

A Review of Substance Use Disorder Treatment in Developing World Communities

Jasleen Salwan, MD-MPH Candidate, and Craig L. Katz, MD

ABSTRACT

Background: As global health endeavors increasingly encompass efforts to prevent and treat mental illness in the developing world, it is important to build a base of knowledge of existing treatment models and experimental outcomes.

Objective: This article reviews the current literature on substance use disorder treatment in countries with a high, medium, or low Human Development Index according to the 2011 United Nations Development Programme Report.

Methods: We searched the databases PubMed, PsycINFO, and Global Health using search terms such as *substance abuse treatment developing countries*, *addiction developing nations*, and *alcohol abuse developing countries*. Opinion pieces and articles published before 1994 were excluded. Thirty relevant articles (excluding those reviewed for background information) were identified.

Findings: Comprehensive overviews of treatment models were markedly absent from the current literature. However, existing research highlights specific areas of need, which may serve as a guide for future research and program development.

Conclusions: In light of the evident need for treatment of substance use disorder in developing countries, future research would do well to blend inquiry with practice. Although further investigation is needed to fully understand the specific needs of developing world populations, assisting those populations should be a primary goal.

Key Words: addiction treatment, drug abuse treatment, global mental health, rehabilitation, substance use disorder

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INTRODUCTION

Presented with clear evidence that global public health objectives cannot be achieved without addressing a broad spectrum of mental health issues, policymakers have called attention to the need to improve access to treatment for substance use disorder (SUD) in developing nations.¹ Although precise measures of the prevalence of substance use and dependence in developing countries is difficult to attain, in part because of the limited capacity of these countries' governments to conduct national surveys,² addiction is still recognized as a large and growing problem for developing societies.³ Resources to address SUD in the developing world are severely limited; 34% of low- and middle-income nations have not developed a substance use policy.³ Background information regarding the prevalence of SUD in the countries for which articles were identified is provided in [Table 1](#) according to the six World Health Organization (WHO) regions.

Inadequate attention to SUD is part of a broader trend of underinvestment in mental health care by these countries, as the poorest nations allocate the smallest portion of their already strained public budgets to mental health.¹⁸ Underutilization of mental health services in resource-poor settings has been attributed in part to stigma. However, WHO has called for investigation into additional explanations.^{1,19} Inequities in the distribution of resources within countries and inefficiencies in the delivery of care have also attracted the attention of scholars.¹⁸

As inadequate treatment for SUD has been firmly established as a major public health problem plaguing developing countries, research into effective and feasible treatment options will inform how to bridge this treatment gap. A comprehensive overview of the disparate substance use treatment models and experimental outcomes across different nations is lacking in the prior literature. This article reviews the current literature on SUD treatment in the developing world, with the aim of informing future program development and research.

METHODS

We searched PubMed, PsycINFO, and Global Health for relevant articles, using search terms such as *substance abuse treatment developing countries*, *addiction developing*

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From the Department of Medical Education Icahn School of Medicine at Mount Sinai, New York, NY. Received July 25, 2013; accepted August 1, 2013. Address correspondence to J.S.; e-mail: jasleen.salwan@mssm.edu

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Table 1. Background Information by World Health Organization Region

The Americas	In Brazil, Alcoholics Anonymous (AA) first established a presence in 1947 and had gained 120,000 members in 5700 active groups as of 1997. ⁴
	In Trinidad and Tobago, AA as well as Narcotics Anonymous (NA) groups comprise part of 110 existing local drug rehabilitation centres and hold both open and closed meetings, but it is not clear how many are active. ⁵
Africa	In Nigeria, 1-year prevalence rates of cocaine use (0.7%) and opioids use (0.7%) rank third in the continent. ⁶ High rates of substance use also have been reported among inpatient psychiatric populations in Tanzania and Kenya. ^{7,8} Alcohol consumption per drinker in the World Health Organization-defined Africa E region, which includes South Africa, Ethiopia, Kenya, and other countries with similar health outcomes, is 16.6 L, compared with 14.3 L for the United States, Canada, and Cuba. ⁹ In much of sub-Saharan Africa, the beverage alcohol industry collaborates with governments to develop national alcohol policies. ¹⁰ Policy documents from Botswana, Uganda, Malawi, and Lesotho drafted following national symposia attended by representatives of government and the beverage industry were nearly identical in structure and wording, reflecting the industry's dominance in policymaking across countries. ¹⁰ A lack of public awareness also may thwart prevention efforts. In Nigeria, underfunding and migration of potential researchers to the private sector or to other countries have stunted what was once a growing knowledge base on alcohol issues. ¹¹
Asia	Following a successful campaign to combat opium abuse in the 1950s, China enjoyed a reputation as a drug-free country for more than 3 decades before the problem resurfaced under the global drug trade. ¹² The number of registered substance abuse users in the country jumped from 70,000 in 1990 to more than 1 million by 2003, with heroin being the primary drug of abuse. ¹²
	In India, AA originated in the 1950s in association with Christian organizations. Its presence has gradually expanded to reach many cities, with more than 250 groups currently operating in Bombay and approximately 120 in the state of Kerala, where the movement first gained a presence in 1987. ¹³ Half of the centers in Kerala were established and are currently managed by churches. ¹³ Little precise data on the effectiveness of AA groups in India is available. ¹³
Europe	In Russia, alcohol dependence has garnered particular attention. A 1998 study declares that alcoholism in the country "threatens to block the current transition towards a functioning democracy." ¹⁴ and today, many consider alcohol-related harm to be a "natural disaster" in the country. ¹⁵ Opiate use is also widespread, with an estimated 2% of the Russian population using heroin or other opiates annually. ¹⁶ Despite increased government regulation on both supply and demand sides, structural barriers to treatment remain, including the illegality of methadone and buprenorphine maintenance programs. ¹⁷ Systematic research on the availability of treatment services is also lacking. ¹⁷

nations, and alcohol abuse developing countries. Epidemiological studies focusing exclusively on prevalence were generally excluded, although some were reviewed for background information. Commentaries were excluded, as were articles published before 1994.

For the purpose of this review, *developing country* is defined as a nation with a high, medium, or low Human Development Index (HDI) according to the 2011 United Nations Development Programme Report.²⁰ Thus, studies conducted in countries with very high HDIs were excluded. Findings are reported here as follows. First, we review the limited prior literature that investigates treatment models in multiple developing countries. Next, we review papers that present comprehensive overviews of treatment models within a single country. Subsequent papers, many of which describe a single treatment center or intervention, are categorized by treatment approach. Some papers fall under multiple sections. A separate section is given to Alcoholics Anonymous (AA)-based treatment approaches due to the substantial body of literature on this model. Finally, articles that focus on services-related issues are reviewed.

FINDINGS

Comparative Papers

Although to our knowledge this is the first undertaking to review treatment models for SUD across the entire developing world, two papers comparing treatment approaches between two different countries were identified in the prior literature.

One comparative study reviewed approaches to drug abuse treatment in China and Germany, drawing particular attention to the use of methadone maintenance treatment (MMT). Although MMT was only approved in China in 2003 and continues to be hotly debated, in Germany, substitution treatment has a 20-year history and is a central component of opioid addiction treatment.²¹ As of 2007, China planned to set up 1000 MMT clinics to serve 200,000 patients over the next 5 years.²¹ The authors express concern that implementing MMT in China will prove difficult given the country's history of detaining drug users. They argue that China should look to Germany and other developed nations as a guide for improving both its MMT programs and its addiction treatment services more generally.

Another study provided an overview of the faith-based approach to treatment in El Salvador, drawing comparisons to that in Puerto Rico. In both countries, the approach to addiction treatment is dominated by Evangelical faith-based programs that are flourishing despite their lack of both trained clinical staff and government subsidization.²² However, El Salvador has both fewer followers of the Evangelical faith and fewer secular treatment options than Puerto Rico.²² In addition to this barrier, the study notes several problems at some Salvadoran faith-based treatment centers, including failure to tailor treatment plans to patients' individual needs and a lack of security personnel resulting in frequent fights among patients.²²

Single-Country Overviews

Four articles were identified that describe the various treatment modalities for SUD available within a single country.

A cross-sectional survey of 31 substance abuse treatment centers in Nigeria found a dearth of treatment facilities relative to patients' needs, as well as a lack of an updated directory or map of all available treatment centers.⁶ The treatment units surveyed were about equally divided between residential and nonresidential centers, were predominantly nongovernmental organization (NGO)-owned (58.1%), and were established within the past decade.⁶ Charitable donations were the primary source of funding, with virtually no money coming from health insurance.⁶ Most centers did not employ individuals recovering from drug abuse, and none provided maintenance or drug substitution therapy.⁶ Informal counseling or short-term crisis support was the most common service provided.⁶ The units were not integrated into a network, and their treatment processes and outcomes were not evaluated through any kind of centralized assessment system.⁶

Another Nigeria-based study analyzed the various ongoing efforts aimed at reducing the demand for drugs, although it focused specifically on the work of NGOs. This descriptive study of 45 NGOs involved in the reduction of the demand for drugs in Nigeria identified a growing role for civil society organizations in addressing substance abuse issues since the 1990s, with an increase in both the number of NGOs founded for this purpose and in the number of existing NGOs shifting their focus toward drug demand reduction efforts.²³ Among the 62 survey participants who represented these organizations, only 32% described their work as treating substance abuse, compared with 84% focusing on prevention and 63% engaging in "research."²³

A study on China described a diverse array of available treatment services for drug dependence, including voluntary detoxification centers run by health departments (there are currently about 200), mandatory detoxification centers run by public security (about 700), and labor-based rehabilitation units run by justice departments (about 300).¹²

As of 2004, rehabilitation labor camps were mandatory for any patient who relapsed after a compulsory detoxification process.¹² However, a 2006 national drug law abolished this practice.²⁴ Still, the notion of exorcising the body of addiction, the goal of compulsory labor, has been observed to influence the behavioral therapeutic practices that have recently emerged.²⁴

For opioid addiction in China, both nonpharmaceutical and pharmaceutical therapy options are available.¹² Nonpharmaceutical services include self-help groups such as AA and Narcotics Anonymous (NA) in some areas, and, more recently, community therapy.¹² Pharmaceutical treatment includes traditional Chinese medicine as well as buprenorphine, clonidine, lofexidine, and methadone.¹²

A Bangladesh study characterized treatment for SUD in the country as falling into 2 distinct categories: the medical hospital model and the ashram model of spiritual.²⁵ Whereas facilities that employ the medical hospital model are staffed by medical professionals, ashram treatment centers are run by nonmedical social activists, including Christian ministers. Historically, public hospitals have dominated the treatment market under a state-run health care system; however, with private providers now allowed to operate, private for-profit as well as nonprofit drug treatment centers have begun to emerge.²⁵

Treatment Modalities

AA/Minnesota model. Several existing studies have begun to characterize the use of AA programs, and/or the Minnesota Model in different countries.

One study investigated the effectiveness of the model at a treatment center in Kottayam, India, a 20-bed inpatient facility that combines AA-based therapy with detoxification. Among a cohort of patients examined at 1-year post-treatment (N = 174), 33.3% had maintained complete abstinence,¹³ but for those examined 5 years after treatment (N = 151), this figure fell to 16.5%.²⁶ Also, at 5 years, 59.6% had not changed their alcohol consumption.²⁶ Patients who came from geographically distant locations and those who had health workers in their localities were more likely to achieve complete abstinence.²⁶ For comparison, a longitudinal study of 3018 men across 15 U.S. Veterans Administration substance abuse programs demonstrated an abstinence rate of 45.2% at 1-year follow-up among patients who did not receive regular additional treatment services after discharge.²⁷

Crossroads Centre Antigua is a 35-bed, 29-day nonprofit residential center that provides drug and alcohol addiction treatment for patients from the Caribbean region (15%) as well as from other countries (85%), wherein involvement in AA or another 12-step program is "deemed essential to recovery."²⁸ In this facility, Caribbean and non-Caribbean clients were equally as likely to use alcohol as their primary drug, whereas Caribbean clients were less likely to use heroin or pills or

to have a prior psychiatric diagnosis and more likely to use marijuana or cocaine. Among all patients entering treatment between November 1998 and October 2002 ($N = 100$), researchers found that the attainment of abstinence was just under 50%.²⁹ Attaining abstinence was significantly more likely for patients who completed treatment, who accepted halfway house placement, and whose families participated in the program.²⁹ Among a separate sample of Crossroads Centre clients ($N = 446$), those who left treatment before completion were more likely than their counterparts who completed treatment to use opioids or be on medication for a psychological illness, but less likely to use alcohol or other sedative drugs.³⁰

It has been reported that in China, self-help groups including AA and NA are available “in some settings and communities,” suggesting that the model is present but limited.¹² One paper uses case vignettes to describe the implementation of a therapeutic community model based on behavioral modification and the 12 steps of NA for opiate addicts in southwest China.²⁴ Described by the author as “one of the only treatment options in China for former addicts to confront their psychology and face their personal problems as curable rather than being treated as criminals working against the state,” the program claims a 35% success rate, although the author does not explain how success is defined.²⁴

Other studies chose adherence to treatment, rather than successful attainment of abstinence among those who remain in treatment, as their outcome variable within the context of the AA model. Among a sample of hospitalized alcoholics in Porto Alegre, Brazil interviewed 6 months after hospitalization ($N = 300$), AA adherence was found to be below 20%, with patients reporting lack of need, lack of credibility, lack of identification with the method, and relapse as reasons for nonadherence.³¹ Higher educational level was associated with participation in AA groups.⁴

Another study measured the rate of premature discharge at the Drug Assessment, Detoxification and Rehabilitation Unit of the University Hospital of the West Indies, which offers an 8-bed, 28-day inpatient substance abuse treatment program for voluntarily admitted patients. The multimodal approach to treatment used by this program emphasizes group psychotherapy but also includes AA and NA participation as well as medication, education, individual psychotherapy, and creative arts therapy.³² Just under one-fourth of patients studied ($N = 224$) ended treatment prematurely due to self-discharge or rule-breaking, and premature discharge was significantly correlated with admission primarily for crack cocaine dependence rather than alcohol dependence.³²

Finally, a Trinidad and Tobago study investigated reasons for initiating drug use and abuse among a sample of women ($N = 20$) attending AA, NA, or other rehabilitation centers. Among the 110 local rehabilitation centers, 46 were used in the study because they were

active and had female patients. The authors identified a variety of critical incidents, including relationship issues, peer pressure, and abuse.⁵

AA-based interventions. An inpatient treatment approach based on the Minnesota/Therapeutic Community Model, including the 12 steps of AA and the disease concept of drug dependence, was implemented at a neuropsychiatric hospital in Nigeria.³³ Approximately 33% of patients who met the admissions criteria ($n = 65$) completed the treatment schedule, and a sharp drop in the abscondence rate was observed within 6 weeks of the introduction of spiritual therapy.³³ However, non-Christian patients expressed concerns about bias in this component of the program.³³

One noncontrolled study investigated the implementation of a psychotherapeutic approach to alcoholism treatment based on the 12-step model at the Recovery Treatment Centre in Moscow. Preliminary results from interviews with patients who had successfully completed treatment and remained abstinent for at least 6 months ($n = 15$) indicated that the treatment offered “core effective elements,” including the ability to establish intimate relationships with other recovering patients and a cathartic feeling from participating in group discussions.¹⁴ Patients who had previously been treated under the Soviet Narcology System, which employed treatment models based on fear and behavior modification and included forced labor camps for severe cases,^{34,35} strongly preferred the AA-based approach.¹⁴ The authors argue that according to their findings, this model can be successfully applied to Russia, with the caveat that their sample of relatively affluent and well-educated patients may not be representative of the general population.

Pharmacological Approaches

Studies in Russia, India, and China described the use of pharmacological treatment for SUD.

One anthropological study based on 14 months of fieldwork at addiction clinics in St. Petersburg found a high prevalence of disulfiram prescription for alcohol dependence in Russia and frequent substitution of placebos by providers. The author argues that the latter practice reinforces a hierarchical clinician-patient relationship in the post-Soviet era.³⁶

Disulfiram treatment is also a component of the treatment approach at the Jawaharlal Institute of Post Graduate Medical Education and Research in Pondicherry, India, which offers a 4- to 6-week inpatient stay program followed by a 1-year outpatient follow-up.³⁷ Disulfiram is offered to all patients with neither medical nor psychiatric contraindications and is self-administered by patients, who pick up the medication on a biweekly basis. All patients are “informed in detail about the experiences they are likely to undergo if they consume alcohol while on disulfiram.”³⁷ In addition to disulfiram, the treatment program includes detoxification, group therapy, and lectures on alcohol-related problems.³⁷

In a study of patients from the Pondicherry district who met criteria from the *Diagnostic and Statistical Manual*, third edition-revised, for alcohol dependence syndrome (N = 60), 32.5% remained abstinent after 1 year, with another 35% improving in occupational and social functioning despite continuing to drink.³⁷ However, a later study at the same facility (N = 800) found that 62.4% of patients did not use the follow-up services beyond 1 month, and only 12.3% of patients who were prescribed disulfiram were compliant for at least 6 months.³⁸

The comparative analysis of substance abuse treatment in China and Germany found high rates of recidivism with MMT for opiate addiction in China.²¹ At the same time, MMT is widely accepted by physicians in China to have “clear positive effects,” including preventing harmful consequences of drug use such as HIV infection.²¹

Multimodal Approach

Another study described the provision of a diverse array of treatment services at a single facility. The Drug De-Addiction and Treatment Centre (DDTC) provides inpatient, outpatient, laboratory, and aftercare services as part of a tertiary care medical center in Chandigarh, India.³⁹ Self-help groups and liaison with other agencies are also provided.³⁹ The DDTC serves patients from several states in northern India, with the majority entering on their own or by family referral.³⁹ A retrospective chart review of women attending DDTC (N = 35) revealed that a typical participant had made 4.17 follow-up outpatient visits in the past 8.4 months, with 54% of all patients and two-thirds of opioid abusers reporting abstinence at the last follow up.³⁹

Prevention, Detection, and Harm Reduction Interventions

Two studies examined interventions to prevent and detect drug abuse as well as to reduce harm among drug users.

A school-based substance abuse prevention program called Breaking the Cycle was implemented for third-grade students in Antigua and Barbuda in 2001.⁴⁰ Modeled after Project Charlie (Chemical Abuse Resolution Lies in Education), which originated in Minnesota in 1976 and has been repeatedly revised to incorporate the aspects of successful school-based prevention programs, the Breaking the Cycle program adheres to most of the criteria for effective evidence-based substance use prevention programs.⁴⁰ However, its effectiveness has yet to be assessed.⁴⁰

A 5-day faculty development program was implemented to train physicians in Venezuela in the prevention and treatment of alcohol-related problems. The model applied, which involved role plays, class presentations, skills-building workshops, and assigning participants to develop teaching plans, was found to be

an effective way to increase physician training, consistent with prior research in other countries.⁴¹

Services

Seven articles were identified that discussed service-related issues in the treatment of SUD in developing countries. Some focused on barriers to treatment for patients, whereas others mainly addressed resource limitations faced by providers.

Access to treatment. A case-control study identified financial constraints, a lack of geographic accessibility, and a lack of awareness of treatment availability as major barriers to treatment initiation faced by substance abusers from disadvantaged communities in Cape Town, South Africa.⁴² These and other conditions restricting patients' ability to attain needed services explained approximately the same proportion of the variance in treatment utilization as variables related to the need for treatment.⁴² The authors recommend food and transport vouchers, mobile outpatient treatment services, expanded awareness efforts through community-based outreach workers, and low threshold services for patients with less severe substance problems as strategies to improve utilization.⁴²

In qualitative interviews, substance abuse treatment providers (N = 35) in three Russian cities identified a severe lack of social support, rehabilitation programs, high costs, and other resources as major barriers to treatment, consistent with findings from previous research.¹⁷ The registration system for drug users was also characterized as a barrier—indeed, a separate study also found that drug users in Russian cities feared a loss of confidentiality as a result of registration.⁴³ Providers noted the availability of high-quality inpatient detoxification services, which can be legally provided only by the state, but they called attention to the relative lack of post-detoxification services, which can be provided privately.¹⁷

Resources for providers. One study identified discontinuation of funds and lack of legal protection for outreach workers as barriers facing harm reduction programs (N = 5 programs) for crack cocaine users in Brazil.⁴⁴ Although the programs are government initiatives, employees faced police violence while conducting outreach work such as distributing safer smoking equipment.⁴⁴

The analysis of the role of NGOs in drug demand reduction in Nigeria determined that increased NGO involvement has not been matched by increases in funding. Most of the NGOs relied on private contributions or personal funds and described underfunding as a major challenge, with 10% of survey respondents desiring further training in fundraising.²³ A lack of training in the areas of prevention and research and evaluation also impedes NGO efforts in Nigeria, as does a shortage of treatment personnel.²³

Provider training. Two studies revealed concerns about the ability of primary care providers to adequately detect and treat alcohol-related problems in Africa. A study that identified 39 alcohol-dependent patients and 126 patients with alcohol-related problems among a sample of primary care patients in Nigeria (N = 878) found neither medical notes mentioning alcohol use/problems in the patients' charts nor discussion about drinking between patients and primary care providers.⁴⁵ The authors recommend increasing the number of hours devoted to alcohol education in the medical school curricula of developing countries.⁴⁵

Among a sample of general practitioners in Cape Town, South Africa (N = 50), the majority reported having seen only 11 to 30 patients specifically for alcohol problems in the past 12 months.⁴⁶ Although 78% of the sample said that they could effectively help patients reduce their drinking given sufficient support, only 12% thought they could be effective at the time of interview, citing reimbursement issues, inadequate training, and lack of materials as obstacles.⁴⁶

CONCLUSIONS

Thirty articles regarding SUD treatment in developing countries were identified in the current literature, suggesting that current knowledge extends beyond mere awareness that SUD is a pervasive problem in the developing world.

The review paper on treatment models in China and Germany not only provides detailed summaries of the various treatment options in the two countries, but it also highlights specific ways in which the differing models might inform one another.²¹ The analysis of differences in the relative spread of Evangelical Christianity within El Salvador compared with Puerto Rico helps to explain why a model that has worked in one country has not met similar success in another. Such comparisons facilitate cultural competence in program implementation.²²

By answering broad questions about ownership, funding sources, and types of services provided, the overviews of treatment models and NGO involvement in Nigeria provide both critical information for planning future treatment and research programs in that country and a framework for exploring the substance use environment in other countries.^{6,23} Along the same vein, the comparison of the medical hospital model and the ashram model in Bangladesh²⁵ and the overview of available treatment services in China¹² offer starting points for categorizing and planning substance abuse treatment programs in these countries and their regions. Even the more limited studies, such as those confined to a single treatment center, are informative when juxtaposed with one another. For example, the studies on disulfiram prescription in India and Russia provide divergent perspectives on a pharmacological approach to alcohol abuse treatment.^{36,37}

The studies reviewed are also valuable in that they point to specific areas of need within developing countries, building on existing awareness of general barriers to treatment for SUD. Existing research highlights the need to provide secular alternatives to the dominant treatment approach in El Salvador,²² improve access to harm reduction programs for crack cocaine users in Brazil,⁴⁴ and ensure the availability of safe havens for recovering addicts in China to avoid being treated as criminals.²⁴ Policymakers can use this information to design programs that meet known population needs and avoid providing extraneous services.

In light of evident need for treatment of SUD in the developing world, future research would do well to blend inquiry with practice. This approach appears to be largely absent from the prior literature, as only 4 intervention studies were identified, with a mere 2 pertaining directly to treatment. Although further investigation is clearly needed in order to better understand the specific needs of developing world populations, assisting those populations should be a primary goal of all endeavors. Conversely, service-oriented planning for addressing SUD in the developing world should be done with a mandate to study the effect of interventions in order to establish program efficacy.

Finally, the mixed results in the literature regarding implementation of the AA model in developing countries invite further exploration, ideally in more systematic and comprehensive ways that perhaps span countries. Although there is reason to question whether a model that relies so heavily on self-revelation and sharing will work in all places due to cultural and privacy concerns, the AA model has great appeal for developing countries that lack financial resources to create more comprehensive substance use treatment programs. Finding successful ways to adapt the AA model in different settings therefore may not only be a cost-effective way to scale up services but also help foster a culture of awareness of substance use issues that can in turn spark greater investment in medicalized resources beyond what AA can offer.

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