



Beyond methamphetamine: Documenting the implementation of the Matrix model of substance use treatment for opioid users in a South African setting



Jessica F. Magidson^{a,b,*,1}, Hetta Gouse^{c,1}, Warren Burnhams^d, Christie Y.Y. Wu^a, Bronwyn Myers^{e,f}, John A. Joska^c, Adam W. Carrico^g

^a Department of Psychiatry, Massachusetts General Hospital (MGH), 1 Bowdoin Square, 7th Floor, Boston, MA 02114, USA

^b Harvard Medical School, 25 Shattuck St, Boston, MA 02115, USA

^c HIV Mental Health Research Unit, Department of Psychiatry and Mental Health, University of Cape Town, J-Block Groote Schuur Hospital, Anzio Road, Observatory, Cape Town 7925, South Africa

^d City of Cape Town City Health, PO Box 2815, Cape Town 8000, South Africa

^e Alcohol Tobacco and Other Drug Research Unit, South African Medical Research Council, Francie Van Zijl Dr, Parow Valley, Cape Town 7501, South Africa

^f Division of Addiction Psychiatry, Department of Psychiatry and Mental Health, University of Cape Town, J-Block Groote Schuur Hospital, Anzio Road, Observatory, Cape Town 7925, South Africa

^g University of Miami School of Medicine, Department of Public Health Sciences, 1120 NW 14th St., Miami, FL 33136, United States

HIGHLIGHTS

- Opioid use has increased in South Africa after a methamphetamine (meth) epidemic.
- We compared opioid and meth users' engagement in the Matrix treatment model.
- Meth users were 4.5 times more likely to engage in treatment vs. opioid users.
- Yet, no differences were found in abstinence rates by primary substance.
- Strategies to enhance treatment entry and engagement among opioid users are needed.

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ABSTRACT

Introduction: The Matrix model of substance use treatment has been evaluated extensively in the United States as an effective treatment for methamphetamine use disorders. Since 2007, the Matrix model has been implemented in Cape Town, South Africa, where one in four treatment-seeking individuals are primarily opioid rather than stimulant users. Yet, there has been limited data on the application of the Matrix model for other types of substance use disorders in a resource-limited setting.

Methods: We compared primary opioid and primary methamphetamine users seeking treatment at the first certified Matrix model substance use treatment site in Cape Town, South Africa from 2009 to 2014 ($n = 1863$) on engagement in treatment, an important early predictor of later substance use treatment outcomes, and urine-verified abstinence at treatment exit.

Results: Compared to primary opioid users, primary methamphetamine users had over 50% greater odds of initiating treatment (defined as attending at least one treatment session following intake; OR = 1.55; 95%CI: 1.24–1.94), and 4.5 times greater odds of engaging in treatment (i.e., attending at least four treatment sessions; OR = 4.48; 95%CI: 2.27–8.84). There were no significant differences in rates of urine-verified abstinence at treatment exit.

Conclusions: Results suggest primary opioid users may experience additional barriers to treatment initiation and engagement in the Matrix model of substance use treatment, yet those who enter treatment are equally as likely to be abstinent at treatment exit compared to primary methamphetamine users. Findings highlight the need for additional strategies to optimize treatment initiation and engagement among primary opioid users in this setting, for instance by integrating medication-assisted treatment (e.g., methadone).

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* Corresponding author at: 1 Bowdoin Square, 7th Floor, Boston, MA 02114, United States.

E-mail address: jmagidson@mgh.harvard.edu (J.F. Magidson).

¹ Authors have contributed equally to this work and fulfilled the criteria of joint first authorship.

1. Introduction

South Africa's Western Cape Province has experienced an ongoing methamphetamine (locally known as “tik”) epidemic (Dada et al., 2016). Since 2002, Cape Town, the largest city in the Western Cape, has experienced an approximately 150-fold increase in rates of methamphetamine users presenting for substance use treatment (Dada et al., 2015). In response, the city of Cape Town has supported the roll-out of evidence-based treatment for methamphetamine use; in 2007, the city began implementing the Matrix model of outpatient treatment (Rawson et al., 1995) within primary health care in local peri-urban communities. Developed and tested in the United States (US), the Matrix model is an evidence-based, 16-week outpatient substance use treatment developed for methamphetamine use (Rawson et al., 2004; Rawson et al., 1995; Shoptaw, Rawson, McCann, & Obert, 1994).

Alongside the methamphetamine epidemic, opioid use in South Africa also has steadily grown since 1994 (Pasche & Myers, 2012). Between 1994 and 2010, treatment demand for heroin increased from <1% to between 5% and 20% depending on the province (Plüddemann et al., 2010). In the Western Cape specifically, reported heroin use among treatment-seeking patients grew from 12% to 19% between 2010 and 2014 (Dada et al., 2016).

The increase in heroin use has resulted in growing needs for opioid use treatment services. Medical professionals are facing increased requests to treat patients with opioid use disorders, but many are not equipped with required skills and training to address these patients' needs adequately (Weich, Perkel, van Zyl, Rataemane, & Naidoo, 2008). Addressing heroin use and improving substance use treatment options for heroin use has been a health policy recommendation for almost 20 years (Parry, Plüddemann, & Myers, 2005). Some privately-owned detoxification and rehabilitation facilities have become available; however, due to the large disparity between the cost of services in the private vs. public sectors, many individuals in need of treatment cannot afford such services (dos Santos, Rataemane, Fourie, & Trathen, 2010).

To date, there has only been limited evidence to evaluate the application of the Matrix model for other substance use disorder types in addition to methamphetamine use (Chatchawan & Rungtip, 2007; Eghbali, Zare, Bakhtiari, Monirpoor, & Ganjali, 2013). Given the lack of access to other affordable treatments for opioid use disorders, primary opioid users also utilize the Matrix model as an available treatment for substance use; indeed, opioids (i.e., heroin) are the second most common primary drug reported among individuals entering substance use treatment in this setting (after methamphetamine) (Gouse et al., 2016). Yet, there is limited data documenting the implementation of Matrix for primary opioid users, particularly in a resource-limited setting.

The overall aim of this study was to examine the application of the Matrix model of substance use treatment for primary opioid users at the first certified Matrix model substance use treatment site in sub-Saharan Africa in Cape Town, South Africa. Specific aims were to compare primary methamphetamine vs. opioid users on (1) demographic and clinical characteristics at treatment entry; (2) treatment initiation (defined as attending at least one treatment session following intake) and treatment engagement; and (3) urine-verified abstinence at treatment exit.

2. Method

2.1. Setting

This study was conducted at the first certified Matrix site in sub-Saharan Africa, located within a city-funded community health center in a peri-urban area outside Cape Town. The Matrix program was officially launched in 2008, and in 2010 it was certified as a Matrix 'program of excellence' (City of Cape Town, 2010). The clinic chiefly serves the surrounding low-income, largely “coloured” (an apartheid classification

for 'mixed race', still in use) community. However, due to the limited drug treatment services in the region, clients from outlying areas also utilize the site. At this facility, after methamphetamine, opioids are the second most common primary substance, followed by alcohol, methaqualone (mandrax) and cannabis (Gouse et al., 2016). The initial point of contact with the program is a drop-in, non-appointment screening visit. At this point, an evaluation is made for whether the patient is suitable for the Matrix program. Referrals to a higher level of service may be made for detoxification or more intensive services (i.e., residential treatment); however, wait times for these services are lengthy (typically a few months at a minimum). Psychiatry referrals to a local psychiatric hospital or emergency department are also made when a patient is experiencing psychosis or is a serious suicide risk. If the client is suitable for the Matrix model program, the first individual session is typically attended within two days of enrollment. At least one mandatory random urine drug panel test screen is required on a weekly basis from all clients.

Medication-assisted treatment is not available at the Matrix program. In Cape Town, methadone is available by physician prescription and dispensed from local pharmacies. Patients are typically responsible for their own methadone management for either detoxification or maintenance, which would be paid for at the patient's own expense. Opioid users who are unable to manage their withdrawal on an outpatient basis are referred for detoxification before entering Matrix, although they can elect to attend the program while they wait for a referral. Opioid users who can manage withdrawal on an outpatient basis (with or without using methadone) can enroll directly into the program.

2.2. Procedures

Data used in this study were extracted from chart reviews from intake and discharge assessments collected during routine care from one-year post inception (June 2009) until May 2014 among patients who reported their primary substance as methamphetamine or opioids ($n = 1863$). The project was approved by the University of Cape Town Human Research Ethics Committee and City of Cape Town Health Department.

2.3. Assessments

Sociodemographic and substance use treatment history: Sociodemographic information included age, race/ethnicity, gender, relationship status, and employment. Number of previous substance use treatment episodes and primary substance at treatment entry were also assessed.

Treatment motivation was assessed using the *Stages of Change Readiness and Treatment Eagerness Scale* (SOCRATES; Miller & Tonigan, 1996). The SOCRATES assesses readiness for change among alcohol and substance users, and has been found to have good internal consistency and reliability across diverse samples. It yields three composite scores ranging from 10 (very low) to 90 (very high): *Recognition* indexes acknowledgement of substance use-related problems. *Ambivalence* measures degree of uncertainty about changing substance use. *Taking Steps* provides information regarding the degree to which individuals are taking concrete actions towards changing substance use (Miller & Tonigan, 1996). SOCRATES administration was initiated after program implementation (starting November 2011).

Clinical outcome variables:

Treatment initiation and engagement. *Treatment initiation* was defined as attending a minimum of one group or individual session following treatment intake. To define *treatment engagement*, the City's Matrix Key Supervisor (WB) provided clinically meaningful cut-offs, including: 1) attending at least four group sessions (two weeks); 2) attending at least eight group sessions (i.e., *completing early recovery*; one month); and 3) later engagement (attending at least 16 group sessions;

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