

Physical abuse, psychological abuse and neglect: Evidence of alcohol-related harm to children in five states of India

MARISSA B. ESSER¹, GIRISH N. RAO², GOPALKRISHNA GURURAJ², PRATIMA MURTHY³, DEEPAK JAYARAJAN³, LAKSHMANAN SETHU³, DAVID H. JERNIGAN¹, VIVEK BENEGAL³ & COLLABORATORS GROUP ON EPIDEMIOLOGICAL STUDY OF PATTERNS AND CONSEQUENCES OF ALCOHOL MISUSE IN INDIA

¹Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA, ²Department of Epidemiology, WHO Collaborating Centre for Injury Prevention and Safety Promotion, Centre for Public Health, National Institute of Mental Health and Neuro Sciences, Bangalore, India, and ³Department of Psychiatry, Centre for Addiction Medicine, National Institute of Mental Health and Neuro Sciences, Bangalore, India

Abstract

Introduction and Aims. In India, alcohol consumption per capita has increased in recent years, and child maltreatment is highly prevalent. We assess alcohol-related harms to children, including physical abuse, psychological abuse and neglect, and correlates for men reporting these harms. **Design and Methods.** We analysed data from household interviews collected in a cross-sectional, case-control study in five Indian states ($n = 5026$). Data were collected from October 2011 to May 2012. Using multilevel mixed-effects logistic regression, we examined male adult's reports of five types of alcohol-related harm to children (respondents were not necessarily the perpetrators of the harms) and respondents' drinking patterns and socio-demographic characteristics associated with the reporting of these harms. **Results.** In this sample, 43.2% of the men reported at least one alcohol-related harm to children in the past year; among them, 61.6% reported multiple. Among all men, 15.7% reported that a child experienced physical abuse from adults' drinking. Adjusting for respondents' drinking pattern and socio-demographics, multilevel mixed-effects logistic regression showed that living in a rural area was associated with greater odds of reporting alcohol-related physical abuse, psychological harm and neglect to children. Compared with past-year abstainers, both non-heavy episodic and heavy episodic drinkers had significantly greater odds of reporting these harms. We found significant differences in the reporting of harms by location. **Discussion and Conclusions.** This study suggests that adults' drinking is associated with physical and psychological abuse and neglect to children. Greater use of evidence-based alcohol policy interventions may help reduce alcohol-related harms to children in India. [Esser MB, Rao GN, Gururaj G, Murthy P, Jayarajan D, S Lakshmanan, Jernigan DH, Benegal V, Collaborators Group on Epidemiological Study of Patterns and Consequences of Alcohol Misuse in India. Physical abuse, psychological abuse and neglect: Evidence of alcohol-related harm to children in five states of India. *Drug Alcohol Rev* 2016;00:000-000]

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Introduction

In India, the prevalence of alcohol consumption is rising [1]. As of 2010, 24.8% of men and 4.8% of women consumed alcohol in the past year [1], up from 20.0% among men and 3.0% among women in 2003 [2].

Alcohol consumption per capita, among those age 15 years and older, is low in India (4.3 L of pure alcohol) relative to other large countries, such as China (6.7 L) and the USA (9.2 L) [1]. However, among Indian drinkers, per capita consumption was 22.3 L in 2003–2005 and 28.7 L by 2010. Increases among male

Marissa B. Esser, PhD, MPH, Research Assistant, Girish N. Rao, MD, Additional Professor, Gopalkrishna Gururaj, MD, Professor and Head of the Department of Epidemiology, Pratima Murthy, MD, Professor, Deepak Jayarajan, MD, Regional Technical Training Centre Coordinator, Lakshmanan Sethu, MOT, Occupational Therapist, David H. Jernigan, PhD, Associate Professor, Vivek Benegal, MD, Professor. Correspondence to Dr Marissa B. Esser, Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, 624 N., Broadway Street, Second Floor, Baltimore, MD 21205, USA. Tel: 608-212-5665; E-mail: messer1@jhu.edu

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drinkers accounted for most of this change, rising from 23.9 to 32.1 L of pure alcohol during that time [1,2]. Per capita consumption among Indian drinkers is substantially higher than that among drinkers in other regions, including Africa (19.5 L), Europe (16.8 L) and the USA (13.6 L) [1].

With India's population of 1.2 billion, there is substantial variation in the prevalence of alcohol consumption across the 29 states. For example, Gujarat is one of the four states where alcohol is still completely prohibited; however, an estimated 17% of Gujaratis aged 15 years and older consume alcohol (16% of men; 0.8% of women). In contrast, alcohol consumption is much more prevalent in north-eastern states, such as Sikkim, with 65% of residents aged 15 years and older consuming alcohol (45% of men; 19% of women) [3].

It is widely documented that child maltreatment (encompassing physical, psychological and sexual abuse, as well as neglect) [4] is a severe problem throughout the world [4,5], including India [6,7]. Experiences of non-sexual child maltreatment are causally associated with long-term health consequences including mental health, substance use, suicide and risky sexual behaviour [8]. In 2007, the Government of India investigated the prevalence of child abuse among 17 200 children from 13 of India's 29 states [6]. The report indicated that two-thirds of these children experienced physical abuse, more than half experienced some form of sexual abuse and half experienced psychological abuse. Parental indicators, such as economic stress and marital problems, are thought to be factors associated with this child abuse, but little has been documented about the role of alcohol.

Global literature suggests that adults' drinking is associated with a range of harms to children [9–15]. For example, in their review of the literature, Rossow *et al.* concluded that parental drinking was associated with alcohol consumption or alcohol-related problems among children [12]. One study in Bangalore found that drinkers attributed 44% of child abuse to alcohol consumption and drinkers were more likely to report abusing a child (26.6%) than non-drinkers (21.3%), including emotional and physical abuse [15]. In the USA, children with mothers who were problem drinkers had twice the odds of being injured compared with children of non-drinkers, but fathers' drinking was not associated with injuries among children [13]. Another US study found that 64% of children in fatal car crashes were riding with a driver who had been drinking; two-thirds of these drivers were males [14]. Additionally, in studies among national samples of Australians and New Zealanders, verbal abuse was the most commonly reported alcohol-related harm to children, reported by 51% and 11%, respectively [9,10].

The consumption of greater quantities of alcohol per occasion is generally associated with alcohol-related

harms to others compared with that of smaller quantities of alcohol per occasion and alcohol abstinence [16,17]. In a study of Australian adults, those who drank weekly had twice the odds of reporting harms to children compared with past-year abstainers [10]. Little is known about how adults' patterns of drinking contribute to harm imposed on children in other societies.

In India, some socio-demographic characteristics may be associated with increased risk of alcohol-related harms to children. For instance, research suggests rural areas have more risky alcohol environments than urban [16,18]. Poverty and low educational attainment are also risk factors for elevated levels of alcohol consumption and alcohol-related harms [19]. Poverty and low educational attainment are widespread in some Indian locations, such as Dhule in Maharashtra [20]. Convenient access to alcohol in other locations may also increase risk of harms to children, such as Gangtok, the capital of Sikkim, which thrives on tourism [21], with breweries and distilleries as leading industries [22]. Furthermore, varying structural policies influence the availability of alcohol across states, including a complete alcohol prohibition policy in Gujarat, bans on arrack (a type of liquor) in Andhra Pradesh and minimum legal purchase ages ranging from 18 to 25 years [23–25] (Table 1 shows the selected characteristics of sites included in our study).

With the growing presence of alcohol in India [26], studies documenting harms to children from adults' drinking and how drinking patterns and socio-demographic characteristics are associated with these harms are needed to inform prevention efforts. The first objective of this study was to assess the types of alcohol-related harms to children in five Indian states, across domains of physical abuse, psychological abuse and neglect. The second objective was to explore: (i) adults' drinking patterns; and (ii) socio-demographic characteristics associated with reporting these harms. On average among Indian drinkers, 13% of men and less than 1% of women engage in heavy episodic drinking [1]. Because of the low proportion of women engaging in this risky drinking behaviour, we only include men in the present analysis in order to investigate differences in reporting alcohol-related harms to children by drinking patterns.

Methods

Data and sample

Data were drawn from a cross-sectional, case-control parent study that was administered by the National Institute of Mental Health and Neuro Sciences, Bangalore, India, and local partners between October 2011 and May 2012. The parent study was conducted to examine drinking patterns and alcohol-related

Table 1. Characteristics of the five study sites

Indicator	Cuttack, Odisha	Dhule, Maharashtra	Gangtok, Sikkim	Surat, Gujarat	Visakhapatnam, Andhra Pradesh
Population (2010)	2.6 million	2.0 million	100 000	6.1 million	4.3 million
Livelihood	Agriculture and very limited industries	Agriculture and limited industries	Hospitality industry	Industries (e.g. diamonds and textiles)	Port and industries
<i>Selected state-level written alcohol control policies</i>					
Prohibition policy?	No	No	No	Total alcohol prohibition	Prohibit arrack production
Minimum pricing policies?	No	No	Yes	Total alcohol prohibition	Yes
Minimum legal purchase age (years)	21	25	18	Total alcohol prohibition for all ages (years)	21

Sources: [23–25].

consequences [27]. As described elsewhere [28], purposive sampling techniques were used to capture a diverse sample from the vast Indian subcontinent. Interviewers aimed to recruit 2000 participants from each of five sites (Cuttack, Odisha; Dhule, Maharashtra; Gangtok, Sikkim; Surat, Gujarat; and Visakhapatnam, Andhra Pradesh), located across India. The samples were smaller in two sites (Gangtok and Surat) because of logistical challenges of data collection. Field staff employed stratified sampling techniques to obtain samples from urban and rural areas that reflected proportions in the Indian population. Each site includes urban and rural areas within the administrative areas of the city, and in each site, 30% of households were selected from Census Enumeration Blocks in urban areas and 70% from a random sample of villages in rural areas. For rural areas, lists of villages with populations of 1000 to 5000 (200 to 500 households) were obtained for areas served by the medical colleges. Listed villages were assigned numbers for random selection.

Interviewers selected individuals aged 15–70 years, from each household. Interviewers designated drinkers as cases (i.e. consumed an alcoholic beverage at least one time in the past year) and abstainers as controls (i.e. had not consumed an alcoholic beverage in the past year), matched by sex and age. In households with a female drinker or a male drinker younger than 25 years old, priority was given to interviewing these individuals because of the small proportion of drinkers in these groups in the Indian population [3]. Subgroups, such as these, are challenging to capture using random sampling techniques [29], supporting the use of non-probability sampling methods. In households without any female or young male drinkers, men were randomly selected for interviews. Field staff made at least three attempts to reach potential respondents. The participation rate was 97.3% (8333 of 8567 heads of households approached).

Interviewers obtained verbal consent and carried out the interviews in the local language or English, lasting 45 min. Incentives were not offered. The Ethical Review Committees of the World Health Organization (WHO) and the National Institute of Mental Health and Neuro Sciences approved the parent study. The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health determined that Board oversight was not required for the secondary analysis of these data.

Data for the current paper were from 5026 Indian adult men, ages 18–70 years (mean 38.8, SD 11.2), who responded to questions on alcohol-related harms to children and for whom data were available on drinking patterns. The interviewer explained that one drink was equivalent to one 30-mL shot of spirits, making a nip equal to six drinks and a half bottle of spirits equal to 12 drinks; a half bottle of plain beer; or one-third bottle of strong beer. Forty-one percent of these men self-reported not consuming an alcoholic beverage in the past year (abstainers), while 34.1% had consumed an alcoholic beverage in the past year but had not had five or more drinks during any occasion (i.e. non-heavy episodic drinker), and 24.5% reported consuming five or more drinks on any occasion in the past year (i.e. heavy episodic drinker; Table 2).

Measures

The questions from household interviews analysed in this study were from the WHO's *Harm to Others from Drinking Master Protocol* [30]. To measure alcohol-related harms to children, interviewers asked adults, 'How many times in the last one year, because of someone's drinking (including your own), was any child... [specific harm].?' Children were defined as age 17 years and younger. Adults were asked to report on harm to any child to remove the pressure for disclosure of information about

Table 2. Characteristics of the study sample and unadjusted ORs for reporting alcohol-related harms to children ($n = 5026^a$)

Characteristics	No. (%)	Unadjusted binary OR (95% CI)			
		Physically hurt ^b ($n = 791$)	Psychological abuse ^c ($n = 1790$)	Neglect ^d ($n = 1189$)	≥ 2 harm types versus none ^e ($n = 1337$)
<i>Respondents' drinking pattern^f</i>					
Abstainer	2081 (41.4)	Ref.	Ref.	Ref.	Ref.
Non-heavy episodic drinker	1712 (34.1)	2.1 (1.7, 2.5)***	2.2 (1.9, 2.5)***	1.7 (1.4, 2.0)***	2.2 (1.9, 2.6)***
Heavy episodic drinker	1233 (24.5)	4.1 (3.4, 5.0)***	4.9 (4.2, 5.7)***	3.8 (3.2, 4.5)***	5.7 (4.8, 6.8)***
<i>Rurality</i>					
Urban	1627 (32.7)	Ref.	Ref.	Ref.	Ref.
Rural	3353 (67.3)	1.4 (1.2, 1.7)***	1.2 (1.1, 1.4)**	1.8 (1.5, 2.1)***	1.7 (1.4, 1.9)***
<i>Family income in rupees, past year (\$US equivalent)</i>					
0 to <35 000 (0 to <580)	838 (16.9)	Ref.	Ref.	Ref.	Ref.
35 000 to <70 000 (580 to <1160)	1795 (36.2)	0.6 (0.5, 0.8)***	0.7 (0.6, 0.8)***	0.6 (0.5, 0.7)***	0.5 (0.4, 0.7)***
70 000 to <110 000 (1160 to <1820)	1029 (20.8)	0.7 (0.6, 0.9)**	0.7 (0.6, 0.9)**	0.6 (0.5, 0.7)***	0.6 (0.5, 0.8)***
$\geq 110 000$ (≥ 1820)	1295 (26.1)	0.2 (0.7, 1.1)	1.0 (0.8, 1.1)	0.9 (0.7, 1.1)	1.0 (0.8, 1.2)
<i>Education</i>					
\leq Primary	1771 (35.6)	Ref.	Ref.	Ref.	Ref.
\geq Secondary	3205 (64.4)	0.8 (0.7, 1.0)*	0.9 (0.8, 1.0)	0.8 (0.7, 1.0)**	0.8 (0.7, 1.0)**
<i>Location of residence</i>					
Cuttack, Odisha	970 (19.3)	Ref.	Ref.	Ref.	Ref.
Dhule, Maharashtra	1310 (26.1)	2.3 (1.8, 2.8)***	2.6 (2.2, 3.1)***	4.4 (3.6, 5.3)***	5.7 (4.7, 7.0)***
Gangtok, Sikkim	302 (6.0)	2.8 (2.1, 3.8)***	0.7 (0.5, 0.9)**	2.5 (1.8, 3.3)***	1.6 (1.2, 2.2)**
Surat, Gujarat	710 (14.1)	0.9 (0.6, 1.1)	0.3 (0.3, 0.4)***	0.6 (0.4, 0.8)***	0.4 (0.3, 0.6)***
Visakhapatnam, Andhra Pradesh	1734 (34.5)	0.4 (0.3, 0.5)***	0.2 (0.2, 0.3)***	0.4 (0.3, 0.5)***	0.2 (0.2, 0.3)***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. ^aMissing responses were excluded from analyses, so samples sizes do not add to 5026 for all characteristics (average missing of approximately 1%). ^bORs from binary logistic regression for reporting a child being 'Physically hurt because of someone's drinking?' ^cORs from binary logistic regression for reporting psychological abuse, including two alcohol-related harms to children: 'Witness serious violence in the home?' and 'Yelled at, or verbally abused?' ^dORs from binary logistic regression for reporting neglect, including two alcohol-related harms to children: 'Left in a risky/unsafe situation due to poor supervision?' and 'In difficulty as there was not enough money for the things needed by them?' ^eORs from binary logistic regression for reporting ≥ 2 types of alcohol-related harm to children versus none. ^fAbstainers were defined as those who have not consumed an alcoholic beverage in the past year. Non-heavy episodic drinkers were defined as those who have consumed an alcoholic beverage in the past year but have not had five or more drinks during any occasion. Heavy episodic drinkers were defined as those who have consumed five or more drinks on any occasion in the past year. CI, confidence interval; OR, odds ratio.

their family, as actions inside a family home are generally considered private [31]. The respondent was not necessarily the perpetrator of the harms. We categorised the questions on five types of harms to children into three domains: 'physical abuse' ('Physically hurt because of someone's drinking?'), 'psychological abuse' ('Witness serious violence in the home?' and 'Yelled at, or verbally abused?') and 'neglect' ('Left in a risky/unsafe situation due to poor supervision?' and 'In difficulty as there was not enough money for the things needed by them?'). The interviewer assessed the frequency of harms; response options were 'never', 'less than monthly', 'monthly', 'weekly' and 'daily'. We collapsed the categories into 'never' versus 'ever occurred in past year' for analyses.

Respondents were also asked 'Can you please give some details about yourself?' They were asked to provide

information on various socio-demographic characteristics, including age, rurality (urban/rural), family income in the past year in Indian rupees [(Rs) low income (<Rs35 000, equivalent to <\$US580); lower middle income (Rs35 000 to <Rs70 000, equivalent to \$US580 to <\$US1160); upper middle income (Rs70 000 to <Rs110 000, equivalent to \$US1160 to <\$US1820); high income (\geq Rs110 000 equivalent to \geq \$US1820)] and education (\leq primary/ \geq secondary).

Statistical analyses

For each respondent, we calculated the sum of the non-never responses for each of the five harm types. We created a dichotomous variable from the total number

of harm types reported to assess correlates for men's reporting of greater than the mean (two or more) harm types versus none. We calculated the proportion and 95% confidence intervals (CI) of those reporting each harm in the past year.

We created dummy variables for characteristics with more than two levels (respondents' drinking, family income and location). Using binary logistic regression [32] and multilevel mixed effects logistic regression [33], we explored the associations between respondents' socio-demographic characteristics and drinking patterns and odds of reporting harms in the three domains, as well as odds of reporting multiple (two or more) types of harms. Given the vast differences in the alcohol environments across states, it cannot be assumed that the relationship between adults' drinking and alcohol-related harms to children is the same in all parts of the country. Therefore, with state as the second-level factor, the multilevel mixed-effects logistic regression analyses modelled a random effect for the state intercepts, allowing for variability in reporting harms across states [34]. Covariates of theoretical importance selected for the multilevel mixed-effects logistic models included respondents' drinking pattern, rurality, family income, education and location [3,16,18]. Results were considered significant at $P < 0.05$. Missing socio-demographic data were treated as missing and excluded from analyses (average missing was approximately 1%). We conducted analyses in STATA 12.1 [35].

Results

In this study, 43.2% of the men reported that a child experienced one or more types of alcohol-related harm

in the past year. Among the respondents, 15.7% (95% CI 14.7, 16.8) reported physical abuse to a child from adults' drinking (Table 3), while psychological abuse was commonly reported (35.6%, 95% CI 34.3, 36.9), as was alcohol-related child neglect (23.7%, 95% CI 22.5, 24.8).

Among those who reported at least one type of alcohol-related harm to children, 61.6% reported multiple harms. The common reporting of multiple harm types suggests the substantial cumulative impact on children experiencing these harms. Among those reporting a child being physically hurt, 42.9% also reported a child being left in a risky/unsafe situation because of poor supervision (Table 4). Likewise, among respondents reporting that a child witnessed serious violence at home, 40.8% also reported there not being enough money for a child's needs.

Non-heavy episodic drinking and heavy episodic drinking were strongly associated with reporting alcohol-related harms to children in each domain and reporting multiple harms, both without and with adjustments for socio-demographic characteristics (Tables 2 and 5). Controlling for socio-demographic characteristics, non-heavy episodic drinkers had 1.7–2.4 greater odds of reporting harms, varying by domain, compared with abstainers (Table 5). Heavy episodic drinkers had greater odds of reporting physical abuse (odds ratio [OR] = 3.5, 95% CI 2.8, 4.4), psychological abuse (OR = 3.6, 95% CI 3.0, 4.3), neglect (OR = 3.4, 95% CI 2.8, 4.1) and multiple harms (OR = 5.3, 95% CI 4.3, 6.6) compared with abstainers.

Living in a rural area was associated with greater odds of reporting a child experiencing alcohol-related physical abuse (OR = 1.5, 95% CI 1.2, 1.8), psychological abuse (OR = 1.2, 95% CI 1.1, 1.4) and neglect (OR = 2.0,

Table 3. Proportion of respondents reporting alcohol-related harm to children in the past year by type of harm ($n = 5026$)

Harm to children	% (95% CI)	
	Never	Ever occurred in past year
How many times in the last one year, because of someone's drinking (including your own), was any child ...		
<i>Physical abuse</i>		
Physically hurt because of someone's drinking?	84.3 (83.3, 85.3)	15.7 (14.7, 16.8)
<i>Psychological abuse</i>		
Witness serious violence in the home?	64.4 (63.1, 65.7)	35.6 (34.3, 36.9)
Yelled at, or verbally abused?	82.2 (81.2, 83.3)	17.8 (16.7, 18.9)
<i>Neglect</i>		
Left in a risky/unsafe situation because of poor supervision?	70.5 (69.2, 71.7)	29.6 (28.3, 30.8)
In difficulty as there was not enough money for the things needed by them?	76.3 (75.2, 77.5)	23.7 (22.5, 24.8)
<i>Overall</i>		
Total respondents reporting at least one harm to a child	84.6 (83.6, 85.6)	15.4 (14.4, 16.4)
	85.7 (84.8, 86.7)	14.3 (13.3, 15.3)
	—	No. (%)
	—	2172 (43.2)

CI, confidence interval.

Table 4. Reports of multiple types of alcohol-related harms to children ($n = 5026$)

Types of harms to children	No. (% ^a)				
	Physically hurt ($n = 791$)	Witness of violence ($n = 894$)	Yelled at/ verbal abuse ($n = 1485$)	Left in risky/unsafe situation because of poor supervision ($n = 776$)	Not enough money for a child's needs ($n = 718$)
Physically hurt	— ^b	—	—	—	—
Witness of violence	373 (47.2)	— ^b	—	—	—
Yelled at/verbal abuse	483 (61.1)	589 (65.9)	— ^b	—	—
Left in risky/unsafe situation because of poor supervision	339 (42.9)	329 (36.8)	557 (37.5)	— ^b	—
Not enough money for a child's needs	361 (45.6)	365 (40.8)	516 (34.8)	305 (39.3)	— ^b

Note: Cells in the top half of the table are intentionally blank as the data on the same pairs of harms are presented in the bottom half. ^aThe proportions in parenthesis are based on a denominator of respondents who reported the type of alcohol-related harm to children listed along the horizontal axis and a numerator of respondents who also reported the type of alcohol-related harm to children listed along the vertical axis. For instance, among those who reported the alcohol-related harm to children of being physically hurt, 373 (47.2%) also reported the alcohol-related harm to children of witnessing serious violence. ^bComparison of the same types of harms, so data are not applicable.

95% CI 1.6, 2.4), controlling for respondents' drinking pattern, family income, education and location (Table 5). Neither family income nor education was significantly associated with reporting alcohol-related harms to children, controlling for other factors.

Reports of children's experiences of alcohol-related harms varied by location (Table 5). Compared with those in Cuttack, Odisha living in Dhule, Maharashtra was associated with 2.6–8.6 greater odds of reporting harms, ranging from reporting physical abuse to reporting multiple harms ($P < 0.001$), controlling for respondents' drinking pattern and socio-demographic characteristics. Living in Gangtok, Sikkim compared with Cuttack, was associated with approximately four times the odds of reporting physical abuse and neglect ($P < 0.001$), but not significantly associated with reporting psychological abuse. In contrast, compared with living in Cuttack, living in Surat, Gujarat or Visakhapatnam, Andhra Pradesh was associated with reduced odds of reporting harms in all domains, except reporting that physical abuse in Surat was not significantly different.

Discussion

Our findings demonstrate that alcohol is a factor in child maltreatment in India, covering three of the four main domains of child maltreatment (physical abuse, psychological abuse and neglect) [4]. Forty-three percent of men in this study reported a child's experience of at least one alcohol-related harm in the past year. Among those reporting any harm to children, 62% reported multiple harms, suggesting that children experiencing any

alcohol-related harm are likely experiencing multiple. The cumulative impact of children experiencing multiple alcohol-related harms is likely to have detrimental consequences on their growth and development, with lasting negative impacts through adulthood [8].

Our findings suggest a dose–response relationship between respondents' drinking patterns and the reporting of alcohol-related harms to children. As alcohol consumption went up from non-heavy episodic drinking to heavy episodic, the magnitude of the odds of reporting harms to children increased relative to abstainers. This finding is consistent with global studies documenting that the consumption of high quantities of alcohol on an occasion increases the likelihood of various harms to others, such as the perpetration of intimate partner violence [16] and other violence-related injuries [36].

The associations between socio-demographic characteristics and men's reports of alcohol-related harms to children were mixed. Our study confirms the expectations that living in a rural area was associated with increased odds of reporting alcohol-related harms to children, which is consistent with other studies that document risky drinking patterns in rural areas of India [16,18]. However, after controlling for respondents' drinking patterns and other socio-demographic characteristics, an unexpected finding was that family income was not associated with the reporting of these harms. One possible explanation is that children living in poverty may be subjected to child maltreatment driven by health and social inequalities [37], which may not necessarily involve alcohol and, thus, may not have been captured in this study. Poverty is associated with harms to children around the world [4,5], and as of 2011, 23.6% of India's

Table 5. Adjusted ORs for reporting alcohol-related harm to children by respondents' drinking pattern and socio-demographic characteristics ($n = 5026^a$)

Characteristics	Multilevel mixed-effects logistic regression OR (95% CI)			
	Physically hurt ^b	Psychological abuse ^c	Neglect ^d	≥2 harm types versus none ^e
<i>Respondents' drinking pattern^f</i>				
Abstainer	Ref.	Ref.	Ref.	Ref.
Non-heavy episodic drinker	2.2 (1.8, 2.8)***	2.3 (1.9, 2.7)***	1.7 (1.4, 2.1)***	2.4 (1.0, 3.0)***
Heavy episodic drinker	3.5 (2.8, 4.4)***	3.6 (3.0, 4.3)***	3.4 (2.8, 4.1)***	5.3 (4.3, 6.6)***
<i>Rurality</i>				
Urban	Ref.	Ref.	Ref.	Ref.
Rural	1.5 (1.2, 1.8)***	1.2 (1.1, 1.4)*	1.0 (1.6, 2.4)***	1.0 (1.6, 2.4)***
<i>Family income in rupees, past year (\$US equivalent)</i>				
0 to <35 000 (0 to <580)	Ref.	Ref.	Ref.	Ref.
35 000 to <70 000 (580 to <1160)	0.9 (0.7, 1.2)	1.0 (0.8, 1.2)	1.0 (0.8, 1.2)	0.9 (0.7, 1.1)
70 000 to <110 000 (1160 to <1820)	1.0 (0.8, 1.4)	1.0 (0.8, 1.2)	0.8 (0.7, 1.1)	0.9 (0.7, 1.2)
≥110 000 (≥1820)	0.9 (0.7, 1.2)	0.8 (0.7, 1.1)	0.9 (0.7, 1.1)	0.8 (0.6, 1.1)
<i>Education</i>				
≤Primary	Ref.	Ref.	Ref.	Ref.
≥Secondary	0.9 (0.7, 1.0)	0.9 (0.8, 1.1)	0.9 (0.7, 1.0)	0.8 (0.7, 1.0)
<i>Location of residence</i>				
Cuttack, Odisha	Ref.	Ref.	Ref.	Ref.
Dhule, Maharashtra	2.6 (2.1, 3.3)***	3.3 (2.7, 3.9)***	5.7 (4.6, 7.1)***	8.6 (6.8, 10.9)***
Gangtok, Sikkim	4.5 (3.2, 6.2)***	1.0 (0.7, 1.3)	3.9 (2.9, 5.4)***	3.0 (2.1, 4.2)***
Surat, Gujarat	1.1 (0.8, 1.4)	0.4 (0.3, 0.5)***	0.7 (0.5, 0.9)*	0.6 (0.4, 0.8)***
Visakhapatnam, Andhra Pradesh	0.5 (0.4, 0.7)***	0.3 (0.2, 0.3)***	0.6 (0.4, 0.7)***	0.3 (0.3, 0.4)***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. ^aMissing responses were excluded from analyses, so sample sizes do not add to 5026 for all characteristics (average missing of approximately 1%). ^bORs from multilevel mixed-effects logistic regression for reporting a child being 'Physically hurt because of someone's drinking?' ^cORs from multilevel mixed-effects logistic regression for reporting psychological abuse, including two alcohol-related harms to children: 'Witness serious violence in the home?' and 'Yelled at, or verbally abused?' ^dORs from multilevel mixed-effects logistic regression for reporting neglect, including two alcohol-related harms to children: 'Left in a risky/unsafe situation due to poor supervision?' and 'In difficulty as there was not enough money for the things needed by them?' ^eORs from multilevel mixed-effects logistic regression for reporting ≥2 types of alcohol-related harm to children versus none. ^fAbstainers were defined as those who have not consumed an alcoholic beverage in the past year. Non-heavy episodic drinkers were defined as those who have consumed an alcoholic beverage in the past year but have not had five or more drinks during any occasion. Heavy episodic drinkers were defined as those who have consumed five or more drinks on any occasion in the past year. CI, confidence interval; OR, odds ratio.

population lived on less than \$US1.25 per day [38]. Indeed, several factors contribute to child maltreatment, and our analyses indicate that alcohol plays a definitive role in these harms, which is notable given the pervasiveness of child abuse in the country [6].

Our findings show substantial differences in the odds of reporting harms to children from alcohol consumption by adults across states, and the interplay between the factors contributing to this variation is likely complex. In Gangtok, Sikkim, alcohol may be readily available because of the prosperous local breweries and distilleries [22]. In Dhule, Maharashtra, alcohol-related harms to children may be exacerbated by conditions of poverty [20], with poor living standards and instability. These characteristics may contribute to environments that put children at risk for experiencing alcohol-related harms from adults' drinking. However, additional research is

needed to understand the range of sociocultural and political factors that contribute to the state-specific variations we observed, particularly related to the reduced odds of men's reporting alcohol-related harms to children in Surat, Gujarat and Visakhapatnam, Andhra Pradesh relative to those in Cuttack, Odisha. The total alcohol prohibition in Gujarat and arrack prohibition in Andhra Pradesh are consistent with our findings on harms to children involving adults' alcohol consumption. Nevertheless, the presence of prohibition policies alone may not explain overall rates of abuse to children in Indian states, as reported by child participants of the Government of India 2007 study [6], which showed that Gujarat and Andhra Pradesh were similar to most other states. However, the comparison of state-specific findings across these studies is challenging because of the reporting of child abuse by male adults

in our study versus reports from children themselves; therefore, the impact of alcohol control policies on overall rates of child abuse warrants further investigation.

The proportion of adult men reporting a child's experience of at least one alcohol-related harm (43.2%) in the present study was substantial compared with the prevalence reported by men in Australia (15%) [10] and New Zealand (15%) [9]. While this could be further evidence of the major problem of child maltreatment in under-resourced countries [4–7], a key methodological difference precludes direct comparisons. The studies in Australia and New Zealand asked about harms to children attributable to drinking of people other than the respondent, while this study asked respondents to also consider their own drinking, along with differences in sampling.

This study has limitations. First, the parent study used non-probability sampling techniques; thus, our findings do not reflect incidence estimates and may not be generalizable to the entire Indian population. Second, challenges exist in measuring the role of alcohol in harm to others [39], with a substantial degree of subjective interpretation involved. In this study, data were based on self-reported perceptions of harms; explicitly defining the types of harms would have reduced the subjectivity of the responses. Third, the respondents may or may not have been reporting about their own perpetration of harms to children. It is also possible that respondents reported, for example, about their family members' perpetration of harm. Thus, respondents' characteristics associated with greater odds of reporting harm may vary slightly from characteristics of those perpetrating harm. Fourth, there were no data to determine whether a child was more negatively affected by frequent occurrences of potentially lower-severity harm versus infrequent severe harm (e.g. frequently being yelled at versus infrequent physical abuse). Fifth, data were available on three of the four domains of child maltreatment [4] (physical abuse, psychological abuse and neglect), but sexual abuse was not included, limiting our ability to document the full scope of alcohol-related child maltreatment.

Nonetheless, to our knowledge, this study is the first multistate Indian study suggesting the involvement of alcohol in various forms of child abuse. Our findings showed that a substantial proportion of men, across five states, reported harms to children from adults' drinking, including physical abuse, psychological abuse and neglect. Future research could study children who are subjected to alcohol-related harms from others' drinking, and examine how experiences of such harms impact their growth and development.

This research has global implications, as it adds to efforts to monitor adherence to the United Nations Convention on the Rights of the Child, which is recognised in 194 countries [40] and gives children the

right to be protected from maltreatment [37]. India has acts protecting children from several types of abuse [41], and there are international initiatives to end violence against children in the region [42]. Consistent with the recommendations of the United Nations and the WHO [4,5], evidence-based policies that aim to decrease the availability of alcohol and thus reduce adults' excessive alcohol consumption are needed to reduce alcohol-related harms to Indian children—in settings where such policies are feasible to implement and enforce [1]. Policies that reduce the availability of alcohol may also be used in combination with initiatives to reduce poverty in India as a strategy for preventing alcohol-related harms to children [37,43].

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