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Original Research

Epidemiology and Pattern of Mental Health (Psychiatric) Disorders in Sierra Leone: A Retrospective Cross-Sectional Study of 4020 Cases.

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Abstract

Background: The organization of mental health services and management of mental health disorders are driven by the availability of information on patterns and prevalence of such conditions. To the best of our knowledge, no study has presented the pattern of mental illness in Sierra Leone disaggregated by ICD (International Classification of Diseases) categorization. This study aims to establish the socio-demographic profile and ICD11 diagnostic categorization of mental health patients in Sierra Leone.

Methodology: All patients registered at SLPTH Kissy from 1st January 2021 to 31st July 2023 were eligible for the study. Data were retrospectively collected from the digital register of patients. Abstracted variables included patients' age, sex, marital status, district of residence, and diagnosis. Each of the diagnoses was further classified into one of the broad ICD-11 mental health diagnostic categories. Statistical analysis was done in Microsoft Excel and SPSS software.

Result: There were 4020 individual patients, translating to an average of 130 new registrations monthly. The age range of patients was 4 to 96 years, with a median (IQR) age of 30(23 -40) years. About 87% of all patients were below 50 years of age. Of the 4020 patients, 2591 (64.5%) were males while 1429(35.5%) were females (P<.001). Disorders due to substance abuse accounted for 38.9% of all presentations, followed by schizophrenic and mood disorders at 25.1% and 19.0% respectively. Disorders of substance use, and Schizophrenia/primary psychotic disorders were significantly more prevalent in males, while Mood disorders were significantly more prevalent in females.

Conclusion: Mental Health disorders in Sierra Leone showed comparable socio-demographic patterns with findings in regional studies. There are significant gender differences in the frequency of some ICD categories of mental disorders. Substance use is a foremost cause of severe mental illness; thus, campaign of demand reduction will improve the mental health situation of the country.

Keywords: Mental Health; Psychiatric Disorders; Pattern; Prevalence.

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Introduction

Sierra Leone has a very long history of relationship with Great Britain dating back to the late 1700s.[1] One legacy of that association is the oldest mental hospital in British West Africa, Kissy lunatic asylum, established in 1820 and upgraded to a hospital in 1844.[2] Currently known as Sierra Leone Psychiatric Teaching Hospital (SLPTH), it remains the country's only inpatient facility for management of mental illnesses

This heritage of a primal psychiatric facility in the West Africa sub-region notwithstanding, mental health care in Sierra Leone still faces humongous challenges, akin to what obtains in many other low-resource countries. Previous reports have documented low government expenditure on mental health, inadequate mental health workforce, inadequate numbers and spread of mental health facilities, scarcity of psychotropic medications, absence of high-quality data, and low research output on mental health.[3–6] Unavailability of adequate data is particularly reflected in the country profile of Sierra Leone in the World Health Organization (WHO) mental health atlas 2020, with no entry displayed for yearly inpatient and outpatient visits.[4] As regards research output, the WHO report attributes Sierra Leone with only two peer-reviewed mental health articles in 2019.[4]

While the current state of mental health services remains suboptimal in many respects, there seems to have been progressive improvement since the end of the country's civil conflict in 2002. The country has a mental health policy and a mental health strategic plan under implementation.[3,4] Efforts at scaling up mental health services have seen the training and deployment of mental health nurses to the district hospitals as superintendents of decentralized nurse-led mental health units since 2015.[6] Another boost to the provision of mental health services in the country has come from the upgrade of Kissy Hospital to a Teaching Hospital status and one of the component hospitals of the University of Sierra Leone Teaching Hospital Complex. The teaching hospital, with a threefold mandate of service, training, and research, has contracted two consultant psychiatrists and a clinical psychologist, and has been accredited by the West African College of Physicians for in-country training of specialists in Psychiatry. An improved workforce has led to the expansion of services offered by the hospital and is helping to further narrow the treatment gap for severe mental illness that was previously estimated to be 98%.[3]

Most recent data on epidemiology and patterns of mental health disorders in Sierra Leone have emanated from nurse-led mental health units in district or mission hospitals.[6,7] In one of the studies, conducted in 2013, Shackman and Price established that out of 549 patients attending a free nurse-led unit in a Makeni mission hospital, 53.7% was diagnosed with psychotic disorders, 12.5% with manic episodes 12.5%, 9.6% depressive episodes, 33.1% substance use disorders, 5.4% dementia, 7.1% mental disorders due to medical conditions and 8.3% with developmental disorders.[7] Similarly, Hopwood and colleagues[6] aggregated data generated in 15 nurse-led mental health units covering 13 government district hospitals. Diagnostic classification of 2401service users of those units was presented as: epilepsy/seizures (43.5%), psychosis (17.5%), other psychological complaints (14.5%), moderate-severe depression (8.6%), alcohol and substance use disorder (8.5%), medically unexplained somatic complaints (4.2%), intellectual disability (3.1%) and behavioral disorders in children (0.2%).

While both studies offer snapshots of different types of psychiatric disorders present in the population, diagnostic classification has been made by the WHO's Mental Health Gap Action Programme (mhGAP), a validated intervention guide for use in non-specialist settings.[8]

Specific diagnosis and classification of types of mental disorders prevalent in a population, together with their epidemiological characteristics, are needed to design appropriate mental health interventions, plan allocation of resources, generate prognostic information, enable refinement of management, and determine research concentration. To the best of our knowledge, no study has presented the pattern of

mental illness in Sierra Leone disaggregated by ICD classification. The present work aims to establish the socio-demographic profile of patients and ICD11categorization of mental health diagnoses at the Sierra Leone Psychiatric Teaching Hospital.

Methods

This study was undertaken at Sierra Leone Psychiatric Teaching Hospital (SLPTH), Kissy, an affiliate hospital of the University of Sierra Leone Teaching Hospital Complex (USLTHC). Sierra Leone is a country in West Africa with a population of about 8million people. It is bordered by Guinea to the north and east, Liberia to the southeast, and the Atlantic Ocean to the southwest. The country covers an area of approximately 27,699 square miles and is divided into sixteen administrative divisions. Freetown is the country's largest urban area and capital city, with a population of just over 1.2 million people [9].

SLPTH Kissy is the only inpatient, government-owned Psychiatric hospital in Sierra Leone. Situated in Kissy, a suburb of Freetown, it was founded in 1820 as the first mental clinic in sub-Saharan West Africa. It was designated a hospital in 1844. It offers inpatient and outpatient services, including psychotherapy, occupational therapy, and addiction services. It is also an accredited center for the training of resident doctors.

The study is a descriptive retrospective cross-sectional survey of patients registered at SLPTH Kissy. Data was collected from the digital register of patients. This digital register is an Excel spreadsheet in which data of all patients attending the hospital are usually recorded. Variables routinely recorded include the patient's age, sex, marital status, district of residence, and diagnoses, among others. Diagnosis and classification were made by two fellows in Psychiatry, each of whom has over 30 years of practice experience as a consultant psychiatrist, with resident trainees of different cadres, including registrars and senior registrars. All cases registered from 1st January 2021 to 31st July 2023 were cleaned up and filtered by their unique hospital number ID to eliminate repeat entries, which often occurred on follow-up visits.

Variables abstracted for analysis included the patient's age, sex, marital status, district of residence, and diagnoses. Each of the diagnoses was further classified into one of the broad ICD-11 mental health diagnostic categories[10]. Data was analyzed using SPSS Statistical software and Microsoft Excel. Categorical variables were presented in tables of frequency, while the median with interquartile range was calculated for the age variable, and a Median test for comparison of group medians was run for continuous variables. For statistical tests, a P value of 0.05 or less was considered statistically significant. The study was approved by the University of Sierra Leone Teaching Hospital's ethical review board.

Results

Within the study period, 4020 individual patients were seen at SLPTH Kissy. This translates to an average of 130 new registrations monthly. These 4020 patients were responsible for 7730 hospital visits, with the number of hospital attendance(s) by the patients ranging from one to 20 times.

The age of mental health patients in this study ranged from 4 to 96 years. By Shapiro-Wilk test, the age variable deviates from normal distribution ($W = 0.92$, p-value < 0.001). The median (IQR) age of patients was 30(23-40) years. Figure 1 shows the age groups of mentally ill patients. About 40 percent (1609/4020) of mental health conditions were seen in the 20-29 years age group, and 87% of all patients were below 50 years of age. Table 1 displays some other sociodemographic features of the patients, including sex, marital status, and district of residence. Of the 4020 mentally ill patients, 2591 (64.5%) were males while 1429(35.5%) were females giving a male to female ratio of 1.8: 1. The difference between the proportions of male and female patients presenting with mental health disorder was statically significant; $X^2(df=1):335.9$; $P<0.001$. In terms of marital status, 75.2% (3022/4020) of the

patients were single. Also, 78.9% (3172/4020) of the patients declared Western Urban as their district of residence. Table 2 presents the frequency of ICD 11 categories of mental health disorders. Disorders due to substance abuse accounted for 38.9% of all presentations, followed by schizophrenic and mood disorders at 25.1% and 19.0% respectively. Table 3 lists specific diagnostic entities seen within the ICD-11 categories and compares their frequency in males and females. It shows that mood disorders occurred more frequently in females than males, and this difference in the rate of occurrence is statistically significant (χ^2; P<.001). This female predominance in mood disorders was seen across most diagnostic entities, including depression, bipolar affective disorders, and mania. In contrast, there is a statistically significant preponderance of male sex in schizophrenic and primary psychotic conditions (χ^2; P=.003). Also, disorders due to substance use or addictive behaviour were predominant in males'and more strongly so (χ^2= 1121.8, P<.001). Secondary mental or behavioural syndromes show no sex predilection(P=.25).

Figure 2 is a plot of the median (IQR) ages of occurrence of the four most common ICD-11 categories of mental illness, namely, Disorders due to substance use or addictive behavior, Schizophrenia or other primary psychotic disorders, Secondary mental or behavioural syndromes, and Mood disorders. Substance-induced mental health disorders and secondary mental health and behavioural syndromes occur at younger ages. Overall, there is a statistically significant difference in the median ages of the four groups (Brown-Mood Median Test, $\chi2$ = 344.4, df = 3, p-value<0.001). Post hoc pairwise multiple comparisons show this difference in median ages to occur between all four ICD-11 categories. Schizophrenic patients are, on average, 6 years older than patients with substance use disorder (adjusted P<.001). Similarly, patients with mood disorder are, on average,11years older than patients with disorders of substance use (adjusted P<.001).

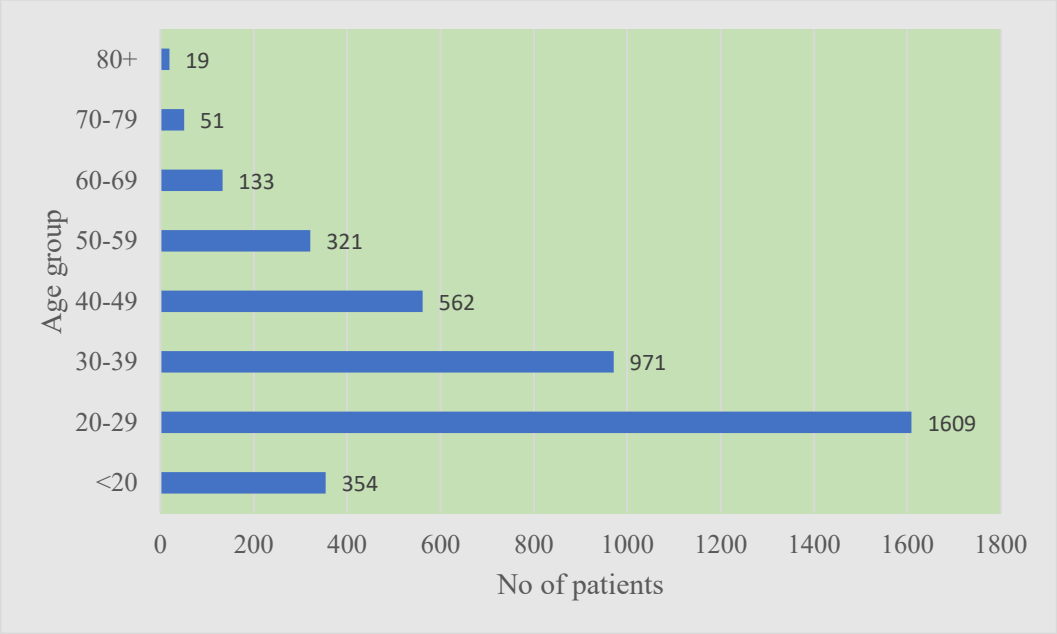

Figure 1: Age group of mental health patients in Sierra Leone

Table 1: Sex, marital status, and reported district of residence of mental health patients in Freetown, Sierra Leone.

Variable		Frequency	Percent (%)
Sex	Male	2591	64.5
	Female	1429	35.5
	Total	4020	100.0
Marital status	Single	3022	75.2
	Married	899	22.4
	Divorced	36	0.9
	Widowed	41	1.0
	Not stated	22	0.5
	Total	4020	100.0
District of residence	Western urban	3172	78.9
	Western rural	382	9.5
	Provinces	274	6.8
	Non resident	1	0.0
	Not stated	191	4.8
	Total	4020	100.0

Table 2: ICD-11 Classes of Mental, Behavioural and Neurodevelopmental Disorders in Sierra Leone

ICD_11 classification	Frequency	Percent
Disorders due to substance use or addictive behaviour	1565	38.9
Schizophrenia or other primary psychotic disorders	1011	25.1
Mood disorders	764	19.0
Secondary mental or behavioural syndromes	377	9.4
Neurocognitive disorders	27	.7
Neurodevelopmental disorders	24	.6
Personality disorders and related traits	18	.4
Anxiety or fear-related disorders	3	.1
Disorders specifically associated with stress	3	.1
Disorders of bodily distress and bodily experience	1	.0

Obsessive-compulsive or related disorders	1	.0
Others	226	5.6
Total	4020	100.0

Table 3: Frequency of specific mental health diagnoses compared in male and female patients

ICD-11 Class	Clinic diagnosis	Sex		Total	Statistics*
		Male	Female		
Neurodevelopmental disorders	Autism	1	0	1	χ^2 (df=1): 0 .18
	Behavioural disorder	1	2	3	P=.64
	Developmental learning disorder	4	5	9	
	Pervasive developmental disorder	4	2	6	
	Special needs	3	2	5	
	Total	13	11	24	
Disorders of bodily distress and bodily experience	Somatization disorder	0	1	1	
	Total	0	1	1	
Disorders due to substance use or addictive behaviour	Alcohol and substance use disorder	1445	120	1565	χ2 (df=1): 1121.8
	Total	1445	120	1565	P<.001
Personality disorders and related traits	Behavioural disorder	13	5	18	χ2 (df=1):3.56
	Total	13	5	18	P=.06
Neurocognitive disorders	Dementia	19	8	27	
	Total	19	8	27	
Schizophrenia or other primary psychotic disorders	Delusional disorder	0	3	3	χ2 (df=1):8.93
	Paraphrenia	1	0	1	P=.003
	Psychotic disorder	162	152	314	
	Schizoaffective disorder	53	94	147	
	Schizophrenia	337	209	546	
	Total	553	458	1011	
Secondary mental or behavioural syndromes	Epilepsy/seizure disorder	120	129	249	χ2 (df=1):1.40
	Organic affective disorder	0	1	1	P=.236
	Organic depressive	1	1	2	

	disorder				
	Organic psychosis	56	69	125	
	Total	177	200	377	
Mood disorders	BPAD*	165	360	525	χ^2 (df=1):102.6
	Depressive disorder	77	162	239	P<.001
	Total	242	522	764	
Obsessive-compulsive or related disorders	OCD*	1		1	
	Total	1		1	
Disorders specifically associated with stress	Anxiety disorder	0	2	2	χ2 (df=1): .33
	Panic disorder	1	0	1	P=.56
	PTSD*	1	0	1	
	Total	2	2	4	
Others	Others	126	100	226	χ^2 (df=1): 2.99
	Total	126	100	226	P=-.084

** Chi square goodness of fit, BPAD-bipolar affective disorder, PSTD-post traumatic stress disorder, OCD-obsessive compulsive disorder.*

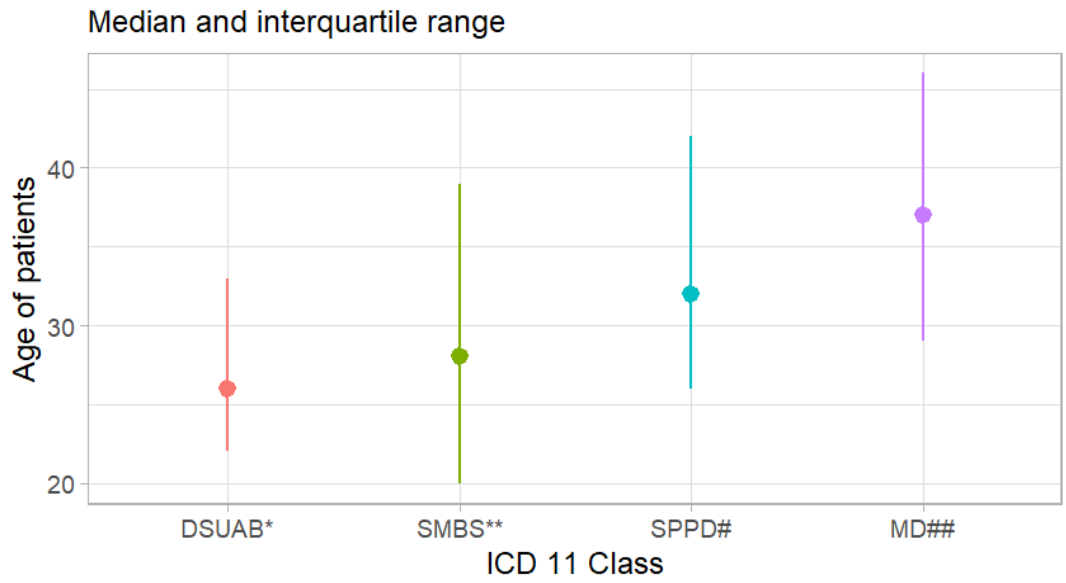

Figure 2: Comparison of median age (IQR) of patients with the four most common ICD_11 categories of mental disorders in Sierra Leone.

*Disorders due to substance use or addictive behaviour; **Secondary mental or behavioural syndromes; #Schizophrenia or other primary psychotic disorders; Mood disorders.

Discussion

Mental disorders have been established to be universal and are as old as human society. Ailments recognizable today as mental illness were mentioned in the holy books and are discussed in ancient medical writings and in treatises of Hellenistic philosophers.[11,12]

In most low-income countries, mental health continues to be a neglected public health issue with multifaceted challenges in policy and legislation, financing, workforce, and research output.[13,14] African countries, grappling with issues of conflict, multidimensional poverty, infectious disease, high maternal and under-five mortality rates, are wont to relegate mental health care to the background, in the scheme of the health and development agenda.[15] And this state of affairs is often compounded by traditional myths and misconceptions, together with stigma that has been historically associated with mental illnesses.[16]

Identification of epidemiological characteristics and establishing the overall burden of mental disorders in a population is a necessary step in planning and the institution of appropriate intervention and care. Our study discloses that disorders due to substance use, or addictive behavior are the most common category of psychiatric diagnosis in the country, followed by schizophrenia or other primary psychotic disorders, mood disorders, and secondary mental or behavioural syndromes in that order. It is instructive that the prevalent pattern of mental disorder we identified varied only slightly from the findings of Shackman and Price reported from Makeni, Northern Sierra Leone, over a decade previously.[7] In a programme closely supervised by volunteer psychiatrists, mental health services (identification and treatment) were delivered by specially trained nurses who used an adaptation of the Mental Health Gap Action Program (mhGAP) published by the WHO, for diagnostic classification. They reported psychotic disorders as the most common psychiatric illness, followed by substance use disorders. Diale et al, using the *French classification of mental disorders*, also identified psychosis as the most prevalent mental disorder in Dakar.[17]By our series, alcohol and substance use disorder was the most common psychiatric illness in Sierra Leone. It was predominantly a problem of the teenage and young adult male segment of the population, with a mean age at diagnosis being 6 years and 9 years younger than schizophrenic and mood disorder patients, respectively. With about 39% of serious mental illness attributed to substance-induced mental disorder, it has a significant impact, currently, on the epidemiology of mental health in the country. Thus, a successful program of demand reduction and control of alcohol and illicit drugs will improve the state of mental health in Sierra Leone.

The median age of our patients(30 years) agrees closely with reports from Senegal and Northern Sierra Leone, respectively.[7,17]More than 70 percent of our patients and more than 60percent of cases reported by Diale and colleagues were below the age of 40 years.[17]This relatively young age at diagnosis of mental illnesses appears to have been consistent overtime, as a dated study conducted in our facility some sixty years ago found mean age of male and female psychiatric patients at 35.2 and 39.2years respectively.[18] Population structure of African countries, with predominance of young people, has been identified as a contributor to young age at diagnosis of mental disorders and some other health problems on the continent. Surveys in Britain, which has a different population pyramid, showed a more even distribution of mental disorders across different age groups.[19]

The mean age at diagnosis of the different ICD categories of mental disorders varied significantly, ranging from 28.9 years for substance use disorders to 38.4 years for mood disorders. Our study did not analyze age at onset of mental disorders, but it tends to be lower than age at diagnosis. A meta-analytic review of population-based studies from around the world determined that, on a global scale, the median age of onset of addiction disorders and schizophrenia spectrum disorders was 25 years, while mood disorders set in at a median age of 31 years.[20] In addition, one-third, half, and two-thirds of all mental disorders in a population would have begun by ages 14, 18, and 25, respectively.[20] Thus, prevention

programmes and early intervention for good mental health, if not implementable over a lifetime, are better targeted at these determined periods of onset for a better outcome.[20,21]

Male to female distribution of our patients was 1.8 to 1, reflecting an established pattern of male preponderance in psychiatric hospital contacts and admissions as reported in many other African studies.[7,17,22]Male psychotic patients may be perceived as more violent, and this may compel their involuntary presentation to a health facility for management.[23]Male sex has been identified as a risk factor for violent clinical presentation and concomitant substance abuse, which is more common in males, worsens violent behaviors and crime.[22,24,25]Beyond the overall male-to-female disparity in hospital consultations, we established statistically significant differences in the sex distribution of psychiatric diagnoses. For instance, schizophrenia and other primary psychotic conditions, as well as substance use and addictive behavior, were significantly more common in males compared with females, while mood disorders were significantly more common in females. Other diagnostic classes did not show any sexual predilection or were too infrequent for comparison. This pattern of sex distribution for schizophrenia, substance use, and mood disorders demonstrated in our series has been a recurrent finding in the literature.[17,22,26]

Differential manifestation of mental disorders among various geographic population groups and subgroups within a population may be attributed to varied levels of exposure and susceptibility to various determinants and risk factors. The overarching framework for the conceptualization of determinants and risk factors in mental health has been the biopsychosocial model.[27] On biology, organic or biological factors such as hormonal influences and adverse polygenic inheritance are held to participate in the expression of mental illness in a population and likely contribute to gender differences. However, much more glaring, in the African context, is the aspect of social determinants which Kirkbride and colleagues defines as 'the set of structural conditions to which people are exposed across the life course, from conception to death, which affect individual mental health outcomes, and contribute to mental health disparities within and between populations'.[27] Africa is replete with most of the social conditions that have been identified to be important to mental health, as comprehensively reviewed by Kirkbride JM and colleagues.[27] Socioeconomic disadvantage, such as unemployment, financial insecurity, poverty, and low living standards, defines Africa's deprived communities. Also not lacking in the African context are early life adversity and childhood adversity, such as obstetric complications, malnutrition, physical, sexual, and emotional abuse, household dysfunction, and domestic violence. Other identified social determinants, including ethno-racial discrimination, gender inequalities, loneliness and social isolation, physical environment, and neighborhood disadvantage, remain components of developmental challenges rampant in our social context. The social determinants that are modifiable present a unique opportunity for preventive intervention.

Other notable findings in our analysis include 75% singlehood in marital status and 79% Freetown residence of our patients. Serious mental ill health impairs the ability to function and capacity to forge marital relationships. Diale and colleagues describe a similar urban preponderance of patients utilizing mental health services in Dakar.[17] This may be explained by the urban locations of the psychiatric hospitals and the logistical difficulties in accessing the psychiatric hospital from rural enclaves. The other likely explanation is the availability of 'traditional mental health service'[16] which has existed within the culture and world view of people in Africa for generations. The majority of rural dwellers have the traditional mental health service as their first recourse. African traditional health care seems to have some support in the view of some contemporary workers. Wondimagegn et al[14] posits that little progress is being experienced in Africa's mental health indices derives from 'historic and current imposition of Western mental health models and frameworks of training, research and service'. This, they argue, is not always relevant to the people in need, and that remedy might come from integrating Africa's traditions

of healthcare, which are in tune with the lives and culture of the people, into mental health training, research, and service delivery.[14]

While Kissy, the study site, is the sole government psychiatric hospital in the country, our design does not allow for the calculation of nationwide incidence or prevalence for severe mental disorders. Such an estimate will be an underestimation because, in addition to the nurse-led mental health units in the district hospitals, we would not have reckoned unknown number of patients patronizing the traditional mental health services. However, being the only specialist psychiatric hospital admitting facility, we do recognize the significance of our figures for national estimates.

Conclusion

We analyzed the incident cases of serious mental illness in Sierra Leone Psychiatric Teaching Hospital over two and a half years. On average, 130 new cases of serious mental illness present monthly. More males than females were affected, and most of the patients were unmarried and lived in the urban city of Freetown. The most common ICD-11 category of mental disorders was disorders due to substance use or addictive behavior, followed by Schizophrenia or other primary psychotic disorders and mood disorders. Disorders of substance use, and Schizophrenia/primary psychotic disorders were significantly more prevalent in males, while Mood disorders were significantly more prevalent in females.

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