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ORIGINAL PAPER

Risk Factors for and Consequences of Substance Use in Post-Conflict Liberia: A Qualitative Study

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Abstract Substance use has a significant impact on post-conflict populations; however, little is known about this critical issue in Liberia. This study examined the current risk factors for and consequences of substance use in Monrovia, Liberia. In-depth interviews were conducted with 20 substance users and 21 key informants. Findings support that Liberia's civil war played a role in increasing substance use, but also that additional risk factors continue to generate substance use today. This study provides insights into the roles of civil war and additional risk factors for substance use in Liberia. Recommendations for substance use-related policies and programs are provided.

Keywords Substance use · Drug use · Post-conflict · Qualitative · Liberia

Background

Substance use is an important global public health issue that is associated with other risky behaviors, violence, and poor mental and physical health (Degenhardt et al. 2013). Post-conflict populations are at increased risk for substance use as a result of traumatic experiences and a breakdown of the societal fabric (UNHCR and WHO 2008; Ezard et al. 2011). Liberia experienced a civil war from 1989 to 2003, which had devastating effects on the human population, economy and infrastructure of the country. By the end of the war, 655,000 people were registered as internally displaced persons (IDPs) or refugees in neighboring countries (United Nations 2006). The per capita GDP is estimated to have declined 90% from US$1,269 in 1980 to $163 in 2005 (United Nations 2006). During the war, there were no functioning public utilities, leaving Liberians without access to electricity, water and basic sanitation facilities, and health care for many years. Approximately 15,000 child soldiers,

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including girls and boys, fought on all sides of the conflict (Human Rights Watch (HRW) 2004). Following the civil war, Liberia is transitioning out of a post-conflict, humanitarian crisis stage and beginning to work towards long-term development goals. At the same time, the nation continues to struggle with the legacy left by the war. Even in 2015, Liberia ranked 177 out of 188 countries in the UNDP Human Development Index, which is a composite measure representing health, education, and standards of living (UNDP 2015).

Substance use was reportedly common during the war with 44.9% and 12.3% of male and female combatants reporting engaging in such behavior, respectively (Johnson et al. 2008). In the post-war context, substance use is thought to be a key factor contributing to increased interpersonal violence, sexual risk-taking, violent crime and other problems in Liberian society (Harris et al. 2011; Cheng 2009).

Despite the importance of this issue, few studies have examined substance use in Liberia. The majority of available evidence was gathered in the immediate post-conflict period, often using surveys that were not adapted or validated for the Liberian population and frequently did not address the populations most at-risk for substance use. Research conducted in the immediate post-conflict period may no longer be relevant given the rapidly changing environment. In 2005, the United Nations High Commission for Refugees (UNHCR) and the World Health Organization (WHO) conducted a rapid assessment of substance use among conflict-affected populations in Liberia (UNHCR and WHO 2006). The study focused on displaced and refugee populations and identified risk factors for substance use that are less likely to be present today, such as displacement, dispossession and livelihood restriction due to conflict. More recently, a survey was conducted among 802 secondary school students in Monrovia, Liberia's capital, which showed that 51% and 9% of students reported using alcohol and marijuana, respectively (Harris et al. 2011). However, this study only captured information about in-school youth. Because over 80% of secondary school-aged youth are not enrolled in school (UNICEF 2015) and lack of education can increase vulnerability to engaging in high-risk behaviors, this sample likely underestimates the true extent of the problem. The authors note that this study was further limited because the instrument used to assess substance use was not piloted and may have lacked cultural appropriateness and/or relevance.

Substance use is not well understood in Liberia. The lack of current and culturally-specific information about substance use makes it difficult to conduct meaningful research on this issue and develop policies and interventions to serve affected populations. A number of studies have explored substance use patterns in other West African countries such as Nigeria (Okulate and Jones 2006; Adamson et al. 2010; Oshodi et al. 2010). While such studies can be useful in outlining questions and potential issues in Liberia, the history and post-conflict economic conditions and social backdrop make Liberia a unique setting, and research findings from other nations may not apply to Liberia.

While there is growing recognition that substance use is a problem in Liberia, the magnitude and nature of this problem are largely unclear. In fact, the need for this study emerged through ongoing interactions with health care providers and law enforcement personnel within a larger mental health research program. Through confusion over local terms and drug use slang, what drugs were actually available and being used, what factors contributed to substance use, and what consequences were resulting from substance use, it became clear that more information on the context of substance use in Liberia was desperately needed. This study aims to qualitatively describe the context of substance use in Liberia and document the perceived risk factors for and consequences of substance use, both for users themselves and the broader community.

Methods

Because substance use is complex, context-specific and difficult to quantify, qualitative methods were chosen to characterize the phenomenon, and to allow unanticipated concepts to emerge. In addition, there are currently no validated measurement tools for substance use in Liberia (Harris et al. 2011); hence, the use of qualitative methods was ideal for documentation of the terminology and meanings employed by substance users. We use the term 'substance use' to refer to the use of marijuana and illicit drugs, such as cocaine and heroin, as well as the illegal or improper use of pharmaceuticals, including benzodiazepines. Alcohol use is an important related behavior; however, alcohol is legal and less stigmatized, thus the dynamics associated with its use and the related consequences are likely different from those linked to other illegal substances. Therefore, data about the context and patterns of alcohol use were not the primary focus of this study.

This study was part of a collaboration between Yale University, Mother Patern College of Health Sciences in Monrovia, and the Ministry of Health and Social Welfare of Liberia. It was approved by the Institutional Review Boards of Yale University and the University of Liberia and the University of Liberia. Our research team was composed of individuals with extensive experience with qualitative research and with research, programmatic and clinical work with substance users and people with mental health problems. Specifically, the principal investigator (MLP) has a Master's of Public Health and experience providing services to substance users and working in low-income and post-conflict countries. The project was supervised by and carried out by

a local Liberian psychiatrist with clinical experience (BH), two clinical psychologists who oversee and direct several mental and sexual risk behavior projects in Liberia (TAC and NBH), an anthropology doctorate student (KM) and a Master's of Public Health student with experience living and working on health-related programs in Liberia (JD), and a health service researcher with expertise in qualitative research (LC).

Data Collection

Data were obtained from in-depth, semi-structured interviews with current and former substance users and key informants in Monrovia, Liberia. Key informants were identified through social and professional networks, and substance users were identified through referrals made by key informants from social service organizations and from other substance users. Participants were recruited with the goal of establishing an information-rich, diverse sample (Patton 2002), particularly in reference to characteristics such as organization type for key informants and gender, drug of choice and geographic location for substance users. The adequacy of the sample size was determined using the principle of theoretical saturation, the point at which no new concepts emerge from a review of data drawn from a sample that is diverse in pertinent characteristics and experiences (Glaser and Strauss 1967; Morse 1995).

Substance users were eligible based on their current or former substance use. Staff from four non-government organizations (NGOs) providing services to substance users assisted with recruitment. Potential participants were given information about the study and invited to the NGO offices for the interview. Key informants were selected based on their current or previous professional roles or community positions, which gave them insight into relevant topics. Interviews were conducted in July and August 2012, either by the American principal investigator or by two Liberian research assistants with training in qualitative methods. Interviews were conducted in Liberian English. The data collection team engaged in an ongoing process of discussion and joint decision-making among multi-cultural study team members to enhance reflexivity (Malterud 2001) in order to maintain awareness of the possible implications for analysis including biases based upon their background and/or position.

The interview guides were developed by the paper authors, with review and input from local researchers and clinicians at Mother Patern College of Health Sciences in Monrovia and policy makers and program managers at the Liberian Ministry of Health and Social Welfare. Interviews addressed topics such as: trends in and terminology for substance use in Liberia; risk factors for substance use; consequences and benefits of drug use; manifestations of substance dependence; availability of substance use services; and barriers to accessing or providing services. The interview guides are available in online annex 1. This paper presents findings from the analysis of a subset of data related to: the current context of, perceived risk factors for, and consequences of substance use.

Sample

Among the substance users interviewed (n = 20), 65% were male (Table 1). Participants ranged from age 18 to 35, with an average age of 25.7 years (SD = 5.0). They were recruited from and interviewed in a variety of communities in greater Monrovia. Participants represented a wide range of experiences, and included current and former substance users as well as participants using different primary substances, including cocaine, heroin, benzodiazepines or other drugs. Key informants (n = 21) were 95% male and included staff from government agencies, NGOs, hospitals, and health clinics, as well as law enforcement officials, and community members.

Data Analysis

Interviews were audio recorded and transcribed, either by the principal investigator or by a local research assistant. The team discussed terminology and linguistic questions

Table 1 Participant characteristics

Characteristics	n (%)
Service provider characteristics	
Role or participant type	
NGO staff	10 (47.6)
Government or law enforcement official	5 (23.8)
Health clinic staff	5 (23.8)
Community member	1 (4.8)
Gender	
Male	20 (95.2)
Female	1 (4.8)
Substance user characteristics	
Age (mean, SD)	25.7, 5.0
Gender	
Male	13 (65.0)
Female	7 (35.0)
Substance use status	
Current user	16 (80.0)
Former user	4 (20.0)
Substances used regularly	
Heroin	13 (65.0)
Cocaine	11 (55.0)
Marijuana	13 (65.0)

to ensure accurate understanding and interpretation of the data and jointly reviewed all transcripts to ensure accuracy. Preliminary findings were presented to and discussed with faculty and research stakeholders at Mother Patern College of Health Sciences in Monrovia. Transcripts were coded by a multi-disciplinary four-person research team, using the constant comparative method to derive a code structure from participant responses (Miles and Huberman 1994; Glaser and Strauss 1967). The research team members independently coded batches of transcripts and then met to agree upon standard codes and to ensure inter-coder reliability. All transcripts were coded by at least two researchers and the coding key was adjusted iteratively. Through this process, the coding structure was refined until a final, comprehensive coding structure was developed, and then the final codes were applied to all transcripts. Qualitative analysis software (ATLAS.ti 6.0) was used to facilitate data organization and retrieval (Richards 2002).

Results

Substances Used and Terminology

Interviews explored the drugs commonly available and the names used for different drugs by substance users (Table 2). According to most participants, marijuana is widely available in Liberia today, as are heroin and crack cocaine to a lesser extent. Substance users and law enforcement officials reported that heroin is more available now than in the past. 13 of the 20 substance users interviewed reported that heroin was their primary drug of choice. Benzodiazepines and amphetamines were reported as having been common during the civil war, but are less widespread today. Participants also reported that injection drug use is not common in Liberia today. Most substance users were familiar with injection, but few of them reported using or having seen others using drugs in this way.

Based on accounts of participants, the use of multiple substances concurrently and the mixing of substances are common practices in Liberia. This was reported as being linked with economic circumstances of participants, who are often unable to afford their drug of choice. For example, a number of participants reported that they preferred to use crack cocaine, but would often 'drop down' to heroin if they could not afford crack cocaine. Perhaps due to the degree of multi-drug use, participants did not often distinguish between different drug classes in describing risk factors and consequences of drug use.

Risk Factors for Substance Use

This section explores the range of factors that put individuals at risk for substance use in Liberia.

War-Time Experiences

A common narrative within the study sample was that the war directly generated increased substance use because young people who fought in the war were given or forced to use drugs in order to improve their performance in combat.

> 'The effect came about by the war. A lot of young people were drugged to be able to go to the front line to fight, it make them brave… Young people got involved at the age of ten, nine, twelve...'—Key Informant (KI) 111, NGO staff.

Substances were utilized not only to improve performance in conflict, but also as a coping mechanism to deal with the psychological consequences of experiences of violence, mistreatment or other traumatic events during the war. Finally, during the time of the war, a lack of institutions and law enforcement allowed for the establishment of drug trafficking networks, which many participants believe still continue today, increasing access to illicit substances.

Social Risk Factors

At the same time, participants uniformly agreed that substance use is increasing, even as the direct experience of war becomes more distant, suggesting that other risk factors may be at play. Participants reported that many of the substance users in Monrovia today are not people who began using drugs during the war, but have been initiated into drug use

Table 2 Key drugs used in Liberia, with Liberian English terminology

Drug	Street names in Liberia	Street names for unit
Marijuana	Opium, grass, ganja, weed, cannabis, bazoga	Load, parcel
Heroin	Italian white, tie, rolling tie, market, Halloween, brown brown, dugee	Knot, nut
Crack cocaine	Coke, coco, crack, rock	Rock
Benzodiazepines	Diazepam, bubble, ten–ten	Tablet
Amphetamines	n/a	n/a
Inhalants	Slide, snuff	n/a

since that time. In particular, participants suggested that former combatants do not make up a majority of the substance users, but that others have adopted the habits associated with former combatants.

> 'Some of them are ex-combatants, but some of them are not ex-combatants. But they join these guys; they adopt the ex-combatant behavior. That is the behavior that all of them carry… violence, use drugs, stealing, hijacking.'—KI 117, NGO staff

A prominent explanation for how young people who are not former combatants become involved in substance use was that they have been influenced by their peers or use drugs as a mechanism for solidifying or maintaining their relationships with others.

> 'I always wanted to be in the crowd with the big boys… That's how I got into drugs… In order to hang around them and to feel good, you know in order to be one of the big boys, you have to smoke.'—Substance User (SU) 220, Male, Former marijuana, heroin, and cocaine user, Age 26

A reported underlying cause for this dynamic was the separation of families and death of family members during the war, which contributed to a breakdown in social support and traditional social networks. Because a large portion of the youth population is perceived to be living in the absence of family or other positive social influences, it was suggested that young people may come to rely on peers and friends in their communities for support and communion.

In addition to the increased importance of relationships with peers, stories also emerged about older substance users who recruited youth to steal and carry out other criminal activities in exchange for drugs to support their drug habit. These relationships also appear to develop in response to the absence of other social supports.

> 'They got people in the ghetto who have been using [drugs] for a long period of time but they want to build somebody who is younger than them to use them to do things. So they provide [drugs] for them and when they got high they tell them what to do, and they do those things for them to get more money to use drugs. That's how people get involved with using drugs.'—KI 109, NGO staff

Economic Risk Factors

Participants also described the impact of economic conditions on the risk of substance use. Many of the substance users interviewed received no economic support from their families, even from an early age, putting them at risk for engaging in crime and sex work, failing to complete their education, and living in poor conditions that increased their exposure to substance use. Many participants described a whole generation of youth that has had little to no access to education because the costs of education are prohibitive and due to disruption of education during the war. Substance users and key informants placed a high value on education and viewed basic education as essential for gainful employment.

> 'I out education, no support for me to go to school. That's why you see me behind friend [following the example of friends] where not supposed to be behind. That's what put me into this type of life.'—SU 206, Male, Current heroin and marijuana user, Age 28

Consequences of Substance Use

> 'I observe that our children have been destroyed by drugs. Future generation has been destroyed.'—KI 104, NGO staff

All participants viewed substance use as having severe negative consequences in Liberia and this section describes the consequences that were perceived to be most significant.

Individual Consequences

Perhaps the most obvious or immediate consequences of substance use are the ones that affect the lives of the individuals that engage in these behaviors. Individual-level consequences including addiction, poor physical and mental health, and social disruption, are described here.

Addiction Many participants described experiencing both severe physical and psychological symptoms of withdrawal when they were unable to obtain drugs, for example due to lack of funds. In this study, the physical symptoms of withdrawal that were described by participants included: nausea, vomiting, stomach ache, diarrhea, loss of bladder and bowel control, running nose, muscle pain, fever, shaking and shivering, loss of appetite, sleeplessness, cold feeling in the body and itching. This set of symptoms was referred to as 'june.'

> 'The drugs people, they can call it june when you not smoke… They can say you're june. When you not smoking, it can start putting that type of cold in you… Your skin can be itching. You go lay down whole day, sleep can never get in your eyeball if you not smoke that drug... I start feeling sick that type of way. Soon I can start vomiting all type of green water.'—SU 215, Male, Current heroin user, Age 18

The term *June* was used to describe withdrawal from any type of drug, and even when prompted, participants did not

distinguish the characteristics of withdrawal from different drugs. Among people who were trying to stop using drugs, they described attempts to 'flush' the drugs out of their system. A strategy that people commonly mentioned for coping with *June* was to take a 'drip' of intravenous fluids from a clinic or hospital; however, this strategy was not often available to substance users because of limited financial and social resources. Others had taken antibiotics or anti-malarials to recover from *June*, and one participant had used oral rehydration salts to cope with withdrawal.

Others discussed addiction and withdrawal in terms that are more consistent with psychological dependency. For example, participants reported that substance use causes changes in people, such as not thinking like a 'normal person,' changes in behavior, and not feeling 'human.' Other participants reported that addiction and withdrawal could be overcome relatively easily.

> 'The drugs thing here, so long two days pass, you not smoke it. That means you already now forget about it. As long as two day pass, it not get in your mouth. Some people can leave it.'—SU 214, Female, Current marijuana, heroin, and cocaine user, Age not available

Poor Physical Health Many substance users described personal experiences with the physical effects of drug use beyond symptoms of withdrawal, and all participants shared stories about peers, friends, and acquaintances who had become seriously ill and attributed the illness to substance use. Participants described the general physical effects of substance use with phrases such as: 'reduce the body' and 'drop the body,' which refer to weight loss, or 'body is turning black,' referring to poor hygiene. A number of specific illnesses or conditions were considered to be related to substance use, including tuberculosis, skin disease, infections, injuries, and chronic disease such as cancer. Substance users reported limited access to healthcare, and often sought medication or care by going directly to a pharmacy, describing their symptoms to the pharmacist and buying antibiotics or other medications without ever seeing a trained healthcare professional. Several participants described frustrations or embarrassment around feeling judged and discriminated against by healthcare professionals for their substance use, which may limit the ability of substance users to get support to stop drug use or address other related health issues.

Mental Health Issues Mental health issues were described as both a cause and a consequence of substance use. On one hand, many people described substance use as a way to self-medicate mental health issues.

> 'Some people take drugs to move sad from on their mind… Some people take drugs because they are disturbed.'—SU 213, Male, Current marijuana, heroin, and cocaine user, Age 22

Mental health issues are heavily stigmatized in Liberia. Stigma and incomplete understanding of the underlying issues may make people less likely or able to seek professional assistance for coping with mental health problems.

On the other hand, Liberian health professionals often referred to 'drug-induced psychosis' as one possible consequence of substance use.

> 'The drugs can leave them in the psychotic state… Some of these drug-induced psychosis patients and they hear voices, they hallucinate a lot… There are some that are aggressive behavior. They are untidy. You can deduce that they are involved with drugs.'—KI 115, Health clinic staff

Based on conversations with some key informants, it appears that some of the Western mental health terminology, such as 'drug-induced psychosis', has been adopted in Liberia, though additional research is needed to understand whether this terminology is used in Liberia in the same ways as in Western clinical settings.

Social Consequences Another important theme in interviews was the idea that substance users can become increasingly isolated from their families and communities as a result of their substance use. Although lack of family support was described as a key risk factor for the initiation of substance use, other substance users do have family or other social supports at the time when they initiate substance use. For this latter group, substance use and related behaviors often lead to substance users being disowned by families or rejected by communities.

> 'If I had a son that is selling drugs, they next thing I would do is throw him out of my house… No one want to see their family lean on drugs and in the street. But because of the frustration that drug use place on the family members, it cause them to avoid those family members.'—KI 109, NGO staff

Additionally, many participants explained that social isolation can encourage communities of substance users to form strong bonds with their peers. Because the most important relationships in the lives of many participants were with other substance users, it was even more difficult for them to seek lifestyle change or access services because it might mean losing these relationships.

> 'They are kind of ostracized, they have been bullied, they have been labelled different label and because of that they feel not too fine with the community… They feel safe, free with their peer. And the more you stay

there… the more [drugs] you take.'—KI 106, NGO staff

Community-Level Consequences

Substance use can also have significant consequences for community members and the family members of substance users, particularly in the form of crime, violence and sexual risk. In considering consequences of drug use, most of the key stakeholders interviewed considered the consequences of all drugs together, without making any distinctions between drug classes. However, based on the interviews with current and former drug users, the consequences of crime and violence seem to be primarily associated with cocaine use, while sexual risk may relate to the use of many types of drugs.

Crime Both key informant and substance using participants discussed crime as being the most salient consequence of substance use with impact on individuals and the broader society.

'The drugs can make you brave to go do evil thing. The drugs can make you brave to jerk [steal] somebody phone… You only thinking how to just support the drug habit… So long you june, if they tell you to do it, you will. The person will say my man if you want smoke drugs, you got to go steal to come to smoke.'—SU 207, Male, Current heroin and cocaine user, Age not available

The crime described included primarily different types of theft, such as armed robbery, opportunistic theft, stealing from family members, and street scams. Several participants described the different forms of crime in terms of 'shifts', with different shifts representing different types of crime:

'They have what they call first shift, second shift, third shift. First shift means that… if you a little bit careless with your wallet, with your purse, with your bag, they carry that… The second shift are those who do armed robbery at night… The third shift is those who just go around pretending like…they're selling, and you leave your buckets or clothes outside. They pick them up, take them and they sell it.'—KI 104, NGO staff

Substance use was described as both a cause and consequence of crime. On one hand, people may begin using drugs and then engage in criminal activities to get money to continue substance use. On the other hand, people may begin stealing as a result of extreme poverty, and then start to use drugs as a way to 'be brave' to commit further crimes. Regardless of which behavior is initiated first, crime and substance use were described as very closely related, with each behavior exacerbating the other. This relationship was most often described in relation to crack cocaine.

'Cocaine really spoils you… You just want to get money, so many criminal activities just to get money to buy cocaine to take in.... [Cocaine] make you to carry some criminal activities like armed robbery, stealing, jacking people's phone to get money.'—SU 219, Male, Current marijuana and benzodiazepine user, Age 19

Participants emphasized the negative impact that substance-related crime has on society, creating an environment of fear and mistrust and heightening stigma.

'Once there's an area that people are taking drugs, people don't move around freely. Your own car, you're afraid to park it… A lot of people have steel gates to their door. Because of drugs… people in Liberia are living in fear.'—SU 220, Male, Former marijuana, heroin, and cocaine user, Age 26

The close association of crime with substance use, whether real or imagined, may have broad-reaching impacts on the success of development and commerce in certain neighborhoods and on the ability of substance users to seek support and help.

Violence Another consequence with broad-reaching effects is the degree of violence that results from substance-related dynamics. Violence was often discussed as being closely related to substance use and crime, and this relationship exists in several ways. First, community members have become reluctant to report crime to law enforcement because of a lack of trust in their ability or willingness to respond. Therefore when people—often substance users—are caught stealing, community members often resort to violence to bring justice to the offender. Second, the distribution of stolen goods within groups of substance users is often associated with violence, particularly in situations where substance users are under stress from withdrawal symptoms and may be more easily angered.

'We have problem because sometime we want come from hustling, when we get out money, they not share it. They want take all for theirself. Ourself, we jump into fight. We start fighting.'—SU 213, Male, Current marijuana, heroin, and cocaine user, Age 22

Participants also reported that substance use makes many people feel 'vexed' or angry, and that they can easily become involved in fights with others. In particular, the family members of substance users are often the victims of violence.

'Some people smoke drugs, get angry faster and the man can't control his temper because he in drugs. And they can beat on they wife, beat on the children.

Get extra mad.'—SU 204, Male, Former heroin and cocaine user, Age 31

Key informants were likely to take this link between drugs and domestic violence as given or obvious. For example, one government employee said, "If you have a girlfriend, you begin to beat on the girlfriend because you start taking drugs." Statements like this one suggest that there is a perception that intimate partner violence is widespread within substance-using communities.

Sex Work and Sexual Risk Whereas men were described as often engaging in stealing and other criminal activity to support their substance use, female substance users were described as earning money through sex work. Women who engage in sex work are known as 'short time women', 'hobojoes', 'street women', and 'prostitutes'. Although the sample of interview participants was not representative of all substance users, it is note-worthy that six out of seven females interviewed reported engaging in sex work.

'Men can go and steal for the money. They take it. But the women can go and do the prostitute work and come smoke.'—SU 203, Male, Current marijuana, heroin, and cocaine user, Age 24

Most participants described the clients of sex workers as being substance users from the same community as well as non-substance users who live in other communities and are unknown to the sex workers. These complex sexual networks create opportunities for sexually-transmitted infections (STIs), including HIV, to spread within and beyond substance-using communities.

Like crime, sex work was described as both a risk factor for and a consequence of substance use. In some cases, women become addicted to drugs and begin engaging in sex work in order to obtain money for drugs. In other cases, women begin engaging in sex work because of poverty, unemployment or other financial need, and begin substance use to cope with the negative and traumatic experiences associated with these behaviors.

'The girls go and take the drugs because they do not want to feel pain. They want to have that activity, to be strong, to withstand, to be able to go through as many persons.'—KI 102, Government employee

Participants reported that the standard price charged by a sex worker is 50–100 Liberian dollars (LD) (72LD is approximately USD$1), but clients are often willing to pay considerably more (200–300 LD) to have sex without a condom, incentivizing riskier sex. For most sex workers, but perhaps particularly for those that are engaging in sex work to support substance use, the opportunity to earn additional money may out-weigh the risk associated with unprotected sex.

'Some of them they don't use condom because they want higher money… Some of them can do the man and woman business [sex] for sixty, seventy, some of them hundred [Liberian] dollars, with condom. But some of them they can't [don't] do it with condom… they can say 'flesh to flesh' because they want for the man to enjoy it so the man can give them enough money like maybe two-fifty or three hundred.'—SU 215, Male, Current heroin user, Age 18

In addition to sex work, sexual risk can be increased by substance use in a number of other ways, for instance, by reducing inhibitions and limiting one's ability to take protective action.

'The drugs, when you taking the drugs, it will make you, you will not even think about whether the person having sickness, you just want to have something to do just because you want the money to go do something what you not supposed to do.'—SU 209, Female, Current marijuana user, Age 33

Some participants also reported that substance use increases one's sexual drive. Increased sexual drive was linked to substance users being less discriminating in selecting their sexual partners.

'Some [drugs] also enhances their sexual prowess, their sexual drive. They tend to go for sex for a longer period under the influence. That applies to the women and the men... If the drug pushes a person into sex, he does not have a sexual partner or sex partner, he goes for sex in some of these motels.'—KI 119, NGO staff

Discussion

This study has identified key themes in the reported risk factors for and consequences of substance use and captured language used by substance users. Given the confusion observed among health care workers, law enforcement personnel, and even drug users about the types of drugs being used and the consequences of this drug use, documenting the language used for different drugs is important. For example, that marijuana is often called "opium" has led some to surmise that heroin is not widely available in Liberia, though our findings suggest otherwise. These results suggest that the prevalence of heroin use in Liberia should be explored through quantitative methods. While the use of cocaine may be more expected in Liberia, since it is well-documented that West Africa has been a transit point for cocaine smuggling from Latin America to Europe

(International Narcotics Control Board 2012), participants in this study suggested that heroin use is also widespread. Furthermore, the language used and perceptions of participants in this qualitative study can inform the development of further research tools.

The risk factors for substance use described in this study include not only the factors directly related to the war in Liberia, but also emergent social and economic factors that continue to generate increases in substance use today. The consequences of substance use, as described by participants, impact individual substance users as well as broader communities in Liberia. Individuals experienced addiction, poor physical and mental health, and social consequences such as isolation from their families. Substance use was described to generate consequences for the broader population, through increased crime, violence, and sex work.

Brofenbrenner's social ecological model (1979) may be a relevant theoretical framework to aid in the interpretation of our findings, as it has previously been used to study youth affected by adversity in post-conflict sub-Saharan Africa (Betancourt et al. 2013; Boothby et al. 2006). Brofenbrenner's work emphasizes environmental influences at different nested levels, ranging from the individual to macro-level social systems—i.e. the family, peer, community, and wider-societal levels. With regards to substance use in Liberia, we found that risk factors were similarly nested according to the individual (e.g. coping with the psychological consequences of experiences of violence and poverty); peer/family (e.g. solidifying relationships with others, especially given separation from families during the war); and macro levels (e.g. dealing with the effects of poverty, lack of education, unemployment). An ecological framework will be useful for considering multilevel, long-term interventions that leverage protective factors at multiple levels to reduce substance use in Liberia and improve the overall wellbeing of substance users themselves.

Our findings highlight some similarities between the Liberian context and other post-conflict settings. Experts have recently pointed out how many researchers and advocates have focused on the impact of direct war exposure on health outcomes while failing to consider the contributions of stressful social and material conditions (Miller and Rasmussen 2010). Such an approach may tend to overlook the factors that continue to perpetuate substance use in post-conflict settings even after the primary conflict has ended, as shown by this study. More specifically, researchers have also exposed the lack of services and coping mechanisms to address mental health as well as the loss of social networks as key factors leading to substance use in Northern Uganda (Blair et al. 2015). Some of the negative consequences of substance use reported by participants in this study, such as gender-based violence and economic problems, have also been highlighted elsewhere (Ezard 2012).

This research has important implications for policy-makers and practitioners in Liberia and other post-conflict settings. During the civil war, many of the risk factors for substance use were directly related to the conflict, which may have led policy makers to believe that substance use would decrease after the conflict. However, this research reveals that a new set of risk factors may be generating increasing levels of substance use. The ongoing substance use and the severe consequences of substance use, both for individuals and for broader communities, demand action. In order to promote development, safety and well-being, our data suggest that substance use be addressed through supporting education and family strengthening for younger children and providing treatment and vocational training for older youth. Unfortunately, empirically-supported interventions appropriate to the context of West Africa generally, and Liberia specifically, are lacking. While a youth behavioral intervention to promote education and employment readiness, the Youth Readiness Intervention (YRI), has been developed and shows promise in this regard in Sierra Leone (Betancourt et al. 2014; Newnham et al. 2015), it has not been adapted for Liberia and does not directly address substance use.

A specific issue that merits attention from program and policy representatives is the reported overlap of substance use and mental health problems, coupled with a strong community stigma towards these issues. The high rates of PTSD and depression following the armed conflict (Johnson et al. 2008), and the continuation of family and community violence (Callands et al. 2013), appear to contribute to substance use. Further, community stigma was described as a strong barrier preventing substance users from obtaining treatment and care, or leading them to seek questionable, alternative forms of care. Further, reports of discrimination against substance users from healthcare providers, as well as potential inadequate training in mental health and substance use assessment and treatment, suggest that barriers to care for substance users also exist within the healthcare system. Efforts to increase the capacity and quality of the mental health treatment system, as well as efforts to reduce community stigma towards mental health problems, are important for improving access and utilization of treatment services by substance users.

In Liberia, awareness and understanding of substance use are marginal and an infrastructure to understand or treat substance use is in its infancy. Liberia has one psychiatric hospital, Grant Hospital, which maintains a capacity of approximately 40 patients. There is one practicing psychiatrist in country and no psychologists. Mental health care is generally provided by health care workers in community clinics with little or no training in mental health or substance use treatment. Recently, the Carter Center provided a mental health training program with the goal of training 150 Liberian health care workers to deliver basic mental

health services. This training, while urgently needed, provided little training around substance use and addiction. In fact, given the strong stigma toward mental health problems, many Liberians (both patients and providers) blame substance use for any perceived mental health problem, and the diagnosis of "drug-induced psychosis" is common regardless of patient history of substance use. On the community side, there are few organizations in Liberia that provide supportive services to substance users, and these have very little funding and no staff with formal training specific to substance use.

In this context, the high prevalence of drug-induced psychosis in Liberia, as reported by participants, is an issue that merits further research. Psychosis has been linked to the use of a number of drugs, including amphetamines, ketamine, heroin, freebase cocaine and marijuana (Rounsaville 2007) but this remains an uncommon and generally transient diagnosis in Western contexts and there is debate about the appropriate diagnostic protocol for people with comorbid substance use and psychosis (Fennig et al. 1995; Paparelli et al. 2011). In contrast, mental health clinicians and other programmatic staff interviewed for this study reported that large percentages of their client populations are suffering from what they call "drug-induced psychosis." However, it is not clear that the general assessment of psychosis and substance use in Liberia adequately differentiates co-occurrence from causal connections. The frequency with which drug-induced psychosis is suggested in Liberian healthcare settings raises the question of over-attribution of the diagnosis, particularly given the lack of training in mental health and substance use problems among health care workers and the lack of appropriate diagnostic tools developed or adapted for the Liberian context. In fact, given the lack of training and experience with severe and persistent mental illness among Liberian health care workers, many of the erratic and disorganized behaviors that can occur within a psychotic episode may be incorrectly attributed to drug use. Because distinctions between substance-induced disorders and other psychiatric conditions could have important implications for the focus of treatment efforts (Schuckit 2006), future research should investigate the root causes of psychosis among these patients in Liberia to confirm whether the diagnosis of drug-induced psychosis is appropriate given the latest research and clinical knowledge.

This study also has other more broad implications for research about substance use in Liberia and in post-conflict settings in general. While this study provides a foundation for the development of measures and hypotheses for future research, quantitative studies are needed to estimate the strength of the association between the risk factors and consequences presented here and to assess the size and demographics of the population of substance users as well as those at risk of engaging in such behaviors and the demographics of this population. This work also highlights the need for supplemental research in a number of areas. This research focuses only on substance use in Monrovia, Liberia, which is the capital and largest city in Liberia. While several participants indicated that substance use is occurring throughout the country, substance use patterns and risk factors may be different in other areas of the country. Research should also explore individual, community, and cultural factors that protect individuals from initiating substance use rather than focusing on risk factors and problem behaviors. Finally, given the impact of the civil war on Liberia's healthcare system and the lack of services and trained healthcare providers to address substance use issues, key priorities include: (1) developing task-sharing approaches whereby non-specialists can be trained to diagnose and offer initial mental health and substance abuse treatments to support the over-worked and under-staffed Liberian health system; (2) developing effective, empirically-informed substance use prevention efforts, as treatment resources are scarce; and (3) developing and validating psychometrically sound assessment tools to support diagnosis of addiction and mental health disorders and evaluation of key treatment outcomes.

This research should be interpreted in light of several limitations. A qualitative method was chosen for this study, and as such, the sampling strategy was meant to ensure that participants represented a range of experiences and perspectives, but was not meant to be representative of all substance users in Liberia. Thus, the results cannot be generalized broadly. It should also be noted that because of recruitment methods and the difficulties associated with accessing a stigmatized group, the sample of substance users primarily, but not universally, includes individuals who were already receiving some type of services or trying to limit their substance use. Additionally, we did not draw a large enough sample to allow for systematic comparisons across potentially important subgroups of users (e.g. by gender, current or former substance use or type of substance used), as this was beyond the scope of this exploratory study. Our aim was to provide a broad understanding of the context of substance use in Liberia rather than compare or contrast across variables such as gender, age, or war-exposure. Our findings do suggest that important differences likely do exist across these variables, however, and further research to understand these differences is needed.

Despite these limitations, this study has several important strengths, including that it offers a contextualized view of substance use in a post-conflict setting. Whereas many other studies and programs focus vertically on one issue, such as substance use, mental health, or sexual risk, the broad scope of this project demonstrates the connections between an array of behaviors and experiences. The use of qualitative methods allowed participants to explain the complex relationships between factors in their lives and share perceptions

and experiences in their own words. For example, interview data document the local and cultural descriptions of addiction symptoms. This study was also designed to be useful for practical and programmatic purposes in Liberia and has relevance for other post-conflict settings.

In conclusion, we note that in the context of the recent Ebola virus outbreak in Western Africa, the current study maintains importance as it describes a critical underlying public health issue in Liberia. The Ebola epidemic has brought attention to the need to strengthen health systems, not only for the treatment of infectious diseases, but also to address non-communicable and other basic health issues. Additionally, the crisis surrounding Ebola may create some of the same type of stressors that contributed to substance use during the civil war (e.g. displacement, unemployment, lack of mobility), and the links between substance use behaviors and the Ebola epidemic may be an area for further research. Substance use is one of many health issues that must be addressed by policy makers and practitioners with the goal of promoting health and welfare in Liberia.

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Compliance with Ethical Standards

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

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