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Medical Conditions of Hazardous Drinkers and Drug Users in Primary Care Clinics in Cape Town, South Africa

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Abstract

Research has identified a wide range of health conditions related to alcohol and drug use in studies conducted primarily in developed countries and in populations with severe alcohol and drug problems. Little is known about medical conditions in those with less severe alcohol and drug use in developing countries. We used WHO AUDIT and ASSIST screeners to identify hazardous drinking or drug use in public health clinics in Cape Town, South Africa, and included questions about doctor-diagnosed medical conditions. Using logistic regression we examined the relationship of medical conditions to hazardous alcohol, drug and tobacco use. Those with hazardous substance use had higher prevalence of many health conditions including tuberculosis. Hepatitis B, migraine, chronic bronchitis, and liver cirrhosis. Optimal treatment for some medical conditions may include treatment of underlying hazardous substance use, particularly use of drugs other than alcohol. In these populations, access to substance use treatment is limited and even brief interventions or advice may be useful.

Introduction

Many individuals presenting in primary care have alcohol and drug problems (Magruder-Habib, Durand, & Frey, 1991; Mertens, Weisner, Ray, Fireman, & Walsh, 2005). A growing body of research has identified a large range of medical conditions related to alcohol and drug use, such as hypertension, HIV, hepatitis B and C, liver dysfunction, chronic liver disease, epilepsy, and psychiatric disorders (Chou, Grant, & Dawson, 1996; Edwards & Peters, 1996; Rodgers, 2002; Sikkink & Fleming, 1992; Stein, 1999). Despite this body of research on the association of medical problems to alcohol and drug use and dependence, many gaps remain in the literature. First, there is very little research on the relationship of medical problems to substance for those with less severe substance use problems. This is true despite an increasing international focus on hazardous drinking and drug use—defined by the World Health Organization (WHO) as a pattern of use which confers the risk of “health and other problems” (Henry-Edwards, Humeniuk, Ali, Poznyak, & Monteiro 2003). The World Medical Association has issued a, “Statement on reducing the global impact of Alcohol on Health and Society” in which it characterizes the effects of hazardous drinking, and recommends that all physicians screen for hazardous drinking (The World Medical Association, 2005). WHO also recommends screening for other substances (Henry-Edwards et al., 2003). Compared to individuals meeting dependence criteria, hazardous drinkers and drug users are less likely to be identified in family, work, or legal settings. Screening provides an opportunity to intervene, prevent worsening of problems, and improve overall health (Edmunds et al., 1997; Institute of Medicine, 1990). Other studies in developed countries have found screening and intervention of hazardous drinking to be cost-effective because it reduces medical costs (Fleming et al., 2002).

As the alcohol and drug field is broadening the focus from tertiary to secondary prevention and on the need for screening and intervention in previously underserved populations with less severe problems, there is almost no research documenting the medical problems associated with these less severe problems. This is particularly true regarding the health risks of hazardous drinking and drug use in developing nations. With a few exceptions (Rodgers, 2002) little prior research, particularly that on primary health care populations, has been conducted in developed countries (Magruder-Habib et al., 1991; Mertens et al., 2005). Little is known about this relationship in countries such as South Africa, where, for example, HIV and TB are prevalent. Developing nations may have different patterns of substance use and of health risks from those evident in the developed world (Rodgers, 2002).

Until recently the main body of epidemiological research has focused on alcohol, rather than other drugs. Heavy drinking is associated with liver and pancreatic disease, hypertension, reproductive system disorders, injury/trauma, stroke, and fetal alcohol syndrome (Chou et al., 1996; Dufour & Fe Caces, 1993; Gmel & Rehm, 2003; Gutjahr, Gmel, & Rehm, 2001; Mertens, Lu, Parthasarathy, Moore, & Weisner, 2003; Mertens et al., 2005; Raab, 1992; Rodgers, 2002; Stein, 1999). A few studies also show associations between particular medical problems and specific drugs. Long-term chronic marijuana use is associated with cognitive impairments such as memory and attention problems (Ashton, 2001; Hall & Solowij, 1998), bronchitis (Ashton, 2001; Hall & Solowij, 1998), and cardiovascular effects (Ashton, 2001). There is evidence of cardiovascular complications among cocaine users, (Lange & Hillis, 2001; Rubin & Neugarten, 1992; Stein, 1999) as well as neurological and psychiatric disorders (Grant & Dawson, 1999; Rubin & Neugarten, 1992; Stein, 1999).

We conducted a study in representative public primary health care clinics in Cape Town, South Africa to examine the association of self-reported health conditions to hazardous drinking, drug and tobacco use. If hazardous drinking, drug, and tobacco users have a higher risk of medical conditions (particularly prevalent conditions such as TB and hypertension), as has been found in a U.S. primary care population (Mertens et al., 2005), this may have implications for screening in these settings in developing countries.

Methods

Sample

The study employed a multi-stage clustered, stratified sampling design in which we first sampled clinics, and then patients within clinics. We sampled 14 clinics from the 49 public health clinics providing primary care in Cape Town. In South Africa, the racial categories defined under apartheid – black, colored (mixed ancestry), Indian and white—remain associated with health disparities (McIntyre, Muirhead, & Gilson, 2002) and have a long association with access both to alcohol and to treatment (Mager, 2004), particularly in the Western Cape Province (McKinstry, 2005). Consistent with other South African research, we stratified the clinics by predominant race served by the clinic (80% or more of patients black, 80% or more colored, or serving a diverse population) because of the continuing association of race with health disparities (Mager, 2004; McIntyre et al., 2002; McKinstry, 2005) (for additional details about the sampling and procedures, see Ward, in press.) We recruited for a week at each clinic, sampling equally all days of clinic operations across clinics. We recruited 2,618 patients for the study sample. The study was approved by the institutional review boards of the University of Cape Town, the University of California, San Francisco and the Kaiser Foundation Research Institute.

On data collection days, we constructed a log of all patients who registered, along with their age, race, and gender. Using the log, we selected patients using a sampling fraction to obtain

ten interviews per day. We sampled every patient aged 18–24 since they come to the clinic less frequently and are also particularly at risk for substance use (Ward et al., 2005). The patient log data was also used to construct weights to estimate population-level statistics.

Measures

We developed the questionnaire in English, then translated it into Afrikaans and isiXhosa and checked the quality of the translation by back-translation. The questionnaire was developed during a pilot study (Ward et al., 2005) in which items were modified for cultural relevance (see below).

Demographic data collected included age, race, gender, marital status, education, employment, and religion. For socioeconomic status, we used items from the South African census measuring relative deprivation in urban areas (McIntyre et al., 2002); access to piped water; access to electricity at home; living in formal housing rather than a shack or traditional dwelling; and employment status of the head of household.

Substance Use

We used the AUDIT (Alcohol Use Disorders Test) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) to assess hazardous alcohol use and the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test) (WHO ASSIST Humeniuk, Ali et al., 2008; Newcombe, Humeniuk et al., 2005; Working Group, 2002) to assess moderate to high risk use of tobacco and other drugs. Both instruments were designed for primary care clinic use and were developed and validated across many developed and developing countries (Babor et al., 2001; Humeniuk et al., 2008; Newcombe et al., 2005; WHO ASSIST Working Group, 2002). These instruments identify individuals with less severe but potentially harmful alcohol, tobacco, and other drug use behaviors (i.e., “hazardous” or “moderate risk” use) who can benefit from brief interventions (Babor et al., 2001; Babor & Higgins-Biddle, 2001; Reid, Fiellin, O’Conner, 1999); hereafter we refer to this threshold as “hazardous use.” The AUDIT is a 10-item instrument, with possible scores ranging from 0 to 40, which measures quantity and frequency of drinking, frequency of binge drinking, harmful use (i.e., blackouts or injuries after drinking, others’ expressing concern about drinking, and feeling remorse) and dependence symptoms (i.e., loss of control over drinking, morning drinking, and, “fail[ing] to do what was normally expected because of drinking”). Scores of 8 or more define “hazardous drinking” or individuals in need of at least a brief intervention (Babor & Higgins-Biddle, 2001; Babor et al., 2001; National Institute on Alcohol Abuse and Alcoholism, 2005). A sample profile of a hazardous drinker would be someone who drank two to three times a week (3 points), drank more than two drinks on a typical day (1 point), had six or more drinks on one occasion at least monthly (2 points), “had a relative or friend, a doctor or other health worker” say that they have, “been concerned about your drinking or suggested you cut down” in the past year (4 points), for a total score of 10.

The ASSIST asks six questions for each of eight types of drugs (i.e., cannabis, cocaine, amphetamines, inhalants, sedatives, hallucinogens, opiates, and “other”) and tobacco. These questions are: frequency of use, having a “strong desire or urge” to use, having had legal, financial, social, or health consequences of use, fail[ing] to do what was normally expected because of use, having someone express concern about use, and having failed to cut down or stop using. Possible ASSIST scores for each drug range from 0 to 33 and 0 to 25 for tobacco. We adapted the ASSIST to local conditions in two ways (Ward et al., 2005; Ward et al., in press). First, methaqualone was added to the list of drugs, as it is one of the most frequently used drugs in South Africa. Second, local drug names were used (such as “dagga” for cannabis, and “Mandrax” for methaqualone). For tobacco, we included use of a pipe and snuff, both of which are commonly used in South Africa.

For the WHO ASSIST specific scores for each substance reported in the prior three months are calculated. A WHO ASSIST score of 4 or higher on tobacco or any drug other than alcohol is an indicator that the patient has moderate (i.e., patient is a problematic drug user) to high (i.e., patient is possibly dependent drug user) risk and needs an intervention (WHO ASSIST Working Group, 2002) (Humeniuk et al., 2008; Newcombe et al., 2005); we were consistent with this threshold. Hereafter we refer to this threshold of moderate to high risk as “hazardous drug and tobacco users.” A sample profile of someone with hazardous cannabis use would be someone who used cannabis weekly (3 points) and who, in the past 3 months, had “a friend or relative or anyone else express concern” about their use of cannabis (2 points) for a total score of 5 points. Similarly we use the term “hazardous tobacco use” to refer to those who have moderate to high risk for tobacco (a score of 4 or higher for tobacco use).

For the analysis examining health conditions by any hazardous substance use, we included those who were hazardous drinkers (based on the AUDIT) or hazardous drug or tobacco users (based on the ASSIST).

Health Conditions

The instrument also included questions about an array of medical conditions, such as whether the condition had ever been diagnosed by a doctor (i.e., lifetime prevalence), and, for those reporting in the affirmative, whether they still had the condition (i.e., current prevalence). We did not ask about HIV/AIDS due to confidentiality concerns and because the low rate of HIV testing in this population would make results unreliable.

Procedures

Interviewers recruited patients as they waited for their medical visit. Patients were interviewed in private rooms by a trained research assistant, who was matched To the patient for gender and language. Data were entered by the research assistants on handheld computers. After the interview, respondents were given a list of referral resources (e.g., substance use treatment, HIV testing, psychiatric services) to use if they wished to seek help for anything addressed by the interview, and those who had reported hazardous behavior were encouraged to do so by the field worker.

Analyses

The interview data were weighted to account for clustering, the over-sampling of 18–24 year olds, non-response differences (by gender, age, and race) within clinics, and the size of clinics proportional to the full population served by Cape Town’s Community Health Centres. The overall weighted sample size was normalized to the observed response sample. Weights ranged from 0.02 to 12.1 (median=0.34; inter-quartile range = 0.14–0.72). The recruitment rate was 43%; non-response was due primarily to attempts to recruit patients who, when sought by the interviewers, were not available. Depending on physician staffing patterns, some clinics had shorter waiting periods; some also had fewer interview rooms, so that selected patients would already have seen a practitioner and left the clinic. In the clinics, patients are seen on a first-come, first-serve basis. Since the recruitment rates were primarily related to practical arrangements within the clinics, it is unlikely that there is systematic bias in terms of the variables of interest (or of sample characteristics such as race or gender). (For details on recruitment see Ward, in press.) Our weights adjust for differences between the sample and population in the clinics represented.

We used SAS Version 9 Proc Surveyfreq and SurveyLogistic procedures to obtain percentages, calculate confidence intervals, and perform logistic regression models; these

procedures take into account the weights, stratification, and cluster design of our sample. To test for differences in prevalence by hazardous users versus non-hazardous users, and to obtain odds ratios we conducted a logistic regression (controlling age and gender) model for each health condition (as the criterion variable) using the relevant substance use variable (i.e., hazardous drinking, hazardous drug use, or tobacco use) as the independent variable. To calculate age and gender-adjusted prevalence for each lifetime and current health condition by patients who met criteria for moderate to high risk substance use versus those who did not, we used logistic regression models. We estimated the age and gender-adjusted prevalence of each outcome in hazardous users versus others in the sample based on the age and gender-adjusted odds ratios (from SurveyLogistic). Due to missing data, *Ns* for analyses ranged from 2543 to 2618. Due to the self-report nature of the medical conditions data, we focus here more on the relative odds of medical conditions (i.e., the odds ratios) than the absolute age and gender-adjusted prevalence. No adjustments were made for multiple comparisons (Rothman, 1990).

Results

Sample Characteristics and Health Conditions

A large majority (64%) of the weighted sample was female; about nine in ten (91 %) were over age 25. The sample was largely black (59.5%) and colored (39.1 %); 0.1% were Indian and 1.3% were white. Forty-four percent of participants were married, 15% were widowed, 11 % were separated or divorced and 29% were never married. A majority (58%) spoke isiXhosa; 38% spoke Afrikaans and 24% spoke English. With regard to religion, 85.1% were Christian, 8.7% were Muslim, 2.5% were of some other religion, and 3.7% reported no religion. Thirty-seven percent had completed grade six or had less education and only 2.5% had completed technical training or at least some college.

The most common current self-reported health conditions were hypertension (37%), arthritis (23%), diabetes (15%), migraine headaches (14%), asthma (14%), depression or anxiety (13%), heart disease (9%), epilepsy (8%), hay fever (6%), stomach ulcer (5%) and STDs (5%). A total of 2.1% reported current TB, 4% reported Chronic Obstructive Pulmonary Disease (COPD), 3% reported bladder infections, and 1.5% reported anemia. Of men, 1.5% reported current benign prostate problems.

Characteristics of Hazardous Substance Users

Those who screened positive for hazardous drinking, drug, or tobacco use compared to those who did not were less likely to be women (40% vs. 76%, respectively), less likely to be widowed (11% versus 18%), and less likely to be Christian (81 % versus 88%). They were also more likely to lack piped water in their house or on site (8% versus 5%). (For more details on characteristics of hazardous drug and alcohol users, see Ward, in press.)

Relationships Between Hazardous Alcohol, Drug, and Tobacco Use

A total of 12.3% of hazardous drinkers were also hazardous users of other drugs; 65% were hazardous tobacco users (not shown). Of hazardous drug users, 57% were hazardous drinkers and 64% were hazardous tobacco users. Thirty-six percent of hazardous tobacco users were also hazardous drinkers, and 8% were hazardous users of other drugs.

Health Conditions in Hazardous Drinkers

Age and gender-adjusted prevalence of health conditions by hazardous drinking status, along with odds ratios of reporting each condition comparing hazardous drinkers to those

who did not screen positive for hazardous drinking, are shown in Table 2. Compared to those who did not screen positive, hazardous drinkers had higher lifetime odds of COPD and bladder infections. Hazardous drinkers also had higher lifetime and current odds of liver cirrhosis. With regard to pain-related diagnoses, hazardous drinkers had lower current and lifetime odds of arthritis, and there was a trend (though not significant) for higher current odds of migraine in hazardous drinkers. Findings regarding cardiovascular disease were mainly consistent—hazardous drinkers had lower lifetime odds of stroke and hypertension and lower lifetime and current odds of heart disease. With regard to infectious diseases, hazardous drinkers had lower lifetime odds of Hepatitis and had higher lifetime odds of TB but lower current odds. Finally, hazardous drinkers had lower lifetime and current odds of thyroid disease. There was no difference by hazardous drinking in odds of reporting depression and anxiety.

To further examine the negative relationship of hazardous drinking to some medical conditions, we conducted post-hoc analyses. These analyses were informed by research showing that both former drinkers and lifelong abstainers have unique health and lifestyle characteristics which make them an inappropriate comparison group for studies of alcohol use and health (Green & Polen, 2001; Mertens, Moos, & Brennan, 1996). We re-ran the logistic regression models after removing abstainers (abstained in the past three months or who were lifetime abstainers) from the reference group (not shown). In these models, the negative relationship of hazardous drinking to arthritis (lifetime and current), hypertension (lifetime), current TB, COPD (lifetime), Hepatitis A (lifetime), were no longer significant. Further, the positive relationship of hazardous drinking to reporting ever having a bladder infection, and lifetime and current liver disease were no longer significant. On the other hand, the relationships of hazardous drinking to higher odds of STDs (current) and lower odds of depression and anxiety (lifetime) and bladder infection (current) became significant. Other results remained the same.

We also re-ran the models controlling for social class variables (employment status, head of household employment status, and education status) (not shown). The pattern of results did not change when including these variables in the models.

Health conditions in Hazardous Drug Users

Table 3 presents age- and gender-adjusted prevalence of health conditions and odds ratios from logistic regression models comparing hazardous drug users (i.e., moderate to high risk use of drugs other than alcohol and tobacco) versus those who did not screen positive for hazardous drug use. Hazardous drug users had higher lifetime and current odds of migraine, but there were no differences in another pain-related condition—arthritis similar to the findings on hazardous drinkers, hazardous drug users had higher current odds of liver disease. Hazardous drug users also had higher lifetime odds of stomach ulcers, and higher lifetime and current odds of bladder infections. With regard to infectious diseases, hazardous drug users had higher lifetime odds of TB, Hepatitis A, and Hepatitis B. They were more likely to have current COPD, although this relationship only approached statistical significance ($p = .07$). Regarding mental health problems, hazardous drug users had higher lifetime and current odds of self-reported depression or anxiety. There were no differences by hazardous drug use for cardiovascular diseases.

Health Conditions in Tobacco Users

Table 4 presents age- and gender-adjusted prevalence and odds ratios of health conditions for those who screened positive for hazardous tobacco use versus those who did not. With regard to respiratory diseases, hazardous tobacco users had higher odds of, current hay fever, lifetime asthma, and lifetime chronic bronchitis. For pain-related diagnoses, there was

no difference for arthritis, but hazardous tobacco users had higher odds of self-reported lifetime and current migraines. With regard to cardiovascular diseases, hazardous tobacco users had lower odds of lifetime and current hypertension and heart disease and no statistically significant differences for stroke. They had a higher odds of reporting lifetime TB but did not differ with regard to other infectious diseases. Tobacco users also had higher odds of lifetime stomach ulcers, lifetime bladder infection and lifetime and current anemia, current STDs, and lifetime prostate problems.

Health Conditions by Any Hazardous Use—Alcohol, Tobacco, or Other Drugs

Table 5 presents age- and gender-adjusted prevalence and odds ratios of health conditions by hazardous substance use (i.e., any hazardous alcohol, drug or tobacco use) versus none. Regarding respiratory disorders, those who had hazardous use of any substance had higher odds of current hay fever and lifetime and current asthma and lifetime bronchitis. With regard to pain-related disorders, hazardous substance users had higher odds of lifetime and current migraine, but lower odds of lifetime arthritis. Regarding infectious diseases, hazardous substance users had higher odds of reporting lifetime TB, and hepatitis B. Regarding cardiovascular diseases, hazardous substance users had lower odds of lifetime and current hypertension and heart disease, although there was no difference for stroke. Hazardous substance users had higher odds of reporting lifetime and current liver disease, lifetime bladder infection, and slightly higher odds of reporting current cancer. On the other hand, hazardous substance users had lower odds of reporting current STDs and lifetime benign prostate problems. Hazardous substance users had lower lifetime but higher current odds of anemia.

To further examine the negative relationships of reporting any hazardous substance use (i.e., any hazardous alcohol, drug or tobacco use) to medical conditions, we conducted post-hoc analyses as above for drinking. We re-ran the logistic regression models after removing those who reported abstaining from alcohol in at least the past three months (not shown). In these models, the negative relationships of hazardous substance use to lifetime arthritis, lifetime and current hypertension, lifetime and current heart disease were no longer significant. Also, the negative relationship of hazardous substance use to lifetime anemia reversed direction so that hazardous substance use was related to a higher likelihood of lifetime anemia. On the other hand, the positive relationship of hazardous substance use to lifetime bladder infections was no longer significant. A new relationship emerged of hazardous substance use to current TB ($OR=1.92$; 95% $CI=1.08, 3.42$). The relationships of hazardous substance use to lifetime stomach ulcer ($OR=3.60$; $p = .068$), lifetime Hepatitis B ($OR=4.62$; $p = .083$), lifetime cancer ($OR=2.02$; $p = .062$) and current cancer ($OR=2.89$; $p = .064$) approached significance.

DISCUSSION

In this descriptive study we examined the odds of current and lifetime medical problems in those with hazardous substance use (i.e., hazardous alcohol use or hazardous use of other drugs or tobacco) compared to those who did not have hazardous substance use. We found heightened odds of many medical disorders for those with hazardous substance use in this primary care, economically disadvantaged population, notably infectious diseases such as TB and Hepatitis B and C. The heightened risk of these conditions in hazardous substance users (particularly TB, a highly prevalent condition in South Africa) warrants attention to screening for hazardous substance use as a potential risk factor. Hazardous drinking, drug use, and tobacco use were each related to a heightened risk for TB. This is consistent with research showing a decreased immune function in those with alcohol disorders (National

Institute on Alcohol Abuse and Alcoholism, 2000) and it may also be an indicator of HIV/AIDS to which it is highly related in South Africa (World Health Organization, 2005). Hazardous substance use is also associated with HIV risk behaviors in this sample (Ward et al., 2005). The higher prevalence of TB in hazardous drinkers and hazardous drug users versus others in primary care has important cost implications, since the costs of diagnosis and treatment of TB are very high in South Africa (World Health Organization, 2005).

Hepatitis A and B are also infectious diseases which have much higher prevalence in developing than developed countries (Centers for Disease Control and Prevention, 2007a; Centers for Disease Control and Prevention, 2007b). This study found unexpected associations of hazardous drinking and hazardous drug use to both Hepatitis A and Hepatitis B in the South African primary care patient sample.

These findings may reflect the known effects of alcohol misuse on immune function (National Institute on Alcohol Abuse and Alcoholism, 2000). They may also reflect an association with HIV/AIDs, particularly for Hepatitis B. However, Hepatitis A is a disease that results from poor sanitary conditions. More research into the causal mechanisms of the association in this population is warranted. The relationship of hazardous drinking and drug use to Hepatitis B, which can be transmitted sexually, may also indicate that risky sexual behaviors are increased in patients with these substance use problems.

We know of no other studies that have examined medical conditions related to hazardous substance use in a population from a developing country. However, some findings are consistent with research in developed countries. For example, hazardous drinking and drug use were both related to increased odds for current liver disease. Depression and anxiety were related to hazardous drug use, consistent with prior studies of those with substance use problems (Mertens et al., 2003), but in contrast to studies in other populations (Mertens et al., 2005), it was not linked to hazardous drinking (even when controlling for social class).

Hazardous tobacco use was also related to a higher risk of TB as well as other disorders including migraine, asthma, chronic bronchitis, and anemia. Hazardous use of drugs other than alcohol and tobacco was related to a higher risk of many disorders including migraine, TB, COPD, Depression/Anxiety, Hepatitis A and B, bladder infection, and stomach ulcers. Interestingly, hazardous drug use, unlike hazardous drinking, was not related to STDs.

Hazardous drinking was related to a higher risk of lifetime TB and current STDs, but to few other disorders, particularly after controlling for abstinence. Removing abstainers from the reference group reduced the association between hazardous drinking and a higher risk of liver cirrhosis. This is most likely because lifetime abstainers, who made up the majority of the abstainers, are not exposed to alcohol, which is a primary cause of cirrhosis. A similar reduction in the odds ratio examining the relationship of hazardous drinking to COPD occurs when removing abstainers from the reference group, perhaps because there is a very low prevalence of smoking in lifetime abstainers, and smoking is a primary contributing factor to COPD.

Our initial analyses found a lower risk of some medical conditions, such as heart disease, stroke, and hypertension for hazardous drinkers. The relationships of hazardous drinking to heart disease and stroke remained even when controlling for abstinence status. This is consistent with prior studies which have found a lower risk of death from cardiovascular diseases among lighter drinkers (i.e., 1–2 drinks per day) but a higher risk of death from trauma, cirrhosis and all non-cardiovascular causes in heavy drinkers (i.e., 6 or more drinks per day) (Klatsky, Armstrong, & Friedman, 1992). On the other hand, perhaps because lifetime abstainers have no exposure to alcohol which can increase high blood pressure, the relationship of hazardous drinking to a lower risk of hypertension diminished and lost

significance when removing abstainers from the reference group. Our focus here was to mainly describe the increased risk of medical conditions for hazardous drinkers in a clinical setting, and we have very limited data on quantity and frequency of alcohol consumption in this cross-sectional study. However, future prospective research should examine the relationship of consumption patterns to medical conditions in developing country populations.

The current study had several limitations. First, we use self-report of medical conditions and substance use. However, there are no systematic data available on clinical diagnoses of medical problems in this population. A second limitation is the relatively high rate of those who were sampled but not recruited. However, for the current study, we focused more on relative risk than absolute risk. While the prevalence may differ among those not recruited, there is no reason to expect bias in the relationship of substance use to medical problems in those recruited. Further, our results were generally consistent with research on these issues in other populations, lending support for our findings. Where differences from prior research were found, for example the relationship of hazardous drinking to a lower risk of depression/anxiety in our sample, these relationships should be further investigated by prospective research. A third limitation is that, due to confidentiality concerns and low availability and a low rate of HIV/AIDS testing in this population during the time of the study (so that HIV status is often unknown), we did not ask about HIV/AIDS so we cannot report on the prevalence of this condition. Future prospective research should document the association of hazardous alcohol and drug use to HIV test results in a study in which both substance use treatment and HIV/AIDS treatment (and, ideally, mental health services as well) are easily accessible to study participants. A final limitation is that our data are cross-sectional and we are unable to determine causality or whether hazardous substance use began before or after these medical conditions developed. However, this is the first study that we know of to examine these relationships in this population. Future research should investigate this issue prospectively, particularly for hazardous drinking.

Conclusions

Our findings suggest that treatment for some medical conditions may benefit from identification and treatment of associated hazardous substance use, particularly use of drugs other than alcohol. Access to substance use treatment is limited in these populations and offering even brief interventions or advice for substance use may be useful. Future research should examine the prospective relationship of substance use, and alcohol consumption in particular, to medical conditions in primary care populations in developing countries.

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Table 1

Demographic Characteristics of Sample (Weighted)*

	Hazardous Substance/Tobacco Use			Non-hazardous/No Use			Total Sample		
	95% CIs			95% CIs			95% CIs		
	Percent	Lower	Upper	Percent	Lower	Upper	Percent	Lower	Upper
% Women	40%	26%	55%	76%	72%	79%	64%	62%	66%
Age									
% age 18–24	10%	7%	13%	8%	3%	13%	9%	5%	13%
% age 25+	90%	87%	93%	92%	87%	97%	91%	87%	96%
Race*									
Black	47%	19%	75%	66%	39%	92%	60%	32%	88%
Colored	52%	24%	80%	33%	7%	58%	39%	12%	66%
Indian	0.1%	0.003%	0.1%	0%	0%	0.1%	0.1%	0.01%	0.10%
White	1.3%	0.0%	4.0%	1.3%	0.0%	4.0%	1.3%	0.0%	4.1%
Marital Status(%)									
Married/living as Married	44%	37%	50%	45%	40%	50%	45%	40%	49%
Widowed	11%	8%	14%	18%	12%	24%	15%	11%	20%
Separated/Divorced	13%	9%	17%	10%	7%	13%	11%	8%	14%
Never Married	32%	24%	40%	27%	21%	33%	29%	24%	35%
Religion									
Christian	81%	74%	88%	88%	83%	92%	85%	81%	90%
Muslim	10%	3%	18%	8%	1%	14%	9%	2%	16%
Other	3%	0%	7%	2%	1%	4%	3%	0.3%	5%
None	6%	1%	11%	3%	1%	4%	4%	1%	6%
Languages Spoken at Home									
English	27%	12%	42%	22%	10%	33%	24%	11%	36%
Afrikaans	49%	23%	75%	32%	7%	56%	38%	12%	63%
isiXhosa	49%	22%	76%	63%	42%	84%	58%	35%	82%
Education(%) *									
Grade 6 or less	34%	28%	39%	39%	28%	50%	37%	29%	46%

	Hazardous Substance/Tobacco Use			Non-hazardous/No Use			Total Sample		
	95% CIs			95% CIs			95% CIs		
	Percent	Lower	Upper	Percent	Lower	Upper	Percent	Lower	Upper
Grade 7 to 12, no H.S. degree	60%	55%	64%	50%	41%	58%	53%	46%	60%
Completed High School	5%	4%	7%	8%	6%	10%	7%	6%	9%
Technical Training/Some College	2%	0%	3%	3%	2%	4%	2%	1%	3%
Employment *									
Full-time	27%	21%	32%	14%	5%	24%	19%	10%	29%
Part-time	8%	6%	10%	6%	2%	9%	6%	3%	9%
Self-employed only	4%	2%	6%	5%	3%	7%	5%	3%	6%
Student/Homemaker/Retired/Pensioner	21%	14%	27%	57%	38.0%	75%	44%	28%	61%
Disabled	10%	8%	12%	5%	3%	7%	7%	5%	9%
Unemployed	31%	28%	34%	13%	8%	19%	19%	14%	25%
Socioeconomic Status:									
% Unemployed Head of Household	52%	47%	58%	40%	22%	59%	56%	42%	69%
% No Electricity at home	7%	1%	13%	10%	6%	13%	9%	5%	13%
% No Piped Water in House/Site	8%	2%	15%	5%	2%	7%	6%	3%	8%
% Living in informal Housing	22%	15%	28%	22%	13%	31%	22%	14%	29%

* Ns Vary from 2603 to 2618 due to missing data

Table 2

Self-Reported Medical Conditions by Hazardous Drinking (N=2607) (Weighted, Age-and Gender-Adjusted)*

	Hazardous Drinking		95% CIs		p-value
	Yes	No	OR	Lower	Upper
Arthritis					
lifetime	16.7%	28.4%	0.50	0.38	0.67
current	15.3%	24.8%	0.55	0.38	0.79
Epilepsy					
lifetime	8.2%	10.6%	0.75	0.32	1.74
current	5.8%	8.9%	0.64	0.29	1.40
Stroke					
lifetime	1.4%	5.0%	0.26	0.08	0.89
Still suffer from effects?	1.2%	3.5%	0.34	0.09	1.21
Migraine					
lifetime	22.0%	19.8%	1.15	0.76	1.74
current	19.1%	12.8%	1.61	0.94	2.75
Hypertension					
lifetime	33.8%	44.3%	0.64	0.44	0.94
current	28.7%	38.5%	0.64	0.36	1.15
Hay fever					
lifetime	10.1%	11.8%	0.84	0.49	1.45
current	5.9%	5.8%	1.02	0.67	1.54
Heart Disease					
lifetime	4.3%	13.2%	0.29	0.15	0.57
current	2.4%	9.7%	0.22	0.12	0.43
Tuberculosis					
lifetime	25.7%	18.9%	1.48	1.11	1.96
current	0.6%	2.3%	0.27	0.10	0.73
Asthma					
lifetime	17.6%	17.9%	0.98	0.69	1.41
current	14.4%	13.4%	1.07	0.61	1.86

Hazardous Drinking			95% CIs			
	Yes	No	OR	Lower	Upper	p-value
Chronic Obstructive Pulmonary Disorder						
lifetime	11.9%	6.2%	2.06	1.51	2.82	<0.001
current	4.7%	3.3%	1.46	0.96	2.22	0.75
Chronic Bronchitis						
lifetime	9.4%	13.7%	0.65	0.34	1.25	0.201
current	1.6%	3.1%	0.49	0.22	1.07	0.072
Depression or Anxiety						
lifetime	21.3%	27.4%	0.72	0.48	1.07	0.105
current	11.9%	12.9%	0.91	0.54	1.56	0.735
Gallstones/Gallbladder Problems						
lifetime	2.5%	2.9%	0.89	0.32	2.45	0.820
Hepatitis A						
lifetime	0.1%	0.7%	0.18	0.07	0.46	<0.001
Hepatitis B						
Hazardous Drug use						
95% CIs						
	Yes	No	OR	Lower	Upper	p-value
Arthritis						
lifetime	23.3%	26.7%	0.83	0.37	1.90	0.666
current	23.9%	23.3%	1.04	0.47	2.30	0.932
Epilepsy						
lifetime	16.6%	10.1%	1.78	0.41	7.71	0.444
current	11.0%	8.2%	1.39	0.34	5.66	0.646
Stroke						
lifetime	11.6%	4.1%	3.05	0.83	11.20	0.094
Still suffer from effects?	5.8%	3.0%	1.99	0.67	5.87	0.214
Migraine						
lifetime	60.8%	18.7%	6.72	1.97	22.6	0.002
current	53.7%	12.4%	8.2	1.73	38.9	0.008
Hypertension						

		Hazardous Drinking			95% CIs		
		Yes	No	OR	Lower	Upper	p-value
Hay fever	lifetime	42.7%	42.7%	1.00	0.42	2.37	0.999
	current	33.9%	37.1%	0.87	0.21	3.51	0.841
Heart Disease	lifetime	11.0%	12.0%	0.94	0.33	2.7	0.908
	current	4.5%	5.9%	0.76	0.31	1.84	0.542
Tuberculosis	lifetime	16.1%	11.7%	1.46	0.36	5.82	0.595
	current	8.6%	8.6%	1.01	0.25	3.98	0.995
Asthma	lifetime	35.8%	19.5%	2.31	1.55	3.44	<0.001
	current	2.5%	2.1%	1.23	0.57	2.63	0.598
Chronic Obstructive Pulmonary Disorder	lifetime	29.4%	17.4%	1.98	0.68	5.72	0.210
	current	24.4%	13.1%	2.13	0.72	6.32	0.172
Chronic Bronchitis	lifetime	23.8%	6.5%	4.48	0.75	26.8	0.101
	current	13.7%	3.1%	4.9	0.9	26.6	0.066
	lifetime	15.5%	12.9%	1.23	0.65	2.34	0.520
	current	4.8%	2.8%	1.73	0.51	5.94	0.382

Table 3
Self-Reported Medical Conditions by Hazardous Drug Use (WEIGHTED, AGE-AND GENDER-ADJUSTED)*

	Hazardous Drug Use		95% CIs		p-value
	Yes	No	OR	Lower	Upper
Arthritis					
lifetime	23.3%	26.7%	0.83	0.37	1.90
current	23.9%	23.3%	1.04	0.47	2.30
Epilepsy					
lifetime	16.6%	10.1%	1.78	0.41	7.71
current	11.0%	8.2%	1.39	0.34	5.66
Stroke					
lifetime	11.6%	4.1%	3.05	0.83	11.20
Still suffer from effects?	5.8%	3.0%	1.99	0.67	5.87
Migraine					
lifetime	60.8 %	18.7%	6.72	1.97	22.6
current	53.7 %	12.4%	8.2	1.73	38.9
Hypertension					
lifetime	42.7 %	42.7%	1.00	0.42	2.37
current	33.9 %	37.1%	0.87	0.21	3.51
Hay fever					
lifetime	11.0 %	12.0%	0.94	0.33	2.7
current	4.5 %	5.9%	0.76	0.31	1.84
Heart Disease					
lifetime	16.1 %	11.7%	1.46	0.36	5.82
current	8.6 %	8.6%	1.01	0.25	3.98
Tuberculosis					
lifetime	35.8%	19.5%	2.31	1.55	3.44
current	2.5%	2.1%	1.23	0.57	2.63
Asthma					
lifetime	29.4%	17.4%	1.98	0.68	5.72
current	24.4%	13.1%	2.13	0.72	6.32

Hazardous Drug Use			95% CIs			
	Yes	No	OR	Lower	Upper	p-value
Chronic Obstructive Pulmonary Disorder						
lifetime	23.8%	6.5%	4.48	0.75	26.8	0.101
current	13.7%	3.1%	4.9	0.9	26.6	0.066
Chronic Bronchitis						
lifetime	15.5%	12.9%	1.23	0.65	2.34	0.520
current	4.8%	2.8%	1.73	0.51	5.94	0.382
Depression or Anxiety						
lifetime	61.0%	25.3%	4.63	1.42	15.13	0.011
current	42.1%	11.8%	5.44	1.43	20.7	0.013
Gallstones/Gallbladder Problems						
lifetime	5.4%	2.7%	2.04	0.55	7.51	0.284
Hepatitis A						
lifetime	3.8%	0.5%	8.24	1.25	54.3	0.028
Hepatitis B						
lifetime	3.2%	0.3%	9.96	3.38	29.4	<0.001
Hepatitis C						
lifetime	0.1%	0.2%	0.36	0.1	2.72	0.323
Liver disease, including cirrhosis						
lifetime	3.0%	1.4%	1.93	0.19	19.4	0.578
current	2.0%	0.4%	5.42	1.34	21.8	0.017
Stomach Ulcer						
lifetime	18.6%	11.6%	1.74	1.11	2.74	0.016
current	4.0%	5.1%	0.76	0.20	2.85	0.687
Bladder Infection						
lifetime	38.7%	16.7%	3.16	1.94	5.13	<0.001
current	12.2%	3.1%	4.34	1.56	12.10	0.001
STD						
lifetime	17.4%	22.2%	0.74	0.32	1.72	0.483
current	4.9%	4.8%	1.01	0.3	3.42	0.999
Anemia						

		Hazardous Drug Use		95% CIs		p-value
		Yes	No	OR	Lower	Upper
lifetime		19.9%	7.1%	3.24	0.84	0.087
	current	2.0%	1.5%	1.28	0.54	3.04
Cancer						
lifetime		1.8%	2.3%	0.79	0.20	3.15
	current	1.2%	0.7%	1.85	0.4	8.59
Diabetes						
lifetime		10.0%	18.0%	0.5	0.2	1.23
	current	10.7%	15.8%	0.64	0.27	1.5
Thyroid Disease						
lifetime		1.3%	1.8%	0.71	0.23	2.2
	current	0.2%	0.9%	0.27	0.06	1.3
MEN: Prostate problem (other than cancer)						
lifetime		2.8%	2.4%	1.18	0.14	9.95
	current	3.2%	1.5%	2.19	0.16	29.16

* Ns vary from 2549 to 2597 due to missing data.

Table 4
Self-Reported Medical Conditions by Hazardous Tobacco Use (WEIGHTED, AGE-AND GENDER-ADJUSTED)*

	Hazardous Tobacco Use		95% CIs		<i>p</i> -value
	Yes	No	OR	Lower	Upper
Arthritis					
lifetime	22.9%	27.9%	0.77	0.58	1.02
current	23.3%	23.6%	0.93	0.7	1.24
Epilepsy					
lifetime	12.3%	9.5%	1.34	0.92	1.97
current	10.0%	7.6%	1.35	0.88	2.06
Stroke					
lifetime	6.1%	3.7%	1.70	0.64	4.52
Still suffer from effects?	4.4%	2.6%	1.70	0.53	5.44
Migraine					
lifetime	29.6%	16.4%	2.14	1.69	2.71
current	19.9%	11.4%	1.93	1.45	2.58
Hypertension					
lifetime	36.2%	45.1%	0.69	0.50	0.95
current	31.0%	39.3%	0.69	0.51	0.94
Hay fever					
lifetime	12.8%	11.1%	1.18	0.75	1.87
current	8.1%	4.9%	1.71	1.04	2.83
Heart Disease					
lifetime	9.0%	12.9%	0.66	0.49	0.89
current	6.1%	9.5%	0.62	0.49	0.79
Tuberculosis					
lifetime	25.4%	17.9%	1.57	1.13	2.18
current	2.6%	1.9%	1.39	0.81	2.39
Asthma					
lifetime	23.8%	15.5%	1.70	1.25	2.32
current	17.3%	12.0%	1.53	0.98	2.39

Hazardous Tobacco Use				95% CIs		
	Yes	No	OR	Lower	Upper	p-value
Chronic Obstructive Pulmonary Disorder						
lifetime	6.4%	7.3%	0.87	0.32	2.35	0.778
current	3.0%	3.7%	0.82	0.16	4.25	0.811
Chronic Bronchitis						
lifetime	18.1%	11.0%	1.79	1.05	3.07	0.034
current	3.6%	2.6%	1.37	0.87	2.17	0.172
Depression or Anxiety						
lifetime	30.1%	25.0%	1.29	0.86	1.94	0.213
current	12.2%	13.0%	0.93	0.59	1.44	0.728
Gallstones/Gallbladder Problems						
lifetime	2.2%	3.0%	0.73	0.46	1.14	0.159
Hepatitis A						
lifetime	0.4%	0.7%	0.53	0.13	2.21	0.386
Hepatitis B						
lifetime	0.5%	0.4%	1.14	0.19	6.96	0.884
Hepatitis C						
lifetime	0.3%	0.2%	1.60	0.17	15.30	0.683
Liver disease, including cirrhosis						
lifetime	3.0%	0.9%	3.34	0.96	11.6	0.057
current	0.8%	0.3%	2.92	0.77	11.1	0.115
Stomach Ulcer						
lifetime	13.9%	10.9%	1.32	1.05	1.66	0.019
current	4.9%	5.2%	0.94	0.59	1.5	0.796
Bladder Infection						
lifetime	31.5%	11.8%	3.43	1.93	6.11	<0.001
current	4.4%	3.0%	1.50	0.82	2.75	0.184
STD						
lifetime	22.3%	21.9%	1.02	0.75	1.39	0.897
current	2.6%	5.7%	0.44	0.22	0.87	0.019
Anemia						

		Hazardous Tobacco Use		95% CIs		p-value
		Yes	No	OR	Lower	Upper
lifetime		14.0%	5.0%	3.08	1.31	7.22
		3.7%	0.7%	5.44	2.62	11.31
Cancer						
lifetime		2.9%	2.1%	1.40	0.58	3.41
		1.0%	0.6%	1.78	0.38	8.33
Diabetes						
lifetime		19.3%	17.5%	1.13	0.65	1.96
		16.5%	15.2%	1.1	0.66	1.84
Thyroid Disease						
lifetime		2.8%	1.4%	2.02	0.63	6.48
		2.0%	0.5%	4.52	0.87	23.36
MEN: Prostate problem (other than cancer)						
lifetime		0.7%	3.7%	0.19	0.06	0.62
		0.6%	2.4%	0.23	0.05	1.03

* Ns vary from 2543 to 2599 due to missing data.

Table 5
Self-Reported Medical Conditions by Any Substance Risk (WEIGHTED, AGE-AND GENDER-ADJUSTED)*

	Hazardous Substance/Tobacco Use		95% CIs	
	Yes	No	OR	Upper Lower p-value
Arthritis				
lifetime	21.8%	29.0%	0.68	0.5 0.93 0.016
current	21.6%	24.1%	0.87	0.64 1.17 0.35
Epilepsy				
lifetime	11.1%	9.8%	1.15	0.55 2.43 0.711
current	8.2%	8.4%	0.98	0.55 1.74 0.937
Stroke				
lifetime	5.4%	3.9%	1.42	0.55 3.68 0.467
Still suffer from effects?	3.9%	2.7%	1.44	0.46 4.47 0.529
Migraine				
lifetime	29.5%	15.2%	2.34	1.82 3.01 <0.001
current	20.3%	10.3%	2.22	1.46 3.38 <0.001
Hypertension				
lifetime	38.2%	44.9%	0.76	0.63 0.91 0.003
current	33.3%	38.9%	0.79	0.64 0.97 0.024
Hay Fever				
lifetime	13.2%	10.7%	1.27	0.82 1.98 0.279
current	8.6%	4.4%	2.05	1.19 3.52 0.009
Heart Disease				
lifetime	8.5%	13.6%	0.59	0.39 0.9 0.014
current	5.6%	9.9%	0.57	0.38 0.84 0.005
Tuberculosis				
lifetime	25.2%	17.2%	1.62	1.18 2.24 0.003
current	2.2%	2.0%	1.11	0.61 2.02 0.745
Asthma				
lifetime	24.2%	14.5%	1.88	1.45 2.44 <0.001
current	18.3%	11.0%	1.82	1.3 2.55 0.001

Hazardous Substance/Tobacco Use			95% CIs			
	Yes	No	OR	Lower	Upper	p-value
Chronic Obstructive Pulmonary Disorder						
lifetime	8.4%	6.4%	1.33	0.67	2.65	0.415
current	4.5%	3.0%	1.54	0.48	4.9	0.464
Chronic Bronchitis						
lifetime	17.0%	10.8%	1.7	1.12	2.58	0.013
current	3.4%	2.7%	1.27	0.88	1.82	0.198
Depression or Anxiety						
lifetime	29.8%	24.7%	1.3	0.87	1.94	0.207
current	12.9%	12.7%	1.01	0.74	1.38	0.948
Gallstones/Gallbladder Problems						
lifetime	2.1%	3.2%	0.66	0.38	1.17	0.156
current	0.5%	1.5%	0.32	0.06	1.84	0.204
Hepatitis A						
lifetime	0.3%	0.8%	0.35	0.06	2.08	0.245
Hepatitis B						
lifetime	0.9%	0.2%	5.07	1.10	23.32	0.04
Hepatitis C						
lifetime	0.2%	0.2%	0.85	0.09	7.64	0.882
Liver disease, including cirrhosis						
lifetime	3.1%	0.6%	4.98	1.97	12.59	0.001
current	0.9%	0.2%	4.19	2.02	8.67	0.001
Stomach Ulcer						
lifetime	14.4%	10.4%	1.45	0.77	2.71	0.252
current	5.9%	4.7%	1.27	0.58	2.79	0.552
Bladder Infection						
lifetime	28.3%	11.7%	2.98	1.93	4.60	<0.001
current	3.7%	3.2%	1.15	0.61	2.19	0.667
STD						
lifetime	22.9%	21.5%	1.08	0.86	1.37	0.497
current	2.2%	6.2%	0.35	0.18	0.67	0.002

		Hazardous Substance/Tobacco Use		95% CIs		
		Yes	No	OR	Lower	Upper
Anemia						
lifetime		13.1%	4.7%	0.17	1.61	5.91
current		3.3%	0.7%	5.09	2.50	10.37
Cancer						
lifetime		2.8%	2.0%	1.37	0.66	2.83
current		1.1%	0.5%	2.3	1.07	4.94
Diabetes						
lifetime		20.2%	16.9%	1.25	0.75	2.07
current		16.9%	14.9%	1.16	0.73	1.86
Thyroid Disease						
lifetime		2.5%	1.5%	1.71	0.49	5.95
current		1.7%	0.5%	3.75	0.66	21.4
MEN: Prostate problem (other than cancer)						
lifetime		1.2%	3.9%	0.29	0.10	0.94
current		0.9%	2.5%	0.36	0.10	1.33

*Ns vary from 2545 to 2596 due to missing data.