Substance use and behavioral addiction patterns: Treatment outcomes among patients admitted to an addiction treatment and rehabilitation center in a Nigerian Teaching Hospital

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ABSTRACT

Substance use and behavioral addiction disorders, pose significant public health challenges. This study investigated the association between drug use and pathological gambling patterns and treatment outcomes among 80 patients admitted to the Drug Addiction Treatment, Education, and Rehabilitation (DATER) unit of the University of Ilorin Teaching Hospital. A retrospective, cross-sectional analysis of case files revealed that the majority of participants were male (76.3%), unmarried (68.8%), and polysubstance users (44.3%). Opiates, alcohol, and cannabis were the most frequently abused substances, with three cases of behavioral addiction specifically related to gambling. Half of the participants had comorbid conditions, and 93.8% reported impairment. Treatment completion rates were high (86.3%), but follow-up adherence was low (28.7%). No significant differences were found in sociodemographic or clinical variables between completers and non-completers. However, a significant inverse relationship was observed between treatment completion and poor follow-up adherence. The study highlights the complexity of managing SUDs, particularly among polysubstance users, and underscores the importance of integrated treatment approaches. While treatment completion was high, the low follow-up adherence suggests a critical gap, necessitating robust aftercare strategies. Future research should focus on understanding factors that promote long-term engagement and sustained recovery in addiction treatment.

Keywords: *Substance use disorder, Drug-use pattern, Polysubstance use, Treatment outcomes, Follow-up adherence, Addiction treatment.*

INTRODUCTION

Addictive disorders, encompassing both substance use disorders (SUDs) and behavioral addictions, continue to pose significant challenges to global public health, contributing to adverse physical, mental, and socioeconomic outcomes (Abiola et al., 2018; American Psychiatric Association, 2013; World Health Organization, 2019). The landscape of addiction has evolved considerably in recent years, with emerging evidence highlighting the increasing complexity of polysubstance use and its coexistence with behavioral addictions, collectively exerting substantial pressure on healthcare systems worldwide (UNODC, 2023; Nkporbu, Oti & Metu, 2022). This shift in prevalence and patterns of addictive behaviors has been particularly notable in Nigeria, where substance use patterns among hospitalized patients mirror global trends, with polysubstance use emerging as a critical factor complicating treatment and rehabilitation efforts (UNODC, 2023; Bakare & Isah, 2016).

Studies have highlighted the significant prevalence of polysubstance use and its correlation with poor treatment outcomes (UNODC, 2023; Nkporbu, Oti & Metu, 2022; Bunting et al., 2022; Kim & Chafetz, 2020). In a study from a Nigerian teaching hospital in Port Harcourt South-south Nigeria, among the patients who received inpatient treatment services, cannabis was identified as the most used drug among patients, followed by alcohol, with over 73% of patients reporting polysubstance use. This underscores the complexity of treating SUDs in hospital settings, as patients often require integrated care that addresses multiple substances and associated comorbidities (UNODC, 2023). Similarly, King et al. (2020) identified three main drug use patterns among hospitalized patients, vis a vis: alcohol-dominant, polysubstance-dominant, and opioid-dominant. Polysubstance users, in particular, showed poorer outcomes and higher rates of re-hospitalization, signaling a need for healthcare systems to adapt to this evolving challenge.

This retrospective study aims to analyze the association between drug use patterns and treatment outcomes among patients admitted to the addiction treatment center of a teaching hospital in Ilorin, North-central Nigeria. By examining variables such as the type of drug used, duration of use, and the presence of comorbidities, this research seeks to provide insights into how these factors impact treatment outcomes. Understanding these associations will be crucial in developing more effective treatment strategies and improving the allocation of healthcare resources in hospital settings.

METHODOLOGY

The study was conducted at the Drug Abuse Treatment, Education and Rehabilitation (DATER) unit of the Department of Behavioral Sciences, University of Ilorin Teaching Hospital, Ilorin, Kwara-State, Nigeria, a location selected due to its epidemiological significance and accessibility of existing infrastructure. As

a leading tertiary healthcare facility in the region, the hospital serves a diverse patient population, making it an appropriate site to explore complex patterns of substance use disorders and behavioral addictions such as gambling. The DATER unit, established in July 2012 as an outpatient afternoon clinic within the general outpatient clinic of the Behavioral Sciences Department, evolved into a stand-alone center on 21st July 2017, equipped with four outpatient consulting rooms, three seminar rooms, and an 11-bed inpatient facility (five for males, five for females, and one amenity room). The unit is staffed by a multidisciplinary team including addiction consultant psychiatrists, resident doctors, mental health nurses, clinical psychologists, occupational therapists, mental health social workers, and other support staff, ensuring comprehensive care and robust data collection. The study site's well-established infrastructure and its location in Ilorin, Kwara-State, a region with growing public health concerns related to substance use and addictive behaviors, particularly in Nigeria's North-west region, enabled this research to address critical gaps in the literature and provide contextually relevant insights to guide local and national addiction treatment and rehabilitation efforts.

The study participants consisted of patients who had undergone treatment for substance use disorders at the DATER unit since June 2017. A total of 80 patients were recruited for the study, a sample size determined using the Raosoft Scientific Calculator, which corresponds to an 11% margin of error at a 95% confidence level.

This research employed a retrospective cross-sectional design, assessing case files of patients admitted to the DATER unit since its inception. Data were collected using a self-developed questionnaire designed to extract information from patient records, covering sociodemographic details, clinical variables, and treatment outcomes. The sociodemographic section captured variables such as age, gender, and marital status, while clinical data included the type of substance or behavioral addiction, duration of substance use before treatment, presence of comorbidities, and functional impairment. Treatment success was evaluated based on completion of a minimum three-month treatment duration and adherence to scheduled post-discharge follow-up visits.

Statistical analysis was conducted by first inputting and cleaning the data in Excel before importing it into SPSS version 26 (2019) for further processing. Descriptive statistics, including frequencies for categorical variables and means/standard deviations for continuous variables, were used to summarize sociodemographic and clinical data. Associations between these variables and treatment completion were examined using chi-square tests for categorical data and independent t-tests for continuous variables. Additionally, the relationship between treatment completion and follow-up adherence was assessed using Kendall's tau-B correlation analysis.

RESULTS

The sociodemographic distribution and clinical variables of the 80 participants in the study is shown in Table 1. The age of participants ranged from 18 to 68 years, with a mean age of 33.3 years (SD = 10.0). Most of the participants were male, representing 76.3% (n=61) and 68.8% (n=55) were not currently married. Among the participants, 44.3% (n=35) used multiple substances, and majority reported that they had used substances for almost a decade (38.0% for 5-9 years and 21.5% for less than 5 years). Comorbid conditions were present in 50% of participants and impairment was reported by 93.8%.

Table 1: Socio-demographic distribution and clinical variables of participants (N=80)

Variables	Frequency (n)	Percentage (%)
Age (years)		
18-29	34	42.5
30-39	29	36.2
40-49	10	12.5
≥50	7	8.8
Mean (SD) 33.3 (10.0)	Range	18 – 68
Gender		
Male	61	76.3
Female	19	23.7
Marital Status		
Currently Married	25	31.3
Currently Not Married	55	68.7
Type of Substances or Processes Use		
Single	35	43.8
Multiple	35	44.8
Not Specified	10	12.4
Duration of Substances or Processes Use Disorder before presentation (years)		
<5	17	21.3
5-9	30	37.5
10-14	8	10.0
15-19	4	5.0
≥20	5	6.2
Not Specified	16	20.0
Presence of Comorbidity		
No	33	41.2
Yes	40	50.0
Not Specified	7	8.8

Presence of Impairment		
1*	61	76.3
>1**	14	17.5
Not Specified	5	6.2

* = occupational (52.5%) and educational (23.8%);

** = occupational with educational impairments (17.5%)

Figure 1 displays the distribution of the most used to the least used of the substances or processes by participants. The chart illustrates in descending order the top four high ranked substances abuse before admission as opiates (25.9%), alcohol (20.1%), cannabis (19.4%) and tobacco (18.0%). The least addictive disorder was behavioral addiction specifically gambling among three participants (3.8%).

All individuals with gambling disorder were male, primarily using e-betting, in severe debts (average of 30 million Naira) with ages of 23, 38, and 43 years. Two were married and one was single. Out of the 3, one of the patients had comorbid severe depression without psychotic symptoms, alongside educational impairment. The other two experienced occupational impairments and completed their treatment but only one maintained regular follow-up, while the other two were inconsistent.

Figure 1: Pie Chart Showing Ranking of the Types of Addictive Drugs and Processes

Table 2 summarizes the treatment outcomes of the participants, detailing their completion rates as 86.1% (n=68) and adherence to follow-up appointments as 29.1% (n=23). Table 3 showed that none of the sociodemographic and clinical variables were statistically different between treatment completers compared to non-completers. Table 4 showed a moderate but inverse statistically significant relationship between treatment completion and poor post-treatment follow-up.

Table 2: Characteristics of treatment outcome (N=80)

Variables	Frequency (n)	Percentage (%)
Treatment Completion		
Completers	69	86.3
Non-completers	11	13.7
Adherence to Follow-up		
Regular	23	28.7
Irregular/Nil	57	71.3

Table 3: Relationship between participants' variables and treatment outcome (N=80)

Variables	Treatment Outcome		Test Statistics	
Age (years)	Completers (n=68)	Non-completers (n=11)	χ^2	p-value
18-29	29	5	6.818*	0.078
30-39	26	3		
40-49	10	0		
≥50	4	3		
Gender				
Male	51	10	0.720*	0.396
Female	18	1		
Marital Status				
Currently Married	24	1	1.842*	0.175
Currently Not Married	45	10		
Number of Addictive Substances or Processes				
Single	31	4	2.093*	0.351
Multiple	31	4		
Not Specified	7	3		
Duration of Addictive Substances or Processes (years)				
<10	41	6	0.406*	0.816
≥10	15	2		
Not Specified	13	3		
Presence of Comorbidity				
No	29	4	1.170*	0.557
Yes	35	5		
Not Specified	5	2		
Presence of Impairment				
1	55	6	3.567*	0.168
>1	11	3		
Not Specified	3	2		

* = Yate's Correction

Table 4: Correlation of treatment outcome characteristics (N=80)

	Treatment Completion	Post-treatment Follow-up
Treatment Completion	1.000	-0.548**
Post-treatment Follow-up		1.000

** = p<0.01

DISCUSSION

The present study provides valuable insights into the demographic characteristics, substance use patterns, and treatment outcomes among individuals seeking addiction treatment in a clinical setting. The study sample predominantly consisted of young adult males, with a mean age of 33.3 years. This demographic profile aligns with previous research indicating higher rates of substance use disorders among males and young adults (Nporbu, Oti & Metu, 2022; Bakare & Isah, 2016; King et al., 2020; Brady & Randall, 1999). The high proportion of the participants who are unmarried individuals tend to reflect the disruptive impact of substance use on social relationships and family formation (Fergusson, Boden & Horwood, 2009).

The most common drug of abuse among patients admitted over the study period is opioid. This observation is quite different from previous studies across Nigeria (Nporbu, Oti & Metu, 2022; Bakare & Isah, 2016) where cannabis is the most reported drug of use among inpatients. This might be related to a more sizeable number of female participants which were almost 20% compared to less than 15% in the other studies (Nporbu, Oti & Metu, 2022; Bakare & Isah, 2016). Nonetheless, the finding of opioids predominance seems to align with the ongoing opioid crisis observed in many regions globally (Volkow & Blanceo, 2021).

A notable finding is the high prevalence of polysubstance use, with 44.3% of participants reporting the use of multiple substances. This pattern was similar to what was obtained in previous studies (Nporbu, Oti & Metu, 2022; Bakare & Isah, 2016; King et al., 2020), and underscores the complexity of substance use disorders and the challenges in treatment planning, as polysubstance use is associated with poorer treatment outcomes and increased risk of relapse (Connor et al., 2014). In addition, the long duration of substance use reported by the majority of participants, might be a result of the high rate of polysubstance use, especially as it relates to delay in seeking treatment, potentially due to barriers such as stigma or lack of access to care (Rapp et al., 2006).

The presence of 3 (2%) participants with gambling disorder in the 80 sample highlighted the growing concern of behavioral addictions in Nigeria. All 2% were male, which begs the question on whether gambling addiction is prevalent among males than females (Calabo & Griffiths, 2016). The use of e-betting as the primary gambling method reflected the increasing

accessibility of online gambling platforms, a trend observed globally (Gainsburry, 2015). The severe debt levels (averaging 30 million Naira) underscore the significant financial impact of gambling addiction, which can exacerbate socioeconomic challenges in developing countries like Nigeria (Oyebisi, Alao & Popoola, 2012). The diverse age range (23-43 years) and occupational statuses of these individuals suggest that gambling addiction can affect various demographics.

The current study shows that there is a high rate of comorbid conditions and impairment among participants, emphasizing the potential of addictive disorders to disrupt various aspects of life (Connor et al., 2014; Dowling et al., 2015). These findings emphasize the need for comprehensive, integrated treatment approaches that address both substance use and co-occurring mental health or medical conditions (Kelly & Daley, 2013).

The high treatment completion rate of 86.1% was higher than many reported in the literature, which often ranges from 30% to 60% (Brorson et al., 2013). This is encouraging and suggests that the program under study is effectively engaging and retaining patients, and has a better outcome. Apart from use of evidence-based treatment approaches, perhaps other reasons might be related to the admission process and criteria which include a thorough engagement and explanation about the duration of stay, ward rules and regulations, positive attitude of managing team and a strict assessment of the level of motivation and attainment of action phase in the cycle of change. Furthermore, further investigation into the factors contributing to this high completion rate could provide valuable insights for improving retention in other treatment settings.

The adherence to follow-up appointments is low (28.7%) and it highlights the challenges in ensuring consistent long-term engagement in addiction treatment programs, a common issue in substance use disorder treatment as well (Mckay, 2009). This drop in engagement is a critical gap in the continuum of care post-treatment. It seems to also relate to the inverse association between treatment completion and poor post-treatment follow-up. This will suggest that factors contributing to successful treatment completion may not necessarily translate to sustained engagement in aftercare. Hence, the need for robust aftercare programs and strategies to maintain patient engagement beyond the initial treatment phase (Stark, 1992; Mckay, 2009). These are critical aspects of tiered or pyramid model which has been reported to be beneficial in the management of substance use disorders (Rush, Tremblay & Brown, 2019).

We identified a significant inverse correlation between treatment completion and follow-up adherence ($r = -0.548$, $p < 0.01$), suggesting that patients who completed treatment were paradoxically less likely to attend follow-ups. This aligns with global reports of post-discharge disengagement (McKay, 2009) but diverges from findings where completion

predicted sustained adherence (King et al., 2020). The observed discrepancy may stem from contextual factors such as limited aftercare support or patient overconfidence after short-term success. Notably, the lack of demographic/clinical predictors underscores that institutional practices (e.g., admission criteria, staff attitudes) or individual motivation, factors not captured in this retrospective design, may drive retention more than patient characteristics.

The lack of statistically significant associations between treatment completion and sociodemographic/clinical variables (age, gender, marital status, polysubstance use, comorbidity, or impairment; all $p > 0.05$). This contrasts with prior studies linking younger age, male gender, and polysubstance use to poorer retention (Lash et al., 2011; Bunting et al., 2022). The absence of such associations in our cohort may reflect the DATER unit's standardized motivational protocols or the homogeneity of the sample (predominantly young, unmarried males).

While this study provides valuable insights, several limitations should be acknowledged. The relatively small sample size may limit the generalizability of findings and the power to detect significant associations. Additionally, the study's focus on a single treatment setting may not capture the diversity of experiences across different treatment modalities and geographic regions.

CONCLUSION

In conclusion, this study revealed three critical findings about addiction treatment outcomes in a Nigerian tertiary hospital: (1) high treatment completion rates (86.3%) contrasted sharply with poor follow-up adherence (28.7%), underscoring a disconnect between short-term engagement and sustained recovery; (2) polysubstance use (44.3%) and comorbidities (50%) were prevalent, complicating care needs; and (3) emerging behavioral addictions like gambling (3.8%) demonstrated severe socioeconomic consequences, particularly among young males. Based on these results, we recommend implementing integrated aftercare programs, including telehealth check-ins and peer support, to bridge post-discharge gaps, alongside policy interventions to address financial and occupational barriers to long-term recovery. Future research should prioritize longitudinal studies to identify predictors of follow-up attrition and assess the scalability of this center's high retention strategies, while expanding investigations into behavioral addictions within low-resource settings. These steps should provide essential transformation to acute treatment successes into enduring recovery outcomes.

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