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Women and substance use disorders in low- and middle-income countries: A call for advancing research equity in prevention and treatment

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Abstract

Although the prevalence of substance use disorders (SUDs) is higher among men, women with SUDs in low- and middle-income countries (LMICs) face unique challenges. Poverty and adversity, inequality of women, and disparities in access to treatment and prevention services exacerbate biological, psychological and social correlates of substance use disorders for women living in low-resource settings. Increasing the inclusion of women in research has long been a goal, though even high income countries struggle to achieve parity. In LMICs, women with SUDs are often neglected from global research due to underreporting and the disproportionate focus of global substance use research on men. We will discuss risk factors for SUDs that are particularly relevant for women residing in LMICs in order to gain insight into neglected areas of research and opportunities for prevention and treatment.

Keywords

Addiction; health equity; gender; low- and middle-income countries; substance use disorders; women

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Introduction

The World Health Organization situates the equitable inclusion of both men and women in research as a basic human right.¹ Similarly, for over 20 years the United States' National Institute of Health (NIH) has published federal guidelines and policies to encourage the inclusion of women in clinical research (see Inclusion of Women and Minorities as Subjects in Clinical Research, <https://grants.nih.gov/grants/guide/notice-files/not94-100.html>) and the analysis of sex as a biological variable (see NOT-OD-15-102: Consideration of Sex as a Biological Variable in NIH-funded Research, <https://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-102.html>). Evidence of persisting poor compliance with these guidelines and policies at publication has led journal editors to develop their own guidelines for addressing Sex and Gender Equity in Research, known as the SAGER guidelines, in an effort to further promote compliance with these policies and guidelines.^{2,3} If a country such as the U.S. with its tremendous wealth in research funding continues to struggle to incorporate women (clinical research) or female samples (animal based, pre-clinical research), then what is the situation in low-to-middle income countries (LMICs)? In this commentary, we discuss the current state of sex disparities in substance use, treatment, and research in LMICs and provide opportunities to address existing gaps in future research.

The gender gap in the prevalence of harmful alcohol and other drug use is narrowing due to stable male prevalence alongside lower, but rapidly increasing, prevalence among females.⁴ In LMICs there are many ways in which women's experience with substance use, though at a lower prevalence rate, may differ from men's. Women in LMICs experience greater social consequences (e.g., stigma) relative to men with similar levels of consumption because substance use is not perceived as consistent with the traditional roles and expectations of women in many cultures.⁵ Additionally, patterns of use in LMICs tend to be riskier relative to those observed in high-income settings, which can elevate the societal burden of substance-related consequences in low-resource settings.⁶ Thus, there is little doubt that despite cultural norms discouraging women from use of alcohol and drugs, there is a rising minority of women with SUD in need of treatment that is scarce and male focused. Reducing this disparity requires a multi-systems (biological, psychological and social) approach to inform clinical practice and policy development that addresses the needs of women in LMICs.

Women & substance use disorders from a multi-systems approach

As noted by (2) sex differences in pre-clinical work can inform clinical care, but only to the extent that the inclusion of females in sampling, data analysis and dissemination. Justification for concerted attention to sex differences in substance use can be seen from pre-clinical and clinical work showing that: (1) women metabolize drugs differently than men; (2) reproductive hormones contribute to observed differences in substance use by sex;^{7–10} (3) sex is associated with differences in positive reinforcement and withdrawal-related negative reinforcement related to substance use;^{11–13} and (4) women respond to lower doses of several substances than men.^{14–16} These differences in drug sensitivity and receptor functions may partially explain why women move from use to disorder faster than men.¹⁷ These biological differences may be elevated in LMICs given the nature of substance use in

these settings. For example, within some LMICs the consumption of home brewed alcohol is high and use by women varies by region.^{18,19} Although men are more likely in some regions to consume fermented grains, both women and children consume low-ethanol beverages from fruits, sorghum, or millet in those regions.¹⁹ Home brewing can impact the consistency of product strength and purity due to variations in water quality and contaminants, including methanol and lead, to which women may be more sensitive.¹⁸ Furthermore, some of the aforementioned mechanisms of sex differences in harmful substance use may be exacerbated in LMICs due to the higher prevalence of moderating factors such as stress, weight status, and malnutrition relative to high-income countries (HICs).^{20,21} For example, as weight and adipose deposition covaries with intoxication rate per gram of alcohol, this highlights the potential for elevated risk of harmful alcohol use in LMIC due to food insecurity and resulting weight variation in the population.

Psychological distress and common mental disorders, such as anxiety and depression, have consistently been documented as risk factors and correlates of SUD in HICs and LMICs and are more prevalent among women.^{22–26} The major social determinants of poor mental health in LMICs (e.g., poverty, lack of education, social exclusion, gender inequality, intimate partner violence) disproportionately affect women.²⁷ The excess risk and burden of poor mental health experienced by females relative to males, particularly in LMICs, may in part explain the differences in vulnerability of women to developing SUDs. In LMICs, where psychosocial risk factors for psychological distress and common mental disorder are prevalent, women may be particularly vulnerable to initiating alcohol and other drug use and developing SUDs as a means to cope with these challenges, particularly in the absence of a health and social services system that provides support services to effectively cope with adversity while preventing and treating common mental disorder.

Socio-cultural norms regarding substance use and structural factors affecting access to alcohol and other drugs impact use and misuse of substances are also crucial areas in need of concerted research. These social factors differentially affect women and may impact their initiation and patterns of substance use. First, different norms surrounding alcohol and other drug use between males and females may reflect broad societal gender roles and expectations, particularly in LMICs. In many cultures alcohol and other drug consumption is a demonstration of masculinity and is often culturally forbidden for women.²⁸ Second, as a country develops economically, the social status of commercialized alcohols increases and control of home brews as a female dominated task decreases, thus leaving women with lost control and role transitions. Producers of “unhealthy commodities” such as alcohol, tobacco and processed foods²⁹ are increasingly targeting LMICs, including specific efforts to appeal to women and youth.^{29–31} Although international and local efforts are underway to control many of these products such as tobacco,^{32,33} incomplete adoption of prevention strategies and industry efforts to find loopholes to protect the growing and profitable LMIC markets for their products have limited success in controlling the growth of these industries.^{31,32,34,35} Third, social adversities, including peer, community and collective violence, may moderate sex differences in substance use and disorder. While the adverse childhood experiences (ACE) literature supports ACEs as a sex dependent moderating factor, in most HICs this is restricted to intra-familial ACEs such as neglect, abuse and household dysfunction. Studies of social adversities (peer, community and collective violence) have shown that they can

predict addictive behaviors even when adjusting for intra-familial ACEs.^{36,37} Fourth, women are more likely than men to experience stigma related to substance use.³⁸ This is compounded by the burden attributable to the social consequences of substance use, which are also disproportionately experienced by women and include violence, social isolation, and structural inequities.³⁸ Finally, more comprehensive treatment and resources may be required to treat women with SUDs, especially if they lack the economic and social support enjoyed by their male counterparts.³⁹

Once an addiction becomes established, women relapse more often than men to many, though not all, harmful substances.^{40–42} Sex-based disparities in research mirror the disparities in treatment availability, initiation, retention, and outcomes in LMICs.^{43,44} Substance use treatment programs are historically oriented towards men and may fail to fully address the personal and contextual hindrances to abstinence or moderation in women.^{44,45} Indeed, women experience unique psychological, social and biological risk factors that may impact their substance use behavior. These factors may be compounded by a paucity of knowledge and difficulties obtaining treatment, particularly in settings where there are limited resources and capacity to provide services, ultimately fostering a negative cycle of substance use. In LMICs these disparities in research and services are increasingly pronounced given the shortage of health providers with training in substance use treatment and prevention, the continued stigma related to substance use, differences in drinking and drug use culture and norms, as well as low political prioritization and resources allocated to substance use services.^{46,47} There is thus a clear need to engage addiction process and services research in a sex-informed manner so as to best meet the global needs of women.^{48–51} While there has been a call in some HICs for tailoring treatment efforts based on sex,⁵² in LMICs women may experience disproportionate obstacles to seeking care; significant gaps in funding for care and a lack of gender-responsive interventions.^{4,53–55}

Conclusion & future directions

This commentary argues for increased inclusion of women in SUD research in LMICs in line with NIH and the WHO guidelines or policies. Admittedly, this may be difficult when funding for research is poor to nonexistence. Some methodologies may be more helpful than others. One alternative approach to expensive pre-clinical or traditional epidemiological survey-based studies might be to start conduct formative community-based participatory research (CBPR) with people who use alcohol or other drugs in LMICs to gain perspective on their lived experience of substance use initiation and disorder and to gather detailed understanding of the country-specific social determinant of substance use.¹ Utilizing CBPR with underrepresented groups increases trust, fosters further research expansion, and ensures equitable partnerships between investigators and community members.⁵⁶ This may reveal new constructs or variables related to harmful substance use that are not evident in Western-based studies. Certain contextual sources of adversity are common in LMICs (poverty, persecution, trauma, displacement, etc.), but clarifying which factors are related to harmful substance use could benefit from a qualitative, as quantitative, research approach using existing data sources across populations to examine sources of heterogeneity in substance use, particularly among women. Secular factors (e.g., economic development; alcohol industry involvement; national policy or legal structures) that contribute to changes in

substance use should also be taken into consideration.^{1,31,57} De novo creation or validation of measurement tools fitting the local culture is needed to improve quantitative research on harmful alcohol and other drug use in LMICs, particularly among women for whom existing psychometric research may not apply due to measurement non-invariance.

A thoughtful, programmatic, and international effort to increase our understanding of SUDs in women should recognize that women in LMICs possess unique factors that may facilitate or protect against initiation of harmful alcohol and other drug use, account for substance use maintenance, and predict relapse that are independent of a simplistic reference to how they are different from men. These factors must be further clarified by research that includes women and informs SUD services that reduce barriers in access and relevance for women. Such a program of research must be multidimensional and consider multi-systems perspective from microbiology to political systems. Sex differences in initiation, maintenance, and relapse are rarely met with adequate access to or funding for comprehensive treatment or prevention.⁵⁸ It is imperative that we do not ignore the interplay between these factors and avoid focusing narrowly on unidimensional aspects of risk and recovery among women. Further dedication to substance use epidemiologic, prevention and treatment research specifically among women may reveal further opportunities to reduce disparities, and improve health equity and wellbeing among women globally.

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