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RESEARCH ARTICLE



## Alcohol use, expectancies and HIV-related sexual risk: a cross-sectional survey of male migrant workers in South India

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### ABSTRACT

Male migrant workers (MMWs) in India are vulnerable to developing alcohol-related problems and engaging in unprotected sex, putting them at risk of HIV. Research has shown that alcohol-related expectancies mediate vulnerability to alcoholism. We examined which expectancies were associated with sexual risk and drinking. We surveyed 1085 heterosexual MMWs in two South Indian municipalities, assessing expectancies, sex under the influence, and unprotected sex with female sex workers (FSW) and casual female partners in the prior 30 days. Men more strongly endorsed positive than negative expectancies ( $t=53.59$ ,  $p<.01$ ). In multivariate logistic regression, the expectancy of having more fun helped drive the combination of alcohol and unprotected sex with FSW partners (OR = 1.22,  $p<.05$ ), whereas the expectancy of better sex helped drive a similar combination with casual partners (OR = 1.24,  $p<.01$ ). Men concerned about alcohol-induced deficits were less likely to drink with FSW partners (OR = 0.81,  $p<.01$ ), but more likely to have unprotected sex with them (OR = 1.78,  $p<.01$ ). To reduce risk, MMWs would benefit from combination prevention approaches that use behavioral strategies to address drinking norms and awareness of risk, while using biomedical strategies to reduce viral transmission when risk does occur.

### ARTICLE HISTORY

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### KEYWORDS

Alcohol; expectancies; HIV; migrants; men

### Background

Alcohol use in India has risen rapidly. One report identified a 55% increase over 20 years (Sassi, 2015). Another noted that 21% of men consumed alcohol during the prior year (Ray, Mondal, Gupta, Chatterjee, & Bajaj, 2004). Unfortunately, 30% of drinkers report high alcohol consumption, which is associated with dependence, violence, and unprotected sex (Mehta et al., 2015; Pillai et al., 2013; Poulouse & Srinivasan, 2009; Ramanathan et al., 2014).

Male migrant workers (MMWs) are especially vulnerable to alcohol-related problems, engaging in sexual risk behaviors, and acquiring HIV (Gupta, Vaidehi, & Majumder, 2010; Rao et al., 2013; Verma, Saggurti, Singh, & Swain, 2010). They are also a “bridge” population, acquiring HIV while in higher prevalence areas and transmitting it to others in lower prevalence regions (Mukhopadhyay, Talukdar, Mitra, Ghosh, & Maji, 2010; Rai et al., 2014). One survey of MMWs found that 17% were having sex with female sex workers (FSWs) and two-fifths were using condoms inconsistently (Saggurti et al., 2008). Others have shown that MMWs who

drink alcohol daily are more likely to engage in risk behaviors and have sexually transmitted infections (Gupta et al., 2010; Rizwan, Kant, Goswami, Rai, & Misra, 2014).

Prior research has shown that alcohol-related expectancies – i.e., beliefs about what will occur if one drinks – mediate vulnerability to alcoholism (Darkes, Greenbaum, & Goldman, 2004; Read & O’Connor, 2006; Wardell, Read, Colder, & Merrill, 2012) and that alcohol plays a significant role in decreasing inhibitions to seek sexual services and facilitating sexual violence or unprotected sex (Berg et al., 2010; Kiene, Simbayi, Abrams, & Cloete, 2016; Verma et al., 2010). High levels of drinking and positive alcohol and sexual expectancies are associated with seeking other partners and having multiple or casual partners (Nash, Katamba, Mafigiri, Mbulaiteye, & Sethi, 2016; Singh et al., 2010). Positive expectancies are also commonly cited as reasons for alcohol use (Rodríguez et al., 2010).

As part of a cross-sectional investigation of alcohol’s impact among MMWs in two South Indian municipalities, we sought to understand which specific alcohol expectancies were associated with sexual risk behaviors

with FSW and casual female partners. Identifying these expectancies is important for developing interventions to reduce alcohol use and HIV risk among this high priority population.

## Methods

We conducted surveys in Chirala, Andhra Pradesh, and Kozhikode, Kerala. Chirala has 87,200 inhabitants (Census of India, 2011) and is located along the eastern shore in the Prakasham district. The primary forms of migrant employment are tobacco and chili farming, weaving, factories, and fishing. Kozhikode, previously known as Calicut, has a population of 550,440 (Census of India, 2011) and is located in the northern part of Kerala. Migrants are found in construction, industries, hotel, catering, and bank and sales jobs.

## Recruitment

Our overall study focused on MMWs and FSWs because interactions between the two groups contribute to HIV transmission (Verma et al., 2010). In this paper, we focus on MMWs. To be eligible as an MMW participant, an individual had to: be male; 18 or older; speak English, Malayalam, Telugu, Tamil, and/or Hindi; have been a migrant worker for at least three months; and have a temporary residence in or around Chirala or Kozhikode. Because men who have sex with men (MSM) tended to have discrete sexual networks and risk behaviors affected by unique social stressors (Mimiaga et al., 2011; Thomas et al., 2012), we limited analyses to men reporting only female partners.

We recruited through direct outreach at locations and venues where MMWs congregated. Participants received a description of the study and provided written informed consent. Illiterate individuals provided verbal consent and a witness, unrelated to the study team, signed on their behalf. All participants received their choice of a gift, such as vouchers, clothing, and small transistor radios. Procedures were approved by the institutional review boards at the University of California San Francisco and the Y.R. Gaitonde Centre for AIDS Research and Education, and received clearance from the Indian Council for Medical Research.

## Study procedures

Participants completed a one-hour survey. Interviewers read each item and answer options and marked responses on forms. Interviewers were trained to remain neutral and conducted assessments in private locations. The survey was developed in English; translated into

Malayalam, Telugu, Tamil, and Hindi; and back-translated into English.

## Survey content

### Alcohol expectancies

We constructed a culturally relevant alcohol expectancies measure. Initial items were drawn from an instrument used in the United States (Leigh & Stacy, 1993). As needed, wording was modified to match Indian conversational norms. We then added items that related to aspirations or concerns in Indian society, such as spoiling one's social status. The final instrument had 21 positive and 17 negative expectancy items. Participants used a six-point Likert-type response scale, running from 0 (no chance) to 5 (certain to happen), to indicate the likelihood that the outcome in each item would occur if they drank alcohol. Scores were calculated by averaging responses to the items.

Positive expectancies were initially divided into five domains: positive social outcomes (six items, example: "It is easier to express my feelings," Cronbach's  $\alpha = .75$ ), greater courage (three items, example: "I feel brave or daring," Cronbach's  $\alpha = .72$ ), increased fun (four items, example: "I feel happy/jolly," Cronbach's  $\alpha = .70$ ), improved sex (four items, example: "I enjoy sex more," Cronbach's  $\alpha = .88$ ), and tension reduction (four items, example: "My body feels relaxed," Cronbach's  $\alpha = .77$ ). Because the greater courage and tension reduction domains were strongly correlated ( $r = .55$ ), they were combined into one domain (Cronbach's  $\alpha = .81$ ).

Negative expectancies were initially intended to be divided into four sub-scales: negative social outcomes (five items, example: "I become aggressive," Cronbach's  $\alpha = .81$ ), undesirable emotional reactions (four items, example: "I feel sad or depressed," Cronbach's  $\alpha = .89$ ), physical problems (three items, example: "I get a hang-over," Cronbach's  $\alpha = .80$ ), and cognitive or performance deficits (five items, example: "I lose my valuables," Cronbach's  $\alpha = .82$ ). Because correlations among sub-scales were large ( $r$ 's  $\geq 0.50$ ), all negative expectancy items were instead treated as one domain (Cronbach's  $\alpha = .91$ ).

### Unprotected sex

Participants were asked questions about sex with wives, FSWs, female casual partners, men, and hijras. Men who reported sex with men and/or hijras were coded as MSM and excluded from analyses. For FSW and casual partners, men indicated if they had had one or more such partners in the past 30 days; if so, they reported the number of times they had vaginal and anal sex with the partner(s) and indicated on a five-

point Likert-type scale the frequency with which they used condoms (0 = never; 4 = always). Responses were recoded so that inconsistent or no condom use was coded as having risk (1) and always using condoms (or not having sex with a specific partner type) was coded as no risk (0). The instrument did not collect comparable past 30-day behavior with wives because most MMWs lived away from their families.

### Sex under the influence of alcohol

For FSW and casual partners, participants used a five-point Likert-type scale running from 0 (never) to 4 (always) to indicate how often they were under the influence of alcohol when having sex in the past 30 days. Answers were recoded into any (1) or no (0) alcohol use while having sex with a given partner type (Those who did not have sex with a partner type were coded as 0.).

### Combined indicator of sex under the influence and unprotected sex

We did not have survey questions that assessed instances in which men both drank and had unprotected sex. Instead, we combined responses from multiple questions to produce two indicators (1 = yes; 0 = no): one identifying men who reported both sex under the influence and unprotected sex with FSW partners, and one identifying participants who reported sex under the influence and unprotected sex with casual partners.

### Analyses

We used descriptive statistics to characterize demographics, alcohol expectancies, and proportions of men reporting any sex, unprotected sex, and sex while drinking with FSW and casual partners. For each partner type (FSW, casual), we initially used bivariate logistic regression to examine the association between each alcohol expectancy predictor and each outcome of interest: having sex under the influence, having unprotected sex, and reporting both sex under the influence and unprotected sex. To account for potential confounders in subsequent analyses, we also used bivariate logistic regression to examine the associations between outcomes and recruitment site, age, marital status, time living as a migrant, religion (Hindu/not Hindu), and education (having/not having more than a primary school education). We then constructed a multivariate logistic regression model for each outcome that incorporated as predictors all expectancy domains and potential confounders that had shown associations of  $p < .25$  in the bivariate models (Hosmer & Lemeshow, 1989).

## Results

We surveyed 1289 MMWs, of whom 204 were classified as MSM. This left a final sample of 1085 heterosexual MMWs: 679 from Chirala and 406 from Kozhikode (Table 1). Compared to Kozhikode, participants from Chirala were younger (31.0 vs. 35.2 years old,  $p < .001$ ), less educated (79.6% vs. 60.4% had no more than primary school education,  $p < .001$ ), and been migrants for fewer years (average of 3.5 vs. 8.3,  $p < .001$ ). At both sites, most participants were married, but none reported living with his wife. There was a greater proportion of Muslims in Kozhikode (24.9% vs. 1.8%) and of Christians in Chirala (14.6% vs 8.6%,  $p < .001$ ), although Hinduism was predominant in both sites. Construction and factory work were frequent forms of employment in both locations. In line with regional industries, men in Chirala also worked in weaving and fishing, whereas men in Kozhikode had jobs related to loading, hotels, and land tilling.

Table 2 presents descriptive information on alcohol expectancies and use. Men were more likely to endorse positive than negative expectancies ( $t = 53.59$ ,  $p < .001$ ) and most reported drinking one to four days per week. Table 3 summarizes participants' sexual behavior in the past 30 days. Among men who had sex with FSWs, nearly all (93%) reported sex under the influence of alcohol, but only 40% reported unprotected sex. A total of 178 participants (36% of the men with FSW partners; 16% of the total sample) reported both sex under the influence and unprotected sex with FSW partners. By contrast, among men who had sex with casual partners, nearly all reported unprotected sex (95%), whereas a smaller proportion (72%) reported sex under the influence of alcohol. A total of 274 men (69% of the men who reported casual partners; 25% of the total sample) reported both

**Table 1.** Demographic characteristics of the participants.

	Mean	SD
Age	32.6	7.9
Years living as a migrant	5.2	5.0
	N	%
Marital status		
Married	726	66.9
Single	301	27.7
Divorced/separated	41	3.8
Widower	17	1.6
Religion		
Hindu	838	77.2
Muslim	113	10.4
Christian	134	12.4
Education		
None	312	28.8
Primary	474	43.7
Secondary or more	203	18.7
Not reported	2	0.2

**Table 2.** Descriptive statistics of alcohol expectancies and drinking.

Alcohol expectancies (range: 0–5)	Mean	Median	Std dev
Expect to be more social	3.13	3.25	1.03
Expect to have greater courage/reduced tension <sup>a</sup>	3.09	3.14	1.04
Expect to have more fun	2.87	3.00	1.08
Expect to have better sex	2.99	3.25	1.29
Expect positive outcomes (aggregate of positive expectancy domains above)	3.04	3.10	0.82
Expect negative outcomes <sup>b</sup>	1.43	1.23	0.91
Frequency of drinking		N	%
Never		30	2.3
<1 day/week		140	10.9
1–2 days/week		453	35.1
3–4 days/week		362	28.1
5–6 days/week		103	8.0
Every day		201	15.6

<sup>a</sup>Because of a high correlation between the alcohol expectancy domains of greater courage and reduced tension, the items from the two domains were combined.

<sup>b</sup>Because of high correlations among negative alcohol expectancy domains, the items from its domains were combined in one overall measure.

unprotected sex and having sex under the influence of alcohol with casual partners.

Table 4 displays the multivariate regression models examining the associations of alcohol expectancies and sex-related outcomes with FSW partners. The odds of experiencing the combined outcome of unprotected sex and sex under the influence with FSWs (Model 3) were higher among participants who more strongly endorsed positive expectancies of being more social and having more fun, as well who more strongly endorsed negative expectancies. By contrast, the combined outcome was less likely if participants endorsed the expectancy of more courage/reduced tension. These predictors were inconsistently associated with the individual outcomes. Sex under the influence (Model 1) was associated with expectancies to be more social and have better sex. It was negatively associated with expecting negative drinking consequences or greater courage/reduced tension. By contrast, having

**Table 3.** Sexual activity with female sex workers and casual partners in the prior 30 days.

	N	%
<i>FSW partners last 30 days</i>		
Any vaginal-anal sex	492	45.3
Any unprotected vaginal-anal sex	197	18.2
Sex under influence of alcohol	459	42.3
Unprotected vaginal-anal sex and sex under influence of alcohol	178	16.4
<i>Casual partners last 30 days</i>		
Any vaginal-anal sex	396	36.5
Any unprotected vaginal-anal sex	373	34.4
Sex under influence of alcohol	286	26.4
Unprotected vaginal-anal sex and sex under influence of alcohol	274	25.3

FSW = Female sex workers.

**Table 4.** Alcohol expectancy predictors of sexual risk behaviors with Female Sex Workers (FSW) in the prior 30 days.

Model 1		
<i>Outcome = Sex with FSW while under the influence of alcohol</i>		
Predictor	OR	p-value
<b>Site<sup>a</sup></b>	<b>2.64</b>	<b>0.001</b>
Age	1.00	0.563
Time as migrant	0.99	0.661
<b>Hindu</b>	<b>1.40</b>	<b>0.044</b>
Education > primary school	0.95	0.753
<b>More social</b>	<b>1.20</b>	<b>0.026</b>
More courage/less tension	0.83	0.043
More fun	1.10	0.201
<b>Better sex</b>	<b>1.37</b>	<b>0.001</b>
<b>More negative expectancies</b>	<b>0.81</b>	<b>0.009</b>
Model 2		
<i>Outcome = Unprotected sex with FSW</i>		
<b>Site<sup>a</sup></b>	<b>0.32</b>	<b>0.001</b>
Time as migrant	1.01	0.785
<b>Currently married</b>	<b>0.63</b>	<b>0.005</b>
<b>More social</b>	<b>1.25</b>	<b>0.017</b>
More fun	1.12	0.209
<b>More negative expectancies</b>	<b>1.78</b>	<b>0.001</b>
Model 3		
<i>Outcome = Unprotected sex with FSW and sex while under the influence of alcohol</i>		
<b>Site<sup>a</sup></b>	<b>0.41</b>	<b>0.001</b>
Time as migrant	1.02	0.448
Currently married	0.72	0.058
<b>More social</b>	<b>1.34</b>	<b>0.003</b>
<b>More courage/less tension</b>	<b>0.72</b>	<b>0.003</b>
<b>More fun</b>	<b>1.22</b>	<b>0.039</b>
<b>More negative expectancies</b>	<b>1.85</b>	<b>0.001</b>

<sup>a</sup>Site was coded as Kozhikode = 0, Chirala = 1.

Note: Age, time living as a migrant, and alcohol expectancies were entered into the models as continuous predictor variables. Their odds ratios represent the increased or decreased odds of a participant having the stated outcome for each one unit increase in the given predictor variable.

unprotected sex was more likely to be reported by those expecting to be more social or to experience negative consequences from drinking.

Table 5 displays the multivariate regression models examining the associations of alcohol expectancies and sex-related outcomes with casual partners. The positive expectancies of being more social and having better sex were associated with greater odds of endorsing the combined outcome of unprotected sex and sex under the influence (Model 3). By contrast, those more strongly endorsing expectancies of greater courage/reduced tension were less likely to report the combined outcome. These same relationships held true when the outcomes of sex under the influence (Model 1) and unprotected sex (Model 2) were examined separately. Expectancies of negative consequences or of having more fun were not related to behaviors with casual partners.

## Discussion

Our findings highlight the role that specific alcohol-related expectancies play in sexual risk behaviors



**Table 5.** Alcohol expectancy predictors of sexual risk behaviors with casual partners in the prior 30 days.

Model 1		
<i>Outcome = Sex with casual partner while under the influence of alcohol</i>		
<i>Predictor</i>	<i>OR</i>	<i>p-value</i>
<b>Site<sup>a</sup></b>	<b>3.39</b>	<b>0.001</b>
Age	1.02	0.024
Time as migrant	1.03	0.174
Currently married	1.32	0.103
Hindu	1.24	0.253
Education > primary school	0.96	0.81
<b>More social</b>	<b>1.22</b>	<b>0.029</b>
<b>More courage/less tension</b>	<b>0.74</b>	<b>0.003</b>
More fun	1.05	0.55
<b>Better sex</b>	<b>1.25</b>	<b>0.003</b>
Model 2		
<i>Outcome = Unprotected sex with casual partner</i>		
<b>Site<sup>a</sup></b>	<b>3.81</b>	<b>0.001</b>
Age	0.99	0.553
Time as migrant	1.04	0.051
Currently married	1.21	0.218
Hindu	1.11	0.533
Education > primary school	0.98	0.900
<b>More social</b>	<b>1.46</b>	<b>0.001</b>
<b>More courage/less tension</b>	<b>0.73</b>	<b>0.001</b>
More fun	1.04	0.613
<b>Better sex</b>	<b>1.07</b>	<b>0.33</b>
More negative expectancies	0.95	0.543
Model 3		
<i>Outcome = Unprotected sex with casual partner and sex while under the influence of alcohol</i>		
<b>Site<sup>a</sup></b>	<b>3.35</b>	<b>0.001</b>
Age	1.02	0.034
<b>Time as migrant</b>	<b>1.02</b>	<b>0.044</b>
Married	1.58	0.313
Hindu	1.25	0.252
Education > primary school	0.98	0.899
More Social	1.26	0.013
More courage/less tension	0.73	0.003
More fun	1.02	0.832
Better sex	1.24	0.003

<sup>a</sup>Site was coded as Kozhikode = 0, Chirala = 1.

Note: Age, time living as a migrant, and alcohol expectancies were entered into the models as continuous predictor variables. Their odds ratios represent the increased or decreased odds of a participant having the stated outcome for each one unit increase in the given predictor variable.

among MMWs. We found that men more strongly endorsed positive than negative expectancies, and that the positive expectancies were divided into sub-domains related to being more social, increased fun, better sex, and enhanced courage/tension reduction. As in prior research (Nash et al., 2016; Rodríguez et al., 2010; Singh et al., 2010; Verma et al., 2010), positive expectancies were associated with drinking and sex. Our study further refines this understanding by showing that the positive expectancy of having more fun is associated with the combination of alcohol and unprotected sex with FSW partners, whereas the expectancy of better sex is associated with a similar combination with casual partners. Expecting to be more social, and not having expectancies related to greater courage/reduced tension, were associated with the combination of alcohol and unprotected sex with both FSW and casual partners. In addition, the data show that men who had concerns

about social, cognitive, and performance deficits were less likely to drink with FSWs, but more likely to have unprotected sex with them. Such concerns were not linked with whether the men drank or had unprotected sex with casual partners.

The findings have important implications for intervention development. With FSW partners, behavior is not influenced by expectancies of what alcohol might do for the quality of sex. Instead, riskier patterns are associated with men's anticipations that they will have a better time when drinking (more socializing, more fun), as well as with beliefs that they do not need alcohol to boost courage and calm nerves and/or will experience negative consequences from drinking. The latter finding is counterintuitive. Taken in context, the findings suggest that negative expectancies may reduce the number of men who engage in sex with an FSW. But once a man is with an FSW, his behavior is driven more by positive expectancies. Given this pattern, interventions to reduce unprotected sex and drinking need to focus on either changing the social circumstances in which MMWs meet FSW partners or reduce the likelihood of HIV transmission when such circumstances occur. An idealized intervention might reduce FSW partners altogether, either by lowering the number of women in sex work and/or men's demand for the services. Implementing such a strategy, however, is likely to be hindered by MMWs' separation from their wives (Gupta et al., 2010) and economic destitution among FSWs (McClarty et al., 2014). Alternately, interventions could adopt a harm reduction approach that encourages use of biomedical prevention methods, such as PrEP for uninfected individuals (Baeten et al., 2012; Murnane et al., 2013; Thomson et al., 2016) and antiretroviral therapy for those living with HIV (Cohen et al., 2011; Kitahata et al., 2009). These approaches, however, would need to be embedded in a combination prevention package (Vermund & Hayes, 2013) as they will not address alcohol dependency or other sexually transmitted infections. Complementary intervention strategies might seek to change the norms around alcohol use by, for example, reducing the availability of liquor in places where sex workers are hired or encouraging moderation of drinking.

With casual partners, the findings suggest that unprotected sex is a norm, regardless of alcohol use. Men who drink while having sex with a casual partner do so because they expect it will improve sex and their socializing. This also do so if they do not need alcohol to boost confidence or reduce anxieties. Their behavior is not influenced by concerns about the negative consequences of drinking. As with FSW partners, biomedical interventions could help break the cycle of HIV

infection. For men who are drinking because they want to improve the quality of sex, such approaches may prove more acceptable than traditional prevention strategies, like condom use. The challenge with casual partnerships, particularly those that are more intimate, is that the partners may have less motivation to adopt HIV prevention strategies (Deering et al., 2011; Ramanaik et al., 2014). As such, an intervention would need to include complementary strategies to address alcohol and HIV risk and encourage HIV prevention norms. Integrated intervention approaches that combine alcohol and sexual risk reduction efforts could enhance men's awareness of the disadvantages of consuming liquor while having sex.

Our study has several limitations. First, data were drawn from self-reported surveys. To guard against recall and presentational biases, we used 30-day recall periods and trained interviewers not to react judgmentally. Multiple Indian studies have shown greater reporting of sensitive data when using face-to-face interviewing than methods like audio-computer-assisted self-interviewing (Jaya, Hindin, & Ahmed, 2008; Rathod, Minnis, Subbiah, & Krishnan, 2011). Second, our research was conducted in two South Indian regions and results may not generalize to areas with different types of migrants or sexual norms. This would include regions with large numbers of migrant MSM, who were excluded from analyses. Third, we did not directly assess instances in which men both drank and had unprotected sex. We had to infer overlap using separate items. We believe we identified nearly all men who simultaneously drank and had unprotected sex because drinking was near universal among men with FSW partners and unprotected sex was near universal among men with casual partners. As such, overlap could be inferred by examining reports of the less common behavior with each partner type. Nonetheless, a risk of misclassification remains. Furthermore, we are not able to identify the frequency with which the overlap occurred and thus cannot distinguish among men for whom such overlap was one-time versus recurrent.

Substantial proportions of MMWs both drink and have unprotected sex with their FSW and casual partners. To break the cycle of HIV risk, these men may benefit from combination prevention strategies that use behavioral strategies to address drinking norms and awareness of HIV risk, while using biomedical strategies to reduce the likelihood of viral transmission when risk behaviors do occur.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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