

Prevalence of co-occurring mental disorders among in-patients at the Alcohol & Drug Abuse Rehabilitation Unit, Moi Teaching & Referral Hospital in Eldoret

Florence Jaguga^{1*}, Nicodemus Kuboi², Julius Barasa³ and Edith Kamaru Kwobah⁴

^{1*} Moi Teaching & Referral Hospital, Eldoret, Kenya

² Kenya Association of Professional Counselors

³ Kenya Population Health, Academic Model Providing Access to Healthcare, Eldoret

*Corresponding Author:

Florence Jaguga MBChB,

Moi Teaching & Referral Hospital, Eldoret, Kenya

E-mail: flokemboi@gmail.com

Submitted: 24th January 2022

Published: 30th June 2022

Abstract

Globally, the burden of mental disorders among patients attending treatment for substance use disorders is substantial. Little has been done to explore this subject in Kenya. The aim of this study was to investigate the prevalence rates of mental disorders among persons undergoing in-patient rehabilitation for substance use disorders at the Alcohol and Drug Rehabilitation (ADAR) Unit, Moi Teaching and Referral Hospital. This was a descriptive cross-sectional study. The Mini International Neuropsychiatric Interview Version 7.0 was used to investigate the lifetime DSM-5 mental disorder diagnoses. Fifty three (53) adult patients consecutively admitted to the unit between June 2019 and May 2020 were interviewed by the investigators two weeks after admission. The data was analyzed using descriptive statistics. The mean age for the respondents was 38.13 years (SD=9.26 years). All 53 (100.0%) of the participants had at least one lifetime mental disorder diagnosis. Antisocial personality disorder (69.8%), Social Anxiety Disorder (49.1%), and Major Depressive Disorder

(47.2%) were the most common mental disorder diagnoses. A large proportion of in-patients at the ADAR unit, MTRH had a lifetime mental disorder. We recommend routine screening for mental disorders for patients admitted for in-patient rehabilitation at the facility. In addition, management approaches for in-patient substance use disorder rehabilitation should address co-occurring mental disorders.

Key words: *substance use disorder, mental disorder, rehabilitation, in-patient, prevalence*

Introduction

High rates of mental disorders have been reported among persons with substance use disorders (SUDs). Regier et al., (1990) in one of the largest co-morbidity surveys, reported that 37% and 53% of patients with an alcohol and drug use disorder respectively in the United States (US) had a co-occurring mental disorder. In that study, the odds of having a mental disorder were reported as higher for those in SUD treatment settings. More recent studies confirm this high burden of mental disorders among persons attending treatment for SUDs. Dauber et al., (2018) and Pereiro et al., (2013) reported that 50.7% and 56.3% of persons attending treatment for substance use had a co-occurring mental disorder in Germany and Canada respectively. In a systematic review, Kingston, Marel, & Mills, (2017) and 59 full articles were assessed for eligibility. Eighteen studies were included in the review. **KEY FINDINGS** Prevalence estimates of current mental disorders in substance use treatment clients varied (47 to 100% reported that 47-100% of persons seeking SUD treatment in Australia, had at least one mental disorder diagnosis. Studies report that the most common mental disorders among persons with SUDs are mood disorders, anxiety disorders, borderline personality disorder and antisocial personality disorder (Chahua et al., 2015; Dauber et al., 2018; Kingston et al., 2017; Pereiro et al., 2013) 42.2% of patients suffering from at least an Axis I condition and 20.2% from some Axis

II condition. Mood and anxiety disorders and borderline and antisocial personality disorders were the most frequent disorders in both axes. Conclusions: A high comorbidity was found between mental and substance use disorders (SUD).

SUDs are associated with significant disability worldwide. In 2015, alcohol and drug use disorders resulted in 13,048,894 and 17,628,729 Disability Adjusted Life Years (DALYs) respectively (World Health Organization, 2017). In Kenya, the DALYs associated with alcohol and drug use disorders were 54,000 and 13,900 respectively in that same year (World Health Organization, 2017). The co-occurrence of mental disorders with SUDs is likely to exacerbate this burden. For example, a study conducted among cocaine-dependent adults in Spain, (González-Saiz et al., 2014) found that those with comorbid mental disorders had worse treatment outcomes compared to those with cocaine use disorder only. In addition, severer psychosocial problems (Vélez-Moreno et al., 2017) and their concomitance generates poorer therapeutic prognosis and more severe psychosocial problems than either disorder alone. The purpose of this study was to compare three models of the relationship between personality disorders, substance use disorders and substance-related problems. Substance use disorder patients ($n = 199$, severer levels of socio-occupational dysfunction and higher levels of health service utilization (Prior et al., 2017) prevalence and correlates of mood and anxiety disorders among those with a (i) have been reported among those with SUD and co-occurring mental disorders compared to those with SUDs only.

Given the high rates and adverse consequences of co-occurring disorders, it is important that SUD treatment incorporates management for mental disorders. Several authorities have highlighted the importance of integrated management. The Substance Abuse & Mental Health Services Administration (SAMHSA) (SAMHSA, 2020) and the United Nations Office on Drugs and Crime (UNODC) (UNODC, 2020) emphasize that mental disorders can worsen the course of SUDs, and recommend that all persons

presenting for SUD treatment should be screened for mental disorders. Both authorities highlight the importance of integrated management for those with a co-occurring disorders (SAMHSA, 2020; UNODC, 2020).

In Kenya, little has been done to investigate the burden of mental disorders among persons in treatment for SUDs. A study conducted by Ndetei et al., (2009), at the Mathari Drug Abuse Rehabilitation Unit, reported that all participants ($n=12$), had a comorbid mental disorder diagnosis. In addition to a lack of data on mental disorders among persons with SUDs, existing guidelines for the management of SUDs do not adequately address co-occurring disorders (Ministry Of Health, 2017; NACADA., 2010). The aim of the current study is to determine the prevalence of mental disorders among patients admitted at the Alcohol and Drug Abuse rehabilitation (ADAR) Unit, Moi Teaching and Referral Hospital (MTRH). The findings of this study are useful in informing policy and practice within MTRH, and in other substance use treatment settings in Kenya.

Methodology

This was a descriptive cross-sectional study. The recruitment of the study subjects was carried out at the Alcohol and Drug Abuse Rehabilitation (ADAR) unit of MTRH between June 2019 and May 2020. The MTRH is the second largest referral hospital in the Kenya serving a catchment population of about 18 million. The in-patient ADAR unit has a capacity of 16 beds with 11 beds allocated to males and 5 beds for females. The unit runs a 90-day medically managed intensive in-patient service, delivered by a multidisciplinary team comprising of psychiatrists, psychological counselors, nurses, occupational therapists, nutritionists and other support staff. All patients are admitted into the unit voluntarily in accordance with the *Mental Health Act (1989)*. The study population consisted of adult patients admitted at the ADAR unit of MTRH during the study period. The study included all adult (18 years and above), patients consecutively admitted to the unit during the 12 month study period. We excluded those who were too ill to respond. The Mini International Neuropsychiatric Interview (MINI)

version 7.0 for DSM-5 was used to collect socio-demographic data on age and gender as well as data on the mental health of the respondents. The MINI is a short structured diagnostic interview for Diagnostic Statistical Manual fifth edition (DSM-5) mental disorders. The tool diagnoses the major Axis I mental disorders, and one Axis II disorder (Antisocial personality disorder). The MINI has been validated against the Structured Clinical Interview for DSM diagnoses (SCID) and the World Health Organization World Mental Health - Composite International Diagnostic Interview (Sheehan et al., 1998). It however has a much shorter administration time, about 15 minutes.

Participants were recruited two weeks after admission to the ADAR unit by a trained research assistant. A two week period was allowed after admission to ensure that any mental health symptoms experienced were not the direct result of substance use. The process of obtaining informed consent was carried out by the research assistant and witnessed by a consultant in psychiatry who had the capacity to understand the merits, risks and procedures of the research and was independent of the research team. Once consent was obtained, the MINI questionnaire containing unique patient identifiers was administered to assess for occurrence of mental disorders. The data was collected using face to face interviews. Consent was obtained from patients who were mentally stable.

Data obtained was verified and entered into a secure SPSS database. Anonymity was maintained by excluding any personally identifiable information from the dataset. Data was analyzed using SPSS version 25. Continuous variables were summarized using means and standard deviations. Categorical data was summarized using frequencies and percentages and presented using frequency tables.

Ethics review and approval was sought and obtained from the MTRH/Moi University School of Medicine Institutional Research and Ethics Committee. Only those who gave consent participated in the study. All patients were given appropriate and indicated care regardless of their willingness to participate in the study or their

capacity to consent.

Results

Socio-demographic characteristics of the participants

A total of 53 respondents participated in the study. The mean age for the respondents was 38.13 years (SD=9.26 years). Of those who responded, 43 (81.1%) were male (**Table 1**).

Prevalence of substance use disorders

Fifty one (96.2%) study participants met criteria for a 12-month alcohol use disorder. The second and third most common SUDs were stimulant (58.5%) and cannabis use disorders (26.4%). Prevalence rates for the other SUDs are presented in **Table 2**.

Prevalence of lifetime mental disorders

All (100%) of the study participants met criteria for at least one lifetime mental disorder. The most common mental disorders were antisocial personality disorder (ASPD) (69.8%), social anxiety disorder (49.1%), Major Depressive Disorder (47.2%), agoraphobia (43.4%), panic disorder (43.4%) and generalized anxiety disorder (GAD) (43.3%) (**Table 3**). Complete data on the prevalence of specific mental disorders has been provided in **Table 3**.

Discussion

The finding that 100% of patients admitted to the ADAR Unit, met criteria for at least one lifetime mental disorder is broadly consistent with those of other studies examining the prevalence rates among patients attending SUD treatment. In a systematic review of the prevalence of co-morbid mental health conditions among people accessing treatment for substance use in Australia, the authors reported the prevalence estimates of current mental disorders to be as high as 100% (Kingston et al., 2017) and 59 full articles were assessed for eligibility. Eighteen studies were included in the review. **KEY FINDINGS** Prevalence estimates of current mental disorders in substance use treatment clients varied (47 to 100%. In a study conducted in New Zealand, 90% of the patient attending an out-patient

substance use treatment service, had a lifetime mental disorder (Adamson et al., 2006). In Kenya, a study conducted among patients at the Mathari Hospital Drug Abuse Rehabilitation Unit, found that 100% of those assessed had a comorbid mental disorder (Ndetei et al., 2009). The high rates of mental disorders in the current study are not surprising. The ADAR unit provides intensive in-patient treatment for SUDs and is likely to admit patients with severe SUD symptoms and multiple physical and mental health comorbidities.

The most common mental disorder in our study was ASPD (69.8%). Other studies have reported much lower rates. In a meta-analysis conducted among Chinese patients with heroin use, 30% had ASPD (Zhong et al., 2014). Pereiro et al., (2013) 42.2% of patients suffering from at least an Axis I condition and 20.2% from some Axis II condition. Mood and anxiety disorders and borderline and antisocial personality disorders were the most frequent disorders in both axes. Conclusions: A high comorbidity was found between mental and substance use disorders (SUD in a study conducted among 2300 patients attending SUD treatment in Spain, reported that 4.6% of them had a diagnosis of ASPD. In a study conducted among persons admitted for SUD treatment in Norway, 16% had ASPD (Langås et al., 2012). The higher prevalence rates of ASPD in our setting are a likely reflection of substance use treatment seeking patterns in Kenya. Often the most severely ill and or the most dysfunctional patients get referred for, or seek treatment. Another possible reason for the high rates of ASPD in our study is that most of our patients were male, and ASPD has been associated with being male (Werner et al., 2015).

The association between ASPD and substance use is well documented in literature. Studies have shown higher rates of antisocial behavior among people using substances compared to those who do not (Nardi et al., 2012). This could partly be explained by the fact that antisocial behavior confers risk for substance use due to the associated impulsivity, affective dysregulation, impaired executive functioning and difficulties with modifying behavior based on outcomes

(Brennan et al., 2017). The high rates of ASPD in our study are worrying because ASPD has been found to be significantly associated with persistence of SUDs (Hasin et al., 2011).

Social anxiety disorder (49.1%), major depressive disorder (47.2%), generalized anxiety disorder (GAD) (43.4%), agoraphobia (43.4%) and panic disorder (43.4%) were the next most prevalent mental disorders in our study. Other studies have reported similar findings with mood and anxiety disorders as the most predominant. In a systematic review of studies conducted in Australia, Kingston et al., 2017 and 59 full articles were assessed for eligibility. Eighteen studies were included in the review. KEY FINDINGS Prevalence estimates of current mental disorders in substance use treatment clients varied (47 to 100% reported that mood and anxiety disorders were the most common, with the prevalence of current depression ranging from 27 to 85% and current generalized anxiety disorder ranging from 1 to 75%. Pereiro et al., (2013) 42.2% of patients suffering from at least an Axis I condition and 20.2% from some Axis II condition. Mood and anxiety disorders and borderline and antisocial personality disorders were the most frequent disorders in both axes. Conclusions: A high comorbidity was found between mental and substance use disorders (SUD conducted a study among 2300 patients attending SUD treatment in Spain. He found that mood (22.2%) and anxiety disorders (14.3%) were the most prevalent of the Axis I disorders. In a study conducted at Mathari Hospital Drug Abuse Rehabilitation Unit, 100% of the patients assessed were found to have a mood disorder (Ndetei et al., 2009).

Although PTSD (41%), bipolar disorder (28%), suicidality (22%) and psychotic disorders (13%) were the least common mental disorders, their prevalence rates were nonetheless significant. Given the potential impact of these disorders on disability and morbidity (Vigo et al., 2016) we estimate the disease burden for mental illness to show that the global burden of mental illness accounts for 32.4% of years lived with disability (YLDs, as well as on SUD treatment outcomes, it is important that interventions that address these disorders are implemented at the ADAR unit.

A possible reason for the high rates of co-occurrence between mental and SUDs is that mental disorders increase the risk for substance use. For example persons with mental disorders often self-medicate with substances in an attempt to relieve their mental health symptoms (Hawn et al., 2020). Another possible reason is that substances increase the risk of occurrence of mental disorders. For example cannabis use has been linked to the emergence of paranoia, and depressive and anxiety symptoms (Freeman et al., 2015). A systematic review and meta-analysis reported that alcohol use disorders were associated with increased risk of subsequent depressive symptoms (Li et al., 2020) regarding alcohol intake, the risk of developing depressive symptoms might vary with alcohol intake level. We aimed to investigate the association between AUD, alcohol intake and subsequent depressive symptoms. Design and Setting: We conducted a systematic search in PubMed, Embase and PsycINFO for cohort studies on the association between AUD or alcohol intake and subsequent depressive symptoms. Participants: We included 338 426 participants from 42 studies. Six and four studies analyzed only females and males, respectively. Measurements: We combined risk estimates for developing depressive symptoms using a random-effects model. We divided alcohol intake into abstinence, light (0–84 g/week. Since our study was cross-sectional, we were not able to determine which disorder preceded the other. Future longitudinal studies ought to be conducted to help clarify the link between SUDs and mental disorders in our setting.

Implications for policy and practice

The findings of this study have 3 key implications for practice and policy both within MTRH and within other SUD in-patient treatment facilities in Kenya:

Firstly, it is important that routine screening for mental disorders is conducted for patients attending SUD in-patient treatment. The high rates of a broad range of mental disorders in our study highlight the importance of conducting comprehensive mental health screening for persons seeking treatment for SUDs. Well established tools that have been validated in our setting such

as the Primary Health Questionnaire-9 (Kroenke et al., 2001), the Generalized Anxiety Disorder scale-7 (Spitzer et al., 2006) there is no brief clinical measure for assessing GAD. The objective of this study was to develop a brief self-report scale to identify probable cases of GAD and evaluate its reliability and validity. METHODS A criterion-standard study was performed in 15 primary care clinics in the United States from November 2004 through June 2005. Of a total of 2740 adult patients completing a study questionnaire, 965 patients had a telephone interview with a mental health professional within 1 week. For criterion and construct validity, GAD self-report scale diagnoses were compared with independent diagnoses made by mental health professionals; functional status measures; disability days; and health care use. RESULTS A 7-item anxiety scale (GAD-7 and the PTSD Checklist for DSM-5 (PCL-5) (Weathers et al., 2013) could be used to screen for depression, GAD and PTSD respectively. The MINI (Sheehan et al., 1998), a brief diagnostic instrument could be used to assess for ASPD as well as for other DSM-5 mental disorders.

Secondly, we recommend that SUD management, in in-patient or residential settings in Kenya, incorporates treatment for mental disorders. Management approaches must include interventions that address both SUDs and mental disorders simultaneously. Given the high rates of ASPD in our study, we recommend that treatment approaches that address this disorder should be prioritized. Thylstrup et al., (2015) in a randomized control trial, found that an Impulsive Lifestyle Counselling Intervention, delivered over 6 sessions resulted in modest reductions in substance use and antisocial behavior among persons attending SUD treatment. Such an intervention could be implemented in our setting.

Thirdly, SUD rehabilitation facilities ought to have adequate capacity to manage mental disorders. This could be achieved by (1) developing facility guidelines or policies that require for mental health screening to be routinely practiced; (2) ensuring that qualified staff with competencies in delivering appropriate mental health interventions are available; and (3) forming linkages with existing mental health facilities for specialized mental health treatment where necessary.

The strengths of this study are that a standardized tool was used to assess for mental disorders. In addition, the study assessed for a wide range of mental disorders, and assessments were conducted two weeks after admission to ensure that mental health symptoms were not substance induced.

We acknowledge two limitations. The sample size was relatively small. This is due to the fact that the unit has a small capacity and only a limited number of admissions are possible in any given period. Secondly, our sample included patients seeking intensive in-patient treatment for severe SUDs. Based on these two limitations, our study findings may not be generalizable to the other SUD patients in Kenya. Our findings nonetheless provide recent and comprehensive data on the prevalence of mental disorders among persons seeking in-patient SUD treatment in Kenya. Future studies with larger samples and conducted across several treatment settings could be useful in improving generalizability of findings.

Conclusion:

The findings of this study indicate a high prevalence rate of mental disorders among patients attending in-patient SUD rehabilitation at MTRH. ASPD, depression, and anxiety disorders were the most common mental disorders diagnosed. Management for persons with SUDs at MTRH, and in other in-patient settings in Kenya, should incorporate assessment and treatment for mental disorders.

Acknowledgement for funding: This work was funded by Moi Teaching & Referral Hospital

Tables:

Table 1: Socio-demographic characteristics of the participants

Variable	Levels	n (%) / Mean \pm SD
Age (Years)		38.13 \pm 9.26
Sex	Female	10 (8.9%)
	Male	43 (81.1%)

Table 2: Prevalence of substance use disorders

Substance use disorder	Frequency* (n=53)	%
Alcohol use disorder	51	96.2
Cannabis use disorder	14	26.4
Stimulant use disorder	31	58.5
Opioid use disorder	0	0.0
Sedative/hypnotics/ anxiolytics use disorder	0	0.0
Other substance use disorders	2	3.8

* There was co-occurrence of substance use disorders among the participants. The frequency of the substance use disorders is therefore more than 53.

Table 3: Prevalence of lifetime mental disorders

Mental disorder	Frequency* (n=53)	%
At least one mental disorder	53	100
Antisocial personality disorder	37	69.8
Social anxiety disorder	26	49.1
Major depressive disorder	25	47.2
Generalized anxiety disorder	23	43.4
Agoraphobia	23	43.4
Panic disorder	23	43.4
Post-traumatic stress disorder	22	41.5
Bipolar mood disorder	15	28.3
Suicidality	12	22.6
Psychotic disorder	7	13.2
Eating disorder	3	5.7

* There was co-occurrence of substance use disorders among the participants. The frequency of the mental disorders is therefore more than 53.

References:

- Adamson, S. J., Todd, F. C., Douglas Sellman, J., Huriwai, T., & Porter, J. (2006). Coexisting Psychiatric Disorders in a New Zealand Outpatient Alcohol and other Drug Clinical Population. *Australian & New Zealand Journal of Psychiatry, 40*(2), 164-170. <https://doi.org/10.1080/j.1440-1614.2006.01764.x>
- Brennan, G. M., Hyde, L. W., & Baskin-sommers, A. R. (2017). ScienceDirect Antisocial pathways associated with substance use disorders : characterizing etiological underpinnings and implications for treatment. *Current Opinion in Behavioral Sciences, 13*(Cd), 124-129. <https://doi.org/10.1016/j.cobeha.2016.11.014>
- Chahua, M., Sánchez-Niubò, A., Torrens, M., Sordo, L., Bravo, M. J., Brugal, M. T., & Domingo-Salvany, A. (2015). Quality of life in a community sample of young cocaine and/or heroin users: the role of mental disorders. *Quality of Life Research, 24*(9), 2129-2137. <https://doi.org/10.1007/s11136-015-0943-5>
- Dauber, H., Braun, B., Pfeiffer-Gerschel, T., Kraus, L., & Pogarell, O. (2018). Co-occurring Mental Disorders in Substance Abuse Treatment: the Current Health Care Situation in Germany. *International Journal of Mental Health and Addiction, 16*(1), 66-80. <https://doi.org/10.1007/s11469-017-9784-5>
- Freeman, D., Dunn, G., Murray, R. M., Evans, N., Lister, R., Antley, A., Slater, M., Godlewska, B., Cornish, R., Williams, J., Di Simplicio, M., Igoumenou, A., Brenneisen, R., Tunbridge, E. M., Harrison, P. J., Harmer, C. J., Cowen, P., & Morrison, P. D. (2015). How Cannabis Causes Paranoia: Using the Intravenous Administration of Δ^9 -Tetrahydrocannabinol (THC) to Identify Key Cognitive Mechanisms Leading to Paranoia. *Schizophrenia Bulletin, 41*(2), 391-399. <https://doi.org/10.1093/schbul/sbu098>
- González-Saiz, F., Vergara-Moragues, E., Verdejo-García, A., Fernández-Calderón, F., & Lozano, O. M. (2014). Impact of psychiatric comorbidity on the In-treatment outcomes of cocaine-dependent patients in therapeutic communities. *Substance Abuse, 35*(2), 133-140. <https://doi.org/10.1080/08897077.2013.812544>
- Hasin, D., Fenton, M. C., Skodol, A., Krueger, R., Keyes, K., Geier, T., Greenstein, E., Blanco, C., & Grant, B. (2011). Personality disorders and the 3-year course of alcohol, drug, and nicotine use disorders. *Archives of General Psychiatry, 68*(11), 1158-1167. <https://doi.org/10.1001/archgenpsychiatry.2011.136>
- Hawn, S. E., Cusack, S. E., & Amstadter, A. B. (2020). A Systematic Review of the Self-Medication Hypothesis in the Context of Posttraumatic Stress Disorder and Comorbid Problematic Alcohol Use. *Journal of Traumatic Stress, 33*(5), 699-708. <https://doi.org/10.1002/jts.22521>
- Kingston, R. E. F., Marel, C., & Mills, K. L. (2017). A systematic review of the prevalence of comorbid mental health disorders in people presenting for substance use treatment in Australia. *Drug and Alcohol Review, 36*(4), 527-539. <https://doi.org/10.1111/dar.12448>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606-613. <https://doi.org/10.1046/J.1525-1497.2001.016009606.X>
- Langås, A. M., Malt, U. F., & Opjordsmoen, S. (2012). In-depth study of personality disorders in first-admission patients with substance use disorders. *BMC Psychiatry, 12*, 180. <https://doi.org/10.1186/1471-244X-12-180>

- Li, J., Wang, H., Li, M., Shen, Q., Li, X., Zhang, Y., Peng, J., Rong, X., & Peng, Y. (2020). Effect of alcohol use disorders and alcohol intake on the risk of subsequent depressive symptoms: a systematic review and meta-analysis of cohort studies. In *Addiction* (Vol. 115, Issue 7, pp. 1224-1243). Blackwell Publishing Ltd. <https://doi.org/10.1111/add.14935>
- Ministry Of Health. (2017). The national protocol for treatment of substance use disorders in kenya 2017. *The National Protocol for Treatment of Substance Use Disorders in Kenya 2017*, 3-4.
- NACADA. (2010). *National Standards for Treatment and Rehabilitation of Persons with Substance Use Disorders*.
- Nardi, F. L., da Cunha, S. M., Bizarro, L., & Dell'Aglío, D. D. (2012). Uso de drogas e comportamento antissocial entre adolescentes de escolas públicas no Brasil. *Trends in Psychiatry and Psychotherapy*, 34(2), 80-86. <https://doi.org/10.1590/S2237-60892012000200006>
- Ndetei, D., Pizzo, M., Kuria, M., Khasakhala, L., Maru, M., & Mutiso, V. (2009). Substance abuse and psychiatric comorbidities: a case study of patients at Mathari Psychiatric Hospital, Nairobi, Kenya. *African Journal of Drug and Alcohol Studies*, 7(1). <https://doi.org/10.4314/ajdas.v7i1.46359>
- Pereiro, C., Pino, C., Flórez, G., Arrojo, M., & Becoña, E. (2013). Psychiatric Comorbidity in Patients from the Addictive Disorders Assistance Units of Galicia: The COPSIAD Study. *PLoS ONE*, 8(6), e66451. <https://doi.org/10.1371/journal.pone.0066451>
- Prior, K., Mills, K., Ross, J., & Teesson, M. (2017). Substance use disorders comorbid with mood and anxiety disorders in the Australian general population. *Drug and Alcohol Review*, 36(3), 317-324. <https://doi.org/10.1111/dar.12419>
- Regier, D. A., Farmer, M. E., Rae, D. S., Locke, B. Z., Keith, S. J., Judd, L. L., & Goodwin, F. K. (1990). Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. *JAMA*, 264(19), 2511-2518. <http://www.ncbi.nlm.nih.gov/pubmed/2232018>
- SAMHSA. (2020). *Substance Use Disorder Treatment for People With Co-Occurring Disorders TIP 42*.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R., & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry*, 59 Suppl 20, 22-33;quiz 34-57. <http://www.ncbi.nlm.nih.gov/pubmed/9881538>
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, 166(10), 1092. <https://doi.org/10.1001/archinte.166.10.1092>
- Thylstrup, B., Schrøder, S., & Hesse, M. (2015). Psycho-education for substance use and antisocial personality disorder: a randomized trial. *BMC Psychiatry*, 15(1), 283. <https://doi.org/10.1186/s12888-015-0661-0>
- UNODC. (2020). International Standards for the treatment of drug use disorders. In *Angewandte Chemie International Edition*, 6(11), 951-952.
- Vélez-Moreno, A., Rojas, A. J., Rivera, F., Fernández-Calderón, F., Torrico-Linares, E., Ramírez-López, J., González-Saiz, F., & Lozano, O. M. (2017). The Impact of Personality Disorders and Severity of Dependence in Psychosocial Problems. *International Journal of Mental Health and Addiction*, 15(5), 1008-1022. <https://doi.org/10.1111/dar.12419>

org/10.1007/s11469-016-9696-9

- Vigo, D., Thornicroft, G., & Atun, R. (2016). Estimating the true global burden of mental illness. In *The Lancet Psychiatry*. [https://doi.org/10.1016/S2215-0366\(15\)00505-2](https://doi.org/10.1016/S2215-0366(15)00505-2)
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5). *National Center for PTSD*. <https://doi.org/10.1037/t02622-000>
- Werner, K. B., Few, L. R., & Bucholz, K. K. (2015). Epidemiology, comorbidity, and behavioral genetics of antisocial personality disorder and psychopathy. *Psychiatric Annals*, 45(4), 195-199. <https://doi.org/10.3928/00485713-20150401-08>

World Health Organization. (2017). *Alcohol and drug use disorders: Global health estimates*. 1-30. http://www.who.int/substance_abuse/activities/fadab/msb_adab_2017_GHE_23June2017.pdf

Zhong, B., Xiang, Y., Cao, X., Li, Y., Zhu, J., & Chiu, H. F. K. (2014). Prevalence of antisocial personality disorder among Chinese individuals receiving treatment for heroin dependence: a meta-analysis. *Shanghai Archives of Psychiatry*, 26(5), 259-271. <https://doi.org/10.11919/j.issn.1002-0829.214091>