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Case report

Treatment of an HIV-affected adolescent with heroin dependence in a low-income country: A clinical case study from Zambia



Christopher Akiba^{a,*}, Jeremy C. Kane^a, Stephanie Skavenski van Wyk^a, Ravi Paul^b,
Chombalelo Mukunta^c, Laura K. Murray^a

^a Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 North Broadway, Baltimore, MD, 21205, United States of America

^b Department of Psychiatry, School of Medicine, University of Zambia, 1 Nationalist Road, University Teaching Hospital, PO Box 50110, Lusaka, Zambia

^c Serenity Harm Reduction Programme Zambia (SHARPZ), The Secretariat Plot #220 C, Mutandwa Road, PO Box 33705, Lusaka, Zambia

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ABSTRACT

Introduction: Although the World Health Organization (WHO) has recommended guidelines for the treatment of opioid dependence, there are myriad challenges to successfully implementing such guidelines in resource constrained settings, such as in low and middle-income countries (LMICs). To highlight these challenges, this paper presents a clinical case study of an adolescent study participant in a randomized controlled trial comparing two counseling programs in Lusaka, Zambia.

Case description: This 15 year-old male reported smoking marijuana and heroin daily, and injecting heroin monthly (while needle sharing). The patient was linked to the only physician capable of treating heroin addiction in Zambia. The patient was placed on a 30-day detox regimen of Tramadol administered from home, as in-patient detox services are unavailable in Zambia. The patient experienced complications with out-patient detox, including a relapse that led to violent behavior and temporary incarceration. The patient's treatment regimen was altered to include Lorazepam, a mild sedative, and psychosocial counseling. After completing detox the client was prescribed Naltrexone for maintenance as Methadone is listed as a banned substance in Zambia, and Buprenorphine is not available and is cost prohibitive.

Conclusions: Despite a considerable amount of time and resources expended to successfully treat the patient, the majority of WHO guidelines for opioid dependence treatment were not attainable within the Zambian context. Additional research into the effectiveness and implementation of evidence-based interventions for substance use in LMICs is warranted.

1. Introduction

Adolescents in low- and middle-income countries (LMICs) are at high risk of exposure to adversities such as scarcity of food, poor nutrition, violence, inadequate education, and living in a neighborhood characterized by absence of social networks, all of which are risk factors for mental health and substance use problems (Patel, 2007). In particular, children who are HIV positive, have been orphaned or made otherwise vulnerable by HIV (Orphaned or Vulnerable Children; OVC), or are in some way HIV-affected have an especially increased risk for substance abuse (Pufall et al., 2014; UNODC, 2012). A survey of Zambian school students revealed that 40% reported the use of a psychoactive substance (World Health Organization, 2009b). Substance

use problems can, in turn, lead adolescents to make unhealthy decisions, such as needle sharing and sexual risk behaviors, further increasing the risk of HIV infection and/or transmission (Pettifor, O'Brien, Macphail, Miller, & Rees, 2009; UNODC, 2012). Despite the continued research and programmatic attention to HIV in LMICs by international organizations, governments, and Ministries of Health, public health attention to substance use in areas with high HIV prevalence has been comparatively limited.

Although the World Health Organization has developed guidelines for the treatment of substance use problems, such as opioid dependence (World Health Organization, 2009a), it is often difficult or nearly impossible to successfully implement such guidelines and recommendations in resource constrained settings, such as the case in LMICs

* Corresponding author at: Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, 8th Floor, Baltimore, MD 21205, United States of America.

E-mail addresses: akiba@live.unc.edu (C. Akiba), jkane29@jhu.edu (J.C. Kane), sskavenski@yahoo.com (S. Skavenski van Wyk), ravipaul35@gmail.com (R. Paul), chombalelo@yahoo.com (C. Mukunta), lmurra15@jhu.edu (L.K. Murray).

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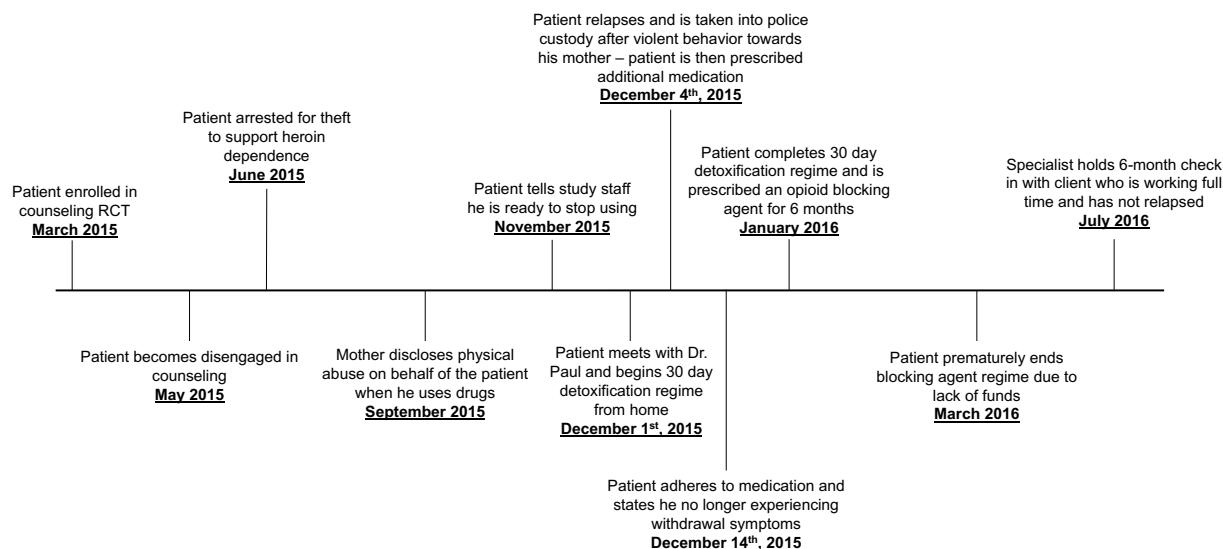


Fig. 1. Timeline of relevant events.

(Chakkalakal et al., 2013; Dua et al., 2011; Kane et al., 2015). In fact, at least 75% of those in need of substance use services in LMICs do not receive adequate treatment (WHO/UNHCR, 2015). This is due, in part, to the infrequent use of evidence-based psychological and pharmacological treatments for substance use disorders in such settings, as well as a lack of trained clinicians to deliver such interventions (Saraceno et al., 2007).

2. Methods

2.1. Study description

As part of an ongoing randomized controlled trial (RCT) of interventions to reduce HIV risk behaviors, substance use, and trauma symptoms among OVC in Zambia (ClinicalTrials.gov identifier: NCT02054780 NICHD project number: 1R01HD070720-01), we are aiming to build the evidence base for effective, implementable psychotherapeutic treatment options (Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Psychosocial Counseling (PC)) that can be delivered by lay counselors and sustained over the long term. During the course of recruitment and enrollment for the RCT, we found high rates of lifetime substance use among our OVC population, even though substance use itself was not a formal study eligibility criterion (Kane, Murray, Bass, Johnson, & Bolton, 2016).

Most patients in our study with substance use have been treated by counselors trained in one of the two interventions under evaluation. However, in exceptionally severe cases of acute substance dependence, we believed that it was necessary and ethically required to refer patients to care outside the study interventions for more intensive treatment. Given the lack of a detailed clinical report on substance dependence treatment in LMICs in the scientific literature, we believed that a case report documenting such a treatment course would fill a critical gap. We therefore present this case report, which details the treatment of a 15-year old male adolescent who met PEPFAR criteria for OVC status and presented with co-occurring trauma symptoms and severe opioid disorder (OGAC, 2012, p.20).

Informed consent was obtained from the patient and his caregiver before enrollment into the trial and additional oral permission was obtained following his participation in the trial to publish the details of his treatment anonymously in this case report. Both the randomized trial and this case report were approved by the Johns Hopkins Bloomberg School of Public Health and University of Zambia Biomedical Research Ethics Committee. Research reported in this

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2.2. Subject

The patient was a 15-year old male who lived with his mother and sister in a Lusaka inner-city compound, a densely populated area characterized by low socio-economic status. He was enrolled in the RCT in March 2015 (see Fig. 1 for timeline).

During an initial counseling session, he self-disclosed daily marijuana and frequent, heavy alcohol use to his counselor. He also reported daily Benylin abuse, an over-the-counter cough syrup that when taken in large quantities (100–1800 mg) can have dissociative effects making the user feel out of control and disconnected from his/her body and environment (Chyka et al., 2007).

In May 2015, after five counseling sessions, the patient began consistently missing scheduled appointments with his counselor. Following study protocol, the research team began calling the patient and his family at home to re-engage him in treatment, retain him in the study, and check on his safety. In June 2015, the patient's mother reported to the study team that the patient had left home to hide from the police after several of his friends were arrested for marijuana possession. Within a few weeks, the patient was arrested himself after being caught attempting to steal the side mirrors from a parked car with the intent of selling them to obtain heroin. The patient spent four days in police custody before being released back into his mother's care. Shortly after his release from jail he began working part time, which precluded his ability to regularly attend counseling sessions.

The study team attempted to follow-up with the adolescent in-person after failing to reach him by phone. The process of finding the address listed by the child on his intake form was also not straightforward; home addresses and streets within Lusaka compounds are often unmarked and individuals frequently move from one home to another. The home was eventually located in September 2015 and the study team spoke with the patient's mother who stated that her son uses “serious drugs that make him violent.” She disclosed that the patient had physically attacked her after she had suggested that he return to counseling at which point she stopped prompting him about re-

Table 1
Time and cost of treatment/coordination by team member.

	Description of time/resources spent on patient's case	Hours (total)	Cost (total)
Research assistants	Skype calls and emails regarding decision making (10.5 h), Coordinating patient follow-up with research staff (8 h), treatment coordination logistics and planning (16 h), treatment planning with MSW clinician and Clinical supervisor (4 h)	38.5	\$1059.14
MSW clinician	12 individual counseling sessions (12 h), 8 group counseling sessions (8 h)	20	\$0 (Volunteer)
Principle investigators	Skype calls and emails regarding decision making	10.5	\$630.21
Dr. Ravi Paul	Face-to-face visits with the patient (6 h), phone calls with the research team (2 h), writing case notes (1 h)	9	\$250.00
Clinical supervisor	In-person visits to patient's home for safety planning (4 h), phone call safety check-ins (2 h)	6	\$37.50
Research staff	Home visits and phone calls trying to locate patient's home	4	\$24.44
Transportation	Taxi fees transporting patient to/from treatment		\$200.00
Medication	Total cost of patient's medication		\$330.00
Total		88	\$2531.29

engaging with treatment all together.

Consistent with study protocol, a study clinical supervisor trained in safety planning called the patient's mother to create a safety plan. During this call, the clinical supervisor learned about a new incident in which the patient had used heroin, became agitated, and assaulted the mother when she forced him to bathe. The clinical supervisor, together with the mother, drafted a safety measure that involved not forcing the patient to do anything if he appeared to be intoxicated. The clinical supervisor also probed the mother and found that the family lived close to a police station. They agreed to institute a further safety measure that included the mother locking herself in her bedroom and calling the police if she ever felt unsafe around the patient. In addition to making regular weekly safety check-ins during the months of September and October 2015, the clinical supervisor also offered a referral for general substance use disorder counseling provided by the local partner organization.

After repeated visits to the patient's home, the study team eventually spoke with the patient face-to-face in late November 2015 to discuss whether he wanted to withdraw consent to participate in the study given his high level of disengagement. At this meeting, the patient disclosed regular heroin use to study staff and stated he would like to begin taking medication to help him stop using. The study team facilitated a referral to the only psychiatrist with substance use disorder expertise in the country, working from the University Teaching Hospital in Lusaka (UTH) (study author Paul who is also a co-investigator on the RCT). Along with the referral, the study team decided that the case warranted financial support for the medications the patient would need.

At his initial meeting with Dr. Paul in late November 2015, the patient reported smoking a mixture of marijuana and heroin, approximately 5–10 g once per day, in addition to occasional heroin injection of approximately 1 mL once per month. When injecting, the patient reported sharing a needle between 4 or 5 of his friends who would inject about 1 mL each. The number of partners engaged in needle sharing is particularly alarming given that data from our trial suggest that 25% of HIV-affect OVC in Lusaka are HIV positive. After hearing of the patient's needle sharing, Dr. Paul prompted him about his HIV status. The patient replied by stating that he had a recent negative test at a local clinic. A study clinical supervisor followed up and gave the youth additional HIV/AIDS education and provided referrals to nearby clinics for further testing. However, it is unknown whether or not the patient even went for additional testing. The patient also admitted to stealing household goods from this mother (i.e., pots and pans, clothing, shoes, and cell phones) that he would sell on the street to obtain heroin.

The patient was prescribed several medications to begin his detoxification from heroin as well as to mitigate withdrawal symptoms. At the initial November 2015 visit with Dr. Paul, he was placed on a 30-day step-down regime of Tramadol. The patient was prescribed 600 mg in divided doses for the first five days (300 mg PO, 300 mg IV), 400 g PO for the next five days, 300 g PO for the following five days, 200 g PO

for the next five days, before concluding at 100 g PO for the final ten days. The patient was also given 0.1 mg of Clonidine PO three times per day for 20 days in order to regulate heart rate and decrease agitation. He was given 2 mg PO of Clonazepam to assist with sleeping, 2 mg PO of Loperamide twice a day initially, and then once daily for 30 days to help control diarrhea (a common symptom of heroin withdrawal), and 4 mg PO of Chlorpheniramine for 10 days to help mitigate flu-like symptoms often associated with withdrawal. These medications were given to the patient to self-administer from home because in-patient detox services are not currently available in Zambia.

In early December 2015, just three days after the patient began this course of treatment, he relapsed by smoking a mixture of marijuana and heroin with his friends. The interaction between the heroin and his detox regime caused extreme behavior changes resulting in severe aggression, including throwing and breaking household items and threatening violence against his mother. Per the safety plan made with the study clinical supervisor, the mother had the patient taken to the neighborhood police station early that morning. The study team was notified shortly after and facilitated the transfer of the patient from the police cells to UTH for assessment. During this visit, the patient was prescribed an additional 100 mg of IV Tramadol to be taken once per day for the next 3 days as well as 8 mg of IV Lorazepam plus 10 mg of Haloperidol to be taken once per day for the following 5 days. Lorazepam is a higher acting sleep agent regularly prescribed by Dr. Paul to decrease insomnia and to counteract the extrapyramidal side effects of Haloperidol. Haloperidol was prescribed to reduce his symptoms of psychosis as well as control his aggressive and violent behavior. The additional medications were administered throughout the day and the client was released in the evening to his mother's home for the night.

The patient returned for a scheduled follow-up visit with the Dr. Paul in mid-December 2015, 10 days after his assessment at UTH. Dr. Paul noted that the patient was highly motivated and had not experienced any withdrawal symptoms (i.e., no reports of diarrhea, muscle cramps, running nose, or insomnia). The patient next visited Dr. Paul in early January 2016 after completing his 30 day step-down detoxification treatment from home. At this visit the patient also complained of depression symptoms (i.e., feeling down, or having a "low mood"). He was prescribed 25 mg of Amitriptyline, an anti-depressant. All other medicines were tapered off and stopped during this time. Starting from the 5th day of the last dose of detox medications, the patient was also prescribed Naltrexone, an opioid antagonist in order to block opioid cravings, at 50 mg per day. The patient continued with these final two medications until March 2016 when study funds could no longer be used to support him financially. Dr. Paul performed a six-month phone check up on the client in July 2016 and found that the client had not relapsed and was employed full time at an auto body business.

Concurrent to the patient's physical health assessment and treatment, he was also referred to a Masters of Social Work (MSW)-level clinician volunteering at a study partner organization, to assist with emotional and behavioral health. The patient's treatment with this

Table 2
Extent to which WHO Guidelines (paraphrased) for treating opioid dependent patients were met in the Zambian context.

	Paraphrased WHO treatment guidelines (minimum standards)	WHO treatment guidelines met in Zambia?	Treatment notes
National health systems level			
Compulsory and coerced treatment	Psychosocially assisted pharmacological treatment should not be compulsory.	Yes	Treatment is not compulsory
Funding	Treatment should be accessible to disadvantaged populations. At the time of commencement of treatment services, there should be a realistic prospect of the service being financially viable	No	Treatment not available to disadvantaged populations in Zambia due to lack of medications and treatment infrastructure
Coverage	Pharmacological treatment of opioid dependence should be widely accessible; this might include treatment delivery in primary care settings. Comorbid patients can be treated in primary health-care settings if there is access to specialist consultation when necessary	No	Treatment of opioid dependence not widely accessible nor available in primary care settings in Zambia
Available treatments	Essential pharmacological treatment options (either Methadone or Buprenorphine) should consist of opioid agonist maintenance treatment and services for the management of opioid withdrawal	No	Methadone listed as banned substance, Buprenorphine is not feasible in Zambia due to cost
Program level			
Clinical governance	Treatment services should have a system of clinical governance, with a chain of clinical accountability within the health-care system, to ensure that the minimal standards for provision of opioid dependence treatment are being met	Partially	While treatment services do exist, they are not fully integrated into the health-care system and are provided at a private clinic run by Dr. Paul. However, minimal standards of treatment are not able to be met due to unavailability Methadone and Buprenorphine in Zambia
Ethical principles and consent	Patients must give informed consent for treatment	Yes	Informed consent received from patient
Staff and training	Treatment of opioid dependence should be carried out by trained health-care personnel. The level of training for specific tasks should be determined by the level of responsibility and national regulations	Yes	Treating psychiatrist trained to local level of responsibility
Clinical records	Up-to-date medical records should be kept for all patients. Confidentiality of patient records should be ensured. Health-care providers involved in the treatment of an individual should have access to patient data in accordance with national regulations, as should patients themselves. Health-care providers or other personnel involved in patient treatment should not share information about patients with police and other law enforcement authorities unless a patient approves, or unless required by law. Patients treated with opioid agonists should be identifiable to treating staff	Yes	Clinical record keeping in accordance with WHO guidelines
Medication safety	Documented processes should be established to ensure the safe and legal procurement, storage, dispensing and dosing of medicines, particularly of methadone and buprenorphine	Partially	Medication safety standards are met in Zambia however methadone and buprenorphine are not available
Clinical guidelines	Clinical guidelines for the treatment of opioid dependence should be available to clinical staff	Yes	Clinical guidelines are available to staff
Treatment policies	To maximize the safety and effectiveness of agonist maintenance treatment programs, policies and regulations should encourage flexible dosing structures, with low starting doses and high maintenance doses, without placing restrictions on dose levels and the duration of treatment	Yes	Treatment policies encourage flexible dosing structures
Individual treatment plan	A detailed individual assessment should be conducted which includes: history (past treatment experiences; medical and psychiatric history; living conditions; legal issues; occupational situation; and social and cultural factors, that may influence substance use); clinical examination (assessment of intoxication/withdrawal, injection marks); and, if necessary, investigations (such as urine drug screen, HIV, Hep C, Hep B, TB, liver function)	Yes	Individual treatment plans regularly conducted
Range of services to be provided	Essential pharmacological treatment options should consist of opioid agonist maintenance treatment (Buprenorphine or Methadone) and services for the management of opioid withdrawal. Naloxone should be available for treating opioid overdose	No	Methadone listed as a banned substance, Buprenorphine is not feasible in Zambia due to cost
Psychology and psychiatric support	Psychosocial support should be available to all opioid-dependent patients, in association with pharmacological treatments of opioid dependence. At a minimum, this should include assessment of psychosocial needs,	Partially	Psychosocial support services exist in Zambia but are not available to all opioid-dependent patients

(continued on next page)

Table 2 (continued)

	Paraphrased WHO treatment guidelines (minimum standards)	WHO treatment guidelines met in Zambia?	Treatment notes
TB, hepatitis, and HIV	supportive counseling and links to existing family and community services. Links to HIV, hepatitis and TB treatment services (where they exist) should be provided.	Yes	Links provided where they exist
Treatment evaluation	There should be a system for monitoring the safety of the treatment service, including the extent of medication diversion.	Partially	All PO treatments are administered by the patient or their caregiver in home setting
Patient level			
Choice of treatment approach	For the pharmacological treatment of opioid dependence, clinicians should offer opioid withdrawal, opioid agonist maintenance and opioid antagonist (naltrexone) treatment, but most patients should be advised to use opioid agonist maintenance treatment.	Partially	See notes below
Management of opioid withdrawal	Tapered doses of Buprenorphine or Methadone should generally be used, although alpha-2 (Clonidine) adrenergic agonists may also be used	Partially	~280 mg Tramadol/day for 30 days AND 0.3 mg Clonidine/day for 20 days
Psychosocial assistance in addition to pharmacological assistance for opioid withdrawal	Psychosocial services should be routinely offered in combination with pharmacological treatment of opioid withdrawal.	Yes	Psychosocial support services met for patient but not widely available to all Zambians due to cost
Choice of agonist maintenance treatment	For opioid agonist maintenance treatment, most patients should be advised to use methadone in adequate doses in preference to buprenorphine.	No	Methadone listed as banned substance, Buprenorphine is not feasible in Zambia due to cost
Initial doses of opioid agonist maintenance treatment	During methadone induction, the initial daily dose should depend on the level of neuroadaptation; it should generally not be more than 20 mg, and certainly not more than 30 mg.	No	Methadone listed as banned substance in Zambia
Fixed or flexible dosing in agonist maintenance treatment	On average, methadone maintenance doses should be in the range of 60–120 mg per day	No	Methadone listed as banned substance in Zambia
Maintenance doses of buprenorphine	Average buprenorphine maintenance doses should be at least 8 mg per day.	No	Buprenorphine is not feasible in Zambia due to cost
Supervision of dosing in opioid agonist maintenance treatment	Methadone and buprenorphine doses should be directly supervised in the early phase of treatment. Take-away doses may be provided for patients when the benefits of reduced frequency of attendance are considered to outweigh the risk of diversion, subject to regular review.	Partially	Methadone listed as banned substance, Buprenorphine is not feasible in Zambia due to cost. Naltrexone maintenance administered from home
Use of psychosocial interventions in maintenance treatment	Psychosocial support should be offered routinely in association with pharmacological treatment for opioid dependence.	Yes	Psychosocial support services met for patient but not widely available to all Zambians due to cost
Opioid antagonist (naltrexone) treatment	For opioid-dependent patients not commencing opioid agonist maintenance treatment, antagonist pharmacotherapy using naltrexone should be considered following the completion of opioid withdrawal.	Yes	50 g Naltrexone/day for 60 days administered to patient in lieu of adequate opioid agonist maintenance treatment

clinician lasted for two months (early December 2015–late January 2016) and consisted of individual sessions delivered twice per week for eight weeks and group sessions delivered once per week for eight weeks. These sessions targeted the patient's substance abuse through psychoeducation (i.e., stages of change, relapse prevention, and triggers), skills coaching (i.e., decisional balance, stress management, and dealing with relationship problems), and personal therapy (i.e., thoughts/feelings/behaviors, trauma, and grief and loss).

3. Results

This paper details a case study of coordination and planning utilized to treat an adolescent with severe comorbid substance use disorder and mental health problems (trauma, depression) in Lusaka, Zambia. Significant levels of effort from this study's investigators and staff—in total, 88 h at a cost of more than \$2500—had to be allocated to the treatment due to ethics and safety, a substantial cost relative to the average income of a family living in Lusaka at \$434/month (see Table 1 for time and costs of treatment/coordination) (Central Statistics Office Republic of Zambia, 2015).

Despite this elevated level of care, the patient was still unable to

receive treatment consistent with WHO guidelines, which highlights challenges for treating co-morbid patients in LMIC (see Table 2 for paraphrased WHO guidelines).

For instance, WHO Treatment guidelines recommend the use of methadone as a first-line opioid replacement detoxification therapy. Methadone is presently a “banned narcotic substance” by Zambia's Ministry of Legal Affairs and not available as a treatment (Ministry of Legal Affairs Republic of Zambia, 1993). WHO treatment guidelines also recommend heroin detox from an in-patient setting in cases of comorbidity. However, the patient in this report was treated from home because no in-patient heroin detoxification centers currently exist in Zambia. The geographically closest drug treatment centers are located in South Africa.

Zambia, along with most LMICs, lacks the facilities and trained professionals necessary to adequately treat patients with severe substance use disorders. There is currently no hospital ward in the county equipped to handle drug overdoses. There are also no secure drug rehabilitation facilities to manage patients who exhibit violence or other psychotic symptoms associated with heroin withdrawal. Thus, in Zambia and in most LMICs, detoxification from home is presently the only feasible option. Treatment from home also puts stressors on family

members who need to care-take during the initial withdrawal symptoms. Our team incorporated cognitive-behavioral therapy-based safety plans to help the patient's mother during times of aggression. This type of safety planning will be critical for settings that use home detox.

4. Conclusion

The adolescent described in this report would almost certainly not have received any treatment for his substance use disorder had he not been formally enrolled in the research study. The research and clinical staff, as well as the financial support from the study provided infrastructure through which formal, evidence-based care could be delivered (albeit at lower levels than recommended by WHO). The literature suggests that substance use disorder treatment delivery can be improved through integration of services into primary care, the creation of in-patient substance abuse treatment centers, and the development of radio or television programs to raise public awareness of treatment options (Dua et al., 2011; WHO guidelines). None of these options currently exist in Zambia or many other LMICs. We therefore urgently recommend hybrid research efforts in LMICs to test dual outcomes of the effectiveness of evidence-based treatment approaches and strategies to implement and sustain such approaches in resource-limited settings.

Declarations of interest

None.

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