

# Mental health in Mozambique; a systematic review

## Abstract

**Context:** Neuro-psychiatric disorders are the world's highest cause of incapacity. Mental disease in Africa is taboo and stigmatized, making it a challenge of a silent even hidden epidemic. In Sub-Saharan Africa it is estimated that 20% of patients with mental disorders are treated in primary health care centres and 50-75% are not detected in health facilities. In Mozambique, the prevalence of mental disorders and the frequency with which mental patients are treated at health facilities are not known.

**Objective:** To estimate mental and neurologic disorders burden in Mozambique and evaluate access to mental health care services.

**Methods:** A systematic review of research published in Portuguese, English, French and Spanish during 2017 and 2018 was carried out. We also consulted hospital and outpatient clinical files and yearly reports in the health units of national health system. Quantitative and mixed methods articles were subjected to quantitative meta-analysis and the qualitative and mixed methods articles were submitted to thematic and ethnographic analysis for qualitative meta-synthesis.

**Results:** After selecting 130 articles meeting the search criteria we applied eligibility conditions and reviewed 17 quantitative, 6 mixed-methods and 7 qualitative articles. Population perception about mental illness shows that it is considered a consequence of spiritual problems and patients mainly seek out traditional health practitioners. Epilepsy, a neurologic disorder, is referred in Mozambique as the most prevalent mental disorder. The provision of care for the mentally ill by the national health service is far below the needs. The Mozambican Ministry of Health has a good development program for future mental health services.

**Discussion:** We find scarcity of research in the area of mental health, but progress over time. Studies, though mostly of low quality, show a high burden of mental illness in the Mozambican population, which uses traditional medicine due to lack of conventional health services and cultural adaptation of therapeutic procedures.

**Conclusion:** This study contributes to reveal the beliefs and main mental health problems in the Mozambican population and health system. We propose recommendations for preventive activities and the development of mental health services. This review was registered at [www.crd.york.ac.uk/prospero](http://www.crd.york.ac.uk/prospero) (CRD42018103923).

**Keywords:** mental disorder, mental health, mental illness, Mozambique, systematic review

Volume 3 Issue 4 - 2019

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**Received:** June 06, 2019 | **Published:** July 01, 2019

## Introduction

The World Health Organization (WHO) defines mental disorder (MD) as an adulteration of thought and emotions, produced by inadequacy or deterioration of psychosocial functioning depending on biological, psychological and social factors.<sup>1</sup> At the world level, neuro-psychiatric conditions are the greatest cause of disability, being responsible for more than 37% of years of life with disability in individuals over 15 years old (DALYs). The burden of disability due to neuro-psychiatric conditions is similar in both genders, but main causes are different: depression is the main cause of disability for men and women, but the burden of depression is 50% higher in females who also present a higher incidence of anxiety disorders, migraine and senile dementia; men present a burden of disorders related to the consumption of alcohol and drugs almost six times greater than women, responsible for a quarter of the burden of neuro-psychiatric diseases.<sup>2</sup> More than 85% of the disease burden caused by non-fatal diseases occurs in low- and medium-income countries, and South Asia and sub-Saharan Africa account for 40% of the loss of disability adjusted life years (DALYs). MD etiology is multi factorial: genetic contribution should be evaluated, along with obstetric complications

and perinatal hypoxia (associated with schizophrenia mainly in men). We know that mentally healthy individuals benefited from greater security, much emotional support and moderate control. Parental or maternal style may also increase vulnerability by influencing personality development. The "cognitive model" assumes that people's emotions and behaviours are more influenced by their perception of events than by the facts themselves. "Core beliefs" influence the way we respond mentally to life situations; negative "central beliefs" lead to worse MH than the opposite "central beliefs" alternatives. We must also include brain lesions, caused by toxic drugs, illicit drug use, and head trauma.<sup>3</sup>

MD in Africa is a stigmatized taboo subject, making it a hidden challenge of a silent epidemic. Social environments in many African countries are not conducive to good mental health (MH), mainly due to numerous conflict and post – conflict situations and on the other hand poverty constitutes one of the greatest determinants of MD.<sup>4</sup> Studies in Africa confirm that mood (depression) and neurotic (anxiety) disorders are the most common. In Mozambique MH is poorly studied but we know that most patients do not have access to treatment, due to the scarcity of resources (professionals, drugs, infrastructure)

but also to the stigma to which these patients are subjected.<sup>5</sup> Most Mozambicans believe that diseases are not caused by physical agents, but consequences from short-circuits in the relationship with invisible forces and their rules. Disease is not an individual problem of the patient, but rather of the collective, family or community.<sup>6</sup> MD indicates an anomaly in bodily, familial, cultural, interior and external relationships, reflected negatively on the behavioural skills to conduct social activities. These facts produced the research question: what is the burden of neuro-psychiatric disorders in the Mozambican population? To answer this question, we intend to investigate the perceived impact by local communities on MD and statistical data on the provision of MH services in the National Health system (NHS). An assessment of MD diagnosis in the National Health Service (NHS), between 2006 and 2008 shows a widespread prevalence increase in all disturbances;<sup>7</sup> It includes epilepsy, classified a neurological disease by WHO, as the main contributor to the MD burden. Epilepsy is caused by “sorcery” for most Mozambicans.<sup>8</sup>

## Objective

This study intends to estimate the burden of MD in Mozambique and evaluate health services provision. We will access existing evidence in three areas: affected population characteristics; diagnostic methods; and health services performance.

## Methods

Our complete review protocol is accessible on request (druidatom@gmail.com); and this review was registered at [www.crd.york.ac.uk/prospero](http://www.crd.york.ac.uk/prospero) (CRD42018103923). A systematic search and review of the literature,<sup>9,10</sup> targeting studies on MH and MD in Mozambique, Ministry of Health (MoH) and civil organizations mental health services and programs, were done during 2017 and 2018.<sup>11</sup> At the same time, we collected statistical data from two annual and monthly reports of available health units, public (Nampula Mental Health Centre) and private (Nacala Porto Capricórnio Medical Clinic).

## Research in literature

- I. Keywords used in the search: affective disorders, bedwetting, bipolar disorder, childhood mental disorders, depression, Eastern Africa, epilepsy, frigidity, mental disorder, mental health, neurosis, premature ejaculation, psychological disease, psychosomatic disease, systematic review, mental health, Mozambique, psycho-somatic disease, psychiatric disease, schizophrenia, Southern Africa, Eastern Africa, Sub-Saharan Africa, substance abuse.
- II. Languages: Portuguese, English, French, Spanish.
- III. Clinical guidance protocols: MoH of the Republic of Mozambique, Southern African Development Community (SADC), WHO.
- IV. Systematic reviews: from specialty journals.
- V. Latest articles: articles published between 2006 and 2016.
- VI. Search engines used: Portuguese Doctors Minutes, Google academic, Google Myway, <http://www.wipo.int/ardi/en>, [Journals.plos.org/Plosmedicine](http://Journals.plos.org/Plosmedicine), Medline, Portuguese Journal of Family Medicine, ResearchGate, [www.ajol.info](http://www.ajol.info), [www.heard.org.za](http://www.heard.org.za), [www.ncbi.nlm.nih.gov/pubmed](http://www.ncbi.nlm.nih.gov/pubmed), [www.nutg.org](http://www.nutg.org), [www.sciencedirect.com](http://www.sciencedirect.com), [www.thelancet.com](http://www.thelancet.com), [www.who.int](http://www.who.int), [www.who.int/Hinari](http://www.who.int/Hinari).

## Bibliography selection criteria

- I. Where: Mozambique>Southern East Africa>East Africa>Sub-Saharan Africa.
- II. When: 2010–2016>2000–2009>1990–1999.
- III. Method: randomized>cohorts>exploratory descriptive>expert opinion.
- IV. Universe: 10.000>1.000>100>10.
- V. Level of evidence/strength of recommendation.
- VI. Selected articles were collected from physical or digital libraries, photocopied or downloaded and printed for review and archiving. They were transcribed to an identification grid (article name, resume, type of study, reference / citation and physical location), noting the exclusion criteria for non-selected articles.

## Literature review

The articles were selected for a complete text review when they met two criteria:

- I. Inclusion of MD description or recommendations, incidence and/or prevalence rate, diagnostic method, treatment, intervention and service program.

Inclusion of data about MH in Mozambique

- II. Then we followed a review and analyses procedure in several phases (Figure 1).

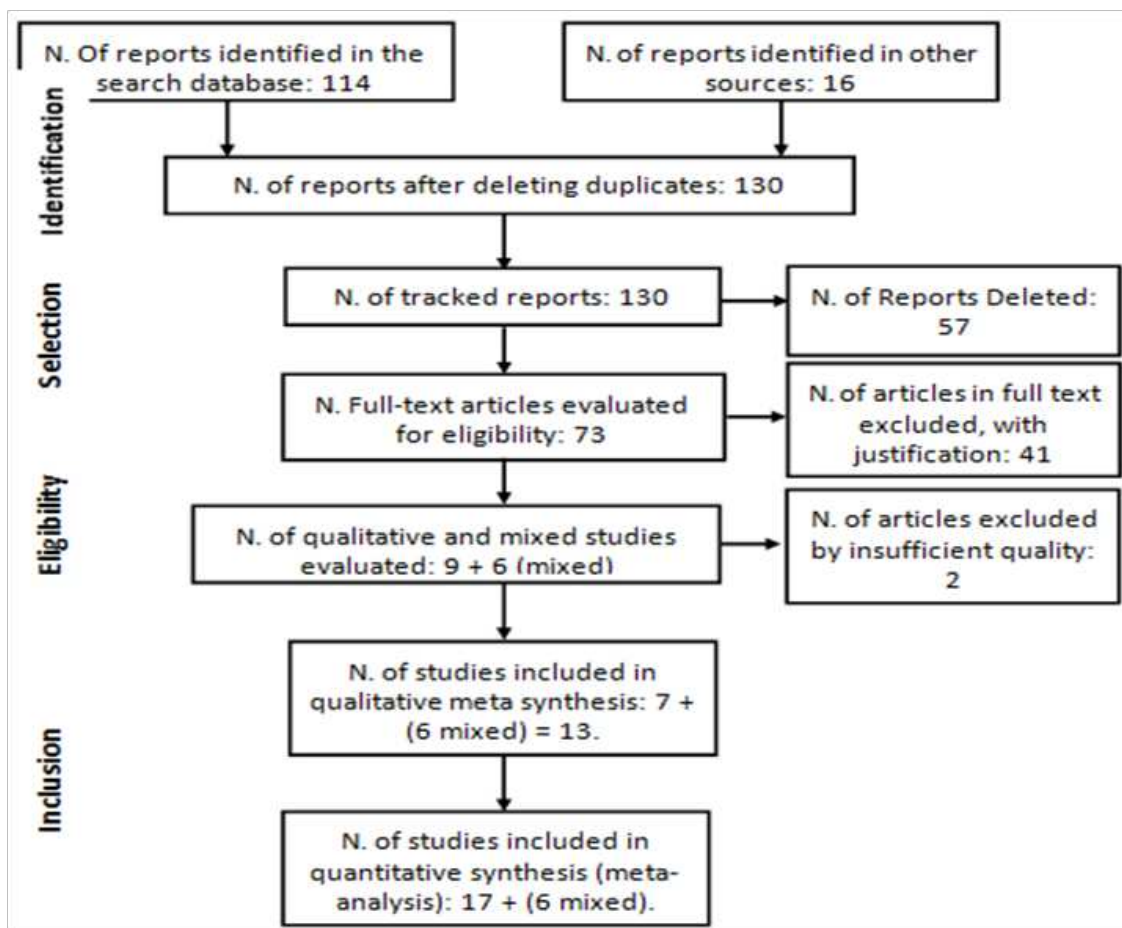
Based on inclusion criteria the articles were evaluated by title and summary and referenced in terms of quotation. If the articles fulfilled the criteria, but if title and abstract evaluation were insufficient to exclude the study, the publication was selected for a thorough review. The articles and other literary sources were then evaluated on their scientific validation, evaluated quality, importance, relevance and applicability of study results for clinical practice and classified according to the level of evidence and the strength of recommendation.<sup>12</sup> After a thorough review, a number of articles were selected for the study, though still subject to quality evaluation.

- I. Selected articles were read by two of the authors and were separated into three categories: quantitative (17), qualitative (9) and mixed methods (6).
- II. For qualitative articles (9) and mixed (6) the analysis was conducted in seven phases:
- III. Quality assessment: inclusion if it has 50% or more of applicable characteristics.<sup>12</sup> Of 15 evaluated articles 2 were excluded.

Determination of theme similarity: 13 articles (7 qualitative, 6 mixed, see Table 1) were evaluated comparatively about type of researchers, research question, objective, method and approach, results and conclusions, concerning three dimensions: populations affected, diagnostic methods, and health services response (see Table 2). Seven articles on affected populations were selected, with key themes 1) pathology; and 2) target group responses. Diagnostic area was eliminated due to the lack of bibliographic support. MH services area had 10 articles selected, with key themes 3) MH services; and 4) proposals and recommendations for future service programs. Methodological comparability: We made a methodologic

comparability analysis grouping studies into each of the four themes and according to the orientation and method: basic theory (narrative and theoretical synthesis) or ethnography, qualitative or mixed methods, program evaluation and critique. For data extraction we

prepared codes for selected themes concerning research issues. Data were collected by two researchers in each article and discrepancies were solved by consensus.<sup>13</sup>



**Flowchart I** Studies selection flowchart.

We assessed bias risk for each article and its practical implications, referring whether this assessment was made during the study or at results level, considering authors and reviewers findings and resolution method. Data were collected by two researchers in each article and the discrepancies were solved by consensus or opinion of a third investigator. This information was used in data analysis, specifying how bias risk assessment influenced cumulative evidence (publication bias, selective reporting). Thematic content grouping was made for narrative and theoretical synthesis studies for thematic analysis and with ethnographic studies for ethnographic meta-analysis. We proceeded with general data interpretation and description of identified contradictions and their resolution. We performed the qualitative meta-synthesis, integrating a realistic criticism perspective (observing the underlying, economic, political and structural processes and its effects) with the ethnographic perspective (observing groups' culture through behaviours and beliefs)<sup>14-17</sup> For quantitative (17) and mixed methods (6) articles the analysis followed three phases:

I. Main article information was identified by two authors and synthesized in a table for descriptive and critical analysis. There

were no opinion discrepancies.

- II. Studies' methods were analyzed: authors, type of study, sample size, place of study and the country where the article was edited, male gender participants proportion, results and main conclusions (see Table 2). Opinion discrepancies were discussed and solved by consensus. Articles information was transferred to tables (see Table 2) following categories: a) population (incidence, prevalence, frequency, treatments); b) diagnostic method (primary health care, differentiated care—secondary, tertiary, quaternary); c) health services responses (use of services, diagnostic and treatment modalities, cultural adaptations, professionals, programs, recommendations, infrastructure). Opinion discrepancies were discussed and resolved by consensus between two authors.
- III. Few studies compared different statistical measures, preventing us from estimating precisely the MD burden in the Mozambican population.

**Table 1** Qualitative and mixed methods studies

Article name	Main observations	Method	Recommendation strength	Evidence level
Alcohol consumption.	Ecologic research based on national economic statistics, WHO 2014 studies standard.		B	2C
Closing the mental health gap in low-income settings by building research capacity: Perspectives from Mozambique	Building mental health dissemination and implementation research infrastructure is an efficient strategy to foster the development of mental health systems tailored to local needs and resources available.	Qualitative	B	2A
A resposta individual da criança à exposição à violência: consequências psicológicas e sociais.	Young people who were children during the civil war at Josina Machel island, Mozambique, present several types of mental disorders.		C	4
Os idosos também se suicidam: da (in) visível dor da violência ao suicídio.	Suicide diagnosis at autopsy (8.6%) between 2000 and 2009 at Maputo Central Hospital Legal Medicine Service.	Mixed methods	B	3A
Saúde e doença em Moçambique.	There is a “deviation” system, to “domesticate” uncertainty, to find a sense for causality.	Qualitative	D	5
Avaliação dos serviços de Saúde mental em Moçambique.	Epidemiologic research is necessary to support mental health advocacy to better patients and community care services.		B	2C
Programa de Saúde Mental 2006 - 2015.	Strategy for mental Health in Mozambique, Ministry of Health, 2006.		D	5
Estratégia e Plano de Acção para a Saúde Mental 2016 – 2026.	Mental health' consultations, health facilities and professional's assessment for several years.	Mixed methods	D	5
Estigma e percepções dos médicos de clínica geral sobre a doença mental e suicídio em Moçambique.	General practitioners' negative perceptions on mental disorders and suicide show they share with general population the same stigma and beliefs.		B	3B
Implementação do mhGAP em Moçambique: programa de redução da lacuna no tratamento da epilepsia.	Number of health professionals and Community volunteers trained on epilepsy with mhCAP and consultation cases 2014 – 2015.		D	5
Sistema Nacional de Saúde Moçambicano e Medicina Familiar, Saúde da Família e da Comunidade na África Oriental.	There are 3 psychiatric hospitals in Mozambique and few psychiatrist, population' mental Health is scarcely studied.			
Severe mental and neurological disorders in Mozambique.	The integration of mental health services into primary-care systems might be the way to cope with that burden worldwide.	Qualitative	D	5
Building capacity for global mental health research: challenges to balancing clinical and research training.	Mozambique has no psychiatric training capacity but created a training programme for 275 psychiatric technicians.			

**Table 2** Articles' data extraction criteria

Theme	Question to answer
1) Pathology	Mental or neurological disease CID-10: incidence, prevalence, frequency
	Mental or neurological disease CID-10: treatment, result of treatment
2) Target group response	Concepts of health and mental illness
	Mental illness: treatment, result of treatment
3) Diagnosis	Mental illness: diagnosis method, sensitivity, specificity, negative predictive value, positive predictive value
	Mental illness: use of diagnostic method by level of care (tertiary, secondary, primary)

Table Continued

Theme	Question to answer
4) Existing services	Mental Illness: diagnostic method and WHO/SADC/MOH recommendations
	Number of outpatient/emergency consultations/hospital diagnosis/year
	Pharmacological treatment/psychotherapy
	Community intervention/culturally adapted
	Number/quality/professional/training MH in service/province/year
	Number/service level of MH/province/year
	MH program released/completed/province/year
5) Development proposals	MH program completed, results
	Recommendations for MH program
	Recommendations for MH studies

**Table 3** Quantitative studies analysis criteria

Article	Study Type	N	Study coverage	(%) Male	Main results and conclusions
Prevalence of severe mental and neurological disorders in Mozambique: a population-based survey	Retrospective with historical control	2,739	Maputo and Cuamba cities, Mozambique	59%	Psychosis (10.3%), mental retardation (8.6%), seizures (13.5%)
Outpatient mental health services in Mozambique: use and treatments	Retrospective with historical control	2,071	Beira Central Hospital	61%	Schizophrenia (40%), epilepsy (60%), mental disorders (73%)
Overview of the mental health system in Mozambique: addressing the treatment gap with a task - shifting strategy in primary care	Retrospective (clinical files)	-	Mozambique	-	Psychiatric hospitals increase number of beds in 2014 (from 172 to 298)
Determinants of adherence to anti-retroviral therapy in HIV positive patients, Nampula, Mozambique, 2014	Retrospective	208	Nampula, Mozambique	70%	18% of patients on antiretroviral treatment abuse alcohol drinks
Global mental health and how to teach it: an example from Mozambique	Retrospective	-	Mozambique	-	Few psychiatrists work in national health system, psychiatrist / mental patient ratio is very low
Mental Health Centre S. João de Deus, Nampula, Statistical data, 1st semester 2017	Retrospective with historical control	8,003	Mental Health Centre S. João de Deus, Nampula, Mozambique	53%	Substance abuse F10-F19 (709);  schizophrenia and other psychotic disorders F20-F29 (2,318); epilepsy G40 (3,118)
Clínica Capricórnio, Nacala Porto, Statistical data, 2014 – 2016	Retrospective (clinical files)	761	Clínica Capricórnio, Nacala Porto, Mozambique	-	Anxiety neurosis (average 1.2%); Depressive neurosis (average 0.4%)
Post-traumatic stress disorder and major depression in conflict-affected populations: an epidemiological model and predictor analysis	Retrospective	-	Mozambique	-	Depression in conflict affected populations: average difference (4.3-7-5)
Mozambique national mortality analysis, 2009 – 2013	Retrospective	-	Mozambique	-	Nervous system disorders 1,773 (5.7%), mental disorders 46 (0.1%)
The availability of essential medicines for mental healthcare in Sofala, Mozambique.	Retrospective with historical control	-	Sofala, Mozambique	-	Medicines an available to treat patients in Sofala hospitals
Health facility determinants and trends of ICD-10 outpatient psychiatric consultations across Sofala, Mozambique: time-series analyses from 2012 to 2014	Retrospective (clinical files)	15,856	Mozambique	-	Medical visits for epilepsy (48.9%);



Table Continued

Article	Study Type	N	Study coverage	(%) Male	Main results and conclusions
Suicide attempts and deaths in Sofala, Mozambique, 2011–2014	Retrospective	-	Sofala, Mozambique	-	schizophrenia (22.4%), neurologic disorders (8.8%) Medical visits number increase for patients with depression.
Preventing suicide, a global imperative	Retrospective	-	Mozambique	-	Suicide rates per gender and age.
Family reintegration of homeless in Maputo and Matola: a descriptive study	Retrospective	71	Maputo and Matola cities, Mozambique	93%	Schizophrenia and psychotic disorders 46 (64.8%); behaviour disorders 21 (29.6%), mental retardation 4 (5.6%)
Post partum psychiatric disorders, Maputo city, Mozambique	Retrospective	-	Maputo city, Mozambique	-	Post partum depression in young mothers with unintended pregnancy (16.9%)
Hazardous alcohol use among female heads-of-household in rural Mozambique	Retrospective	-	Mozambique	-	Average percentage of people drinking alcohol beverages in Northern and Central Mozambique (8.4%)
Alcohol consumption, pregnancy and maternity attitudes of pregnant women, users of José Macamo and Mavalane Hospitals	Retrospective	252	Maputo city, Mozambique	-	Pregnant women alcohol consumption (12.8%)

## Data synthesis strategy

A quantitative synthesis used frequencies together with narrative synthesis of findings, structured around target population pathologies frequencies, MH concept and population responses to MD, MH care services, programs and innovation and development proposals.

## Results

From 130 evaluated articles we selected 17 quantitative studies, 7 mixed methods and 8 qualitative.

### Qualitative meta synthesis

Of 15 qualitative and mixed methods studies evaluated for quality, 2 were excluded; qualitative metasynthesis was performed with 13 articles (7 qualitative and 6 mixed methods, see [Annex I](#)). Of these, 8 (62%) presented results about affected populations and pathologies, one with level of evidence 2C, one with 3A, one with 4, and five with level 5 (63%); nine (69%) presented results on the MH care system and its responses, one with level of evidence 2A, two with 2C, one 3A, one 3B and four (44%) level 5. Regarding approach, an article conducted program evaluation, three ethnography and nine (69%) theoretical narrative synthesis. In seven qualitative articles, two (29%) were evaluated with bias during the study, one evaluated bias in results, none considered bias implications or resolution methods. In six mixed articles, four (67%) evaluated bias during the study, three (50%) assessed it in results and considered its implications, one (17%) indicated bias resolution methods.

The main results, according to the proposed categories, follow.

### Populations

**Concept of MD:** MD is not an individual phenomenon and results from social reasons; physical, mental and social health are directly associated; stigmatizing beliefs are common (people with MD are

considered bewitched, weak, lazy, crazy, unable to do things or think) and individuals labelled as mentally ill are feared, ridiculed, neglected, rejected, abused and excluded. Most people believe epilepsy is caused by demonic spirits, being considered a disease of “spirits.” More than 50% of the population is unaware of MD causes and most invoke supernatural causes and consulted a traditional healer (TH); a minority points to a biological cause.

**Affected populations:** a large part of Mozambican population is subject to MD etiological factors (poverty, low schooling, unemployment, homelessness and drug addiction). There are also high-risk groups: ex-civil war children (socialization, personality and cognitive ability disorders), the elderly (high number of victims of violence and, suicide), and chronic patients.

**Pathologies:** most frequent diagnoses in MH services are epilepsy, followed by schizophrenia, organic disorders, substance use, neuroses, affective and mood disorders, suicide, mental deficiency and violence. Diagnoses of anxiety or depression are scarce. Violence in general is frequent and cases of “post-traumatic stress” also trigger all kinds of violent phenomena.

**Responses and treatments:** health professionals have poor training in MH, limiting their diagnostic capacity; the therapeutic approach to post-traumatic stress has limitations of conventional psychotraumatology in transcultural contexts; on the other hand there are non-conventional therapeutic resources providing specific psychosomatic and contextual responses (traditional healers, religious congregations); they use their own diagnostic methods such as divination (1, find out what the patient’s problem is, whether it is illness or not; 2, find out the cause of this problem, and if it is of a spiritual nature who provoked it and what he wants; and 3, choose therapy), which can be considered a “chance domestication” system; treatment or healing implies reestablishing social harmony and with ancestors, and the TH are potential intermediaries and translators between both practices and conceptual systems.

## Diagnosis

We did not find any research about diagnostic methods. None of the qualitative and mixed methods studies used ICD-10 classification to diagnose MD.

## Mental health care services

Use of services: the majority of the mentally ill, including epileptics, have no access to treatment. Treatment modalities: MH clinical services have few human resources, working mainly with psychiatry technicians and low availability of psychotropic drugs.

- I. Cultural adaptations: the WHO biopsychosocial model is not fully implemented, and few services offer psychosocial support (rehabilitation, reintegration), beyond pharmacological intervention (one of the main causes of relapses identified in all provinces in 2012). There are no proper cultural adaptations of diagnostic or therapeutic processes. An information, education and communication campaign (on National radio and television) implemented in 2014 and 2015 translated information into local languages.
- II. Professionals: to fill the shortage of professionals dedicated to MH, 1,157 community agents and 275 Psychiatry Technicians (between 1993 and 2018) were trained; 120 health providers were trained about epilepsy (19 general practitioners, 31 medical technicians, 24 psychiatry and MH technicians, 1 senior health technician, 1 Mother and Child Health nurse, 7 general nurses, 5 basic nurses, and 2 psychologists).

A considerable number of general practitioners show pessimism regarding MD evolution and reveal negative attitudes like those of the general population, sharing negative attributions, beliefs and perceptions about psychic illness and suicide, forming stigmatization. The time period of contact with MH services and training in the area is associated with improved knowledge about MH, appropriate perceptions and attitudes toward subjects with MD and suicidal behaviour, less prejudice and more understanding.

**Infrastructure:** there is little infrastructure in Mozambique dedicated to MH (one psychiatric hospital in Maputo, one MH centre in Nampula).

**Programs:** MoH has the political will to address the problem, expressed in the Mental Health Plan, and legal instruments to support initiatives in this area. MH program goals set to 2026 are: update MH policies and plans; expand MH services to all districts based on PHC; increase funding for MH services; reduce suicide and harmful alcohol consumption rates; organise a national MH forum; implement prevention activities (epilepsy, schizophrenia, MD and behaviour disorders of children and adolescents, suicide, drug addiction); advocacy for people with MD; ensure MD related human rights; study and reduce MD risk populations; improve the quality of MH services; monitor, evaluate and research in MH; train human resources; and manage psychoactive drugs.

Concerning alcoholic beverages consumption, there is no national policy addressing the problem, nor national monitoring and evaluation system (consumption, health or social consequences), time limit for consumption or conditions for beverages acquisition; though there are tax and minimum age regulations for consumption.

**Recommendations:** MoH must organize better MH services. MH National Program development will create a National Institute of

Psychiatry and MH, to coordinate activities to improve service quality, assess needs and expand care and treatment at all levels. It needs to be mandated to adapt and test locally the interventions; promote basic, specialized and post-graduate training in psychiatry and MH, psychology, occupational therapy and other clinical areas of MH, combining clinical training in MH with implementation science; fostering implementation research and dissemination of knowledge and innovation; carry out research and epidemiological surveillance rounds to improve diagnostic procedures and support advocacy in MH; monitor and evaluate the long-term program results; and multiply North-South and South-South partnerships in research and training in MH services. MH should be integrated into PHC. Concerning epilepsy, additional antiepileptic drugs should be acquired and distributed, and conditions created to attend epileptics at primary care levels. Health professionals at medium and higher levels need better training which will require further curriculum development on epilepsy, epidemiological and clinical research and on analysis of knowledge, attitude and practices (KAP). The elderly group should be targeted for specific clinical, social, political and economic attention and it is necessary to train health professionals in gerontology and palliative care with mental health considerations.

## Quantitative meta analysis

Most studies had a quantitative approach (17 studies, 53%, see [Annex I](#)). Six articles (20%) had a mixed approach, utilizing both quantitative and qualitative methods. Quantitative studies had a predominance of observational studies and none of the articles considered follow up. Thus, in most studies it becomes impossible to determine causal evidence but are good sources of hypotheses. Some articles had samples with variables not reflecting the general population. About 71% of the quantitative studies were published in English and all were conducted in Mozambique. Articles' objectives analysis allowed grouping according to similarities for a better understanding of the contents. Of 17 articles 10 (59%) had the evaluation of MH services as their main theme, 4 (23%) addressed risk factors for the development of MD, and 3 (18%) targeted risk factors for suicide. Concerning evidence level, there were four (23%) articles of level 1B, four (23%) level 2B, two (12%) level 3B, two (12%) level 1A, two (12%) level 2A, two (12%) level 1C and one (6%) level 2C. Regarding recommendation degree, eight of 17 articles (47%) are grade A and nine (53%) grade B. Quantitative studies were analyzed by year of publication, location (city where the study was conducted), type of study, main results, conclusion and language of publication.

Regarding studies' methods, the sample size varied between 71 and 31,286 subjects; 25% did not involve samples and describe the MH situation. In Table 3, we see that all studies point to a relationship between common MD and gender, even when it was not the focus of the work. This characteristic was also noticed in seven studies where the population with MD and depression are male. Other studies point issues of a social, economic and cultural nature that Mozambique needs to solve in order to minimize problems related to MD: scarcity of human resources in terms of both quantity and quality; lack of MH infrastructure, lack of medicines; social inequality; cultural perceptions of MD; and scarcity of investments to support the MH system. Results from all quantitative and mixed methods studies show percentages of patients with schizophrenia, psychotic disorders, epilepsy, organic disorders or MD resulting from the use of psychoactive substances. We present the main results according to the proposed categories.

## Populations

- I. Prevalence of main MD in general population, respectively in urban and rural settings: psychosis, 1.6 and 4.4% (66% male); epilepsy, 1.6 and 4% (57% male); and mental retardation, 1.3 and 1.9% (54% male). We note a consistent trend of higher prevalence in rural populations.
- II. Substance abuse: alcohol consumption is estimated to be 2.3 L alcohol/per capita among those over 15 years of age/year, 82.1% abstainers, 4.4% drinkers with episodes of abuse, 1.1% dependent, 2.5% with injuries caused by alcohol consumption (men 4.6 and women 0.6%).
- III. Prevalence of consumption of alcoholic beverages in female heads of households in rural areas in Central and Northern Mozambique: 8.4%.
- IV. Prevalence of alcohol consumption in pregnant women: 12.8%.
- V. Prevalence of alcohol consumption in patients on antiretroviral treatment: 15%.
- VI. Prevalence of postpartum depression: 16.9%.
- VII. Prevalence of depression in patients on antiretroviral treatment: 37%.

## Diagnosis methods

- I. We did not find any research about diagnostic methods.
- II. ICD-10 classification to diagnose MD was used in 7 (41%) of 17 quantitative studies, and in none of the 7 mixed methods studies.
- III. Primary and differentiated health care services are not routinely diagnosing bipolar disorder.

## Health care services responses

- I. Infrastructure: 298 beds in psychiatric hospitals and 203 beds in general hospitals.
- II. Human resources: 10 psychiatrists, 109 psychologists, 241 psychiatric technicians.
- III. Use of outpatient psychiatric services: the main reason for consultation is epilepsy (48.9%), followed by schizophrenia (22.4%) and neurotic disorders (8.8%). The burden of schizophrenia has been declining over time, accompanied by a greater diversification of diagnoses, as opposed to epilepsy that has increased significantly. Women are more likely to have neurotic disorders (12.8% vs. 5.7% for men) and men substance abuse (6.4% vs. 1.9% for women).
- IV. Attempted suicide as a reason for consultation in the emergency department of psychiatry: 18%, mean age 26.8 years, mainly women (68.3%).
- V. Suicide rate in autopsy due to violent death: 10%, mean age 30.8 years, mainly men (67.3%). Treatment modalities: some treatment regimens do not follow updated protocol. Essential psychotropic medications are rarely available in public health facilities. The current list of essential drugs only refers to six typical antipsychotics, with marked side effects.

## Discussion

Our review confirms a general lack of research on MH in Mozambique. And most of the existing studies have a low level of evidence and those using qualitative methods rarely analyze bias. The population considers MD to be a consequence of “spirits”; those may belong to ancestors, if a due traditional rite (“animist”) is not performed, or “evil” (witchcraft) from some enemy (family member or other). This population is subjected to numerous MD etiological factors. The most frequent diagnoses are epilepsy and schizophrenia, and alcohol abuse is poorly evaluated. We did not find any studies on diagnostic methods. NHS is poorly accessible to the mentally ill, due to a shortage of resources, professionals’ poor training and lack of cultural adaptations in the therapeutic procedures, resulting in widespread demand for traditional healers. MoH developed a major effort to train professionals in MH and a well-structured program; however, practice in the field is still far below the proposed targets and goals. The meta-quantitative analysis allowed us to understand how MH has been studied by Mozambican researchers, as well as to identify the methods they used. Most researchers analyzed MD prevalence, mainly using traditional quantitative methods, followed by descriptive statistics.

Low health care accessibility is confirmed by a study in five southern African countries, where only 36.2% of epileptics are medicated.<sup>18</sup> The widespread use of traditional healers is also well demonstrated, as in a study in South Africa where 31% of patients with MD consulted them in the past 12 months.<sup>19,20</sup> The lack of research in MH limits planning and quality of care in the NHS.<sup>21,22</sup> A prevalence of 4% of epilepsy in rural areas exceeds the world average (between 0.4 and 1%),<sup>23</sup> probably due to unfavourable perinatal conditions (trauma, hypoxia) or mass lesions diseases, like cisticercosis, which is highly prevalent in Mozambique. Likewise, a prevalence of 4.4% of schizophrenia in rural areas also surpasses the world average (between 0.59 and 3%).<sup>24</sup> Suicide also appears as a serious public health problem, affecting mainly adolescent and young men.<sup>25</sup> Alcohol consumption and dependence are below African average, but traditional local production of alcoholic beverages and consumption are poorly studied (estimated 1 L alcohol/per capita/year). The widespread conception of MD and the use of traditional healers by Mozambican population make them a potential ally of conventional medicine to improve access to health care and treatment adherence. Therefore, it would be necessary to train traditional healers in MH in collaboration with health professionals. Our limitations include the fact that a thorough and comprehensive assessment of MH situation in Mozambique, considering service supply and demand, should include the user’s opinion about the sector performance model, not contemplated in this study.<sup>26</sup> The fact that no financing was found for this work limited the analysis to free access articles (4 articles out of a total of 134, 3%).

## Conclusion

Our study identifies the scarcity of epidemiological data on MD in Mozambique as well as a vague definition of MH by the population. In this context, it will be important to promote research at health unit level and with an anthropological perspective in the communities, to plan an efficient and timely intervention. At the same time, the incorporation of MH into primary health care and the diversification of available psychotropic drugs will be decisive in dealing with this complex of diseases. Our systematic review of selected bibliography



on the perception of MD in Mozambique, shows a cultural concept of “spiritual disease” (caused by ancestors or witchcraft). Local, regional and national statistical data review shows the high burden of MD in the country, without adequate response in access and quality of care from the health care system. There has been progress, though with various limitations in the MH care system as implemented by Mozambican MoH, suggesting ways of future research and development.

## Funding

The study was financed by the authors.

## Ethics statement

The authors declare they have signed an ethics statement, obtained approval from Lúrio University Health Sciences Faculty Scientific Committee and have followed all the World Medical Association's Helsinki Declaration (2013) recommendations.

## Acknowledgement

None.

## Conflicts of interest

The authors declare they have no conflicts of interest with study design or final report.

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