

SMOKING, ALCOHOL, AND SUBSTANCE ADDICTION TREATMENT PROGRAM (SAMBA): A RETROSPECTIVE ANALYSIS OF THE EFFECTIVENESS

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Smoking, Alcohol, and Substance Addiction Treatment Program (SAMBA): A Retrospective Analysis of the Effectiveness

Sigara, Alkol, Madde Bağımlılığı Tedavi Programı (SAMBA): Retrospektif Etkinlik Analizi

ABSTRACT

Objective: Alcohol and substance use disorders are common public health issues that impair individuals' biopsychosocial functioning and present various challenges during the treatment process. The Tobacco, Alcohol, and Substance Use Disorder Treatment Program (SAMBA) is structured with the aim of providing psychoeducation to individuals struggling with addiction, enhancing their communication and problem-solving skills, and supporting impulse control. This study aims to evaluate the implementation, participant characteristics, and treatment-related outcomes of the SAMBA program conducted over the course of one year at a training and research hospital. **Method:** This study was designed as a retrospective cohort study conducted over a defined period. The study examines the demographic characteristics of the individuals participating in the program, their level of treatment adherence, and their relationship with the SAMBA program. **Results and Conclusion:** Completion of the SAMBA program was associated with a 2.795-fold reduction in the odds of urine positivity or treatment non-compliance (OR = 2.795). The findings suggest that SAMBA provides a structured and holistic approach to addiction treatment and may serve as the potential to enhance treatment adherence.

Keywords: Addiction, retrospective cohort, SAMBA, group therapy

ÖZET

Amaç: Alkol ve madde kullanım bozuklukları, bireylerin biyopsikososyal işlevlerini bozan ve tedavi sürecinde çeşitli zorluklar yaratan yaygın halk sağlığı sorunlarıdır. Tütün, Alkol ve Madde Kullanım Bozukluğu Tedavi Programı (SAMBA), bağımlılıkla mücadele eden bireylere psikoeğitim sağlamayı, iletişim ve problem çözme becerilerini geliştirmeyi ve dürtü kontrolünü desteklemeyi amaçlamaktadır. Bu çalışma, bir eğitim ve araştırma hastanesinde bir yıl boyunca yürütülen SAMBA programının uygulanmasını, katılımcı özelliklerini ve tedaviyle ilgili sonuçlarını değerlendirmeyi amaçlamaktadır. **Yöntem:** Bu çalışma, tanımlanmış bir dönem boyunca yürütülen retrospektif bir kohort çalışması olarak tasarlanmıştır. Çalışma, programa katılan bireylerin demografik özelliklerini, tedaviye uyum düzeylerini ve SAMBA programıyla ilişkilerini incelemektedir. **Sonuçlar ve Sonuç:** SAMBA programının tamamlanması, idrar pozitifliği veya tedaviye uyumsuzluk olasılığında 2,795 kat azalma ile ilişkilidir (OR = 2,795). Bulgular, SAMBA'nın bağımlılık tedavisine yapılandırılmış ve bütüncül bir yaklaşım sağladığını ve tedaviye uyumu artırma potansiyeline sahip olabileceğini göstermektedir.

Anahtar Kelimeler: Bağımlılık, retrospektif kohort, SAMBA, grup terapisi

INTRODUCTION

Alcohol and substance addiction is a public health issue that adversely affects both the individual and their environment, bringing with it numerous biopsychosocial problems (1). Over time, this issue has become increasingly widespread, posing a threat not only to individuals but also to society and social order as a whole (2). According to a report published in 2014 in Türkiye, the prevalence of tobacco use was found to be 51.8%, alcohol use 28.3%, and illicit substance use 2.7% (3). According to the 2023 NSDUH, approximately 17.1% of Americans aged 12 or older, equating to about 48.5 million individuals, met the criteria for a substance use disorder (SUD) in the past year (4). Recent prevalence studies indicate that the global rate of substance use disorder is approximately 2.2%, which is higher than the prevalence of many other mental disorders (5). According to the World Health Organization (WHO), around 3 million people die each year worldwide due to causes directly related to alcohol consumption, accounting for 5.3% of all global deaths (6). Substance use disorders, in particular, have emerged as a growing public health concern, especially among the younger population. The United Nations Office on Drugs and Crime (UNODC) reported in 2023 that approximately 296 million individuals aged 15–64 globally have used an illicit substance at least once, reflecting a 23% increase compared to 2010 (7). Data from the National Poison Control Center (UZEM) indicate that hospital-based reports of drug-related poisonings stabilized around 2.8% between 2018 and 2020, involving approximately 6,000 incidents annually. Worryingly, even children under five showed a 2.7% exposure rate to unknown psychoactive substance (8). In addition to their high prevalence, alcohol and substance use disorders frequently co-occur with other psychiatric conditions such as depression, anxiety disorders, and post-traumatic stress disorder, further complicating prevention and treatment efforts (9). In light of all these findings, it is evident that tobacco, alcohol, and substance use remain serious public health concerns both in Türkiye and around the world.

Studies have shown that patients with Alcohol and Substance Use Disorders (ASUD) tend to have low treatment adherence and shorter hospital stays (10). Treatment adherence in this population is often compromised due to various factors such as the challenges encountered during treatment, comorbid diagnoses, the type of substances used, and patients' demographic characteristics (11). Maintaining treatment adherence and motivating individuals with ASUD to continue treatment are of critical importance. A study conducted in Türkiye on patients with alcohol use disorder found that age, the presence of bipolar disorder and depression significantly affected the length of hospital stay. Additionally, the year of

hospitalization was also found to be associated with the duration of inpatient treatment (13). Interventions aimed at increasing patients' adherence to treatment are considered a fundamental component of addiction treatment. However, many studies conducted in Türkiye have primarily focused on identifying patients' sociodemographic characteristics rather than evaluating treatment effectiveness in probation settings or specialized addiction clinics (14).

The Tobacco, Alcohol, and Substance Addiction Treatment Program (SAMBA), implemented in probation settings and addiction clinics, is a structured program with primary objectives that include enhancing participants' ability to communicate effectively, cope with impulse control issues, develop problem-solving skills, provide psychoeducation on addiction, manage stress, prevent relapse, and foster motivation necessary for treatment. The SAMBA is a multi-component intervention that incorporates various therapeutic approaches, including motivational interviewing, cognitive behavioral therapy, psychoeducation, relapse prevention strategies, group therapy, and goal-setting for life planning. SAMBA is delivered in a group format, typically consisting of 6 to 8 sessions, which incorporate various interactive exercises and activities. These sessions aim to improve motivation, strengthen problem-solving and communication skills, manage stress, and prevent recurrence. Additionally, an optional session addressing tobacco use may also be included. Research indicates that the SAMBA program may be effective in enhancing treatment adherence. The study by Ögel et al. (2016) provides valuable insight into the implementation and effectiveness of structured group-based interventions within the criminal justice system (15). The study include the use of both subjective (questionnaires) and objective (urine testing) outcome measures, enhancing the validity of the findings. The significant improvements in clinical symptoms and the high odds ratio associated with program completion suggest a robust treatment effect.

In Türkiye, the number of studies examining the effectiveness of the SAMBA program remains very limited in the literature. To date, only a few peer-reviewed studies have systematically examined the outcomes of the SAMBA program, particularly in terms of treatment compliance, relapse rates, and psychological indicators such as craving, depression, or anxiety. Only two studies have found that examine effectiveness of SAMBA or characteristics of participants and those are below mentioned. A study investigating the effectiveness of the SAMBA program was conducted by Ögel and colleagues and is available in the literature (16). Moreover, no long-term follow-up studies have been conducted to evaluate the program's efficacy. Existing research primarily consists of pilot studies or publications with small sample sizes.

Regional differences within the country regarding the implementation of the program, treatment adherence, or its effectiveness are not well understood, and related publications are insufficient.

The aim of this study is to evaluate the impact of the SAMBA program on treatment outcomes at the end of its first year of implementation in a training and research hospital located in southeastern Turkey. In addition, the sociodemographic characteristics of the participants were examined, and their associations with treatment adherence and urine test positivity were analyzed. This study contributes to the literature as one of the limited number of studies examining the relationship between SAMBA program completion, treatment adherence, and urine test positivity.

MATERIALS AND METHOD

Sample and Data Collection Process

Participants:

Our study is a retrospective, comparative cohort analysis conducted between 2024 and 2025. This study included data from 101 participants over the age of 18 who sought treatment at a training and research hospital for substance use disorder. All participants were diagnosed with Alcohol and Substance Use Disorder (ASUD) by a specialist psychiatrist at the psychiatry outpatient clinic and had initiated treatment. The participants joined the program on a voluntary basis. The data were collected retrospectively from individuals who, between February 2024 and February 2025, were enrolled in the SAMBA program after testing positive in at least one of the first three urine drug screenings, as stipulated by the Ministry of Health's 2021/13 probation directive. These individuals were scheduled to participate in a six-session structured educational program within the SAMBA framework.

Implementation:

As outlined in the program content, methods such as Cognitive Behavioral Therapy (CBT) techniques, Motivational Interviewing (MI), and Dialectical Behavior Therapy (DBT) techniques were utilized. Participants' urine test results prior to and following participation in the SAMBA program were recorded. The program was implemented by experienced psychologists who have been working in the field of addiction for five years and hold official SAMBA practitioner certification. The participants' last four urine analyses recorded in the system were reviewed, and even a single positive result was considered as noncompliance. Participants who missed even a single session without providing a valid excuse - such as a medical report or documented illness - were classified as non-attendees. Individuals who enrolled in and completed the SAMBA program were categorized into one group, while those who were excluded from the program due to violations or who

voluntarily discontinued participation were categorized into a second group. Similarly, participants were also divided into two groups based on post-program urine test results: those who either tested positive or failed to attend scheduled urine testing appointments, and those who had at least two negative urine tests. These groups were then subjected to comparative analysis. Among the different implementations of the SAMBA program, the version used in our study was the SAMBA Application for Probation in Clinical Settings.

All personal identifiers were kept confidential throughout the process, and only data retrieved from the hospital information system were analyzed. Ethical approval for the study was obtained from the Ethics Committee of Mardin Artuklu University with decision number 2025/3-22 and document code M5.TUT.019.

Data Collection and Statistical Analysis

Sociodemographic Data Form:

Each participant's information was recorded using a sociodemographic data form and entered into the hospital system, with personal identities kept confidential. The substances used by patients, their ages, genders, the number of sessions attended, hospitalization history, and whether they had previously received treatment were documented. The data were analyzed using a pre-post design. Patient names were kept anonymous and were not recorded. Since the study was based entirely on system records, no additional psychological scales or questionnaires were administered to participants.

The normality of data distribution was assessed through visual methods (histograms) and the Shapiro-Wilk test. For continuous variables, the independent samples t-test was used, while categorical variables were analyzed using the chi-square test. The Mantel-Haenszel method was applied to calculate odds ratios. To assess the causal relationship of significant parameters on the dependent variable, logistic regression analysis was conducted. All statistical analyses were performed using the SPSS software package, version 27.

RESULTS

A total of 101 participants were included in the study. A total of 69 participants completed the SAMBA sessions. Of these, 98 were male (97%) and 3 were female (3%). The majority of participants (69.3%) were diagnosed with cannabis use disorder. The mean age of the participants was 30.72 ± 8.1 years. Among them, 77.2% were employed, 69.3% had completed primary education, and 49.5% were married.

Before enrolling in the SAMBA program, 100% of participants had at least one positive urine test, and all participants (n=101) reported using both tobacco and alcohol. Additionally, every participant had made at least one previous attempt to quit substance use.

A significant proportion (96%) had no prior hospitalization in an Alcohol and Substance Addiction Treatment Center (AMATEM), and 76.2% had never received previous treatment.

Further sociodemographic details and the comparison between groups are presented in Table 1 (Table 1).

The average number of sessions attended by participants in the 6-session SAMBA program was 4.8 ± 1.76 . A statistically significant difference was found between participants who completed the SAMBA program and those who violated the rules or dropped out, in terms of post-program urine test positivity or compliance with scheduled urine testing ($p < 0.001$).

Completion of the SAMBA program was associated with a 2.795-fold reduction in the odds of urine positivity or treatment non-compliance ($OR = 2.795$). Furthermore, a statistically significant difference was found between participants with no previous treatment history and those with a history of prior treatment, regarding program completion rates ($p = 0.001$). Participants who had not received previous treatment were more likely to complete the SAMBA program. All odds ratio (OR) data are presented in Table 2 (Table 2).

A multiple regression analysis was conducted to assess the relationship between past treatment history, type of substance used (THC vs. other), and SAMBA program completion with urine test positivity. The analysis revealed that past treatment history and substance type were not statistically significant predictors ($p = 0.351$ and $p = 0.052$, respectively), whereas completion of the SAMBA program was found to be a statistically significant predictor of lower urine positivity ($p < 0.001$; Nagelkerke $R^2 = 0.347$). These findings are presented in Table 3 (Table 3).

DISCUSSION

In our study, the effects of the Tobacco, Alcohol, and Substance Use Treatment Program (SAMBA) on treatment adherence and urine test positivity were retrospectively investigated for the first time in a city where the program was implemented. When comparing the group with positive drug test results in urine to the group with negative results, significant differences were found in sociodemographic parameters such as age, gender, education level, type of substance used, and marital status. Statistically significant differences were observed between education level and substance type. The majority of participants had primary school education, and only 11.6% had completed higher education.

A review of the literature reveals a bidirectional relationship between education level and Alcohol and Substance Use Disorder (ASUD). On one hand, lower education levels are a contributing factor to an

increased risk of substance use, while on the other hand, substance use negatively impacts an individual's education, leading to school dropout, poor academic performance, and disengagement from education

(17). Studies have also shown that individuals with substance use disorders often exhibit academic deficiencies, learning difficulties, attention problems, absenteeism, and disciplinary issues (18). In this context, facilitating the school adaptation of individuals with ASUD is of great importance for both **preventive interventions** and **rehabilitation processes**. Our findings align with these established patterns in the literature.

The data from the study indicate that **tetrahydrocannabinol (THC, cannabis)** dependence stands out as particularly prevalent among the substances used. Research has shown that substances such as **cannabis (THC)**, **methamphetamine**, **heroin**, and **synthetic cannabinoids** are the most frequently chosen substances among individuals with substance use disorders (19). In a study conducted at another AMATEM center in Turkey, **opioid use** and **methamphetamine use** were found to be significantly higher compared to other substance dependencies (20). The literature demonstrates that the **lifetime prevalence of marijuana use** is considerably high among substance users, and one study indicated that **38% of participants** used THC, with this rate further increasing when **synthetic cannabinoids** were included (21). These findings align with the patterns observed in our study, emphasizing the prominence of THC use in the population of individuals with substance use disorders.

In Türkiye, the **Tobacco, Alcohol, and Substance Use Treatment Program (SAMBA)** developed by the Ministry of Health offers a structured, scientifically grounded, and holistic intervention model for addiction treatment. In our study, it was found that participants who completed the SAMBA program had **2.895 times fewer positive urine tests** compared to those who did not complete the program for any reason. The **12-step programs**, known for their similarity to SAMBA, have been shown to be effective treatment methods in the literature. These programs encourage individuals to view addiction as a "lifestyle" and promote the continuation of the recovery process through social support mechanism (22). Additionally, **family-based interventions** have proven to be particularly effective in **preventing and treating substance use** among adolescents (23). Active participation of the family in the process not only reduces the risk of relapse but also strengthens the individual's emotional support system. These findings align with the broader literature on the importance of family involvement in addiction treatment and recovery.

In the context of the current study, although comorbid diagnoses were not systematically assessed, clinical experience and prior research suggest that untreated or undertreated psychiatric symptoms can interfere with engagement in structured interventions like the SAMBA program. Individuals with dual diagnoses often require integrated treatment approaches that address both substance use and psychiatric symptoms concurrently (22).

Since the focus of substance use in the study was on **marijuana**, the data were analyzed by categorizing participants into **marijuana /Other** groups. It was found that individuals using **marijuana** had **1.534 times lower** frequency of substance use relapse compared to those using other substances. Although the relationship was borderline nonsignificant in the **multiple regression** analysis ($p=0.052$), it was suggested that the recurrence of substance use might be associated with the **type of substance**. Further research with larger and more diverse samples is needed to clarify the clinical implications of this finding. This finding aligns with existing literature. Specifically, individuals with **opioid (heroin, fentanyl, etc.)** dependence are observed to have high initial treatment participation rates, but their **treatment continuation rates** tend to decline over time. This is linked to the **strong physical dependence** caused by opioids, the **severity of withdrawal symptoms**, and the **loss of motivation** during the treatment process (24). On the other hand, **marijuana (THC)** users tend to have relatively higher treatment adherence, although the **treatment initiation rates** remain low. This could be due to cannabis being perceived as a “**harmless**” or “**non-addictive**” substance in society (25). In such cases, **motivational interviewing** and other **psychosocial interventions** have been shown in the literature to have a **positive effect** on **treatment participation** and **adherence** (26). These findings reinforce the importance of tailored interventions and the need to address societal perceptions when treating cannabis use.

Individuals using **stimulants** (such as **cocaine** and **methamphetamine**) show varying levels of treatment adherence depending on factors such as **addiction severity**, the presence of **comorbid psychiatric disorders**, and the level of **social support**. Among **methamphetamine users**, it has been observed that **cognitive impairments** and **paranoid thoughts** significantly contribute to **low participation in therapy** and **sustained treatment adherence** (27). Moreover, in this group of individuals, factors such as **fear of judgment** and **mistrust of treatment centers** can negatively affect their **integration into the treatment process**.

The findings of our study are consistent with those reported by Ögel et al. (2016). Similarly, the rate of positive urine drug tests was lower among participants

who completed the program, whereas it was higher in the group that did not complete the intervention. In Ögel’s study, levels of depression, craving, and anxiety were also measured and found to have decreased following the program. Both studies employed non-randomized designs. In our study, previous hospitalization or treatment due to addiction was examined as a potential predictor; however, no statistically significant regression was identified.

Meta-analysis studies in the literature also support the notion that the type of substance affects treatment response rates. For example, a comprehensive review by Mattick et al. (2009) on methadone treatment showed that the pharmacological treatment response was high in opioid-dependent individuals, but treatment adherence was further strengthened when combined with psychosocial support (28). Similarly, studies indicate that **motivational interventions in cannabis addiction treatments** enhance long-term success rates. These interventions play a key role in increasing treatment engagement and adherence, thereby improving overall treatment outcomes for individuals with cannabis dependence (29). The findings highlight the importance of developing **substance-specific treatment protocols**. Given that each substance has a different effect on the brain, varying levels of addiction, withdrawal symptoms, and social perception, **individualized and substance-specific intervention strategies** may be more effective than a “**one-size-fits-all**” treatment model. Tailoring treatment to the unique characteristics of each substance can lead to better engagement, adherence, and overall outcomes for individuals undergoing addiction treatment.

Our study has certain limitations. Firstly, due to its retrospective nature, it is difficult to exclude confounding factors related to the treatment process. Parameters such as the medications used by the patients and any additional psychiatric diagnoses, which could influence treatment adherence, were not included in the study. Although our study is a retrospective follow-up study, it is not a controlled prospective follow-up study, which introduces limitations regarding causality. However, to address this, multiple regression analysis was applied, and it was shown that completing the SAMBA process significantly reduced urine positivity. The retrospective design of this study, reliance solely on system-based records, and the lack of evaluation of comorbid psychiatric disorders and prescribed medications represent significant limitations. Furthermore, the predominance of male participants restricts the generalizability of the findings. The study did not assess parameters such as impulsivity, motivation, addiction symptoms, or levels of withdrawal, all of which could influence treatment adherence. Additionally, the length of time the patients had been using substances could not be determined from the data. Motivation, in particular,

is known to affect treatment continuity. Despite this limitation, as indicated by both the regression analysis and observational data, it can be suggested that the completion of the SAMBA process, independent of the aforementioned factors, increased treatment adherence. The study included 101 addiction patients who underwent psychotherapeutic interventions, which can be considered a sufficient sample size for an intervention program. Additionally, the fact that this is the second study conducted on the effectiveness of the program in our country, being a retrospective cohort study with a strong statistical foundation, are strengths of the study.

In conclusion, SAMBA is a multidimensional program developed specifically for the Turkish context, and based on our findings, it appears to have the potential to be an effective intervention. However, to enhance the success of this program, it is essential to strengthen individualized approaches, provide continuous training for professionals, and reinforce monitoring and evaluation systems. Additionally, by integrating international practices, updating both the content and implementation aspects of the program will further increase its treatment efficacy. Nevertheless, to fully determine its effectiveness, large-scale, randomized prospective follow-up studies are required.

RESOURCES

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