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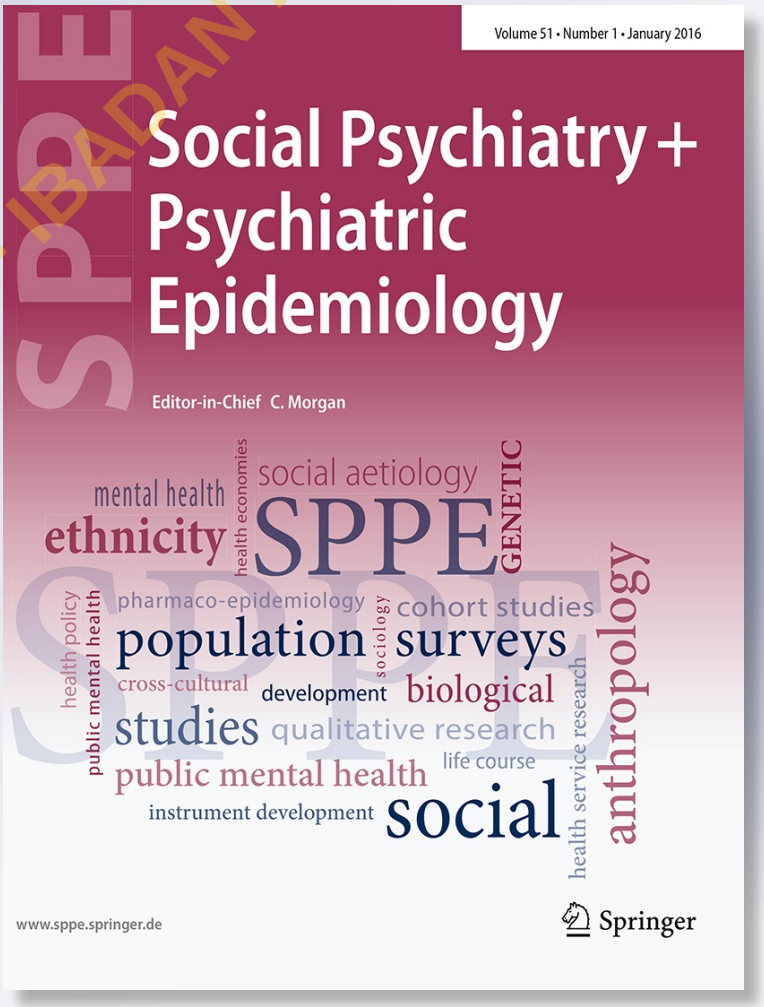

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REVIEW

Epidemiology and burden of bipolar disorder in Africa: a systematic review of data from Africa

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Abstract
Background Bipolar disorder impacts negatively on the patient, the family, as well as the society. It taxes the health care services due to a combination of the illness with associated medical and psychiatric comorbidities. In Africa, unfortunately, knowledge of the epidemiology and burden of bipolar disorder is based mainly on studies from the USA and Europe. In this systematic review of literature from Africa, we highlight the epidemiology and burden of bipolar disorder.
Methods A systematic review of publications from Africa relating to the epidemiology and burden of bipolar disorder was conducted.
Result Data from community surveys conducted in Nigeria and Ethiopia indicated a lifetime prevalence estimate of 0.1 % to 1.83 for bipolar disorder. Missed diagnosis rate of bipolar disorder was up to 36.2 %. In one study, 8.1 % of the males and 5.4 % of the females reported a previous suicide attempt. A study showed that up to 60 % of patients with bipolar disorder had at least one comorbidity. There were no reports on all-cause mortality and cost of illness.
Conclusion Bipolar disorder is a major mental health problem in Africa. Scientific findings on bipolar disorder from Africa are consistent with the existing literature from other parts of the world. There still exists a dearth of high quality studies addressing the epidemiological, clinical, social, and economic burden of the disorder.

Keywords Epidemiology · Burden · Bipolar disorder · Africa

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Background

In the Global Burden of Disease study 2010, the burden of disease attributable to mental illness and substance use disorders in terms of disability-adjusted life years (DALYs) was 183.9 million. This was about 7.4 % of all DALYs worldwide. Bipolar disorder alone accounted for 7 % of the DALYs caused by mental and substance use disorders [1]. Bipolar disorder impacts negatively on the patient, the family, as well as the society. It taxes the health care services, due to a combination of the illness and associated medical as well as psychiatric comorbidities [2–5].

In a study which assessed the expenditures for mental health care by employers, bipolar disorder (when compared to other mental health diagnoses) was found to be the most expensive mental health care diagnosis. In that same study, bipolar disorder imposed a major financial burden on employers, costing more than twice as much as depression per affected employee [6]. In terms of the cost of illness, a substantial proportion of the total cost of bipolar disorder is attributable to indirect costs from lost productivity, arising from absenteeism and presenteeism [7, 8].

Unfortunately, in Africa, our knowledge of the epidemiology and burden of bipolar disorder is based mainly on reports from the United States and Europe.

Given this gap in knowledge, we undertook this review to determine the epidemiological, clinical, and economic burden of bipolar disorder in Africa. We also sought to

efficiently integrate existing information from Africa on bipolar disorder and provide data for rational decision-making. Additionally, we tried to determine whether scientific findings on bipolar disorder from Africa are consistent with the literature or whether findings vary significantly.

Methodology

Study eligibility

Studies were selected for inclusion in this review if they met the following criteria:(A) Studies specifically had data on bipolar disorder, bipolar spectrum disorder, Mania, or Manic–depressive disorder, (B) studies used data obtained from patients in Africa, and (C) studies provided data on issues relevant to the burden of bipolar disorder, such as prevalence, incidence, missed diagnosis, disability, comorbidity, mortality, suicide, functional and symptomatic recovery, and costs of illness.

Search strategy

In July 2014, we searched the PubMed database. The search terms included "bipolar disorder + Africa," "mania + Africa," "bipolar + Africa," "Manic + Africa," and "Manic-depressive + Africa." No language or date restrictions were applied to the search. We hand-searched the edited book on The WHO World Mental Health Survey: global perspectives on the epidemiology of mental disorders [9]. Identified studies were screened for suitability. Where a study was reported in more than one article, we extracted data from the more recent report. We consulted experts in the field to check if there were any omissions from our identified studies. Where there were uncertainties about the data in studies, we approached authors for clarification.

Results

A total of 962 articles were initially identified by the search strategy. Of the 962 studies identified, we excluded 889 studies because they exclusively addressed issues unrelated to the study objectives. Such excluded studies might have been conducted on patients with bipolar disorder, but addressed other issues outside burden/epidemiology. Examples included studies on cognitive function among patients with bipolar disorder. Consequently, only 73 abstracts were shortlisted for detailed analyses. After reading through the abstracts, 51 of these studies were further excluded, as they did not address the objectives of this study. A final total of 18 studies were identified as relevant to this study and were reviewed (Fig. 1). Of the eligible studies 5 Cohort studies, 8 cross-sectional studies and 5 prevalence survey met the predefined inclusion criteria (Table 1). We found no study on incidence survey, stigma, mortality, or cost of illness that met the inclusion criteria. The studies were from 7 countries (Table 1).

Included studies

Of the 18 studies that met the inclusion criteria, 9 studies reported prevalence estimates on bipolar disorder. Five studies were carried out on the general population, while the rest were mainly on clinical samples such as inpatient psychiatric admissions and patients with HIV. There was one national survey from Nigeria. Nigeria was one of the countries that participated in the World Health Organization World Mental Health Surveys (WMH), the largest cross-national series of community epidemiological surveys of mental disorders. The survey had over 150,000 respondents surveyed across 28 countries. Although South Africa was part of the World Mental Health Surveys, there was no specific report on bipolar disorder. The South African report was consequently excluded.

Prevalence estimates of bipolar disorder

Five studies had reports on the general population [10–14] Table 2. Reported estimates ranged from 0.1 % in Nigeria to 1.83 % among the adult population of Zeway islands in

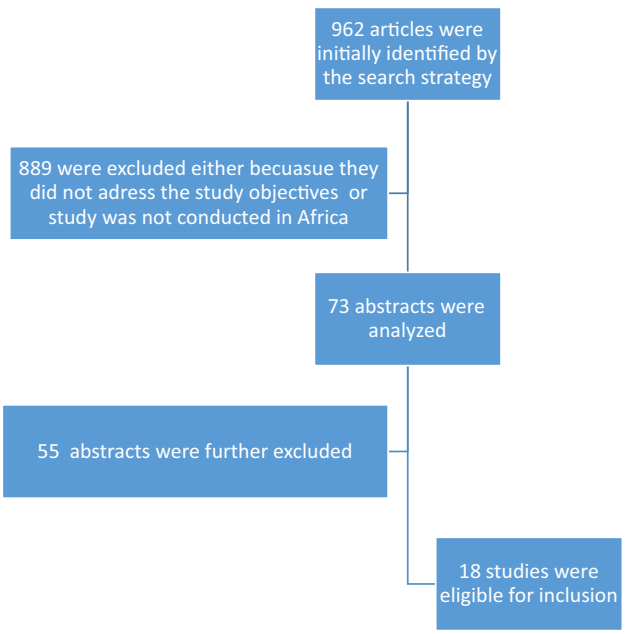

Fig. 1 Search strategy and the reasons for exclusion

Table 1 Studies included in the systematic review

References	Country	Type of study	Study population	Sample size
Kebede et al. [10]	Ethiopia	Prevalence survey	General	70,000
Negash et al. [11]	Ethiopia	Prevalence survey	General	68,378
Gureje et al. [13]	Nigeria	Prevalence survey	General	4984
Fekadu et al. [12]	Ethiopia	Prevalence survey	General	1691
Kebede and Alem [14]	Ethiopia	Prevalence survey	General	1420
Ndetei et al. [15]	Kenya	Cross-sectional	Psychiatry inpatient	691
Kebede et al. [27]	Ethiopia	Cohort	Bipolar patients	315
Fekadu et al. [24]	Ethiopia	Cohort	Bipolar disorder	312
Okasha et al. [19]	Egypt	Cross-sectional	Hospital patients with major depressive disorder	306
Ezzaher et al. [25]	Tunisia	Cross-sectional	Bipolar patients	260
Naidoo and Mkize [17]	South Africa	Cross-sectional	Prisoners	193
Gassab et al. [23]	Tunisia	Cross-sectional	Bipolar and unipolar depression	155
Ezzaher et al. [26]	Tunisia	Cross-sectional	Bipolar patients	130
Atwoli et al. [16]	Kenya	Cohort	Readmitted psychiatric inpatients	114
Adegbaju et al. [20]	Nigeria	Cross-sectional	Bipolar patients	100
Onyeama et al. [22]	Nigeria	Cross-sectional	Bipolar hospital patients	49
Bakare et al. [21]	Nigeria	Cohort	Bipolar hospital patients	46
Uys [18]	South Africa	Cohort	HIV-positive female inpatients	19

Table 2 African studies that reported prevalence surveys on bipolar disorder in the general population

References	Methodology adopted	Prevalence of bipolar disorder
Kebede et al. [10]	SCAN interviews and clinical assessment	Lifetime prevalence was 0.5 %
Negash et al. [11]	CIDI interview, key informant interview, SCAN interviews	Lifetime prevalence was 0.6 % for males and 0.3 % for females
Gureje et al. [13]	CIDI—DSM IV	Lifetime prevalence was 0.1 %;12 months prevalence was 0.1 %
Fekadu et al. [12]	Three stage screening design (CIDI + SCAN, key informant interview, clinical assessment	Point prevalence was 1.83 %
Kebede and Alem [14]	Amharic version of CIDI	Lifetime prevalence was 0.3 %

CIDI Composite International Diagnostic Interview, *SCAN* Schedules for Clinical Assessment in Neuropsychiatry, *DSM IV* Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition

Ethiopia [12]. Only two studies reported prevalence estimates of bipolar disorder among psychiatric inpatients. Both studies were from Kenya and the estimates were 42.3 % [15] and 30.7 % [16], respectively. A study, conducted among prisoners in South Africa, gave the prevalence of bipolar disorder among the total prisoners' population as 1.6 % [17].

One study, from South Africa, reported prevalence estimates among female HIV-positive psychiatric inpatients, with diagnosis made using DSM IV-TR criteria. In that study, mania resulting from HIV infection accounted for 60 % of all the psychiatric disorders that were due to HIV infection [18]. In Egypt, a prevalence estimate of 62.2 % of bipolar disorder was found among patients undergoing a major depressive episode [19].

Disability

Two studies addressed the issue of disability among patients with bipolar disorder. In one of the studies, using the 36-item WHODAS-II to compare the pattern of disability between clinically stable patients with bipolar disorder and similar patients with schizophrenia in a mental health facility in Nigeria, bipolar disorder was found to have less disability in most of the measured domains of disability compared with patients with schizophrenia [20].

Patients with bipolar disorder who were unemployed and those who spent less than <$13 per month on treatment were found to be less disabled [20]. In the other study, the authors assessed general functioning in Nigerian adolescents with bipolar disorder using the Children Global Assessment Scale (CGAS). They found a minimal to moderate impairment in functioning in the past year. Factors associated with poor functioning included comorbidity, a higher number of hospital admissions in the past year, poor pre-morbid peer-relationship, poor relationship with siblings, low level of religious activities, and history of sexual risk behavior [21].

Risk factors

Seven studies had reports on risk factors. Male gender, age between 21 and 34 years [10, 11, 22] and being married were identified as risk factors for developing bipolar disorder [10]. In a retrospective comparative study in Tunisia compared the epidemiological, clinical, and evolutional characteristics of patients with major depression in bipolar disorders to those with recurrent depressive disorders to ascertain the factors that correlated with bipolarity. It was found that a high rate of separation and divorce, family history of psychiatric disorders (especially if the family member had bipolar disorder), onset at an early age, number of affective episode (more frequent episodes), sudden onset of depressive episode, the presence of psychotic symptoms, the presence of catatonic symptoms, and psychomotor inhibition all correlated with bipolarity [23]. A similar community-based follow-up study of patients with bipolar disorder also in Ethiopia reported that female gender predicted depressive relapse, while male gender predicted manic relapse [24].

Comorbidity

Three studies from this review showed evidence that patients with bipolar disorder suffer from comorbidities. A study from Tunisia showed that obesity and being overweight were common in patients with bipolar disorder. In the study, being overweight and being obese were found to be associated with disturbances in lipid profile particularly an increase in total cholesterol, Low density lipoprotein-cholesterol (LDL-c), Lipoprotein (Lp), and a decrease in High density lipoprotein-cholesterol (HDL-c) [25]. Another study, also from Tunisia, reported that patients with bipolar disorder have a high prevalence of metabolic syndrome [26]. The third study, conducted in Egypt demonstrated that compared with unipolar disorders, borderline personality disorder occurs at a higher rate in bipolar than in unipolar patients [19].

Suicide behavior

Only one study reported findings on suicide among patients with bipolar disorder. In the study, 315 subjects were identified as having bipolar disorder. Of this, 8.1 % of the males and 5.4 % of the females reported a previous suicide attempt [11].

Outcome

Two outcome studies were identified [24, 27]. In one of the studies, 312 patients with bipolar disorder in Ethiopia were followed for an average of 2.5 years. During the period of the follow-up, 65.9 % of patients experienced a relapse. Of the relapses that occurred, 47.8 % were manic episodes, 44.3 % were depressive episodes, and 7.7 % were mixed episodes. A significant proportion of the cohort (31.1 %) had persistent illness. The study also showed that female gender predicted depressive relapses, while male gender predicted manic relapses [24]. In the other study, 315 patients with bipolar disorder were followed up for a mean period of 2.5 years to assess the symptomatic and functional outcome of bipolar disorder. Between 35 and 47 % of the recent-onset cases had functional role restrictions, while 42–52 % of the long-standing cases had such restrictions during the follow-up years. Physical and social functioning deficits were present in at least 52 and 35 % of recent-onset and long-standing cases, respectively. The severity of depressive and manic symptoms was associated with poor functional outcome. Male gender, a rural residence, and being married were found to be associated with a better functional outcome [27].

Missed diagnosis

Only one study addressed the issue of missed diagnosis. In the study, the Hypomania/Mania Symptom Checklist (HCL-32) was used to estimate the frequency of bipolar disorder among patients with a major depressive episode (MDE) in 306 patients undergoing a MDE at health facilities throughout Egypt. The positive screen rate for bipolar disorder was 62.2 %. However, only 26 % of patients had been previously diagnosed as bipolar disorder, indicating that 36.2 % of the cases were missed [19].

Discussion

Prevalence

General population prevalence

In this review, the lifetime prevalence of bipolar disorder in the general population was 0.1–1.83 %. In the World

Mental Health Survey Initiative, the lifetime prevalence of bipolar I disorder was 0.6 % [28], while in the National Comorbidity Survey Replication conducted in the United States, the lifetime prevalence for bipolar I disorder was 1.0 % [29]. The lifetime prevalence estimate of (0.6 %) reported in Ethiopia is similar to the values from these two studies. However, the lower limit in our review (0.1 %) was quite low compared to what has been reported. This lifetime estimate (0.1 %) was obtained from Nigeria, in the Nigerian Survey of Mental Health and Well-Being (NSMHW) which was a part of the WHO- World Mental Health Survey. The authors of the NSMHW were quick to point out that the rates reported in their study underestimated the occurrence of mental disorders in the community for a number of reasons, which included demographic and ascertainment factors. In the NSMHW, the methodology entailed the conduction of face-to-face interviews using the World Mental Health version of the Composite International Diagnostic Interview (WMH-CIDI). However, Shibre et al. (2002) posited that for community surveys, which aim at identifying cases of major mental disorders in low-income countries, the combined use of both CIDI and the Key Informant method was necessary [30]. It was therefore not surprising that in a subsequent study (conducted in Ethiopia), which adopted the methodology of a combination of CIDI and key informant for screening, the lifetime prevalence of bipolar I disorder rose to 0.6 % [11]. This prevalence estimate is similar to the estimate of 0.6 % from the World Mental Health Survey. Another factor that could account for the low estimate is a high rate of missed diagnosis, which our review showed to be as high as 36.2 % [19]. Such high prevalence of missed diagnosis makes the prevalence estimates of bipolar disorder from Africa a bit conservative. Another plausible explanation for the low prevalence estimate reports that bipolar disorder is commoner in high-income than in low-income countries [31]. All the community surveys on bipolar disorder from Africa in our review were from low-income countries. Thus, geographic, environmental, or economic factors may play a role in the low prevalence estimates obtained from Africa [31].

The community point prevalence of 1.83 % obtained among the adult population of Zeway islands in Ethiopia was high compared to 0.6 % obtained in a similar point prevalence study in a community survey in Florence, Italy [32]. Again this is at variance with previous reports of higher prevalence of bipolar disorder in high-income countries [31]. While this may be due to methodological differences (differences in defining and diagnosing bipolar disorder), it also may reflect true variation in prevalence estimates of bipolar disorder across different geographical areas and cultures. Nevertheless, the investigators of the Zeway study noted this high prevalence of bipolar disorders and suggested that it may represent an environmental or genetic factor of etiologic relevance that deserves further exploration.

Prevalence among prisoners

In prison population, a report from Kenya indicated that up to 42 % of psychiatric inpatients were being managed for bipolar disorder [15]. Such high prevalence entails a substantial use of healthcare services, an indication of the burden of inpatient hospitalizations of patients with bipolar disorder in Africa. It has been stated that in the USA, for every mental health care dollar spent on outpatient care for patients with bipolar disorder, $1.80 is spent on inpatient care [33]. Although there is no study specifically addressing the economic cost of bipolar disorder in Africa, it is unlikely that the trend deviates significantly from what has been observed in the United States.

Disability

The outcome for bipolar disorder was previously considered quite favorable; however, current findings suggest that disability and poor outcomes are prevalent, despite adequate treatment [4, 34]. Although the acute syndrome resolves in the majority of the cases of acute episodes of mania or bipolar major depression, residual symptoms of fluctuating severity and impaired functional outcome are the rule [4, 34]. An integration of genetic, neurological, clinical, illness severity, cognitive, and psychosocial factors interact to negatively impact persons with the disorder with a severe course of illness [35–41]. In Nigeria, Adegbaju et al. [20] found that patients with bipolar disorder though adjudged to be clinically stable had substantial disability. This corroborates reports from outside Africa which indicates that there is the presence of residual functional impairment in patients with bipolar disorder despite resolution of the acute syndromes [4, 34, 42].

Risk factors

Outside Africa, risk factors other than genetic factors, demonstrated to be important in the initial onset of bipolar disorder include pregnancy and obstetric complications, early parental loss (in particular maternal), winter-spring birth, stressful life events, traumatic brain injuries, and multiple sclerosis [43–45]. In this review, the male gender was identified as a risk factor for bipolar disorder. This is, however, at variance with reports from the ÆSOP study in the UK, where Llyod et al. (2005) reported that there was no significant difference in the rates of bipolar disorder between men and women with bipolar disorder [46].

Bipolar disorder has quite an early age of onset. The mean age at onset is 19–29 years [47]. In this review, the age at onset was lower 14.6–34 years. An early age at onset is associated with more severe illness, greater risk for recurrence, chronicity of mood symptoms, functional impairment, as well as delay in seeking treatment [48, 49]. Whether such earlier age of onset among Africans suggests a heavier burden of bipolar disorder among Africans needs to be explored further.

Bipolar disorder occurs less frequently among married people compared to people who have never married or who are divorced [55]. In contrast to this trend, a study in our review showed that being married among male subjects was associated with a higher risk of developing bipolar disorder [55]. The reason for this reversed trend is unclear. However, in DSM-5, it was similarly noted that the direction of association between marital status and rates of bipolar disorder was unclear [31].

Comorbidity

Persons with bipolar disorder are significantly more likely to have medical morbidity than the general population [52]. Over 60 % of people diagnosed with bipolar disorder have at least one other psychiatric comorbidity. Anxiety disorders, substance abuse, and other mood disorders being the commonest of these comorbidities [53, 54]. Evidence from a systematic review of the burden of the bipolar disorder in Europe shows that comorbidities ranged from 31 to 75 % for comorbid psychiatric disorders and from 13 to 28 % for comorbid anxiety [55]. Comparably, a study from our review indicated that obesity was common (30.1 %) in patients with bipolar disorder [25], while another study indicated that patients with bipolar disorder have a high (26.1 %) prevalence of metabolic syndrome [26].

Suicide behavior

Bipolar disorder is associated with a high risk of self-harm and suicide [56]. Between 25 and 50 % of patients with bipolar disorder will attempt suicide at least once over their lifetime, while 8 to 19 % will complete suicide [56]. The risk is up to 20–30 times greater than that for the general population [57]. A study in our review indicated that 8.1 % of the males and 5.4 % of the females reported having a previous suicide attempt [11]. This is 3–10 times lower than the values reported by Latalova et al. [56]. However, the basis for comparison is shaky because the report from Africa is neither geographically representative nor does it represent the population of patients with bipolar disorder in Africa.

Outcome

Studies from outside Africa indicate that patients with bipolar disorder often suffer many relapses and impaired psychological functioning. Up to 60 % still experience poor post hospital adjustment in one or more areas of functioning [58]. Between 30 and 60 % of individuals with bipolar disorder fail to regain full functioning in occupational and social domains [59], most studies with samples of people with established bipolar disorder demonstrate that only 40–60 % are in employment [60]. In addition, long-term symptomatic remission in bipolar patients does not guarantee functional recovery. These trends were corroborated in our review on outcome.

Limitations

Our research was not without limitations. Ideally, a high quality systematic review should identify all relevant published and unpublished evidence. We cannot quantify how much of unpublished data we omitted in this review. Furthermore, we only searched one database, i.e., PubMed. Nevertheless, we tried to synthesize the findings from individual studies or reports in an unbiased way. We interpreted the findings and presented a balanced and objective summary of the findings with due consideration of any error in the evidence.

Conclusion

Despite the heterogeneous methodologies, samples and inadequate representative evidence on some issues, we have identified bipolar disorder as a major mental health issue in Africa. There exists a dearth of evidence regarding the epidemiological, clinical, social, and economic burden of the disorder. The lifetime prevalence of bipolar disorder in Africa is between 0.1 and 1.83 %, although missed diagnosis and methodological issues probably underestimate this figure. Comparable to other parts of the world, certain issues may impact on the burden of the disorder. These include disability, comorbidities, stigma, suicide, and HIV infection.

Future research needs

Owing to a paucity of representative studies and methodological issues, we call for further research on bipolar disorder in Africa. Key problems that need to be addressed include issues of stigma, unemployment, cost of illness, care giver burden, suicide, psychiatric comorbidities (such

as substance use disorders, anxiety), injury, medical comorbidities, and poisoning. We also suggest the conduct of community surveys using methodologies shown to be effective in Africa.

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