Effectiveness of a Music Based Intervention in Enhancing Problem Recognition among Clients with Substance Use Disorders in Residential Treatment Centers in Kenya

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Abstract

The treatment of clients with substance use disorders (SUDs) is a challenge especially when they lack insight into the substance use problem. Such clients may not seek treatment and if they do, may not benefit much from it. Therefore there was a need to enhance problem recognition (PR) among such clients. The study sought to determine the effectiveness of music-based intervention (MBI) in enhancing problem recognition among clients with substance use disorders in residential treatment in Kenya. The objective was to determine if there were significant differences in PR between clients exposed to MBI and the control group in a selected residential treatment center in Kenya. The study used a quasi-experimental, nonequivalent control group pretest posttest design. A total of 40 clients participated in the study, with the experimental and control group having 20 participants each. Findings revealed that the experimental group had significantly higher levels of PR at post-test compared to the control group after controlling for various covariates, suggesting that MBI in addition to treatment as usual may have contributed to increased PR in the treatment group. This indicates that the MBI was effective in enhancing PR among clients with SUDs. Therefore, the MBI may be used as an evidence-based complementary intervention in enhancing problem recognition among clients with SUD in treatment settings in Kenya.

Key Words: *substance use disorder, music therapy, music-based intervention, problem recognition*

Background

Substance use disorder (SUD) is a major global challenge. According to the World Health Organization (WHO) (2017) report, SUDs are associated with a significant disease burden and are the highest cause of deaths among all mental and behavioral disorders. The report also shows that the disease burden caused by SUDs, measured in disability-adjusted life years (DALYs), increased from about 0.44 % (about 12.8 million) in the year 2000 to 0.66% (over 17.6 million people) in 2015. A recent study by the United Nations Office on Drug and Crime (UNODC) (2019) shows that about 35 million people suffer from SUDs or drug use dependence globally.

Many countries in the West are experiencing the burden of SUD cases among their population. According to Peacock *et al.*, (2018) North America (United States of America and Canada) has one of the most prevalent cannabis, opioid and cocaine dependence at 748.7 (649.8, 812.3), 650.0 (574.5, 727.3) and 301.2 (269.3, 333.7) per 100 000 people, respectively. In Eastern Europe, more than 5 % of people who use drugs suffer from SUDs (Ritchie & Roser, 2019). Similarly, in Africa statistics show that SUDs are a major challenge in the mental health edifice. According to WHO (2021) about 15.3 million people suffer from SUDs. In fact, Sankoh *et al.*, (2018) note that the number of years lost to disability as a result of SUDs among other mental health challenges increased by 52% between 2000 and 2015 in Africa. This causes a health burden to countries in Africa most of which are resource limited.

In Kenya, the National Authority for Campaign

Against Drug Abuse (NACADA) (2017) found that about 10% of people aged between 15-65 years suffered from alcohol use disorders, a majority of whom had the severe form. This indicates that SUDs such as alcohol use disorders seem to be a common phenomenon in most parts of the world, including developing countries such as Kenya.

People suffering from SUDs experience difficulties in their lives. Their physical and psychological well-being is compromised. Furthermore, they experience socio-economic challenges since their productivity and human relations are dented as a result of the disorders.

Even with these challenges it is hard for individuals with SUDs to receive treatment when they lack awareness of their problem dynamics. Therefore, problem recognition is of paramount importance in the rehabilitation and treatment of substance use disorders. Problem recognition (PR) refers to the degree of the person's acknowledgment or denial of behavioral complexities, and, personal and life problems that may result from the use of drugs (Simpson *et al.*, 1993). It is viewed as one of the indicators of motivation to treatment (Simpson, 1992; Simpson *et al.*, 1993). It precedes action or inaction to address the identified problem which in this case is difficulties arising from substance use.

Literature suggests that clients who lack insight into their drug use problems are less likely to seek treatment. For example, a study conducted among male prisoners found that the ones who were not aware that they had a substance abuse problem had not sought treatment in their lives (Brooke *et al.*, 2000). In another study clients that had low levels of problem recognition associated treatment with personal defeat (Rogers *et al.*, 2019). Low problem recognition made it difficult for them to see the need to seek treatment.

Other studies have found that problem recognition significantly predicted treatment participation and generally, treatment engagement among SUD clients (Pankow *et al.*, 2012). This indicates that with high levels of problem recognition, clients are likely to join and actively engage in treatment.

In addition, problem recognition influences the therapeutic relationship between clients and therapists. A study among offenders found that those with greater awareness of their substance use related difficulties developed more positive therapeutic relationships with their therapists (Broome *et al.*, 1997). This study seems to suggest that enhancing problem recognition is essential in building the client-therapist relationship which is a factor that may have a profound impact on treatment effectiveness.

In helping clients with SUDs enhance insight into the substance use problem, various interventions such as music-based interventions (MBI) have been used. As a complementary and alternative medical intervention, MBI is viewed as the clinical and evidence-based use of music interventions to accomplish various treatment goals within a therapeutic relationship by a therapist (Hohmann *et al.*, 2017). Therapists have employed music to enhance self-esteem (Sharma & Jadgev, 2012), positive mood (Shuman et al., 2016), change perceptions and enhance motivation (Dean, 2005).

There is evidence that MBIs have been effective in helping clients with SUDs recognize the harmful effects of drug use in their lives. In a randomized effectiveness study conducted among 104 clients in a detoxification center, Silverman (2015) found that the experimental group that received the music therapy intervention had a significantly higher mean score on problem recognition than the control group. It is noted that the study was done in a detoxification center where the primary function is medical detoxification and minimal psychosocial treatment. This raises the question whether the same would be observed in a long-term inpatient SUD treatment facility offering psychosocial treatment. Furthermore, Silverman's study's only inclusion-exclusion criteria were the ability to read English and to consent. As noted by (Garg, 2016) inclusion-exclusion criteria is important as it helps the researcher sample from a population in a reliable, objective and uniform manner. It also helps in marking out characteristics that may make an individual eligible or ineligible for the study. In addition, some of these exclusion characteristics may act as confounding factors for

the outcome of the study. Therefore in Silverman's study, there may have been characteristics that influenced the outcome, hence the need to determine if similar results would be established in a study that has inclusion and exclusion criteria, like in the current study.

In another study, Silverman (2011) conducted a randomized effectiveness trial on music therapy and change readiness among 141 clients from a university hospital detoxification unit in the USA, where the clients were admitted for a short period to get medical detoxification as part of their treatment regimen. Silverman randomly assigned the participants into three groups; rockumentary music therapy (A), verbal therapy groups (B) and recreational music therapy (C). The experimental conditions (A and C) received music therapy as the intervention while the control condition received verbal therapy. Rockumentary music therapy, entails lyric analysis combined with the story of the musicians' (mainly the band/singer of the song being discussed in the session) struggle with substance use and their journey of recovery and sobriety. Using a post-test only design, Silverman assessed the participants' readiness to change, contemplation and action score and established that the music therapy groups (A and C) had significantly higher scores on readiness to change and contemplation scales compared to the control group. Contemplation scores show that the participants realized there was a need to change from the status quo. Therefore, higher scores on contemplation could indicate that the participants' problem recognition was enhanced. In this study, the story of the musicians' struggle with substance use and their journey to recovery could have an influence on enhancing the participants' problem recognition. It may be difficult to tell whether lyric analysis was responsible for the greater scores in the rockumentary group hence the need for the current study to find out whether the use of lyric analysis, which is a technique in music therapy, could help in enhancing problem recognition.

While some studies found significant differences on the effectiveness of MBI, others did not. In a randomized clinical effectiveness trial, Silverman (2009b) compared music therapy and talk therapy (specifically lyric analysis technique) among clients in a detoxification unit in the USA. The focus of both experimental and control groups, was relapse prevention. In this study Silverman did not find significant differences in problem recognition between the two groups. Perhaps this was because the participants were at a stage where their main focus was exiting the detoxification facility. In contrast, the current research was designed to focus on patients who were in the first eight weeks of treatment in an inpatient treatment facility. It was interesting to find out whether the MBI would have an effect on the clients ability to recognize substance use as a problem in their lives. In addition, in the current study, the experimental group received four sessions of the MBI in addition to treatment as usual (TAU) while the control group received TAU only in four weeks.

With the above literature, it is evident that problem recognition is an important part of change among clients with SUDs. It is also evident that there are inconsistent findings on the effectiveness of MBIs on problem recognition where some studies have found significant differences (Silverman, 2015; Silverman, 2011) while others did not (Silverman, 2009b). It is this inconsistency in literature that shows the need for more research to build on available literature. The researchers note the dearth of findings on the effectiveness of MBI in enhancing problem recognition with most such studies done by Silverman. Because these studies were all conducted in the West, there was need for findings from music based intervention studies in developing countries such as Kenya. The current study therefore sought to fill these gaps.

The main objective of this study was to investigate on the effectiveness of music-based intervention in enhancing problem recognition among clients with substance use disorders in residential treatment in Kenya. Further, the study sought to determine if there would be significant differences in problem recognition between clients exposed to music-based intervention (MBI) in addition to treatment as usual and the control group exposed to treatment as usual (TAU) only in selected treatment centers in Kenya.

Methodology

The study employed the use of the nonequivalent control group pretest-posttest quasi experimental design. Participants were selected from SUD treatment residential facilities accredited by the National Authority for the Campaign against Alcohol and Drug Abuse (NACADA). This study required an experimental and a control group. It was however not feasible to randomly assign participants to the two groups within the same physical setting as this would pose a risk of obtaining contaminated results arising from the interaction of the participants of the two groups (experimental and control). At the same time, there was need to ensure that both the experimental and control groups were as similar as possible in characteristics and in TAU. For this reason, participants in both groups were sampled from two facilities owned and operated by the same management using one treatment model. This sampling ensured selection of clients with similar characteristics. Having the same management and treatment model also ensured that clients experienced similar conditions and, the same TAU modality during the study. This allowed the treatment and control groups to be selected from one common treatment program but in two physically distinct locations. One branch of the facility was designated as the experimental group, while the second branch, the control group through random assignment. The participants were purposively sampled based on meeting the inclusion criteria. Notably, the participants were blinded on which group (experimental or control) they belonged.

Inclusion criteria

To participate in this study, had to be: aged 18 years and above, able to consent, conversant with English, have been in the treatment center for not more than eight weeks, had to remain in treatment for the next four weeks, and, had not had MBI sessions before.

Exclusion criteria

To be excluded, they had to be younger than 18 years, not conversant with English, had been in the treatment center for more than eight weeks, were not to be present in the subsequent four weeks or had had MBI sessions before.

In line with the recommendations of Roscoe (1975) as cited by Sekaran (2003) a sample size of 30 is sufficient for research studies. A total of 40 participants met the inclusion criteria and were all included in order to cushion for those that may opt to drop out of the study. Getting more participants from other treatment centers would not be feasible as they would be receiving a different form of treatment modality (TAU) which would have contaminated the study.

A two-section questionnaire was used. The first section sought to obtain demographic information of the participants. The second section had the problem recognition scale adapted from the Texas Christian University Self-rating Form (TCU/SRF) (Simpson, 1992). This instrument was chosen as it is easy to read and understand and is suitable even for people with low literacy levels (Knight *et al.*, 1994). The problem recognition scale is a 9-item scale that designed to measure acknowledgment or denial of the behavioral problems caused by substance use (Knight *et al.*, 1994). The items are scored on a five-point Likert scale; from strongly disagree to strongly agree. A high score on this scale indicates a high level of problem recognition.

In terms of its psychometric properties, TCU/SRF Problem recognition scale has been found to be valid in measuring problem recognition among clients with SUDs (De Weert-Van Oene *et al.*, 2002). Further, the scale had a reliability coefficient of .87 for the Drug Abuse Treatment for AIDS-Risks Reduction 2 (DATAR 2) sample and .90 for the Substance Abuse Treatment Facility (SATF) sample (Knight *et al.*, 1994). The test-retest reliability of the problem recognition scale was conducted using the pre and post-test data of the 20 participants in the control group (they did not receive the MBI). The findings indicated that problem recognition had a reliability coefficient of .87. The test-retest reliability coefficients of the PR scale was considered acceptable (>.70) as suggested by Wheelan (2014).

Before commencement of the study, the researchers obtained ethical clearance from the

Kenyatta University Ethics Review Board and a research permit from the National Commission for Science Technology and Innovation (NACOSTI). All participants consented to be part of the study after.

At the beginning of the study, the researcher-therapist conducted a pretest on problem recognition using the TCU/SRF problem recognition scale on both the experimental and control groups after which the experimental group received the MBI in four weekly 60-minute sessions, in addition to TAU, while the control group only received TAU. In this facility, TAU included conventional treatment modalities such as individual and group counseling, psychoeducation, pastoral activities and pharmacotherapy. The researcher-therapist was not involved in offering TAU, both prior to and during the study.

After the four-week intervention, a post-test was administered to both groups using the TCU/SRF problem recognition scale (Simpson, 1992) research assistants who were blinded to which group had received the intervention and which one had not.

Study data were then analyzed using One Way Analysis of Covariance (ANCOVA) to determine whether the MBI was effective in enhancing problem recognition. ANCOVA was chosen as it enables one to control for some of the confounding factors since randomization was not feasible in this study. The other two researchers were involved in the analysis of data in order to eliminate possible researcher bias in the results of this study.

Music-Based Intervention Protocol

The MBI was developed by the researcher-therapist. It comprised a live presentation of songs and structured lyric analysis sessions that focused on the enhancement of problem recognition. During the lyric analysis, participants shared their understanding of the lyrics as well as how they interpreted them in relation to their experiences in addiction. The pre-selected songs used include; "The more I drink" by Blake Shelton, "Mac Muga" by Ali Kiba, "Desparado" by Eagles and "Roar" by Katty Perry. These songs were based on four themes from the Transtheoretical model of change by Prochaska and DiClementi (1984), namely; consciousness raising, self-evaluation and discrepancies in life, decisional balance and, self-efficacy. In addition, the songs were selected based on the Iso principle that is conceptualized as the principle of matching music with the behavior of the clients (Michel & Pinson, 2005). Such music is likely to have an influence on the clients if it resonates with them and their behavior and experiences.

In the opening phase of the MBI session (15 minutes), the researcher began by checking in with the participants in an attempt to build rapport and a therapeutic alliance. This required that the participants state how their week was and how they were feeling at that moment. They were then provided the song lyric sheet and an opportunity to select instruments (djembe drum or tambourine).

In the second phase (5minutes), the researcher-therapist practiced a simple rhythm, in line with the song of the day, together with the participants playing the djembe drum and the tambourine. This was important as it encouraged engagement and participation during the session.

In the third phase (5 minutes), the researcher-therapist did a live presentation of a pre-selected song playing a six steel-string guitar accompanied by some of the participants playing the djembe drum and tambourine. The other participants were also invited to sing along to encourage participation.

The fourth phase (30 minutes) involved the analysis and discussion of the lyrics by the participants. It is at this point that the participants gave their understanding and interpretation of the lyrics in relation to their experiences with substance use. The discussions were guided by a lyric analysis discussion guide (see appendix I) to keep the participants focused on the themes of the sessions.

In the fifth and closing phase (5minutes), the researcher-therapist provided a summary of the session and a remark on the next session.

The four-weekly sessions were similar in structure as described, although each of them had its unique theme and song (see appendix II). The intervention was delivered on Tuesdays at noon over a period of four weeks in a private group therapy room, within the treatment facility.

To ensure fidelity to the intervention, the researcher developed a treatment protocol that highlighted the themes of each session based on the tenets of the transtheoretical model of change, song chosen and activities for each session (see appendix II). Additionally, the researcher developed questions that focused on the reflection and identification of issues resulting from substance use. These questions were meant to raise awareness of the participants' addiction related behaviors. Notably, the questions were from the lyrics of the respective song in the intervention and focused on the theme of the session.

Results

The research comprised 40 clients with SUDs. Majority (92.5%) of the participants were male while only 7.5% were female with the highest number aged 33-37 years (22.5%) and had attained university education (75%) while the rest had secondary education as their highest qualification. Approximately 63% of those who took part in the study were in salaried employment. In terms of admission type (voluntary or involuntary), 75% of the participants were voluntarily admitted with 80% of participants being their first time in an SUD treatment facility.

In order to analyze data from the experimental and control groups, on the effectiveness of the MBI in enhancing Problem Recognition (PR) among clients in a selected treatment center in Kenya, ANCOVA was computed. This would enable the researcher to compare data from the experimental and the control group while controlling for various covariates that may have an effect on the findings.

To use ANCOVA, the assumptions of normality of distribution, homogeneity of variance across the groups and a linear relationship between the covariate and the dependent variable were tested. The findings are as presented on Figure 1.

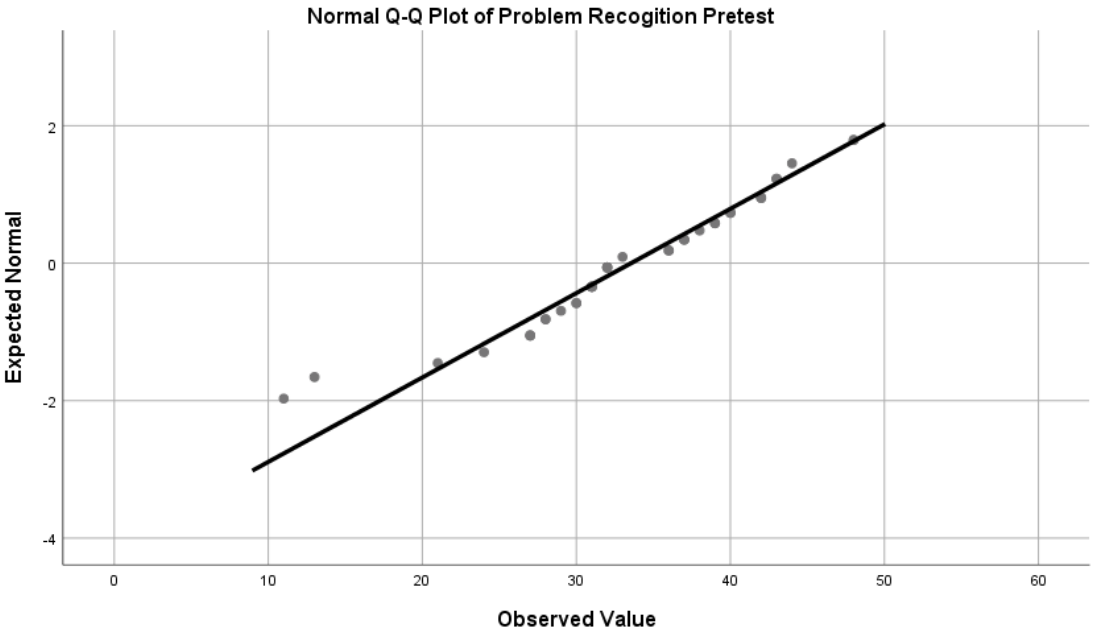

Figure 1 *Problem Recognition Scatter Plot for Normal Distribution of Means*

The results indicated that the level of problem recognition was normally distributed and since the *p* value was greater than .05, at W (40) = .95 *p*=.10, the assumption of normal distribution was met as demonstrated in Figure 1.

On the second assumption, namely, homogeneity of variance the Levene's test was computed. This test was to find out whether the variance is equally distributed across the two independent groups, that is, the experimental and the control groups. The results are as presented on Table 1.

Table 1

Levene's Test of Equality of Error Variances

Dependent Variable: Problem Recognition Post-test

F	df1	df2	Sig.
1.14	1	38	.29

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Problem Recognition Pretest + Age of Respondent + Level of Education + Nature of Admission + Number of Admissions + Group Membership

The difference in variance between the two groups was not significant F (1, 38) = 1.14, p =.29 reported at the value p < .05 as shown on Table 1. This indicates that the data met the assumption of equal variance.

The researchers then proceeded to test the assumption on the linear relationship between the covariate and the dependent variable (problem recognition) using the Pearson product-moment correlations. The findings were as presented on Table 2.

Table 2

Pearson Correlation Linear Relationship Test

		Problem Recognition Pretest	Problem Recognition Posttest
Problem Recognition Pretest	Pearson Correlation	1	.785**
	Sig. (2-tailed)		.000
	N	40	40
Problem Recognition Total Posttest	Pearson Correlation	.785**	1
	Sig. (2-tailed)	.000	
	N	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

As Table 2 shows, there was a strong positive correlation between the covariate (problem recognition pre-test) and the dependent variable (problem recognition post-test) which was statistically significant at r = .71, n =40, p = .00. This indicates that the covariate, PR pre-test, and the dependent variable, PR post-test, have a linear relationship. Therefore, the data met this assumption.

Since the data met the assumptions, the null hypothesis that there were no significant differences in problem recognition (PR) between clients exposed to MBI in addition to TAU and the control group only exposed to TAU was tested. The findings are presented in the following section.

MBI and Problem Recognition One-Way ANCOVA Analysis

A pre-test on Problem Recognition (PR) was conducted at the beginning of the study on both the treatment and control groups. After the MBI was administered to the experimental group, in addition to TAU, a post-test was carried out on both the groups (experimental and control (exposed to TAU only). ANCOVA was performed to compare the pre-test and post-test means. The findings are as presented on Table 3.

Table 3

Descriptive Pre-Test and Post-Test Means Comparison between the Experimental and the Control Group

	N=	PR Pre-test means	Std. Deviation	PR Post-test Means	Std. Deviation	PR Post-test Adjusted Means	Std. Errors
Experimental Group	20	34.05	8.71	40.85	7.20	40.46[a]	1.01
Control Group	20	33.05	7.74	35.50	7.56	35.88[a]	1.01
Total	40	33.55	8.15	38.18	7.77		

a. Covariates appearing in the model are evaluated at the following values: Problem Recognition Pretest = 33.55, Age of the respondent = 4.28, Level of education = 2.75, Nature of Admission = 1.25, Number of Admissions = 1.30.

At post-test, results revealed that the experimental group had a higher PR mean score (M= 40.85, SD= 7.20) compared to the control group (M= 35.50, SD= 7.56) as shown on Table 3. The standard deviation of the control group (SD= 7.56) was slightly higher indicating that the PR scores of the control group were spread out from the mean than the ones of the experimental group (SD= 7.20). The researcher controlled for a number of covariates namely; problem recognition pretest scores, age, level of education, nature of admission and number of admission, and found that the experimental group had a higher PR mean score of M= 40.46, SE= 1.01, compared to the control group that had M= 35.89, SE= 1.01. Notably, even after statistically removing the covariates, the experimental group's PR mean score remained higher than that of the control group.

The researchers then tested the null hypothesis that there are no significant differences in Problem Recognition (PR) between clients exposed to music-based intervention (MBI) in addition to TAU and the control group in selected treatment centers in Kenya using one-way ANCOVA. The results are as presented on Table 4.

Table 4

One-Way ANCOVA Problem Recognition Post-test Means Comparison between Experimental and Control Group

Tests of Between-Subjects Effects

Dependent Variable: Problem Recognition Posttest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1704.065[a]	6	284.011	14.381	.000	.723
Intercept	106.159	1	106.159	5.375	.027	.140
Problem Recognition Pretest	921.061	1	921.061	46.639	.000	.586
Age of Respondent	1.267	1	1.267	.064	.802	.002
Level of Education	33.635	1	33.635	1.703	.201	.049
Nature of Admission	.128	1	.128	.006	.936	.000
Number of Admissions	1.465	1	1.465	.074	.787	.002
Group Membership	199.318	1	199.318	10.093	.003	.234
Error	651.710	33	19.749			
Total	60649.000	40				
Corrected Total	2355.775	39				

a. R Squared = .723 (Adjusted R Squared = .673)

The results revealed that there was a significant difference in the problem recognition (PR) means F (1, 33) =10.09, p=.00, n_p^2 =.23 between the experimental and the control as shown on Table 4. Therefore, the null hypothesis was rejected (at $p < .05$) in favor of the alternative hypothesis that there are significant differences in PR between clients exposed to MBI in addition to TAU and the control group, in selected treatment centers in Kenya. This suggests that MBI in combination with TAU is associated with significantly higher outcomes in problem recognition compared to the TAU only. The findings indicate that the four week MBI had a positive effect on improvement of PR among clients with SUDs.

Discussion

The results show that there were significant differences in problem recognition (PR) between the experimental group and the control with the experimental group (exposed to MBI in addition to TAU) having significantly higher means than the control group (only received TAU) after statistically controlling for the covariates. Therefore the null hypothesis was rejected in favor of the alternative hypothesis that there are significant differences in PR between clients exposed to MBI and the control group in selected treatment centers in Kenya.

These findings are similar to those of Silverman's (2015) that showed significant group differences on PR among clients with SUDs. It is important to note that while the current study was conducted among clients in an inpatients SUD facility, Silverman had investigated patients in a detoxification unit. This may be evidence that music-based intervention is effective in increasing PR in different addiction treatment environments including long-term residential facilities.

The findings of the current research are not consistent with Silverman's (2009b) study. Silverman found no significant differences in PR between groups that received talk therapy and the ones that received music therapy. This could be because this study was conducted in a detoxification center where the primary focus is medical treatment. Furthermore, the focus of Silverman's study was relapse prevention which indicates that the participants were almost concluding their stay at the detoxification center. The current study on the other hand engaged clients who were in their first few weeks of treatment and its focus was on enhancing recognition of the substance use problem.

The current findings could be due to the possibility that through music, the MBI influenced the participants' self-awareness. Research shows that music serves various psychological functions when people listen to it. For example, Schäfer et al. (2013) in their study of music established that one of the reasons people listen to music is to achieve self-awareness. Therefore, it is possible that the participants' self-awareness was enhanced during the MBI sessions while listening and interrogating the lyrics. Such self-awareness in turn increased insight on the problem of substance use as well as the resulting challenges in their lives.

In addition, the music used in the intervention reflected the universality of the human experience. For example, the lyrics of the song, "the more I drink" by Blake Shelton reflects the life of a person recovering from alcohol use disorder and the experiences he had. His story is similar to people living with SUDs even in Kenya, yet the song is written in the context of a person in a Western country. This acted as a source of comfort and probably reduced the shame and self- and internalized stigma among participants upon realizing that they are not the only ones who suffer from SUDs and have had difficult and shameful experiences in their lives in addiction. Research shows that internalized stigma reduces the likelihood of problem recognition (Rogers *et al.*, 2019). According to Yalom and Molyn (2008), knowing people with similar experiences and working through the similar issues as one is, helps one realize that they are not alone in terms of their experiences. The sense of universalism of human experience triggered by the lyrics probably acted as a bridge in acknowledging the problem of drug use addiction and the challenges brought about by it. Therefore the MBI would benefit clients who suffer shame and internalized stigma as it creates a safe opportunity of self-reflection which in turn may enhance problem recognition.

It is also possible that since the theme of the songs chosen were based on raising consciousness on the destructive effect of drug use, the negative effects on relationships and the problems that it brought to their lives, the clients were able to reflect on their lives and as a result recognized and acknowledge the significant issues caused by use of drugs. This recognition and acknowledgement was reflected in the higher scores on the PR scale among the participants in the experimental group regardless of their nature of admission (voluntary or involuntary) among other variables that were controlled for. This is mirrored in the Transtheoretical Model of Behaviour Change, which posits that consciousness raising and evaluation of behaviour is important in influencing motivation

towards change (Prochaska & DiClementi, 1984). Thus, since the MBI evoked the participants' self-evaluation through consciousness raising it may have influenced the increase of problem recognition.

In the current study, the use of MBI in addition to TAU may have improved PR through the song's lyrics whereby clients were able to reflect about themselves and their lives. The nature and design of the MBI created an environment that was less threatening and provided a more experiential tool of processing their thoughts, emotions and experiences. This offers therapeutic benefits that may have resulted in increased PR. This suggests that MBI may be a useful tool for inclusion as part of therapeutic intervention for clients in treatment settings for SUDs.

Limitations of the study

Notably, the study used a small sample and only one treatment facility. Therefore the findings of this study should be generalized with caution.

Conclusion

The results showed that the MBI in addition to TAU seems be effective in enhancing problem recognition among clients with SUDs as the experimental group had higher PR means even after controlling for various variables. This indicates that MBI may be effective as a complementary tool in enhancing insight on the drug use problems among clients with SUDs even when they are not ready for treatment. Furthermore, since the MBI enhanced PR despite of the number of admissions among other covariates shows that it may be a useful intervention among clients who have relapsed and been readmitted.

Based on these findings, the professionals working in the SUD treatment edifice such as counselors, psychologists and social workers may use MBI as a complementary and experiential treatment modality in their programs to enhance PR. This may be helpful while working with clients who have little insight on their substance use problem as well as the ones who are ambivalent. In addition, due to the potential that the MBI has as an experiential and complementary treatment modality, the institutions of higher learning training addiction treatment and mental health practitioners should include music-based intervention and music therapy courses in their training programs. This is paramount in enhancing competence among the music-based interventionists and music therapists especially in Kenya where the practice is still young.

Indeed, there is need for more research in the area of music-based interventions and music therapy. Future studies may consider a randomized controlled trial on the effectiveness of MBI on problem recognition among clients with substance use disorder in residential and out-patient treatment facilities in Kenya. In addition, one may use mixed methods to conduct a similar study in order to also document the participants' lived experiences.

Conflict of Interest: None declared

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