under age 18, were included in this article. Throughout, we refer to

Table 1. Description of country samples.

Country (survey year)	Total N	Response rate, %	Respondents responsible for children (caregivers), N (% Total N, unweighted)	Women, % among caregivers (% unweighted)	Age, mean years among caregivers ^a
Australia (2008)	2649	35	1142 (43.1)	53.6 (63.5)	38.8
USA (2015)	2830	60 ^b	778 (27.5)	54.7 (60.0)	38.9
Ireland (2010)	1008	— ^c	694 (68.8)	51.4 (51.4)	42.3
Chile (2012–2013)	1500	72	409 (27.3)	59.2 (60.9)	39.3
Thailand (2012–2013)	1695	94	937 (55.3)	53.0 (60.9)	43.6
Sri Lanka (2013–2014)	2475	93	1251 (50.5)	57.9 (57.6)	40.2
Nigeria (2012–2013)	2270	— ^d	1626 (71.6)	48.4 (38.7)	43.3
Viet Nam (2012–2013)	1501	99	961 (64.0)	51.5 (50.2)	43.0
Lao PDR (2013)	1257	99	784 (62.4)	51.0 (59.6)	42.0

^aLMIC caregivers are more likely to be grandparents and other extended family caregivers.

^bCooperation rate (Kaplan et al. 2017).

^cResponse rates were not calculable for Ireland because it was a quota sample.

^dResponse rates were not calculable for Nigeria because information on non-respondents was not collected.

respondents included in the study as ‘caregivers’ or simply as respondents.

Measures

Outcome variable: Child alcohol-related injury or exposure of children to alcohol-related violence

The Alcohol’s Harm to Others (HTO) surveys (Hope 2014; World Health Organization and ThaiHealth 2016; Kaplan et al. 2017; Laslett et al. 2017) measured harms to children from others’ drinking (that is, harm from any adult’s drinking, including the respondent’s) using a series of six specific items concerning alcohol-related impacts on children. This analyses focus on the two most serious of these harms to children: ‘Thinking about all the children under 18 you’ve mentioned, whether they live with you or not, in the last 12 months...’ (a) ‘was one or more physically hurt because of someone’s drinking?’; and (b) ‘did one or more witness serious violence in the home because of someone’s drinking?’. Respondents were categorized as reporting one or both harms versus reporting neither of these harms. If a respondent answered neither item or answered ‘no’ to one of the two harm items but did not answer the other they were coded as missing and excluded from the analyses (range of number missing within countries = 1–32).

Explanatory variables

The presence of a heavy or harmful drinker in the family/household: Heavy or harmful drinker (HHD) was scored 1 if either the respondent engaged in heavy episodic drinking (HED) at least monthly or if the most harmful drinker (MHD) in the person’s life was a person in their household (see below) and 0 if neither of those was true. Respondents were coded as missing for HHD if either the HED variable or the MHD variable was missing (less than 2% in each country except for Chile and Nigeria). Chilean respondents ($N=126$) and Nigerian respondents ($N=88$) who were not asked, refused to reply or answered ‘can’t say/don’t know’ to HED and answered ‘no’ to MHD, and Nigerian respondents ($N=99$) who answered ‘no’ to HED and refused to answer MHD, were coded into extra categories for HHD to avoid a proportion of these countries’ sample being excluded from and thus biasing, multivariate models.

HED: In all countries except Ireland, respondents who reported consuming five or more alcoholic drinks (approximately 60 g ethanol) in one day at least monthly during the prior 12 months were classified as regular HED, and respondents who abstained or drank alcohol but did not consume five or more drinks as often as monthly were classified as not being HEDs. Irish respondents were categorized as HEDs according to their answer to the following question: ‘How often have you had an alcohol beverage equivalent to four pints of beer or more, one bottle of wine or more, or seven single measures of spirits or pre-mixed spirits drinks or more on one drinking occasion?’ Irish respondents who drank at least the specified amount monthly or more often (*vs.* less than monthly) were classified as HEDs. The percentage of Irish respondents who were

classified as HEDs may be underestimated relative to other countries, because the Ireland survey used a larger amount than used elsewhere to define HED. A proportion of Chilean drinkers, who were not asked/did not answer the question on five or more drinks were categorized into a third category to avoid them being coded as missing for HED. Nigerian respondents who answered ‘can’t say/don’t know’ or refused to reply about their own drinking were also classified separately. Although these results are not presented for this additional sub-grouping, these cases are included in regression analyses as a separate sub-grouping of HHD, rather than being excluded listwise from the regression analyses (ensuring a portion of the sample is controlled for and not non-randomly dropped).

MHD in household: In all countries except Ireland, respondents were asked three items about HHDs in their life. Respondents were asked whether they had any people in their life who they would consider a heavy drinker or who drinks large amounts of alcohol sometimes and whether they had been negatively affected by any of these people’s drinking in the last 12 months. Respondents who knew a heavy drinker who had harmed them also were asked what their relationship was to the person whose drinking had most negatively affected them in the last 12 months. Respondents were deemed to have an MHD in the household if their MHD was a spouse, partner or other members of the household, except for US respondents, who were deemed to have a MHD in the household if they said in an earlier question that they lived with their MHD. As the Irish questionnaire did not include questions about the MHD, Irish data are included only for analyses that estimate the prevalence of child harm and that make HED comparisons.

Gender, age and education of the respondent: Respondents reported being men or women, and their age was reported or calculated from the date of birth. Relative (‘low’ or ‘high’) education, according to the highest level of education they had completed, was based on whether the respondent was in the highest 50% most educated respondents within each country. This produced a country-relative education dichotomy such that, for example, higher education sometimes is indicated by completion of secondary and other times post-secondary education.

Gender of the MHD: Respondents reported the gender of the MHD. A high percentage of respondents from Chile, Nigeria and Lao PDR who had an MHD in their household did not report the gender of the MHD (20–26% of caregivers with an MHD in their household) and were coded as missing for this variable.

Analysis

Weighting: For six countries, the sample was weighted according to the respondent’s likelihood of being selected to participate in the study given the number of adults in the household and gender of the respondent. For Australia, the sample was weighted for age and geographical location; for the US, more complex survey weights were derived as described by Kaplan et al. (2017). Irish weights could not be

constructed as quota sampling was used and household size was not collected. Statistically significant differences ($p < .05$) in weighted estimated percentages and odds ratios (ORs) between groups are indicated (conservatively) by confidence intervals (CIs) that do not overlap.

Percentages of caregivers who report children to alcohol-related violence (CAIV) in the last 12 months and CIs were calculated for each of the nine countries, as were pooled meta-analysis estimates of the percentage of caregivers that reported CAIV by gender of caregiver and overall. We used logistic regression models to estimate the odds of reporting CAIV according to whether an HHD lives in the household, adjusting for the respondent's age and relative level of education, for each gender in each country. A sensitivity analysis was undertaken to compare the use of the HHD variable to using the HED and MHD variables as separate independent variables in regression models by exchanging the HHD variable first with the MHD and then with the HED variable. The DerSimonian-Laird method of two-stage inverse-variance random-effects meta-analysis of pooled individual respondent data (*via* the `ipdmetan` command in STATA version 14.0 (College Station, TX, USA) (Fisher 2015)) was used to compute adjusted effect estimates using STATA version 14. Gender was controlled for in the combined-sample analyses. An interaction term between gender and HHD in the household was fitted to logistic regression models predicting CAIV, and interaction coefficients were

also estimated across countries *via* the DerSimonian-Laird method described above. Country-level and pooled meta-analysis estimates and accompanying I^2 statistics for the effect estimates are presented in forest plots stratified by gender. The relationship between caregiver education and CAIV was also analyzed using the DerSimonian-Laird method, adjusting for gender and age and then stratified by gender and adjusting for age and HHD.

Results

As shown in Table 1, response rates were very high in most countries (except Australia and the US). The sample characteristics varied; for instance, the mean age of caregivers ranged from 39 years in Australia, the US and Chile to 44 years in Thailand.

Prevalence of HED, MHD and HHD

Table 2 displays descriptive information for each country on the percent of caregiver respondents reporting that they were HED, the percent who reported that the MHD in their life was a male in the household or a female in the household, the presence of an HHD in the household (including either the respondent as HED or someone else as MHD). As shown in the table, higher percentages of men than women in all countries were HED (13.1–62.6% for men; 0.1–40.1%

Table 2. Selected drinking and household characteristics of men and women caregivers.

Country (survey year)	N	% Caregiver heavy episodic drinker – HED (CI)	% Men most harmful drinker (CI)	% Women most harmful drinker (CI)	% Heavy drinker in household (CI)	% Child experienced alcohol-related physical harm or witnessed serious violence in the home (CI)
Australia (2008)	1142	30.9 (27.8, 34.1)	4.7 (3.6, 6.3)	2.4 (1.3, 4.4)	35.0 (31.8, 38.3)	3.5 (2.5, 4.8)
Men	417	46.6 (41.4, 52.0)	1.0 (0.4, 2.8)	3.7 (1.7, 8.1)	47.9 (42.6, 53.3)	3.6 (2.1, 6.1)
Women	725	17.2 (14.3, 20.5)	7.9 (5.9, 10.5)	1.2 (0.5, 2.7)	23.8 (20.5, 27.4)	3.3 (2.2, 4.9)
USA (2015)	778	8.1 (5.9, 10.9)	3.0 (1.9, 4.9)	0.5 (0.2, 1.4)	10.8 (8.3, 13.9)	2.7 (1.7, 4.2)
Men	311	13.1 (9.0, 18.7)	0.5 (0.1, 2.7)	0.2 (0.0, 0.8)	13.4 (9.3, 18.9)	0.5 (0.1, 2.1)
Women	467	3.9 (2.2, 6.7)	5.1 (3.1, 8.4)	0.8 (0.2, 2.5)	8.7 (5.9, 12.5)	4.5 (2.8, 7.2)
Ireland (2010)	694	51.0 (47.3, 54.7)	n/a	n/a	n/a	6.2 (4.6, 8.2)
Men	337	62.6 (57.3, 67.6)	n/a	n/a	n/a	5.2 (3.2, 8.2)
Women	357	40.1 (35.1, 45.2)	n/a	n/a	n/a	7.1 (4.8, 10.3)
Chile (2012–2013)	409	34.1 (29.0, 39.5)	6.0 (3.9, 9.1)	0.8 (0.2, 2.6)	43.2 (37.9, 48.7)	5.0 (3.2, 7.7)
Men	160	52.9 (44.3, 61.2)	3.4 (1.4, 8.1)	0.5 (0.1, 3.8)	57.7 (49.2, 65.8)	5.6 (3.0, 10.3)
Women	249	21.2 (15.9, 27.6)	7.8 (4.7, 12.5)	1.0 (0.2, 4.2)	33.1 (26.8, 40.2)	4.6 (2.4, 8.5)
Thailand (2012–2013)	937	14.6 (12.1, 17.5)	7.1 (5.5, 9.0)	0.3 (0.1, 1.3)	22.0 (19.1, 25.3)	7.9 (6.3, 10.0)
Men	366	27.6 (22.8, 33.1)	1.5 (0.6, 3.4)	0.7 (0.2, 2.8)	30.0 (24.9, 35.7)	5.8 (3.8, 8.9)
Women	571	3.0 (1.8, 4.9)	12.1 (9.4, 15.3)	0.0	15.0 (12.0, 18.5)	9.8 (7.4, 12.9)
Sri Lanka (2013–2014)	1251	13.3 (11.4, 15.5)	12.6 (10.7, 14.7)	0.1 (0.0, 0.8)	25.5 (23.0, 28.2)	3.2 (2.3, 4.4)
Men	531	31.5 (27.4, 35.9)	3.6 (2.3, 5.8)	0.3 (0.0, 2.0)	34.0 (29.8, 38.4)	3.8 (2.3, 6.1)
Women	720	0.1 (0.0, 1.0)	19.2 (16.2, 22.5)	0.0	19.3 (16.4, 22.6)	2.7 (1.7, 4.3)
Nigeria (2012–2013)	1626	12.6 (11.0, 14.3)	2.8 (2.0, 3.9)	2.4 (1.6, 3.5)	18.5 (16.5, 20.6)	3.0 (2.1, 4.1)
Men	996	22.0 (19.3, 24.9)	1.2 (0.7, 2.3)	2.8 (1.8, 4.3)	26.4 (23.5, 29.6)	1.9 (1.2, 2.9)
Women	630	2.6 (1.6, 4.3)	4.5 (3.0, 6.7)	1.9 (1.0, 3.8)	9.8 (7.6, 12.7)	4.1 (2.6, 6.3)
Viet Nam (2012–2013)	961	15.9 (13.6, 18.6)	18.0 (15.4, 21.0)	1.2 (0.6, 2.2)	34.0 (30.8, 37.5)	6.9 (5.3, 9.0)
Men	479	31.1 (26.8, 35.9)	6.6 (4.4, 9.6)	1.7 (0.9, 3.5)	37.8 (33.1, 42.7)	5.2 (3.5, 7.7)
Women	482	1.7 (0.9, 3.4)	28.8 (24.4, 33.6)	0.6 (0.1, 2.6)	30.5 (26.0, 35.4)	8.5 (6.0, 11.9)
Lao PDR (2013)	784	15.9 (13.1, 19.2)	3.9 (2.5, 6.1)	0.1 (0.0, 0.6)	20.0 (16.9, 23.5)	1.4 (0.7, 2.6)
Men	317	21.8 (17.1, 27.3)	3.5 (1.6, 7.3)	0.2 (0.0, 1.2)	25.2 (20.2, 31.0)	0.7 (0.2, 3.0)
Women	467	10.2 (0.7, 14.0)	4.4 (2.6, 7.2)	0.0	15.0 (11.5, 19.2)	2.0 (1.0, 3.9)
Overall ^a	8582	21.7 (14.6, 28.8)	7.1 (4.3, 10.0)	0.7 (0.3, 1.1)	26.0 (19.7, 32.2)	4.3 (3.0, 5.5)
Men ^a	3914	34.2 (24.5, 43.9)	2.2 (1.2, 3.2)	0.8 (0.3, 1.1)	33.8 (25.9, 41.7)	3.2 (2.0, 4.5)
Women ^a	4668	10.2 (6.6, 13.8)	11.0 (0.4, 15.6)	0.7 ^b	19.1 (13.7, 24.4)	4.9 (3.4, 6.4)

HED: Respondent is a heavy episodic drinker – consumes five or more alcoholic drinks in a day at least monthly.

^aPooled across country-level estimates *via* the DerSimonian-Laird method of two-stage inverse-variance random-effects meta-analysis using individual participant data; n/a: not available – equivalent variable could not be derived.

^bAn arithmetic mean was computed for this cell as zero values were not able to be included in the DerSimonian-Laird method of meta-analysis.

for women), with the gender difference especially large in Thailand, Sri Lanka, Nigeria and Vietnam. In addition, a greater percentage of respondents reported that the MHD was male, with women more likely than men to report that the MHD in the household was a man (4.4–28.8% of female caregivers *vs.* 0.5–6.6% of male caregivers), except in Australia and Nigeria, where male caregivers were more likely to report that the MHD was a woman than a man. Overall, a very small percentage of both male and female caregivers (0.0–3.7%) reported that the MHD in the household was a woman.

The main independent variable – having an HHD in the household – is indicative of whether the child in the household is exposed to an MHD and/or an HED respondent. The prevalence of HHD varied from a low of 10.8% of caregiver households in the US to 43% of caregiver households in Chile, with one-quarter to one-half of respondents with children in most countries reporting the presence of an HHD. The pooled estimate shows that 26.0% (CI: 19.7%, 32.2%) of caregiver respondents reported the presence of an HHD. In addition, based on the percent reporting HED, for male caregivers, the HHD is likely to be themselves – men were more likely to report their own HED (34.2%) than were women (10.2%). Men were also more likely to report that the MHD was a man (2.2%) than a woman (0.8%). For women, in five countries the percentage who reported an MHD (11.2%) in the household was higher than the percentage of women who reported that they were HED (10.2%) drinkers themselves. Thus, when women indicated that there was an HHD in their lives they were more frequently reporting harm from a drinker other than themselves than were men.

Prevalence of alcohol-related injury and violence to children (CAIV)

The final column of Table 2 presents the prevalence in the caregiver sample of reporting that a child in the household has been physically harmed or exposed to violence (CAIV) in the previous 12 months. The pooled overall (unadjusted)

prevalence estimate was 4.3% (95% CI = 3.0%, 5.5%). However, CAIV varied considerably among countries. Based on non-overlapping CIs, rates were significantly higher in Thailand, Viet Nam and Ireland than in Lao PDR, US and Nigeria. Male and female respondents did not differ significantly on percent reporting CAIV (based on non-overlapping CIs) in all countries except for the US where female respondents were significantly more likely than male respondents to report CAIV.

In order to compare men's and women's odds of reporting an HHD and CAIV, we tested the interaction of the gender of the respondent on the association between CAIV and having an HHD in the household (*vs.* no HHD in the household), controlling for the respondent's age and level of education. In the interaction analysis, gender was coded women *vs.* men (i.e. men were comparison group) and for the HHD *vs.* non HHD (non-HDD was comparison group). The significance of each interaction is indicated by the ORs in Figure 1. These show at least a significance greater than 0.05%. We found a significant interaction overall (shown in Figure 1) and significant interactions for Australia, Nigeria and Vietnam. For the combined sample of men and women without the interaction (figure not shown), the odds of CAIV were significantly higher in households where there was an HHD (*vs.* no HHD), with a pooled effect estimate of OR = 4.51 (95% CI = 3.06, 6.71), indicating a greater than four-fold increase in risk of CAIV for children in households with an HHD after adjusting for caregiver gender, age and education.

Given the presence of this significant interaction, we stratified our results by gender. The Forest plot in Figure 2 shows the odds of male and female caregivers reporting CAIV according to whether there was an HHD in the household, controlling for the caregiver's age and relative level of education. Both women (OR: 6.53, CI: 4.61, 9.24) and men (OR: 1.83, CI: 1.09, 3.06) were more likely to report CAIV if there was an HHD in the household compared with no HHD in the household. For women, the association is significant for all countries. For men, while the pooled effect is significant, the overall association is weaker

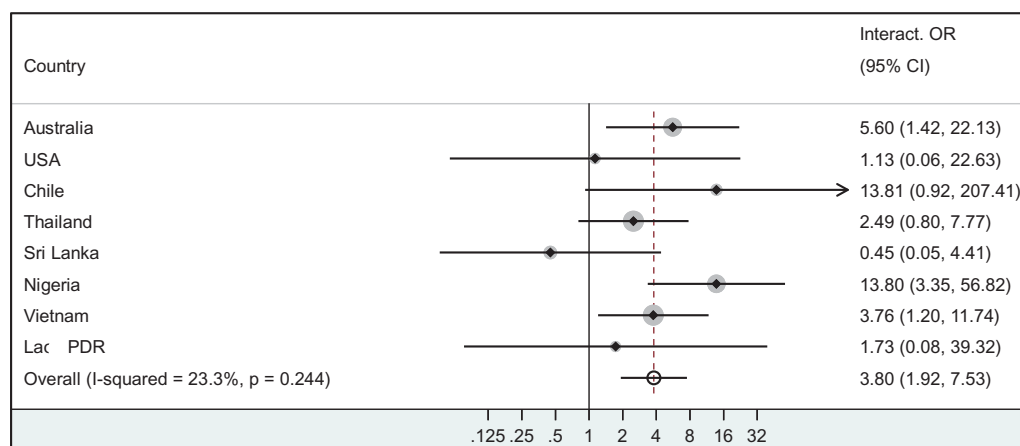


Figure 1. Interaction (ratio of odds ratios) of the gender of the caregiver (women *vs.* men) on the association between likelihood of a child being physically harmed or witnessing serious violence in the home if there is a heavy or harmful drinker (HHD) in the household (*vs.* no HHD in the household), controlling for the caregiver's age and relative level of education. Weights of the contribution of country-level estimates to pooled estimates are represented by the relative area of the corresponding gray circle. OR: odds ratio.

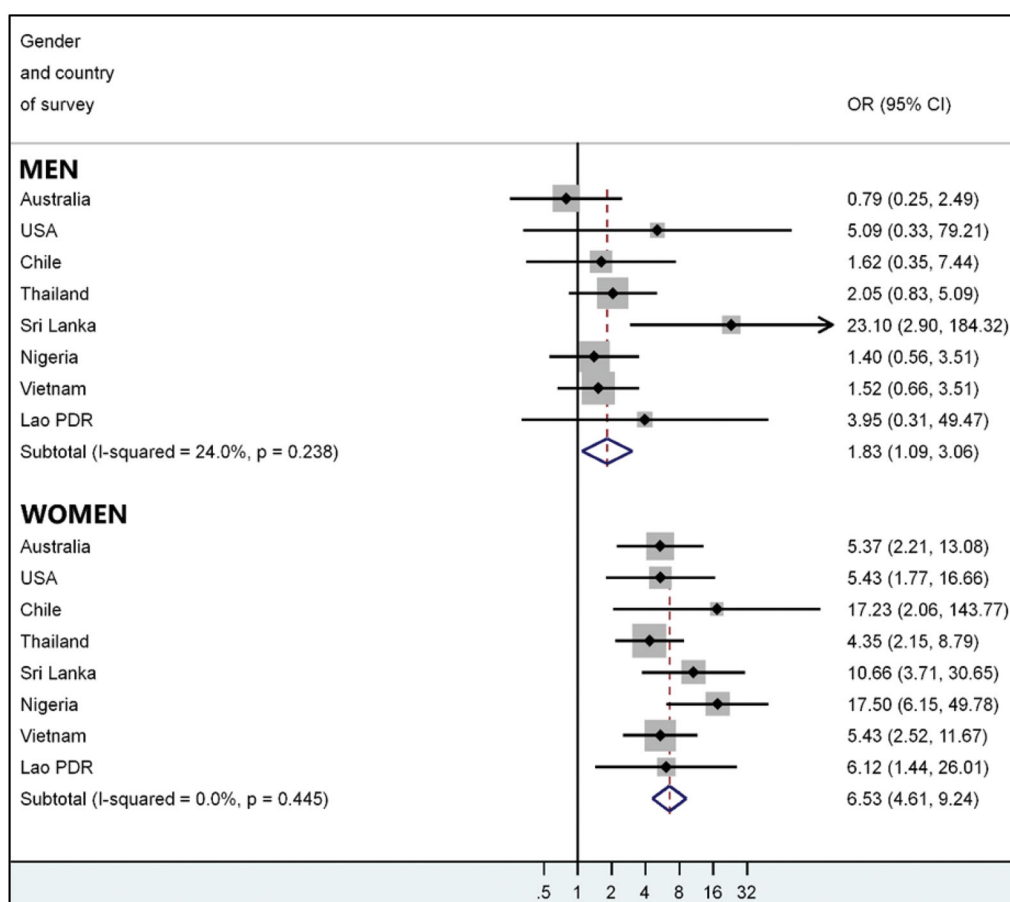


Figure 2. Likelihood of a child being physically harmed or witnessing serious violence in the home if there is a heavy or harmful drinker (HHD) in the household (vs. no HHD in the household) by gender of the caregiver, controlling for the caregiver's age and relative level of education. Weights of the contribution of country-level estimates to pooled estimates are represented by the relative area of the corresponding gray square; All ORs and confidence intervals are weighted; Ireland was excluded from the model because an equivalent variable for HHD in the household was not able to be derived. OR: odds ratio.

and only significant in Sri Lanka, with the CIs wide due to small subsample sizes in several countries.

Sensitivity analysis comparing the use of the HHD variable to the HED and then the MHD variable. The results for MHD were in the same direction as for HHD, with MHD significantly related to CAIV for men and woman and more strongly related for women (pooled effect estimate was: OR: 9.89; CI: 6.15 15.90) than for men (OR = 5.04, CI: 2.06, 12.32). For the HED variable, the relationship with CAIV was similar for women and men (OR = 1.84, CI: 1.04, 3.26, $p < .05$ for women; OR = 1.77, CI: 0.90, 3.49, $p = .07$) but did not quite reach statistical significance of $p < .05$ for male caregivers.

Figure 3(a) shows the associations between education and CAIV for the combined samples of men and women. As evident in the figure, the odds that higher educated caregivers reported CAIV were significantly less than those with lower education (OR: 0.66, CI: 0.44, 0.99). In individual country analyses, higher- vs. lower- relative education was significantly associated with lower odds of CAIV in Sri Lanka and Viet Nam. However, when gender and age were controlled for, the relationship of CAIV with education was no longer significant (OR: 0.72, CI: 0.50, 1.06) in the pooled country analysis. Figure 3(b) shows the association of education separately for male and female caregivers, after adjusting for age and the presence of an HHD. The adjusted pooled ORs indicate that relative education of caregivers was not significantly

associated with CAIV for either male or female caregivers, although the odds of more versus less educated caregivers were significantly lower in Sri Lanka. The I^2 values for all meta-analyses, except that in Figure 3(a), were under 50%.

Discussion

Prevalence

In this article, the estimated mean prevalence of physical harm to children and exposure of children to family violence due to others' drinking varied around the grand mean of 4.3% in our sample of countries. The CIs around the estimate were narrow (3.0%-5.5%), and the I^2 values also indicate homogeneity. These statistics support the creation of a pooled estimate. This estimate of children seriously harmed by someone's drinking is far higher than is evidenced by the numbers of children receiving child support and in child protection systems worldwide. For instance, only 0.3% of children are managed in the child protection system in Australia, which has a relatively well-developed child protection system (Laslett et al. 2013), yet 3.5% of the Australian survey respondents reported that a child (or multiple children) for whom they were caring were physically hurt or exposed to family violence related to someone's drinking. This estimate of harms attributed to drinking does not

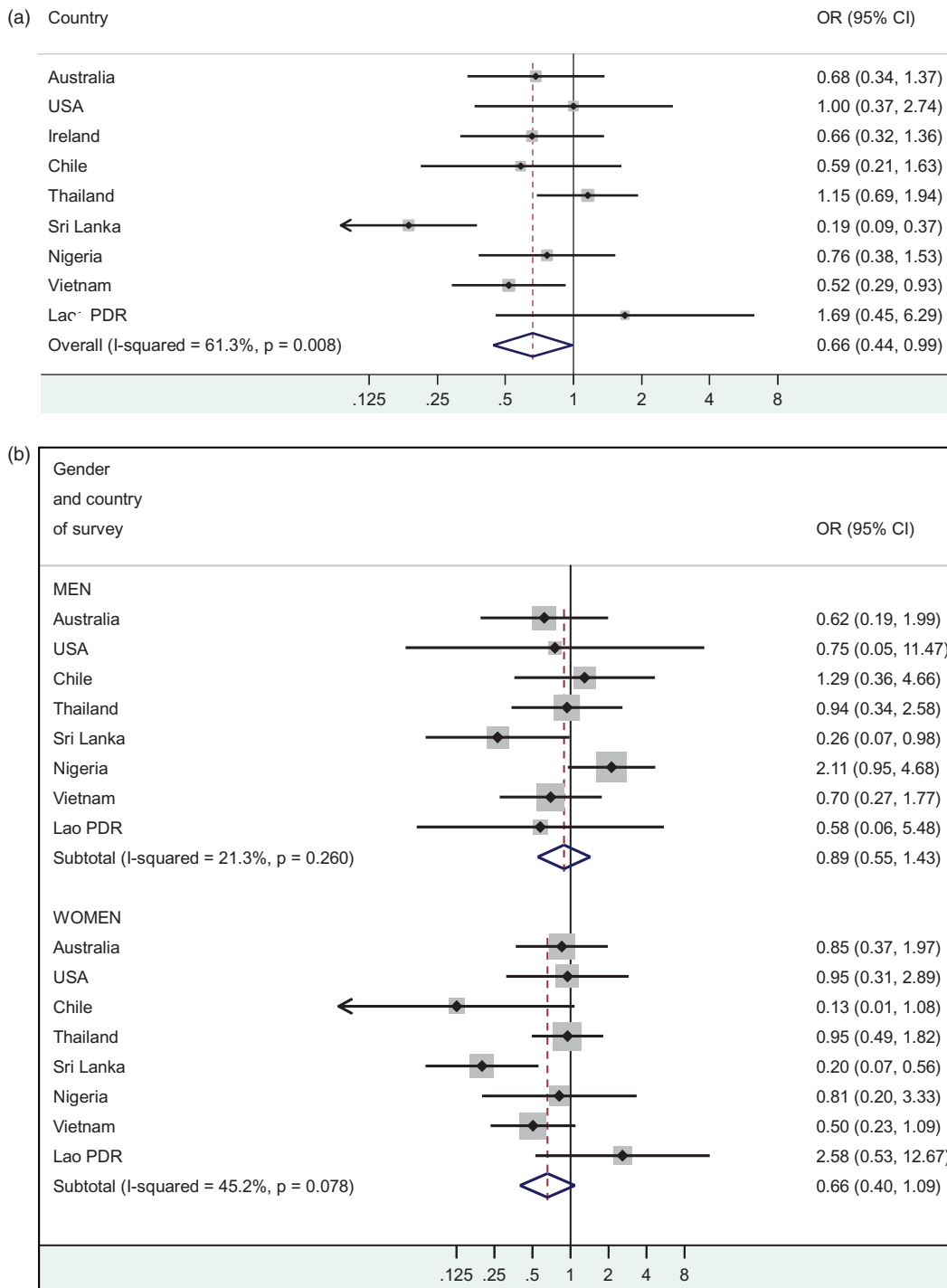


Figure 3. Likelihood of a child being physically harmed or witnessing serious violence if the caregiver has higher (vs. lower) relative level of education (a) combined for both genders, unadjusted (b) stratified by gender, controlling for the caregiver’s age and whether there is a heavy or harmful drinker (HHD) in the household (vs. no HHD in the household). Weights of the contribution of country-level estimates to pooled estimates are represented by the relative area of the corresponding gray square; All ORs and confidence intervals are weighted; Ireland was excluded from the model because an equivalent variable for HHD in the household was not able to be derived. OR: odds ratio.

include harm to children that would have occurred without drinking or other less severe harms to children from others’ drinking such as neglect and verbal abuse. Thus, we are measuring only a subset of child maltreatment. However, the findings show the prevalence of potentially serious harms that might be reduced by targeted strategies to reduce heavy drinking of caregivers or other members of the family.

Alcohol-related injury and exposure of children to violence when there are heavy and harmful drinkers in the home

The presence of an HHD in the household was consistently associated with CAIV. The meta-analysis showed a large pooled effect that has not been reported previously, indicating an almost four-fold increase in the risk of injury or

exposure to family violence for children in households that included a heavy or a harmful drinker. However, as noted below, this relationship varied for men and women.

Gender and reporting child injury and exposure to family violence when there are harmful and heavy drinkers in the household

A significant gender by HHD interaction and the results analyzed separately by gender indicated a stronger relationship between HHD and CAIV for female than for male participants.

One possible explanation of this gender difference may be because the HHD variable reflects mostly their own drinking for male respondents while it reflects living with a harmful drinker (MHD) for female respondents. Thus, HHD tended to reflect HED for men but an MHD for women. Given that a person defined as the MHD is someone who causes the most harm from drinking in the respondent's life while HED only requires that the person drink five or more drinks at least once a month, it is possible, that the gender difference in the results was due to this measurement artifact. Therefore, we ran models with HHD, HED and MHD as the exposure variable. In the pooled analyses, there was a strong and significant association between MHD and CAIV for both men and women, but as with HHD, the relationship was stronger for women (OR = 9.89 for women and OR = 5.04 for men). For HED, the relationship with CAIV was much weaker than for MHD and less difference between men and women (OR = 1.84 for women and OR = 1.77 for men), although it was significant only for women.

Thus, the overall analyses suggest that the main influence on harms to children is MHD, although HED was still significant for women and close to significant for men. In terms of individual countries, gender-specific models for MHD and HED could be calculated only for three countries because of the low rate of reporting of MHD by men in many countries. For these reasons, we have used HHD for individual country analyses.

The sensitivity analyses suggest even though some of the gender differences for HHD may be due to the composition of the measure, the relationship between having an HHD in the household and CAIV is still stronger for women, especially for MHD. Some possible explanations are that men are less likely than women to have a drinker in their lives who harms their children, or may be less likely to recognize or know that a child has been harmed, or they may be less likely to disclose behaviors they may be embarrassed about. Men and women may also have different perceptions of alcohol's role in violence and physical harm, and they may differ to the extent that they recognize or acknowledge physical harm and violence as having negative effects on their children. Finally, the relationship of HHD with violence may be stronger for female participants because the HHD is more likely to be both the MHD in their lives and male for female than for male respondents and some evidence suggests a stronger relationship between alcohol consumption

and violence for male than for female drinkers (Cafferky et al. 2018).

Important here is the finding that in most countries the percentage of caregiver respondents who reported that the MHD in their lives was a woman was less than 1%. This is consistent with previous studies that show that men drink more than women and cause more harm (e.g. IPV) than women even if they do drink (Graham et al. 2008; Wilsnack and Wilsnack 2013).

Education not associated with less harm to children

Our initial analyses suggested that having a higher level of education was protective against risks of alcohol's harm to children in the majority of countries, but once age, gender and the presence of an HHD in the household were adjusted for in our models, education was no longer significant.

Policy and service implications

Substantial numbers of children were physically harmed or affected by family violence in all of the countries studied, and such experiences early in life may have a crucial impact on psychological and physical wellbeing and are a risk factor for children's own alcohol misuse later in life (Dube et al. 2002) and IPV (Mair et al. 2012). For these reasons, intervention efforts should target heavy drinkers within families. Screening by health practitioners or social workers may be a useful strategy to identify heavy drinkers and could encourage the entry of heavy drinkers into treatment, in turn supporting children and families at increased risk of these harms (Hegarty 2012). Brief interventions may provide a promising way to decrease HED at the population level and therein improve the lives of children who live with heavy drinkers (Henry-Edwards et al. 2003; Babor et al. 2007; American Public Health Association and Education Development Center 2008). Restricting alcohol availability and higher pricing options have also been shown to be effective strategies to reduce consumption (Babor et al. 2010). The effectiveness of these strategies, specifically in terms of the outcomes for children and families affected by others' drinking, has seldom been studied and needs further research.

Limitations

There are a number of other factors that could be important predictors of CAIV that were out of the scope of our study. For instance, caregiver mental health, caregiver's experience of child abuse and neglect as a child, misuse of other drugs, gender inequitable attitudes and authoritarian parenting practices (Mathews and Kenny 2008; Gilbert et al. 2009; Holzer and Lamont 2010).

A limitation of this article is that physical harm, which may include physical discipline and family violence as well as accidental harms caused by an intoxicated adult, may be tolerated differently in different countries (and therefore may vary to the extent that it is seen as a 'harm'). Moreover,

alcohol's involvement in these harms may be attributed differently to caregivers in different countries and gender. However, respondent interpretation differences are likely to be more marked where questions are more subjective (Room et al. 2016; Stanesby et al. 2018) and this article focuses on specific questions about relatively severe harms to children that are likely to be interpreted more similar across countries.

Although a common questionnaire was used across countries, variations in the ways that surveys were modified and implemented could affect the comparability of results between countries. We are comparing answers to questions asked in different languages, and the nuances involved in translation, as well as cultural distinctions, can affect the responses given. However, the consistency of the associations found for the presence of a heavy drinker in the household and associated harms suggests that these factors operate similarly in terms of risk of harm to children across the societies studied here.

While weights have been used to adjust for non-representative sampling and to enhance cross-country comparison, lower response rates among certain demographic groups may reflect response bias that cannot be corrected by analytic weights. Finally, these data are cross-sectional and do not necessarily indicate causality.

Conclusions

Cross-culturally in our diverse sample of nine countries, about one in 25 children experienced severe alcohol-related harm by either being physically harmed or witnessing family violence in a 12-month period. Having an HHD in the family increased the odds of children experiencing alcohol-related physical harm or witnessing alcohol-related serious violence in the home approximately four-fold in almost all countries. The association between having an HHD in the household and harms to children was stronger for female than for male respondents. Both men and women reported that the MHD was more likely to be a man. Strategies to reduce heavy drinking within the household, particularly by men, are likely to result in reduced physical harm to children and less exposure of children to family violence. Caregiver education was not associated with alcohol-related harm to children, suggesting that education had less power to mitigate severe alcohol-related child harm than might be expected.

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