



# “I Wasn’t in My Right Mind”: Qualitative Findings on the Impact of Alcohol on Condom Use in Patients Living with HIV/AIDS in Brazil, Thailand, and Zambia (HPTN 063)

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Published online: 13 August 2018

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## Abstract

**Purpose** There have been significant biomedical improvements in the treatment and prevention of HIV over the past few decades. However, new transmissions continue to occur. Alcohol use is a known barrier to medication adherence and consistent condom use and therefore may affect treatment as prevention (TasP) efforts. The purpose of this study was to further explore how alcohol is associated with condom use and sexual transmission behavior in three international cities.

**Method** HIV Prevention Trials Network 063 was an observational mixed-methods study of HIV-infected patients currently in care in Rio de Janeiro, Brazil; Chiang Mai, Thailand; and Lusaka, Zambia. Across these three global cities, 80 qualitative interviews were conducted from 2010 to 2012. From these interviews, quotes related to substance use, almost all of which were alcohol, were analyzed using thematic analysis to identify how the use was related to sexual transmission behaviors.

**Results** Overall, the theme that alcohol impairs cognitive abilities emerged from the data and included the following subthemes: expectancies, impaired decision-making, loss of control, and less concern for others. Themes specific to international settings and risk subgroups were also identified.

**Conclusion** Our analysis identified how alcohol influences sexual transmission behavior in HIV patients in three international settings. These findings may provide direction for content development for future secondary prevention interventions to effectively implement TasP internationally.

**Keywords** Alcohol · International research · Qualitative research · Sexual HIV transmission · Substance abuse  
Treatment as prevention (TasP)

## Introduction

The past several years are marked by significant improvements in biomedical HIV prevention. Treatment with antiretroviral therapy (ART) definitively reduces the transmission

risk in serodiscordant partners via attaining a suppressed viral load [1, 2]. The model of “treatment as prevention” or TasP has also been shown to reduce overall incidence when ART delivery is scaled up systematically within a specific region [3]. However, to maximally benefit from TasP, individuals in

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HIV care need to be on ART and adherent enough to their medications to achieve viral suppression. Alternatively, HIV transmission is prevented by consistent condom use with unknown or HIV-negative partners.

The HIV Prevention Trials Network 063 (HPTN 063) was a multi-site longitudinal, observational cohort study of HIV-infected individuals in HIV care ( $N = 749$ ) in Brazil, Thailand, and Zambia, aimed at understanding psychosocial factors associated with transmission risk in the global context [4]. This study found substantial numbers of estimated infections in the cohort. Specifically, the data yielded estimates of 3.81 HIV sexual transmissions per every 100 participants over the 15-month period, with variability across risk group (from highest to lowest risk: men who have sex with men, heterosexual women, and heterosexual men) and site, and found that substance use was a significant predictor of HIV transmissions at the bivariate level. High rates of incident bacterial STIs were also found in the MSM and heterosexual women in the cohort, with alcohol use being a significant predictor.

The primary analysis from the study identified a quantitative relationship between alcohol use, HIV transmission, and STI incidence [4]. However, as these data are quantitative, more information about the specific pathways through which this relationship occurs could augment the significance of the findings. The current study, as a qualitative exploration of these relationships, allowed us to analyze the relationships identified quantitatively at a new richness and depth only afforded by qualitative methods. Specifically, the current study utilizes the available qualitative data to explore emergent themes relevant to the connection between alcohol and sexual transmission risk in these populations.

Alcohol use is a known barrier to ART adherence and HIV transmission risk behaviors, such as condomless sex with serodiscordant or unknown status partners [5–10]. To explain how alcohol and HIV behaviors are related, the literature has largely relied on two dominant theories—Alcohol Myopia Theory [11] and Alcohol Expectancy Theory [12]. Alcohol Myopia Theory posits that individuals who are intoxicated are unable to process all of the information in their environment, and so, they are influenced by only the most salient cues so that alcohol shifts attention away from inhibiting cues (e.g., concerns about HIV) and towards salient cues (e.g., sexual arousal) [11]. Alcohol Expectancy Theory explains that individuals who believe alcohol will enhance sexual experiences are more likely to engage in alcohol use and less inhibited sexual behavior after drinking [12]. Expectancy theory could also be used to explain why individuals are more likely to engage in risky behaviors (e.g., unprotected sexual intercourse) because they may believe that drinking alcohol is likely to result in this behavior. Additionally, the sensation-seeking theory has been posited to explain the high co-occurrence of alcohol and sexual risk behavior, which posits that some individuals are high on “sensation seeking” as a

personality trait and may be motivated to seek out multiple novel and potentially high-risk experiences [13]. Many individuals have attempted to merge these theories into a more comprehensive model of alcohol-sex behaviors and have suggested a more complex interaction between an individual and their environment [14, 15].

The relationship between alcohol-sex behaviors, individuals, and their environments has also been examined internationally. A meta-analysis by Shuper and colleagues (2009) of alcohol and unprotected sexual behavior in PLWHA showed that across multiple studies in international cities, any alcohol consumption (OR = 1.63; 95% CI 1.39–1.91), problematic drinking (OR = 1.69; 95% CI 1.45–1.97), and alcohol use in sexual contexts (OR = 1.98; 95% CI 1.63–2.39) were all significantly associated with condomless sex. A meta-analysis of alcohol use and sexual transmission risk behavior that included studies in America, Southeast Asia, and Africa again found an association between alcohol use and sexual behavior. Specifically, they found that 37% of participants reported consuming alcohol on a regular basis and 33% reported using alcohol before sex. Condom use was 67% and 25% of the sample reported multiple, concurrent partners [16]. Finally, a recent meta-analysis of alcohol and sexual transmission risk in Russia [17] found that individuals with high levels of alcohol use or “hazardous/harmful alcohol use” reported significantly more sexual partners and less consistent condom use than those who used alcohol recreationally. For a comprehensive review of alcohol and sexual behavior that can lead to HIV transmission, see Freeman [18].

However, additional data to further support the use of theory to explain these associations in international studies would be useful [19, 20]. Attempts have been made to combine existing alcohol and sexual behavior theories and make them applicable to international HIV epidemics. For example, Woolf-King and Maisto (2011) utilized existing theory to generate two conceptual models (one for women and the other for men) to explain the relationships between alcohol use, sexual behavior, and HIV transmission in Sub-Saharan Africa that include culturally relevant power dynamics [19]. Taken together, these studies suggest the importance of research that examines these factors within international settings and across risk groups to examine the unique factors that may impact HIV transmission and epidemics globally.

HPTN 063 examined alcohol and sexual behavior, and other factors related to HIV transmission, across the three risk groups and in three international cities and found, quantitatively, that individuals who used alcohol were significantly more likely to have STIs and transmit HIV [4]. To unpack the quantitative findings that alcohol use was predictive of HIV transmission risk and STI incidence, in the current study, we sought to explore themes from the qualitative data regarding the relationships between alcohol use, sexual decision-making, and participant understandings of these relationships.

To contribute to a more nuanced analysis, we also evaluated whether these themes were shared or unique to risk group and international setting.

Specifically, we used three research questions to guide our analysis: (1) How did the participants view substance use (alcohol emerged principally) as a contributing factor to sexual transmission risk behavior? (2) What are the common themes across risk groups and international settings? and (3) What are the unique themes within these risk groups and international settings?

## Methods

### Participants and Procedures

Participants were sexually active patients recruited from HIV/AIDS clinics in Rio de Janeiro, Brazil; Chiang Mai, Thailand; and Lusaka, Zambia, between June 2010 and June 2012 as part of a mixed-methods (qualitative and quantitative) observational study [4, 20]. In Brazil, the setting was a clinical research institution that also offers HIV care. In Thailand, the site was part of a public university affiliated with several local HIV clinics. In Zambia, the setting was a local HIV clinic. Each site had its own local community advisory board (CAB) that reviewed interview guides, pilot tested questions, and helped shape the study procedures. Informed consent was obtained from all individual participants included in the study.

A total of 80 participants were included in the qualitative portion of the study [21] and included mixed sexual orientation and gender identity (see Table 1). Recruitment for this qualitative portion of HPTN 063 was voluntary. Staff members within clinics selectively invited and recruited individuals in their HIV care settings who they thought would be open to talking to a member of the research team about their experiences. Eligibility criteria for this sample and the larger HPTN 063 study were the same. Patients had to be adults (18 years of age and older), HIV infected, and have attended at least two documented HIV-related medical appointments in the prior 9 months. They also had to have reported sexual risk behavior, which was operationalized as either having a sexually transmitted infection, engaging in condomless anal or vaginal intercourse, reported difficulty negotiating condom use, or had not disclosed their HIV status to an unknown or seronegative partner within the year prior to enrollment.

After expressing interest in the study, all participants received information on the purpose of the study, the voluntary nature of research participation, and potential risks and benefits before providing informed consent. Participants in Brazil received a voucher for their travel and food while participants in Thailand and Zambia received a small monetary payment for participation. All staff members were trained in research ethics and qualitative interviewing prior to data collection.

**Table 1** Characteristics of total sample and subsample with substance use quotes

	Total sample		Substance use quotes	
	N	%	N	%
Age (M, SD)	39.08	8.53	40.85	8.65
Gender				
Male	40	50	18	45
Female	30	37.5	15	37.5
Transfemale (male to female)	5	6.3	3	7.5
Other	5	6.3	4	10
Country				
Brazil	30	37.5	11	27.5
Thailand	30	37.5	20	50
Zambia	20	25	9	22.5
Marital status				
Never married	32	40	16	42.5
Married	35	43.8	17	40
Separated/divorced	6	7.5	3	7.5
Widowed	7	8.8	4	10
Religion				
Christianity	33	41.3	11	27.5
Islam	2	2.5	1	2.5
Buddhism	28	35	20	50
Spiritism/Kardecism	5	6.3	4	10
Afro-Brazilian	3	3.8	1	2.5
No religion	7	8.8	1	2.5
Other	2	2.5	2	5
People in home				
Live alone	11	13.8	7	17.5
1–5 people	57	71.3	26	65
6–10 people	10	12.5	6	15
11–15 people	2	2.5	1	2.5

Study procedures were approved by the Internal Review Boards (IRBs) at the Comissão Nacional de Ética em Pesquisa (Brazil); the Instituto de Pesquisa Clínica Evandro Chagas (Brazil); Johns Hopkins School of Public Health (Thailand); the Research Institute for Health Sciences, Chiang Mai University (Thailand); and the University of Alabama at Birmingham (Zambia) and were reviewed by the HIV Prevention Trials Network (HPTN) and the Division of Acquired Immunodeficiency Syndrome (DAIDS) Prevention Science Review Committee.

### Data Collection

The current study is a secondary data analysis of HPTN063. Within the qualitative portion of the parent study, participants completed a semi-structured qualitative interview conducted

in the participant's preferred local language about individual barriers and facilitators to safer sexual practices, communication with sexual partners about HIV, HIV-related stigma, structural factors influencing sexual risk behaviors, and preferences for future secondary prevention interventions. The interviewers followed a standard set of probes for each topic area to ensure consistency across interviewer, interviewee, and site. Interview guides were pilot tested with study staff and community advisory board members and were adapted for site-specific cultural competency. The interviews lasted approximately 1 hour and took place in a private space. They were audio recorded and transcribed verbatim. Transcripts were then translated by a bilingual staff person into English and independently assessed for accuracy and consistency.

Approximately half of the participants mentioned alcohol in relation to barriers and facilitators of safer sexual practices, and there were specific questions in the interview guide to address these. These interview guide questions were as follows: (1) What do you think "safe sex" means? By safe sex, we mean using condoms for vaginal and anal intercourse. That is the definition that we will refer to throughout this interview. (2) What are the major barriers to practicing safer sex for individuals with HIV? and (3) What are the things that can help people who are like you engage in safer sexual practices? Slightly more than half the sample mentioned drugs or alcohol during their interview. Sample characteristics of the current sample (who commented on the role of alcohol) compared to the total qualitative sample are presented in Table 1. Additional information and procedures regarding the qualitative parent study are reported elsewhere [21].

## Data Analysis

Data analysis for the current study was conducted by the lead authors. Data were organized in ATLAS.ti version 7 qualitative data analysis software (Berlin, Scientific Software Development, 2013). For the current study, we conducted a thematic analysis [22]. Thematic analysis is a useful qualitative method when conducting psychological research as it is a method for identifying, analyzing, and reporting patterns within the data. It is best characterized as a "contextualist" method, sitting between the two poles of essentialism and constructionism. Thematic analysis acknowledges the ways individuals make meaning of their own experience while also recognizing the broader social context and how that may be reflected in individual experiences.

In our thematic analysis of this data, we sought to balance two contrasting perspectives: constructivist and positivist. From a constructivist perspective, we stayed as close to the data as possible while coding and made minimal interpretations regarding the intended meaning of the selected excerpts. From a positivist perspective, we sought to

identify themes that we as researchers in behavioral medicine believe highlight a true reality that individuals experience. Integrating these two perspectives, although sometimes challenging, capitalizes on participants' lived experiences while also acknowledging the subjectivity of the outside researchers making meaning of these lived experiences.

The "corpus" of our data, or the full set of data available [22], included interviews conducted with patients in three international HIV clinics. The dataset we used was comprised of any quotes initially coded as "substance use" by the qualitative coding team for HPTN 063 [21, 23]. An initial review of the data corpus showed that there were few mentions of illicit substances and that almost all quotes coded as substance use were related to alcohol. As such, the current analyses were refined to focus on the role of alcohol use. We examined the data for semantic themes following the process of semantic thematic analysis as described by Braun and Clarke (2006); specifically, two coders (BGR and NM) looked for the surface meaning, engaged in the description of data, and interpreted that data within the larger context of literature and theory [22].

Raters coded data independently. Both coders completed separate, inductive coding of the data to create initial codes and then grouped them together iteratively as they emerged from the data. Each built their own list of thematic codes based on the themes that emerged as they coded. Following this, raters met and reviewed their separate coding. Discordant codes were discussed among the two coders and then rated to consensus. Finally, codes were organized into larger themes, consistent with approaches described by thematic analysis. Based on our research questions, we sorted these themes into those shared across subpopulations and those that were unique. Following the analysis, we explored how these themes were consistent with the existing literature and theory. To enhance the accuracy and generalizability of study findings, authors from each of the international sites served as co-authors and reviewed multiple versions of the paper.

## Results

Half of the individuals interviewed reported alcohol as being associated with sexual transmission risk behaviors. The theme that was shared among risk groups and international settings was the role that alcohol plays in impairing individual judgments and sexual decision-making. Themes that were unique to population or setting included (1) gender-related difficulties navigating condom use, (2) country-specific barriers to condom use, and (3) barriers to condom use in specific sexual venues for MSM. Results and representative quotes are discussed in more detail below. Participant characteristics for the total sample and the subset providing substance use quotes are listed in Table 1.

## Research Question 1: How Did Participants View Alcohol as a Contributing Factor to Sexual Transmission Risk Behavior?

Overall, participants expressed that they viewed alcohol as contributing to sexual behavior that could lead to HIV transmission. In fact, across risk groups and international settings, participants unanimously voiced their perception of the role of alcohol in condomless sex.

One participant went as far as to say that people live their lives without consideration of HIV transmission and that he considers alcohol as the main cause of transmission:

People just live business as usual. They forget about it at all. They don't think there is anything, which is scary. So I am saying alcohol actually is also the main driver of spreading of HIV. (Zambian MSW)

Similarly, another participant stated that alcohol was not only a barrier to safer sexual practices, but also the main cause for less safe sexual behavior:

They [alcohol/substances] are not called obstacles, but rather the main causes for unsafe sex. (Thai MSM)

These quotes are illustrative of participants' perception that alcohol is an important factor to consider in HIV transmission in these international contexts and across risk groups.

## Research Question 2: What Are the Common Themes Across Risk Groups and International Settings?

Repeatedly, across risk groups and sites, participants spoke of *alcohol impairing cognitive abilities* and that those changes led to condomless sex and poorer ART adherence, both of which increase the odds of sexual transmission of HIV. Changes in these cognitive abilities were further grouped by (1) expectancies, (2) impaired decision-making, (3) loss of control, and (4) less concern for others.

### Shared Theme: Alcohol Impairs Cognitive Abilities

#### Expectancies

Even before consuming alcohol, participants' thoughts are altered by alcohol expectancies, or what they expect will happen when drinking alcohol. Participants expressed that drinking often leads to condomless sex or poor ART adherence and felt it was unreasonable to plan or prevent these incidents. Further, in the context of casual partners, participants felt it was quite difficult to be prepared for safe sex, especially if drinking was involved. As one MSM from Brazil explained of his "insecure" (i.e., casual) sexual relationships, these encounters are often spontaneous and

occur in alcohol serving venues, making it difficult to prepare for them adequately ahead of time:

In times when I have more that kind of insecure relationship is when I'm drunk...Yes, drunk, you can say so, and in transient situations. For instance, how am I going to leave work planning my whole day? I'm not that kind of people. I know there are people like that, but I'm not leaving my home putting a condom, a sachet of gel in my backpack, thinking that maybe at night I'll go drink and maybe I'll go to have sex, and still my psychological would not help to use the sachet of gel to have sex. (Brazilian MSM)

Another participant spoke of deciding to drink and have sex without condoms ahead of time, again highlighting the importance of alcohol expectancies and sexual behavior that could lead to HIV transmission:

Alcohol use and drunkenness is a barrier because it makes us fearless and reckless bold. So, it's a barrier. It's easy to get infected. People who know themselves [their HIV positive statuses] would use the condoms. But, when they hang out or socialize drinking and end up with having sex with their girlfriends, they make decisions that, "today I won't use a condom," something like that. So, it's a barrier. It can get people infected. (Thai MSW)

Both quotes illustrate the power of expectancies in determining sexual behavior even prior to consuming alcohol, such that individuals who already believe that sex in the presence of alcohol will likely be condomless sex may not take steps to prepare themselves ahead of time.

#### Impaired decision-making

Impaired decision-making due to the cognitive effects of alcohol was a robust theme. Participants were able to articulate the role that alcohol had played in making less safe sexual decisions and the consequences of these decisions in the moment and later.

As one man from Zambia stated alcohol makes it difficult to reason, in general, and that translates to sexual decision-making as well:

when you have taken alcohol it becomes very difficult to reason and make a decision because it stimulates most of your brain so much that at some point you might fail to reason...So alcohol intake also attributes to us men making poor and wrong decisions in terms of sexual advances. (Zambian MSW)

Another participant, an MSM from Brazil, highlighted the ways in which alcohol can “fog” decisions at night that then “clear” during the day and result in feelings of guilt and shame related to less safe sexual behavior and the possibility of having spread HIV, or even contracting a different strain from an unknown partner, because of that behavior:

Like in everything, like when you drink, have sex, do drugs, everything is worse the following day, because when you wake up the following day, your head is clear, then you begin to think about the consequences of what you did the night before, what can happen. What will happen? Because I did that, what will that generate for me? You know? Sometimes, nothing, and sometimes it generates bad things, right? Normally it is like that, I have never seen that generate good things. The afterwards, the awareness comes later. At the time nothings occurs to you, you are there, ready to go, then you do it and you don't even remember, sometimes you don't even take the meds, but then comes the next day and you say: “Damn, why did I do that?” Then you think: “Gosh, the doctor told me that if I did that my bugs would get mixed with the other bugs and that could be a problem... Why did I do it? I wasn't supposed to do it. (Brazilian MSM)

As one MSM in Brazil described, he feels like a different version of himself when drinking. He compares his sober behavior to his behavior while drinking, again highlighting the impaired decision-making because of alcohol use:

I wasn't on my right mind [when drinking/using drugs], because if I was like I am now, like I am talking to you right now, I would say: “Wait a moment, stop it!” “...Let's get a condom.” But if you are going with the wave, all boozed up... You do it. (Brazilian MSM)

For the receiving partner, this impaired decision-making can also be described as forgetfulness, as one woman in Zambia explained that men “forget” to wear condoms when drinking:

Like drinking beer, like drinking beer when they get drunk, they forget to wear condoms and they just do it like that. (Zambian WSM)

### Loss of control

Participants reported the cognitive effects of alcohol were sometimes so great that they went beyond “impaired decision-making” to a point where individuals felt they no longer had control over their mind, motor coordination, or behavior. The description of many of these scenes was what might be described

as a “brown out” or “black out” and may indicate higher levels of drinking or binge drinking among these participants.

As one participant reported, having sex without a condom was a result of him being “out of control”:

How can I say this...It's because I was drunk...You know, I was out of control and I just let it be. (Thai MSW)

Similarly, another participant reported that his loss of control in the context of alcohol led to sex despite a lack of expectation or planning for sex:

For example, I hung out drinking alcohol without expecting to have sex. After I was drunk, I somehow had sex. I just lost all controls when I was drunk. (Thai MSM)

### Less concern for others

Finally, several participants noted an altered sense of fear, reserve, and concern for others and themselves while drinking. They expressed having less concern for others' well-being when drinking alcohol, including the sexual health of their partners.

As one Thai MSW stated, when he is drunk, he is no longer concerned about safety, HIV transmission risk, or his partners' safety:

For safety, we have to use condoms. But sometimes when I got drunk, I had no thoughts about the safety, but to have sex. Sometimes, I didn't use any condoms... no prevention. Sometimes when I was so drunk, I just didn't care whether my partner was infected or not. (Thai MSW)

As one Brazilian MSM stated, he is not concerned about infecting his casual partners with HIV, especially when he has been drinking:

And the issue that I am HIV [positive] and the person may not be, that are casual people, does not inhibit me...Normally I'm kind of drunk and the barriers fall, I do not wonder if the other person will be hurt later. (Brazilian MSM)

For these individuals, alcohol removes the self-perception of HIV transmission risk, making it more likely they will have sex without condoms.

### Research Question 3: What Are the Unique Themes Within These Risk Groups and International Settings?

We also identified specific themes by risk group and/or international setting that require further exploration as these

themes may have potential implications for TasP and future prevention efforts in these subpopulations.

### **Unique Theme #1: Women Across Sites Reported Difficulties with Condom Negotiation**

Women identified the difficulty they had and the powerlessness they felt when trying to engage in condom negotiation with intoxicated partners. This theme occurred with women (having sex with men) across all sites.

One woman highlighted her sexual partners' lack of concern or attention to having safe sex:

sometimes, men are drunk and they pay attention to nothing...they pay no attention to having [safe] sex. They just want to have fun. (Thai WSM)

Another stated the challenge of wanting to use a condom, but having a male partner who does not want to use condoms and who may be more “stubborn” because he is drunk:

Sometimes you may want to use a condom but that other person will be stubborn because he is drunk. He will never even want to use a condom. (Zambian WSM)

One woman described requiring the use of substantial assertiveness to have her sexual partner use a condom while under the influence:

He only used [a condom] because I said that I wouldn't have without it [a condom]. I had to say: “Either you put it on or I'll leave.” (Brazilian WSM)

Another spoke of the complexity of asking a permanent partner or spouse to use condoms, especially when they had been drinking:

Especially, when the partners use alcohol. Most men don't want to use condoms (when they are drunk). They might think “this is my wife - why I have to use condoms with my wife?” (Thai WSM)

### **Unique Theme #2: Heterosexual Participants in Brazil Reported Alcohol as an Excuse for Sexual Behavior that Could Lead to HIV Transmission**

Although several individuals in Brazil recognized the contribution of drinking and drugs in sexual decision-making, others and, in particular, heterosexual participants, believed that substances were an excuse or post hoc explanation for not using condoms.

One woman from Brazil stated that she thinks that men prefer not to use condoms, but that they and others observing their behavior use alcohol as a way of excusing condomless sex:

People think that men have sex without a condom because they are drunk. Bullshit! They have because they want for we didn't have even one glass of beer. We came to the hotel and he simply didn't want to use. (Brazilian WSM)

Another participant echoed this same sentiment and related it to his own experiences, by stating that he believes people are lying when they say they are not aware of their behavior while drinking because he very much is:

Let's say, you're in a fucking party, drink a lot, in quotes because to me who drinks and loses consciousness is lying, because I drink and I know very well what I'm doing. (Brazilian MSW)

This group of participants expressed that substance use is often a convenient, if not plausible, explanation for unsafe and unhealthy sexual decisions. In this manner, they saw substance use as a means of justifying otherwise illogical or socially unacceptable behavior.

### **Unique Theme #3: MSM Reported the “Club Scene” and Social Environment as the Setting for Drinking and Sex Behaviors**

MSM in the sample reported meeting casual sexual partners mostly in alcohol-serving venues such as gay bars or nightclubs. Because these venues serve alcohol, most of these men reported it was unlikely not to be drinking when having sex in these venues. Also, some noted that the experience of being in an exclusively gay space was linked with feelings of liberation and enjoyment, which encouraged expressions of that freedom through drinking alcohol and sexual behaviors.

As one MSM from Brazil stated, the presence of alcohol in social venues makes it likely that people will drink and then will feel more liberated in general, which could result in changes in sexual behavior:

Attending nightclubs for example. It is a place where you hardly will not drink, this changes your behavior and also changes other people's behavior, who also drink at parties, music, everything, I think that this changes and people typically attending the clubs think they are more liberated (Brazilian MSM)

Another participant, an MSM from Thailand, also reported going out to alcohol-serving venues as an obstacle for HIV prevention:

Mmm. Most obstacles which make people are not free from HIV are going out for fun, drinking alcohol and forget to prevent themselves, something like that. (Thai MSM)

## Discussion

This study explored the role of alcohol use in the context of condomless sex among PLWHA in three distinct international settings and among three populations affected by HIV. Within our sample, we identified one general theme across sites and risk groups and three unique themes specific to sites. We frame our discussion in the context of the common and unique themes identified in the analysis.

### Shared Theme: Alcohol Impairs Cognitive Abilities

The shared theme of alcohol impairing cognitive abilities, and specifically targeting expectancies, impaired decision making, loss of control, and less concern for others emerged in our analysis. These findings are consistent with existing alcohol and sexual behavior theories [12, 14], including Alcohol Myopia Theory and Alcohol Expectancy Theory, suggesting that these theories may also explain these phenomena in international contexts. Alcohol Myopia Theory was represented by these quotes, as most participants spoke of the narrowing of cognitive abilities and capability to make informed decisions while under the influence of alcohol. Although our approach to analysis was inductive and we were not specifically searching for these theories, we discovered that our participants expressed views consistent with existing literature and theories. Additionally, although not explicitly stated by our participants, these findings also appear to be consistent with a range of other theories including sensation-seeking theory, social opportunity theory, and others that explain the high co-occurrence of alcohol use and sexual transmission risk behavior [20]. Both alcohol use and sexual risk behavior involve high pleasure and high-risk experiences, associated with sensation seeking, which is a personality disposition associated with the tendency to pursue novel and existing experiences that offer stimulation and arousal, often at the dismissal of potential risks involved [13, 24]. Alcohol use and sexual risk behavior also may co-occur because of the environment in alcohol-serving venues [14, 16, 18]. Finally, there is some research to suggest that it is some combination of these theories that explain the reciprocal risks of alcohol use and sexual risk behavior that create an environment for sexual behavior that could lead to HIV transmission.

### Unique Theme #1: Women Across Sites Reported Difficulties with Condom Negotiation.

Within our study, heterosexual men expressed reduced concern for their partners while using alcohol, and heterosexual women stated they felt their partners were unwilling to use condoms,

particularly when under the influence of alcohol. This is consistent with the previous research, which has identified alcohol as a barrier to condom negotiation in heterosexual couples. A systematic review of alcohol use and sexual risk-taking in Africa [20] found that men are more likely to drink and engage in high-risk behaviors while women are more likely to be risky as a result of their male sexual partner's alcohol use. A qualitative study [25] also found that HIV-positive heterosexual women reported condomless sex with their primary partners at the insistence of their male partner. Half of the women in this study in serodiscordant relationships engaged in condomless sex because they could not convince their partners to wear a condom. A more recent qualitative study conducted by Ngure et al. [26] also reported that men not wanting to use condoms was the main cause for unprotected sex for serodiscordant couples in Kenya and that alcohol use was a common cause of men's inconsistent condom use. Women in this study reported it was harder to engage in condom negotiation when their partner was intoxicated. Taken together, these findings are similar to our results from the women in our sample, who reported condomless sex was often at their partners' insistence.

There have been attempts made within the literature to contextualize these findings within existing and new theoretical models. Woolf-King and Maisto (2011) proposed a culturally tailored model that explains alcohol, gender, and power dynamics as they relate to HIV transmission in Sub-Saharan Africa, which may be particularly appropriate for our Zimbabwe site [19]. More generally, the theory of gender and power, which has been applied to HIV prevention in young women in the USA, may serve to explain why women in heterosexual relationships are at increased risk for HIV and how patriarchal power structures may lead to increased risk for women [27, 28]. Previous research and theories, in combination with our findings, explain the overall disadvantage heterosexual women face in negotiating and engaging in safer sexual practices with their heterosexual male partners, which is only exacerbated by alcohol use [28], leaving them at greater risk for HIV acquisition and transmission. This suggests that primary and secondary prevention programs aimed at women in international settings, particularly those with patriarchal cultures, should include discussions of gender and power within the context of sexual health and family planning including condom negotiation, pharmacological options (e.g., pre-exposure prophylaxis) for HIV-negative women, and medication adherence for those who are positive.

### Unique Theme #2: Heterosexual Participants in Brazil Reported Alcohol as an “Excuse” for Sexual Transmission Risk Behaviors.

The quotes from Brazil seem to suggest that substance use may actually serve as a “cover story” for men not wanting to wear condoms [25]. This was unique from the other international cities, none of whom mentioned alcohol as an

“excuse” for these behaviors. In part, it seems that participants in Brazil were suggesting that because it is socially undesirable to engage in unprotected sex, when individuals do engage in this behavior, they need to use alcohol as an excuse for it.

Brazilian participants’ assertion that alcohol is an excuse for sexual behavior has support within the literature. Although it is largely believed that alcohol use is related to sexual risk behavior, much of these data are from overall association studies that demonstrate, overall, an association between these behaviors, but do not measure individual event data. To that end, Weinhardt and Carey (2000) conducted a review of alcohol use risk and sexual behavior using studies with event-related data and did not find support for event-related influences of alcohol on sexual risk behavior [29]. Instead, they concluded that individuals who used condoms when sober were also likely to use them when drinking alcohol and that individuals who did not use condoms when sober were more likely to also not use them when drinking [29].

These comments are also reflective of Alcohol Expectancy Theory, which states that individuals will behave according to the predefined beliefs they have about the effects of alcohol. As applied to this context, an individual’s belief that alcohol will cause him to have condomless sex will make it more likely this will occur [15, 30, 31]. This suggests that addressing alcohol use as a problem within an intervention in Brazil may benefit from content related to alcohol expectancies as a barrier for practicing consistent condom use.

### **Unique Theme #3: MSM Reported the “Club Scene” and Social Environment as the Setting for Drinking and Sex Behaviors.**

For MSM, the experience of nightclubs and bars and the liberation associated with these spaces seemed to promote both alcohol use and sexual transmission behavior. The feelings of liberation associated with clubs and the association of these clubs with sex and alcohol use [32] seemed to play an important role in sexual transmission behavior. This is consistent with the sensation-seeking theory [13, 33] if we interpret that MSM are seeking to go out in search of novel, and potentially high-risk, experiences including alcohol use and condomless sex.

However, there is an alternative perspective consistent with social cognitive theory, which states that individual and environmental factors interact reciprocally to influence behavior, and has been applied to HIV-related behaviors [34, 35]. The use of this theory to understand findings in lieu of sensation-seeking theory would suggest that individuals were not specifically seeking these environments because of a desire for excitement, but rather, the environments available to MSM (typically restricted to environments that include alcohol use) are influencing their behavior. This seems to be particularly relevant for MSM in international settings who may have limited options for social environments in which they feel safe and affirmed. The sentiments expressed by MSM in our study may reflect a shortage of safe spaces for

sexual and gender minorities in their respective cities and a reliance on alcohol-serving venues to fill that need [36, 37]. This finding is also consistent with several articles in recent years, which have identified the ways in which venues may influence HIV sexual transmission behaviors [18]. Recent political and social action has called for the creation of more safe spaces and/or policies that are more inclusive of MSM. These societal changes have the potential to reduce the reliance on nightclubs and bars for social venues, and thus would change the environment, and reduce both alcohol consumption and HIV sexual transmission risk behaviors for this population [7, 18, 36, 37]. These findings suggest the importance of community and safe spaces outside of bars and nightclubs for MSM internationally. Efforts to reduce HIV transmission for MSM may benefit from community capacity building to create programs and environments for socializing that are not in alcohol-serving venues.

### **Limitations and Future Directions**

There are some limitations to note in the present study. First, although participants at each site came from a large and diverse group, the sample is limited by representing only three international cities. Although similar principles may apply to a more generalizable population, it is not possible to know whether there are additional factors in other global settings that may not be represented in the current sample. The qualitative interviews utilized semi-structured interview guides, which means they had sufficient similarities to be comparable across sites, but due to language differences, there might have been slight differences in interview guides. Additionally, while all interviews took place in the participants’ native language, they were translated into English for analysis. We recognize it is possible that there was some loss of information in the transcription process. We believe this potential limitation was balanced by the use of investigators across sites who were able to provide input on the quotes and meaning in this manuscript. Finally, the study included a set of structured prompts on the interview guide and data were secondary data. Because the interview guide was limited by the questions included at the time of data collections, findings may not represent the depth or full range of sociocultural factors that influence drinking, drug use, and sexual behavior among PLWHA across international regions and sexual orientations. Although this study did not aim to evaluate substance use and ARV adherence, this theme emerged during our analysis. Future qualitative studies should examine this relationship to contribute to the impact of substance use on ARV adherence and TasP.

### **Conclusion**

This study describes several ways in which alcohol use may contribute to sexual transmission of HIV/AIDS across

international settings, including cognitive effects of substances and interpersonal dynamics in HIV sexual transmission risk behaviors. Participants across risk group and international settings reported similar experiences of alcohol impairing cognitive abilities through expectancies, impaired decision-making, loss of control, and less concern for others, which suggests that evidence-based interventions should address alcohol use within the context of secondary prevention of HIV in global settings. The unique themes identified highlight potential focal points for cultural adaptations of these interventions such as condom negotiation skills and discussion of power dynamics for heterosexually partnered women, discussing the ways in which substances can change cognition and behavior in Brazil, and addressing the influence of venues and alcohol expectancies in MSM sexual transmission risk behavior. These more nuanced findings elucidate specific ways in which substances may be operating within these groups and also highlight the importance of doing local work to inform interventions for HIV prevention and treatment internationally.

**Acknowledgments** The authors would also like to acknowledge the staff at the HPTN 063 study sites for their contributions to the study.

**Funding** HPTN 063 was funded by the Division of AIDS (DAIDS), National Institute of Allergy and Infectious Disease (NIAID), National Institute on Drug Abuse (NIDA), and the National Institute of Mental Health (NIMH) under Cooperative Agreement # UM1AI068619. The content of this article is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health (NIH) or the HIV Prevention Trials Network (HPTN). Dr. Sherman was also supported by the Johns Hopkins University Center for AIDS Research (1P30AI094189). Dr. Mayer was also supported by the Harvard University Center for AIDS Research (HU CFAR) NIH P30AI060354 and Dr. Safren from the University of Miami CFAR (P30AI073961). Additionally, some of the author time was supported by NIH grants 9K24DA040489 (Safren) and 1F31MH113481 (Rogers).

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

## Statement of Human Rights

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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