



Substance use treatment using cultural arts and 12 steps: Curriculum training and community-led implementation in Zambia

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ABSTRACT

Introduction: Substance use in Zambia is stigmatized and treatment access is limited. Over 30,000 people are homeless in Lusaka, where one-quarter of homeless youth report use. Zambia's Ministry of Health recently developed policies targeting alcohol, suggesting Chainama, the only mental health hospital, offer treatment. Together, they endorsed training in the curriculum studied in this paper. We hypothesized training Zambian professionals would improve their perceptions of substance users and treatment. We then explored if treatment using the curriculum, as delivered to clients by training participants, would encourage client motivation to change, participation in groups, and reduce substance use frequency.

Methods: Part 1: One-hundred professionals were trained in a curriculum-based, literacy-free intervention employing cognitive behavioral and rational emotive behavior therapy techniques to explore 12 Steps of addiction recovery through Zambian art forms. Pre/post questionnaires captured perspectives around substance users and treatment. Part 2: Trained organizations delivered the curriculum in their communities. Twenty-five organizations rated feasibility and benefit of the curriculum. Data for 200 clients recorded pre/post motivation to change, open-sharing/participation, and frequency of substance use.

Results: While training significantly modified professionals' perspectives regarding the value of offering treatment, their views of substance users did not change. Clients endorsed increases in "motivation to change" and "participation/open-sharing." Frequency of alcohol, marijuana, inhalant, and cigarette use significantly decreased.

Conclusion: Training in the curriculum helped address a public health need, playing a role in increased motivational variables and decreased substance use. Research addressing this study's limitations is encouraged.

Video abstract: For a video summary of this paper, please visit <https://youtu.be/uDZTVxtzF1Y>.

1. Introduction

Worldwide, over 35 million people suffer from substance use disorder (SUD) (UNODC, 2021) and only 1 of 6 can access SUD treatment (UNODC, 2015). SUD refers to a person's relationship with alcohol and/or drugs manifesting as impaired control, social dysfunction, risky use,

and pharmacological indicators, such as tolerance and withdrawal (APA, 2013).

Effective treatments for SUDs include group and individual cognitive behavioral therapy (CBT) (McHugh et al., 2010), rational-emotive behavior therapy (REBT) (Obi-Nwosu et al., 2019; Omeje et al., 2018), and 12 Step groups which offer peer support to over 2 million members

Abbreviations: SUD, Substance Use Disorder; CBT, Cognitive Behavioral Therapy; REBT, Rational Emotive Behavior Therapy.

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globally (Arkowitz & Lilienfeld, 2011).

Zambia is one of the African nations with the greatest alcohol consumption (WHO, 2015) and greatest prevalence of regular alcohol use in adolescents compared to 73 other low and middle-income countries (de la Torre-Luque et al., 2021). Other substances abused in Zambia include marijuana, cigarettes, opiates, cocaine, and inhalants such as glues and petrol.

Zambia's Ministry of Health, Ministry of General Education, and Drug Enforcement Commission provide substance use prevention education in school settings (Masiye & Ndhlovu, 2016). Drop-in centers are essential for reaching youth not in schools. Most commonly, drop-in center services focus on family reintegration, mentoring, and basic care, but not specifically on SUD treatment (Lemba, 2002; Sampa, 1997). Some Zambian churches have informal counseling ministries, occasionally including 12 Step programs (Kane et al., 2017). Gaps remain for accessible SUD treatment.

Historically, SUD treatment has been inaccessible to disadvantaged populations in Zambia due to lack of treatment infrastructure. Where services do exist, they are rarely fully integrated into the health-care system and often privately provided at great cost (Akiba et al., 2018; Smith, 2011; Mwape et al., 2012). Common barriers include too few professionals trained to provide treatment, and mental health resources that are centralized around larger cities and institutions rather than broadly dispersed throughout communities (Saraceno et al., 2007).

Substance use in Zambia is on the rise (von Hammerstein et al., 2017; WHO, 2015). Zambia's Ministry of Health responded by recently developing alcohol policies suggesting that Chainama, Zambia's sole mental health hospital, position itself to offer SUD treatment (Maninga, 2017; Republic of Zambia Ministry of Health, 2018). Together, they endorsed training in the curriculum studied.

Substance use and mental illness are both stigmatized health conditions (Luoma, 2010; McGinty et al., 2018), even among Zambian mental health care providers (Kapungwe et al., 2010; Ngungu & Beezhold, 2009; Saraceno et al., 2007). Like elsewhere in the world, substance users are devalued as having self-inflicted problems, being morally deficient, or having purely criminal behavior (Dubey et al., 2020; Luoma et al., 2014; Room, 2005). Even when substance use is understood appropriately as a mental health concern, public stigma remains a blockade to treatment because formal treatment for mental health is stigmatized (Mwape et al., 2012). Stigma limits support for mental health services on a public level (Saraceno et al., 2007). Mental health services have been under-funded and fragmented in Zambia despite the Ministry of Health's efforts of "providing equity of access to quality health care as close to the family as possible" (Mwape et al., 2012). About 70 percent of Zambians with mental health problems prefer to consult traditional healers before seeking help from formal treatment (Mayeya et al., 2004).

When negative messages of public stigma are internalized into self-stigma, not only may it undermine treatment seeking, but also treatment involvement and outcome. Stigma experiences have been found to negatively impact substance users' feelings of self-efficacy, diminishing their belief in their ability to attain a successful treatment outcome (Crapanzano et al., 2018; Luoma et al., 2014). Consideration must also be given to understanding perceptions of substance users held by health care professionals offering treatment (Dubey et al., 2020; Luoma et al., 2014). Perceived public and health care provider stigma has been found to lead to increased self-stigma and decreased treatment engagement (Crapanzano et al., 2018).

Universal barriers to accessing SUD treatment include lack of motivation to change and lack of active engagement in treatment. Higher motivation is a significant predictor of treatment retention (Longshore & Teruya, 2006; Simpson et al., 1995; Simpson & Joe, 1993) and multiple studies associate motivation with better treatment outcomes (Degenhardt et al., 2013; Korcha et al., 2011). Pre-treatment motivation relates to higher treatment engagement (Simpson et al., 1997), while active engagement in SUD treatment helps predict treatment outcomes (Harris

et al., 2010; Kelly et al., 2016a; Simpson et al., 1995). Observed behaviors of engagement include participation or open-sharing.

In 12 Step groups, admitting substance use and participating in groups by open-sharing is identified as crucial for seeking and maintaining sobriety (World Service Office, 1993). The 12 Steps are guiding principles for seeking recovery from SUDs (VandenBos, 2007). One study evaluating a manualized 12 Step group found greater participation related to greater abstinence (Kelly et al., 2016). Overall, motivation to change and engagement may be barriers to recovery when lacking, but when present, they may help predict successful treatment outcomes.

There is a global history of incorporating arts into treatment as a way of removing barriers and offering expressive means for clients to voice needs (Awais, 2011; Barz et al., 2011; Bogen, 2016; Chu, 2010; Fancourt, 2017; Iwasaki & Byrd, 2010; Kleisiaris et al., 2014; St Denis, 2000; Stone, 2017; Thomas et al., 2019). Zambia is made up of 72 different tribes, all bringing their own art forms. Peaceful relations among tribes contribute to sharing art forms between tribes (Tembo, 2012). An overview of art expressions and functions follows, which focuses on methods incorporated into the "Literacy-Free 12 Step Expressive Arts Therapy" curriculum.

Arts and handicrafts served as the bedrock of Zambia's culture from its beginning, typified by ancient rock paintings (Smith, 1997). It now also finds expression in drum-making, oil and woodblock painting, sculpture, beadwork, carving, masks, and abstract/semi-abstract painting styles (Taylor, 2006). Arts and handicrafts are useful for substance users to explore motivation for treatment and gain personal insight (Hanes, 2017; Horay, 2006).

Gourds are both functional and expressive. Gourds find use as "Lukoma" or "Insuwa" for water containers, storing milk, and making butter (Smith & Dale, 1968). "Baja" gourd kazoos accompany dance (Tembo, 2012). Gourd rattles bear significance at life's beginning and end, by mothers soothing babies and by funeral mourners (Smith & Dale, 1968). Beyond physical vessels, gourds can be vessels for emotion - as horticultural therapy benefits substance users (Berger & Berger, 2017; Detweiler et al., 2015; Haller et al., 2019; Richards & Kafami, 1999).

A variety of drums ("Ng'oma") represent tribal functions (Syabballo, 1996), like "Namalwa" funeral drums (Syabballo, 1996) or "Indandala" drums to signal village chiefs (Smith & Dale, 1968). Traditional drum rhythms and polymeters flow through Zambian music. Cross-beats become physical and auditory metaphors for drumming out individual and shared emotional challenges (Peñalosa, 2009). "Call-and-response" style is most common. Music is interwoven in all of Zambian life, including games, funerals, celebrations (Taylor, 2006), and is used therapeutically across Africa (Barz, 2011; d'Ardenne & Kiyendeye, 2015; Hartwig, 2010).

Drumming and dancing are interconnected; traditionally embodied by dance circles, with dancers encircled by drummers, singers, instrumentalists, and audience (Smith & Dale, 1968). Dance is a social commentary, communally expressing joy, sorrow, and satire (Tembo, 2012) and has treatment value aiding in client's self-expression in African settings (Niwenhuti, 2014).

Zambian storytelling expresses wisdom through parable-style teaching for information and enjoyment in all tribes (Cancel, 1989, 2013). Storytelling may be aided by gourds and drama/role play (Sibande, 2021). Integrating African storytelling into therapy as well as dramatic roleplay improves understanding between client and therapist (Beck, 2011; Neethling, 2013; Ngazimbi, 2016).

"Literacy-Free 12 Step Expressive Arts Therapy" is an evidence-based group curriculum manual for substance use treatment that incorporates CBT and REBT to explore 12 Steps and psychoeducational topics through Zambian art forms (Stuebing et al., 2018, 2020). It was developed out of the need for culturally appropriate SUD treatment reported by a Zambian drop-in center. It was written and field-tested in Zambia before the study at hand, yielding significant findings (Stuebing et al., 2018). A US version was also field tested and then employed as adjunct to inpatient treatment with adults who were dually diagnosed

with mental health and substance use disorder, also yielding significant results (Stuebing et al., 2020).

This paper describes a two-part study. Part 1 involved training Zambian professionals in the “Literacy-Free 12 Step Expressive Arts Therapy” curriculum. It was hypothesized that there would be pre-to-post training improvements in how professionals perceived substance users and in how much offering SUD treatment is valued. Part 2 examined effectiveness of SUD treatment using the curriculum as delivered by trained Zambian professionals in their organizations. It was hypothesized that frequency of substance use would significantly decrease while motivation to change and participation/open-sharing would significantly increase in clients.

2. Methods

2.1. Part 1: Training Zambian professionals in the curriculum

Ethical approval was granted by Washington College’s ethics review board (S15-018/S18-A). All participants provided informed consent.

2.1.1. Participants

One-hundred professionals representing 41 organizations received training. Organizations came from across Zambia and were already serving their communities, including known substance users, through non-therapeutic services. Inclusion criteria for training participants were English language abilities and willingness to attend the training. Organizations were not required to offer SUD treatment using the curriculum following training, but art supply funding was provided to those who did.

Some organizations sent different staff to the training on each day, when they could be spared from work, and combined the learning for their organization. Of the 100 training participants, two missed day 1 (pre) and seven missed day 2 (post). Training participants with missing data on one or both days were excluded from analysis via listwise deletion.

2.1.2. Procedure

Zambian-led organizations were invited to a free 2-day training in “Literacy-Free 12 Step Expressive Arts Therapy.” Organizations were recruited to attend the training through a local Rotary club and CoLaborers International, a nonprofit with a local network in Zambia that developed and field tested the curriculum. The link to online registration was distributed via fliers, online advertising, and email.

Training was endorsed by Zambia’s Ministry of Health. It was conducted in an experiential learning format with training participants functioning in the role of clients, doing expressive art activities and participating in discussions. Expressive art materials include basic art supplies, percussion instruments, gourds, gardening supplies, and curriculum materials. Group content is summarized in Table 1.

2.1.3. Measures

Data was collected pre and post training. Items from the “Addiction Psychiatry Survey”, which previously led to statistically significant results in a training setting (Karam-Hage et al., 2001), were used to assess perspectives of training participants pre/post training. Item response used a Likert scale of 1 (strongly disagree) to 5 (strongly agree):

1. Therapy for alcohol and other drug problems is effective and worth the effort.
2. With proper training, staff can learn to motivate addicted people for therapy.
3. Most addicted people resist therapy and do not get better.
4. Addiction is more of a character problem than a disease.
5. I think I might want to increase the number of addicted people I see/help in the future.
6. There is little role for staff like me in addiction treatment.

Table 1
‘12 Step’ steps, group content, therapeutic techniques and expressive arts modalities represented in the curriculum.

Session number	Steps	Group Content	Therapy Techniques	Expressive Art (bolded)
1	Step 1	Admitting powerlessness over addiction and unmanageability of one’s life.	REBT centers on activating events and circumstances surrounding onset of substance use. Narrative therapy is also utilized.	Art (drawing, painting, crafts) maps out significant life events.
2	Psycho-education	Reviewing short- and long-term effects of substance use on physical and mental health.	REBT identifies feelings around use and consequences. CBT identifies how our thoughts, feelings, body and behaviors are connected and maintain difficulties.	Drama and a picture card game teach about substances.
3	Steps 2 & 3	Utilizing moral and spiritual insight as a resource for recovery.	REBT discovers feelings surrounding substance use and consequences.	Art (responsive painting) during guided meditation explores spiritual concepts of light/darkness.
4	Psycho-education	Exploring relapse triggers and coping skills.	REBT analyzes beliefs about addiction. CBT practices problem solving and coping skills in response to urges, triggers and unhelpful environments through role play. It teaches cognitive restructuring to aid the formation of new, balanced beliefs.	Personified art (masks) and drama activities explore consequences of beliefs and how to challenge unhelpful thoughts/beliefs through thought challenging and by forming new beliefs
5	Steps 4 & 5	Making a moral inventory of weaknesses and strengths.	CBT encourages laying plans to adjust maladaptive coping and acknowledge/reinforce adaptive coping.	Group drama and horticultural activities apply CBT techniques. Art opens discussion about initial goals and self-care plans.
6	Steps 6 & 7	Committing to work on behaviors revealed in previous moral inventory.	CBT reinforces the need for utilizing social support and being receptive to help from others in creating attainable recovery plans.	Music (drum circle) while storytelling , becomes a therapeutic metaphor to expose fears, resentments, and maladaptive behaviors. Call and response

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Table 1 (continued)

Session number	Steps	Group Content	Therapy Techniques	Expressive Art (bolded)
7	Steps 8 & 9	Forgiving others and ourselves unpicks making amends as a healing part of recovery.	CBT emphasizes forgiveness through admitting the need for personal behavior change.	singing of traditional Zambian choruses in tribal languages builds group cohesion. Storytelling through gourd art helps to seek peace with others and themselves. As an alternative, rock art may be substituted with the same process.*
8	Steps 10 & 11	Sharing personal stories, noting goals and progress discussing and stigma.	CBT plots a tangible course for daily future sobriety goals. REBT discusses daily practices for self-awareness of beliefs and actions to prevent future maladaptive behaviors.	Drama, art, and storytelling expresses participants' past, present, and future together.
9	Step 12	Preparing to share their stories in the community to share the message of recovery, stigma reduction, relapse prevention, and to help others.	CBT guides participants in finalizing self-care and recovery plans.	Traditional Zambian dance circles therapeutically explore group dynamics.**
10	Closing Group: Peer Support	Building recovery friendship: discussing self-care, spirituality, and community-care.	REBT and CBT principles from all previous sessions are revisited.	Woven handicrafts are made together to symbolize participants' goals of what to work on after treatment.
11	Addendum	Identifying defense mechanisms.	REBT identifies defense mechanisms that prevent participants from viewing the reality of their situation.	Drama activity breaks into small groups of clients to create role-plays illustrating specific defense mechanisms to then present to the entire group.

*During the training, cultural feedback was received on this session alone. Training participants adjusted their curriculum to all incorporate edits. ** For the training, the song “Chimwemwe (happiness/celebration) dance” was chosen for its popularity and positive message.

2.2. Part 2: Using the curriculum with clients

2.2.1. Participants

Organizations trained in part 1 were invited to implement the curriculum in their communities for part 2 of the study. This was optional. According to correspondence, any lack of participation was not due to resistance to incorporate arts or objection to curriculum content, on the contrary, inclusion of Zambian cultural arts was welcomed and the need

for SUD treatment recognized. Non-participation in part 2 of the study was in consideration of staff availability or stage of service development within the restricted 6 months of data collection. Twenty-five of the 41 trained organizations provided organizational feedback on feasibility and benefit.

Participants of curriculum groups, led by the training participants, will be referred to as ‘clients’ throughout this study. Data for 200 clients was received. On average, clients attended 7.35 of the 11 curriculum sessions with a mode of 11 and a range of 1 to 11 sessions.

The majority of the clients lived with their family (56.5%) prior to treatment. See Fig. 1. Substance use was recorded in 79% of pre-treatment living environments altogether. One organization with 35 clients used the curriculum as substance use prevention education. These clients stated no substance use at pre or post. However, it was noted that substances were present in clients’ living environments. Considering stigma related to disclosing substance use, substance use was not one of the study’s inclusion criteria for participation, and prevention education is an established approach in Zambia (Masiye & Ndhlovu, 2016).

When data collection ended, 165 (82%) of the 200 clients were still receiving services from organizations, while 32 were no longer receiving services, and 3 were unknown. Of the 32 clients no longer receiving services, 16 stayed sober, 14 relapsed, and 2 had an unknown outcome. See Fig. 2. The post-treatment living environment for the 32 clients no longer receiving services was reported as 12 in substance-free environments, 19 not in substance-free environments, and one unknown. Overall, church and school were reported as the most common social activities to support recovery once no longer receiving services.

Clients with missing data at pre or post-intervention were excluded from analysis via listwise deletion. The sample size therefore varied between 197 and 200.

2.2.2. Procedure

After the training, 25 of the 41 organizations provided feedback on SUD treatment using the curriculum. Outcome measures were collected for clients pre and post curriculum. Data collection lasted 6 months.

2.2.3. Design

A one-group pretest–posttest design was chosen over a randomized control design, to allow maximum treatment access, in line with the wishes of collaborating organizations to not exclude any clients from potential help, as well as minimize the burden of data collection.

2.2.4. Measures

During implementation of the curriculum, organizations reported whether groups opened conversation for clients to talk about substance use, whether it was beneficial to offer groups, whether it was feasible, and whether organizations would recommend the curriculum to others, using a Likert scale of 1 (not at all) to 5 (a lot).

Single-item questions recorded clients’ pre/post motivation to change and participation/open-sharing using a Likert scale of 0 (not at all) to 4 (a lot), as well as pre/post substance use frequency by substance, on a 7-point scale ranging from 0 (no use) to 6 (multiple times a day). Group attendance and whether clients received services post-curriculum, relapsed, or engaged in supportive social activities was recorded.

Questionnaires were submitted via online forms, word documents, or phone interviews, depending on local access to internet, computers and phones. Analyses were conducted using SPSS (Version 25; IBM Corp., 2017).

2.3. Author reflections

Authorship of this study included one male and one female Zambian (GL and CN), from Ngoni and Namwanga tribes, two female Americans (MDS and LL) and one female German (HL). Our perspectives on

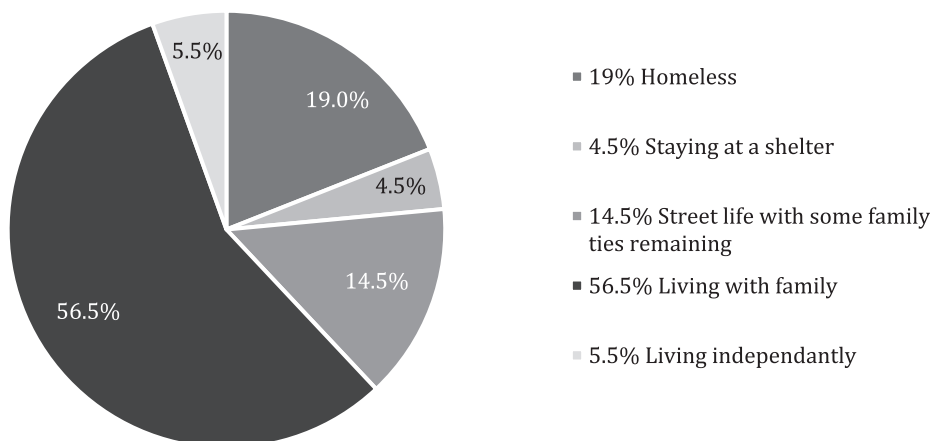


Fig. 1. Living environment before study participation.

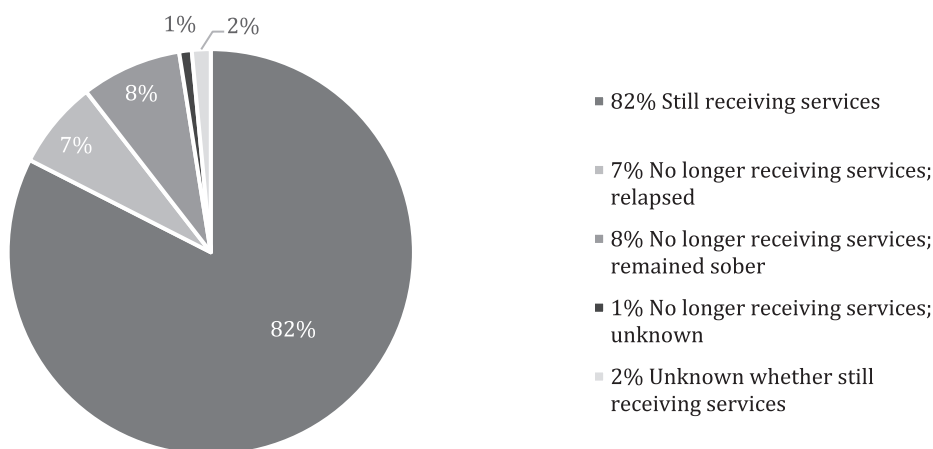


Fig. 2. Status of clients at the end of data collection.

substance use are shared through our professional experience - MDS, CN, and GL through primary work with substance users and LL and HL as psychologists.

GL and CN brought experience working with Zambian substance users in medical (GL) and humanitarian (CN) contexts. Through their cultural lens, they contributed to understanding of expressive arts as well as treatment barriers. MDS' experience of community engagement with Zambian charities shaped the research process for the curriculum intervention which HL and CN field tested in Zambia under MDS and LL's supervision. Knowledge acquired through this formed our beliefs and thought process about what measures for the current study would feasibly capture relevant data without adding burden, as well as what funding provisions would be necessary to make training and implementation accessible.

From the outset of the study, we wanted to combat both the historic power imbalance of White Western researchers conducting research in African countries without local collaboration, and the dominant narrative of superiority of Western approaches. In terms of reflexivity, this is why collaboration with Zambian-led organizations running the intervention and collecting data was foundational in our methodology. We acknowledge remaining limitations as our author group remains slightly culturally imbalanced with design and ethics approval stemming from Western collaborators. Our perspectives may also still be limited as we

all come from helping professions and share values, beliefs and motivations around providing treatment to substance users.

3. Results

3.1. Hypothesis 1: Perceptions of professionals regarding substance users and the value of offering SUD treatment

Paired sample t-tests were conducted to compare perceptions of professionals before and after training. Significant changes were seen in items 1, 2, 5 and 6, indicating (1) increased agreement that 'therapy for alcohol and other drug problems is effective and worth the effort' with medium effect size, (2) increased agreement that 'with proper training, staff can learn to motivate addicted people for therapy' with medium effect size, (5) increased agreement that 'I think I might want to increase the number of addicted people I see/help in the future' with very large effect size, and (6) decreased agreement that 'there is little role for staff like me in addictions treatment' with small effect. There was no significant change in items 3 ('Most addicted people resist therapy and do not get better') or 4 ('Addiction is more of a character problem than a disease'). Descriptive statistics are provided in Table 2.

3.2. Hypothesis 2: Effectiveness of the curriculum

Participating organizations (N = 25) reported the curriculum as beneficial (M = 4.52), feasible (M = 4.12), recommendable (M = 4.72), and reported groups as opening conversation for clients to talk about substance use (M = 3.88).

3.2.1. Hypothesis 2a: Frequency of substance use

Clients completed measures at the start (pre) and the end (post) of the curriculum. Pre/post intervention t-tests showed significant decreases in frequency of substance use of marijuana, $t(198) = 5.308, p < .001$ (small effect), inhalants, $t(198) = 5.793$ (small effect), $p < .001$, alcohol, $t(197) = 7.599$ (medium effect), $p < .001$, and cigarettes, $t(199) = 4.392, p < .001$ (small effect). No significant change was seen for opiates or cocaine. Descriptive statistics are shown in Table 3.

3.2.2. Hypothesis 2b: Changes in client motivation and participation

Pre/post intervention t-tests showed significant increases in clients' motivation to change. $t(196) = -15.891, p < .001$ (large effect), and participation/open-sharing in curriculum groups, $t(198) = -13.213, p < .001$ (large effect). Descriptive statistics are shown in Table 4.

4. Discussion

This two-part study evaluated training and implementation of "Literacy-Free 12 Step Expressive Arts Therapy" as SUD treatment in Zambia.

First, as hypothesized, training professionals led to an increased value of offering SUD treatment, showing mixed effect sizes. This is unsurprising in a sample coming together for that purpose. Support for "I think I might want to increase the number of addicted people I see/help in the future" increased with a particularly large effect size pre/post training, possibly because professionals felt more equipped to help after being trained. Different than hypothesized, training did not lead to significant changes in perception of substance users. Mean scores for these questions (number 3 & 4) started (pre) and remained (post) around the mid-value of 3, between 1 (strongly agree) and 5 (strongly disagree), possibly indicating uncertainty around the perception of substance users. However, looking at frequency distribution of scores, few indicated uncertainty (score of 3). Instead, for both questions, perceptions divided between extremes on statements of seeing substance users as resisting therapy and never getting better (question 3) and seeing

Table 2
Perceptions of substance users and the value of offering SUD treatment.

Item	M pre	SD	M post	SD	p	Cohen's d
1. Therapy for alcohol and other drug problems is effective and worth the effort.	4.30	1.02	4.84	0.58	<0.001	0.650
2. With proper training, staff can learn to motivate addicted people for therapy.	4.49	0.82	4.78	0.55	<0.001	0.415
3. Most addicted people resist therapy and do not get better.	3.34	1.18	3.14	1.46	0.209	0.151
4. Addiction is more of a character problem than a disease.	3.62	1.27	3.55	1.46	0.644	0.051
5. I think I might want to increase the number of addicted people I see/help in the future.	2.56	0.65	4.38	1.06	<0.001	2.070
6. There is little role for staff like me in addiction treatment.	2.53	1.41	2.18	1.46	0.041	0.244

Note: Items from "Addiction Psychiatry Survey" (Karam-Hage et al., 2001).

Table 3
Frequency of substance use.

Drug	M Pre	SD	M Post	SD	p	Cohen's d
Marijuana	1.61	2.53	0.89	1.93	<0.001	0.320
Inhalants	1.31	2.16	0.66	1.47	<0.001	0.352
Opiates	0.30	1.15	0.28	1.06	0.86	0.018
Alcohol	2.79	2.73	1.67	2.38	<0.001	0.437
Cocaine	0.14	0.80	0.17	0.84	0.75	0.036
Cigarettes	2.32	2.70	1.67	2.47	<0.001	0.251

Table 4
Clients' self-perceived motivation and participation.

Question	M Pre	SD	M Post	SD	p	Cohen's d
Participation/ Open-sharing	1.45	0.97	2.66	1.10	<0.001	1.167
Motivation to change	2.41	1.11	3.48	0.98	<0.001	1.022

addiction as a character problem (question 4), averaging out to mid-value of 3. This is perhaps a reflection of culture, on the one hand showing aforementioned stigmatized views (Dubey et al., 2020; Kapungwe et al., 2010; Ngungu & Beezhold, 2009) and, on the other hand, revealing a growing awareness of SUD as a treatable mental health problem (as reflected in new policies through the Republic of Zambia Ministry of Health, 2018). Professionals' perceptions of the intersectional identities associated with substance users should be considered. Not only is substance use associated with mental illness which is also highly stigmatized (Kapungwe et al., 2010, 2011), but substance use may additionally be associated with lower socioeconomic status, lower education, unemployment, homelessness, positive HIV status (Biamba et al., 2020; Parsons et al., 2015) or sex work (Hargreaves et al., 2017). Even for professionals, these associations may influence their perspectives of substance users. Change takes time. While the training was only 2 days, lasting attitude and perception changes occur gradually, taking weeks to years (Briñol, Rucker, & Petty, 2015). Changes in widely-held societal views about groups of people, implicit social cognition, take about 10 years (Charlesworth & Banaji, 2019).

Second, as hypothesized, SUD treatment using the curriculum as delivered to clients by training participants led to significant decreases in frequency of substance use for marijuana, inhalants, alcohol, and cigarettes, with small to medium effect sizes. This matches extensive research demonstrating that approaches used in the curriculum (such as CBT, REBT and 12 Steps) are beneficial in SUD treatment (Arkowitz & Lilienfeld, 2011; Jensen et al., 2011; McHugh et al., 2010; Obi-Nwosu et al., 2019; Omeje et al., 2018). There were no significant changes in the frequency of opiate or cocaine use, possibly because the number of clients using opiates or cocaine was quite low. This reflects Zambian reports showing substances most frequently used by homeless youth were alcohol, inhalants, and marijuana (de la Torre-Luque et al., 2021; Lemba, 2002; Tyler et al., 2016), while cocaine and opiates were more expensive and less available. Clients significantly increased in motivation to change and participation/open-sharing, with large effect sizes, while substance use decreased. This mirrors previous research on how crucial motivation and engagement in treatment are to treatment success (Harris et al., 2010; Korcha et al., 2011; Longshore & Teruya, 2006).

4.1. Limitations and future research

Results should be viewed in context of multiple limitations. In part one, while encouraging that changes in perception were significant pre/post-training, it was not assessed how long changes were maintained after training or whether offering SUD treatment reinforced perception changes. Long-term and sustained changes in perception may take longer and need repeated exposure or reminders.

Similarly, long-term follow-up was not conducted after part 2 of this study to see if changes to substance use frequency were maintained. Organizations had limited availability to follow clients after no longer providing services. Another limitation is SUD treatment using the curriculum was only assessed from pre to post, instead of compared to a no-intervention control group.

The majority of clients in this study lived with family at the beginning of treatment. Substance use was also reported in most pre-treatment living environments. While family is valuable when supportive of treatment, they can also become detrimental in situations where substance use is in the home of the person seeking recovery. Family members of clients can also feel encumbered by stigma - such as parents feeling shamed by society, internally blaming themselves, or expecting family members to keep substance use secret rather than seek treatment (O'Shay-Wallace, 2020). While this study did not methodically engage clients' families in treatment, at the closing of the study family members of 2 different clients did reach out to researchers to discuss how to be supportive and received resources. Reflecting on this, inclusion of family in the treatment process may benefit future studies.

Outcome measures were single items instead of full validated measures. This increased the risk for skewed interpretation. Single-item questions were chosen to decrease questionnaire burden on clients and professionals. It made data collection more feasible in settings with reduced literacy and basic English skills. No demographic data was collected on training participants.

Future studies can minimize limitations by including a no-intervention control group, longer follow-up with professionals as well as clients, family inclusion, fully validated measures, and an investigation of associations between demographic factors. Building on our field tests, local collaboration and quantitative results, future research could add insights through qualitative interviews with training or curriculum participants, explore barriers and attitudes towards SUD treatment and reflect more on the human experience of treatment.

4.2. Strengths of the study in a Zambian context

The current study addresses substance use, a significant public health problem in Zambia (Lemba, 2002; Tyler et al., 2016; WHO, 2015), by training professionals from locally-led organizations. Because it is manualized, SUD treatment can be delivered by even those newly trained in this curriculum. Training lay-community leaders in SUD treatment through the curriculum addresses the difficulty of having limited workers trained in mental health (Saraceno et al., 2007). It enables greater and evidence-based SUD treatment access. This helps address another barrier to treatment that resources are often centralized around big cities and large institutions (Saraceno et al., 2007).

Substance use remains stigmatized in Zambia (Dubey et al., 2020; Kapungwe et al., 2010; Ngungu & Beezhold, 2009). Stigma can form barriers for advocacy and limit funding for services (Saraceno et al., 2007). The curriculum seeks to dismantle barriers of stigma by encouraging open-sharing through Zambian art forms as therapeutic metaphors to connect with peers. Embracing local art forms helps substance use treatment to be community-owned and culturally appropriate. Favoring a one group pre-test/post-test design met local concerns to not exclude any clients from potential help. Freely training professionals in a deliverable treatment while providing art supplies removed financial barriers and enabled sustainable support.

It is encouraging to see a growing wellspring of treatment options for substance users. Some months after the study's training was completed in 2018, the Ministry of Health opened a detoxification unit at Chai-nama, treating more than 5,000 substance users as implementation of new alcohol policies (Republic of Zambia Ministry of Health, 2018). Expansion of SUD treatments that incorporate cultural context and are accessible to trained community members is a promising development. As the African parable says, "If you want to go fast, go alone. If you want to go far, go together."

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CRediT authorship contribution statement

Hjördis S. Lorenz: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization. **Melissa Davis Stuebing:** Conceptualization, Methodology, Formal analysis, Investigation, Resources, Writing – original draft, Writing – review & editing, Visualization, Project administration, Funding acquisition. **Chipecto Nambeye:** Investigation, Writing – original draft, Writing – review & editing, Visualization. **Gabriel Lungu:** Writing – original draft, Writing – review & editing, Visualization. **Lauren M. Littlefield:** Conceptualization, Methodology, Writing – review & editing, Visualization, Supervision.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: There are no conflicts of interest for any authors - Hjördis S. Lorenz, Melissa Davis Stuebing, Chipecto Nambeye, Gabriel Lungu, and Lauren M. Littlefield. Melissa Davis Stuebing is the author of the curriculum. To eliminate potential bias, the pre/post training questionnaire was administered by other researchers. Delivery of SUD treatment using curriculum and all client data collection was solely handled by training participants.

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Appendix A. Supplementary data

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