Suicidal ideation, depressive symptoms, and mental health care-seeking in Central Mozambique

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A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2018

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Program Authorized to Offer Degree:

Global Health

University of Washington

Abstract

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Introduction: To our knowledge there has never been a community assessment of suicidal ideation, depressive symptoms, or care-seeking in Mozambique. Understanding the prevalence of depressive symptoms, suicidal ideation, and care-seeking patterns are needed to inform the development of effective mental health services that meet the burden of disease in the community.

Methods: Generalized estimating equations were used to assess factors associated with depressive symptoms, suicidal ideation, and mental health care-seeking among 3,080 individuals surveyed in a representative household survey in Sofala and Manica provinces, Mozambique.

Results: 19% of respondents reported depressive symptoms in the past year and 16% reported lifetime suicidal ideation. Only 10% of respondents had ever sought care for mental health, but 27% of respondents who reported depressive symptoms and/or suicidal ideation had sought care.

Factors associated with depressive symptoms and suicidal ideation included: female gender, divorced or separated, widowed, and +56 years old. Individuals in the poorest wealth quintile had lower depressive symptoms, and individuals in higher wealth quintiles had higher prevalence of suicidal ideation. Individuals with higher education had lower odds of suicidal ideation. Factors associated with care-seeking included: female gender, rural residence, divorced or separated, 46-55 years old, and +56 years old. Individuals in lower wealth quintiles and with no religious affiliation had lower odds of seeking care.

Conclusions: A large number of individuals in Central Mozambique experience depressive symptoms and suicidal ideation, yet rates of care-seeking are very low. These findings highlight the urgent need for mental health implementation science to improve community-level screening and ready access to community-based mental health services. Limited resources could be targeted towards women, those in rural areas, older individuals, those with low education, and those marginalized from society due to divorce, separation, or widowhood.

Introduction

Depression and Suicide Globally

Mental, neurological, and substance use (MNS) disorders are leading causes of disability worldwide and significantly impact the social and economic well-being of individuals and communities (1). Depression is the most common mental disorder, with over 300 million people living with depression worldwide (2). Suicide accounts for over 800,000 deaths per year and is the second leading cause of death among 15-29 year olds globally (3). It is estimated that for every suicide death there are more than 20 suicide attempts (4).

More than 85% of the world's population live in 153 low and middle-income countries (LMICs), comprising almost three quarters of the global burden of MNS disorders (5,6). A cross-national study conducted in 18 high-income countries (HICs) and LMICs reported that the average lifetime and 12-month prevalence estimates of depression in LMICs were 11.9% and 5.9% (7). Another cross-national study conducted in 17 high and LMICs found that the prevalence of suicidal ideation in LMICs ranged from 3.1% to 12.4% (8).

Despite the growing literature that MNS disorders are a leading cause of disability worldwide, most LMICs allocate scarce financial resources and often lack the human resources and infrastructure to provide mental health services (5,9). Collectively, developing countries spend less than 2% of health budgets on mental health and a large proportion of LMICs lack mental health policies, programs, and legislation (5,10).

Depression is ranked as the seventh most important cause of disease burden in LMICs and 85% of suicides in the world occur in LMICs (11,12). However, between 76% - 85% of mental, neurological, and substance use cases in LMICs do not receive any treatment (13,14). There is strong international consensus that narrowing the treatment gap in LMICs requires

integration of mental health services into primary care (15). Research indicates that effective pharmacological and psychosocial interventions can be delivered in non-specialized healthcare settings (16).

Depression and Suicide in Mozambique

In Mozambique, it is estimated that mental and substance use disorders account for 21.7% of all years lived with disability for those aged 15-49 (17). MNS disorders are estimated to account for more years lived with disability in the country than HIV, TB, malaria, neglected tropical diseases, diarrhea, lower respiratory infections, and neonatal conditions combined (18). Additionally, it is estimated that Mozambique has the seventh highest suicide rate in the world (27.4/100,000), and the highest suicide rate in Africa (4). However, these studies are from international modeling efforts; to our knowledge no community-level prevalence studies have been published on depressive symptoms and lifetime or current suicidal ideation in Mozambique.

Mozambique has made great strides in reducing the treatment gap for mental health services. In 1996 the Ministry of Health implemented a task-shifting strategy through the development of a two-year psychiatric technician training program, in which mid-level professionals are trained to provide mental health services at the primary care level (13). This training has resulted in a new cadre of health professionals who currently provide the vast majority of psychiatric services nationwide (19). The strategy has successfully increased mental health service coverage from 44% of country districts in 2010 to 100% of country districts in 2014 (13). However, despite this strategy, there is still a significant shortage of mental health professionals and limited capacity to bring evidence-based mental health interventions to scale. For instance, essential psychotropic medications are routinely unavailable at public health

facilities and psychiatric technicians are predominately located at district-level health facilities, leaving a majority of the population whose care is provided by lower-level facilities without ready access to mental health services (19,20).

In addition to limited human and financial resources, research suggests that mood disorders are currently not well addressed by the Mozambique healthcare system, with a very low percentage (<4%) of yearly consultations representing mood disorders (19). This is particularly concerning given their estimated high population prevalence and disease burden, as well as their link to suicide attempts and deaths (19). There are likely many individuals who would benefit from basic mental health services, but are unable to access care within the current healthcare system. For this reason, the present community-level survey seeks to clarify the prevalence and associated factors for depressive symptoms and suicidal ideation.

Factors Associated with Depression and Suicide

Epidemiologic data on depression and suicide is not readily available across many low- and middle-income countries (LMICs). A cross-national study conducted in 10 high-income countries (HICs) and 8 LMICs reported that the average lifetime and 12-month prevalence estimates of depression in LMICs were 11.9% and 5.9% (7). The same study found the average age of onset for depression in LMICs was 24 years, the female to male ratio was 2:1, and the strongest demographic correlate was being divorced or widowed. These findings are consistent with other studies, reporting that being female and unmarried are consistently correlated with major depressive episodes (21,22). The minimal research in LMICs suggests that there is either no association between depression and age or that the prevalence of depression increases with age (23–25).

With regard to suicide, a cross-national study conducted in 10 HICs and 7 LMICs found that the prevalence of suicidal ideation in LMICs ranged from 3.1% to 12.4% (8). A systematic review of suicide in Africa reported that risk factors include interpersonal difficulties, mental and physical health problems, low socioeconomic standing, and drug and alcohol use/abuse (26). Other risk factors that appear to be common include youth or old age, low levels of education, being unmarried, previous suicide attempts, family history of psychopathology, and stressful life events (8,27–29). It has also been reported in a number of studies that females have higher rates of suicidal ideation and behavior than males, but males have higher mortality rates from suicide than females (30,31).

The aforementioned epidemiologic results are informative, but not necessarily representative of the Mozambican population. There is very limited local research on suicide and common mental disorders, such as depression, in Mozambique. To our knowledge, there is currently only one peer-reviewed publication that addresses factors associated with suicidal attempts and deaths in Mozambique (31), and only one community-level mental health study conducted previously (32). The former was focused at the clinic level, while the latter was focused solely on severe mental disorders with no consideration of depression; both were limited in geographic scope.

The present paper seeks to address this gap in the literature, providing a better understanding of the burden, risk factors, and healthcare seeking behavior for depressive symptoms and suicidal ideation in central Mozambique. This study aims to inform the development and scale-up of care for common mental disorders and suicidal thoughts in Mozambique and other similar LMICs.

Methods

Study Setting

Mozambique is a southern East African country with some of the lowest rankings for health and development globally. The country has a population of 28.8 million with more than half of the population under the age of 18 and 45% under the age of 15 (33,34). Mozambique is classified as a low-income country, and a majority of the population (67%) resides in rural areas (34).

Sofala province is located in central-eastern Mozambique and has an estimated population of 1.7 million inhabitants, with 63% living in rural areas (35,36). The province has a relatively high population density (24.8/km^2) and ranks among the poorest of Mozambique's 11 provinces (35). Manica province borders Sofala province to the west and has a population of 1.4 million inhabitants. Manica province has a similar population density (23.3/km^2), baseline health indicators, and culture as Sofala province (35,37). Socioeconomic status indicators are comparable across both provinces; however, the wealth distribution is more even in Manica province (Gini coefficient 0.44) than in Sofala province (Gini coefficient 0.55) (35).

After gaining independence from Portugal in 1975 Mozambique endured a 15-year civil war between government forces led by Frelimo and a rebel movement Renamo. This war resulted in the displacement of millions of refugees and the destruction of key infrastructure. After the war ended in 1992, Mozambique had a period of relative political stability until 2012-2013 when the Renamo insurgency restarted. This insurgency continues to result in violent attacks and nighttime raids, especially in Sofala and Manica provinces.

Study Design and Sampling Procedure

Data for this study come from a cross-sectional community household survey of 3080 households conducted in Sofala and Manica Provinces, Mozambique with data collected from September 2016 to February 2017. The full sampling methods for this community survey have been previously published. Briefly, we used remote satellite imagery to develop a provincial-level representative community survey sampling frame in Sofala and Manica Provinces. The satellite imagery was integrated with the open-source OpenStreetMap platform to digitize all buildings, which were then used to represent population density and generate probability proportional to size sampling. The primary sampling unit was the household, where we identified the "head of household" to complete the survey.

Data Collection

Data was collected on Samsung tablets using Open Data Kit (ODK) software. Data were transferred from ODK to a REDCap database through a cloud server. The household survey questions were adapted from the Mozambique Demographic and Health Survey with additional modules to address the burden of cardiovascular disease, mental health conditions, alcohol abuse, epilepsy, and general disability. If a participant reported current suicidal ideation, he or she was referred to the nearest health facility

Due to civil conflict, 9 of 31 subdistricts in Sofala and 15 of 39 subdistricts in Manica were excluded from our sample. The final sample included 1,554 households in Sofala and 1,526 households in Manica.

Outcome and Explanatory Variables

We analyzed the prevalence and associated factors for three primary outcomes: depressive symptoms, suicidal ideation, and mental health care-seeking. These outcomes were defined as follows: 1) depressive symptoms: self-reported period of sadness and/or loss of energy that lasted more than 2 weeks in the past year; 2) suicidal ideation: self-reported thoughts of suicide or self-harm (lifetime, in the past month, and current); and 3) care-seeking behavior: respondents who reported having sought care for mental health issues, calculated among all respondents, among respondents who reported depressive symptoms and/or suicidal ideation, among respondents who reported depressive symptoms only, and among respondents who reported suicidal ideation only.

Our depressive symptoms variable was a single survey question and cannot be interpreted as clinical depression. While this question lacks specificity, we anticipate it is sensitive, allowing for a general understanding of depressive symptoms in this study population. Our care-seeking variable included respondents who reported seeking care for mental health, depressive symptoms, and/or suicidal ideation. We decided to include all three subcategories in our outcome given the common misconception that mental illness only refers to severe mental disorders.

We selected explanatory variables from existing literature on factors associated with depressive symptoms and suicidal ideation. We primarily focused on socio-demographic factors, but also included variables that we believed could increase one's risk for depressive symptoms or suicidal ideation. Factors assessed included the following: age, gender, urban vs. rural home location, marital status, socioeconomic status (SES), education level, religious affiliation, alcohol consumption, history of injury in the past year, history of epilepsy, and overall disability. See Table 1 for categorizations of explanatory variables.

The SES variable was generated using principal component analyses (PCA) of household characteristics and ownership of household items (38,39), and then disaggregated into five wealth quintiles. Overall disability was measured using the short-version of the WHO Disability Assessment Schedule 2.0, which is a 12-item questionnaire to assess health and disability (40). The 12 questions relate to the functioning difficulties experienced by the respondent during the previous 30 days and responses can range from 0 to 60.

Table 1. Demographic characteristics of 3080 individuals completing a representative household survey in Sofala and Manica provinces, 2016

Characteristic	N (%)
Sex	
Male	1395 (46%)
Female	1646 (54%)
Missing	39 (1%)
Urban or Rural	
Urban	914 (30%)
Rural	2153 (70%)
Missing	13 (0%)
Level of School	
No School	574 (19%)
Basic	1620 (54%)
Higher	790 (26%)
Missing	96 (3%)
Age	
18-25	705 (23%)
26-35	969 (31%)
36-45	630 (20%)
46-55	336 (11%)
>56	394 (13%)
Missing	46 (1%)
Marital Status	
Married	2556 (83%)
Divorced/Separated	170 (6%)
Widowed	240 (8%)
Single	72 (2%)
Missing	42 (1%)
Religion	
Pentecostal	1385 (46%)

Catholic	389 (13%)
Muslim	39 (1%)
Zione	393 (13%)
Anglican	42 (1%)
Johan Masowe/Johan Maranga	32 (1%)
No religion	504 (17%)
Other Christian	124 (4%)
Not sure	12 (0.4%)
Other	88 (3%)
Missing	72 (2%)
SES	
1st quintile (poorest)	615 (20%)
2nd quintile	613 (20%)
3rd quintile	612 (20%)
4th quintile	614 (20%)
5th quintile	612 (20%)
Missing	14 (0%)
Alcohol	
Never	1656 (54%)
Once a month or less	306 (10%)
2-4x per month	144 (5%)
2-4x per week	93 (3%)
4x or more per week	32 (1%)
Missing	849 (28%)
Overall Disability	
0 - 12	993 (32%)
13 - 24	1904 (62%)
25 - 36	117 (4%)
37 - 60	66 (2%)
Missing	0 (0%)
Epilepsy Diagnosis	
No epilepsy	2951 (96%)
Epilepsy	129 (4%)
Missing	0 (0%)
Any Injury (in the past year)	
No Injury	2754 (90%)
Injury	316 (10%)
Missing	10 (0%)
Injured by Assault (in the past year)	
No assault injury	3041 (99%)
Assault injury	39 (1%)
Missing	0 (0%)

Statistical Analyses

Factors associated with depressive symptoms, suicidal ideation, and mental health care-seeking were identified using generalized estimating equations with clustering by sampling unit, using the binomial family, logic link function, and an exchangeable working correlation matrix. Selected explanatory factors were additionally analyzed stratified by sex to determine if associations differed strongly by gender. We conducted both univariable and multivariable analyses for each exposure-outcome relationship. Existing literature was used to inform the selection of control variables in the multivariable models. Confounders were selected a priori based on a literature review, and were selected individually for each exposure of interest. We also analyzed the associations between the 12 WHODAS 2.0 disability measures and depressive symptoms, suicidal ideation, and mental health care-seeking. These associations were identified using ordered logistic regressions with robust standard errors clustered by sampling unit.

Results

Prevalence Estimates

Overall, 19.3% of respondents reported a period of sadness or loss of energy that lasted more than 2 weeks in the past year – which we interpret hereafter as 'depressive symptoms'. Of all respondents, 16.4% reported lifetime suicidal ideation, 5.9% reported suicidal ideation in the last month, and 1.7% reported suicidal ideation currently. Of those with lifetime suicidal ideation, 36.1% had suicidal ideation in the last month and 10.2% had current suicidal ideation.

Only 9.8% of respondents had ever sought care for a mental health problem. Of those who sought care, 85.8% sought care for depressive symptoms and 6.3% sought care for suicidal ideation. When looking at the subpopulation of respondents who reported depressive symptoms

and/or suicidal ideation, roughly one quarter (26.5%) sought care for mental health. Of those who reported depressive symptoms only, 32.8% reported receiving treatment. And of those with suicidal ideation in the past month, only 10.5% reported receiving treatment (See Appendix Table 1 for additional care-seeking estimates).

Table 2. Prevalence of Depressive Symptoms and Suicidal Ideation among 3080 individuals completing a representative household survey in Sofala and Manica provinces, 2016

Description	N	Total	Percentage
Proportion of respondents who reported period of sadness or loss of energy that lasted more than 2 weeks (yes/no) out of total number of respondents.	591	3064	19.29%
Proportion of respondents who reported thoughts of suicide or self-harm in their lifetime (yes/no) out of total number of respondents.	502	3066	16.37%
Proportion of respondents who reported thoughts of suicide or self-harm in the last month (yes/no) out of total number of respondents	181	3066	5.90%
Proportion of respondents who reported thoughts of suicide or self-harm currently (yes/no) out of total number of respondents	51	3066	1.66%
Proportion of respondents who reported thoughts of suicide or self-harm in the last month (yes/no) out of total number of respondents with lifetime suicidal ideation.	181	502	36.06%
Proportion of respondents who reported thoughts of suicide or self-harm currently (yes/no) out of total number of respondents with lifetime suicidal ideation.	51	502	10.16%

*Total N differ due to missing data

Figure 1. Prevalence of depressive symptoms and care-seeking behavior

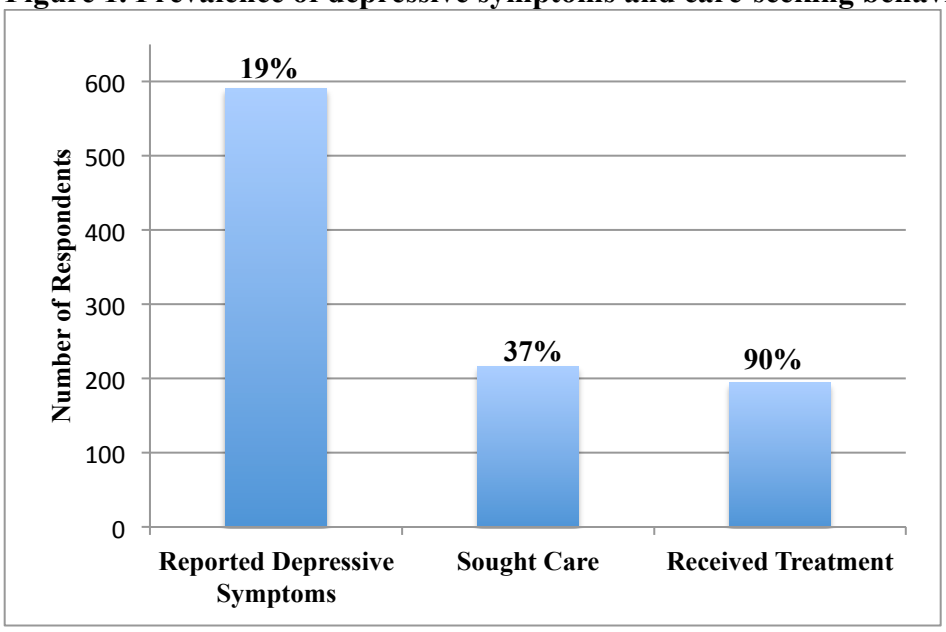
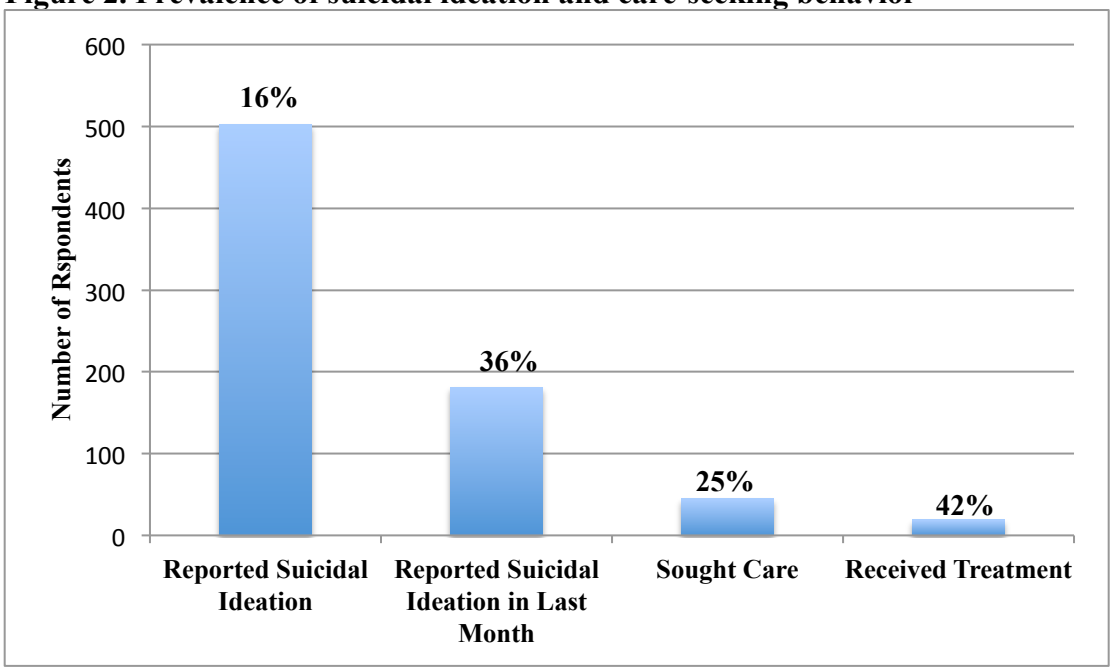


Figure 2. Prevalence of suicidal ideation and care-seeking behavior



Factors Associated with Depressive Symptoms

Being female (adjusted odds ratio [aOR]: 1.40, 95% Confidence Interval [CI]: 1.13 - 1.73) and living in a rural area (aOR: 1.47, CI: 1.08 - 1.99) was significantly associated with self-reported depressive symptoms. There was a monotonic positive relationship between age and depressive symptoms; however, the association was significant only for those aged >56 years (aOR: 1.83, CI: 1.38 - 2.42) compared to those aged 26-35 years. Of all socio-demographic factors, marital status had the strongest association with depressive symptoms, with unmarried single, divorced or separated, and widowed individuals having greater odds of depressive symptoms in comparison to married individuals (aOR: 1.23, CI: 0.67 - 2.26; aOR: 1.80, CI: 1.24 - 2.62; aOR: 2.00, CI: 1.40 - 2.86 respectively). Contrast to our hypothesis, the lowest wealth quintile had lower self-reported depressive symptoms (aOR: 0.65, CI: 0.43 - 0.98) in comparison to the highest wealth quintile, and individuals with higher levels of education were not

statistically different from individuals with no schooling. Other factors not significantly associated with higher odds of depressive symptoms included religion and alcohol consumption.

Additional explanatory factors significantly associated with depressive symptoms included familial epilepsy diagnosis (aOR: 2.4, CI: 1.62 - 3.55), injury (aOR: 1.62, CI: 1.21 - 2.13) or injury from assault (aOR: 1.49, CI: 0.71 - 3.12) in the past year, and severe disability (aOR: 2.89, CI: 1.64 - 5.09) (See Table 3 for associations with individual disability measures).

Table 3. WHO-DAS Disability Measures: Ordered Logistic Regression analyses of individuals completing a representative household survey in Sofala and Manica provinces, 2016

	Depressive symptoms		Suicidal ideation		Mental Health Care-seeking	
	aOR	p-value	aOR	p-value	aOR	p-value
Standing for long periods of time	1.39	0.002	1.57	0.000	1.39	0.020
Doing household chores	1.92	0.000	1.57	0.005	1.93	0.000
Learning new task	1.45	0.001	1.19	0.171	1.26	0.081
Participating in community activities	1.04	0.794	1.32	0.032	1.12	0.514
Health affect emotional state	0.88	0.183	1.20	0.116	1.30	0.064
Concentrating 10 minutes	1.14	0.348	1.68	0.000	1.69	0.002
Walking long distance	1.53	0.002	1.48	0.011	1.86	0.000
Taking a bath	1.82	0.178	1.36	0.470	2.55	0.072
Getting dressed	2.01	0.123	1.95	0.136	2.16	0.159
Dealing with strangers	0.93	0.559	1.14	0.285	1.01	0.945
Maintaining friendships	0.78	0.060	1.15	0.357	1.11	0.534
Difficulty at work or in school	1.37	0.046	1.63	0.006	1.83	0.001

Factors Associated with Suicidal Ideation

There were considerable similarities between factors associated with depressive symptoms and factors associated with suicidal ideation. First, females were more likely to report suicidal ideation (aOR: 1.46, CI: 1.16 - 1.84) in comparison to males. Second, divorced or separated individuals (aOR: 1.77, CI: 1.20 - 2.60) and widowed individuals (aOR: 1.73, CI: 1.20 - 2.48) had greater odds of suicidal ideation in comparison to married persons. Third, there was a

monotonic positive association between age and suicidal ideation, with individuals aged 36-45 (aOR: 1.60, CI: 1.20 - 2.09), aged 46-55 (aOR: 1.76, CI: 1.27 - 2.44), and aged +56 years (aOR: 1.62, CI: 1.18 - 2.22) being significantly more likely to report lifetime suicidal ideation than individuals aged 26-35 years. Fourth, both injury (aOR: 1.62, CI: 1.20 - 2.18) and injury from assault (aOR: 2.08, CI: 1.01 - 4.32) in the past year were significantly associated with suicidal ideation. Last, individuals with higher levels of disability were more likely to express suicidal (aOR: 2.04, CI: 1.29 - 3.23).

Compared to 5th quintile SES (highest), all other quintiles were more likely to report lifetime suicidal ideation; however, only the 4th quintile was statistically significantly different (aOR: 1.45, CI: 1.01 - 2.07). Individuals with higher levels of education were less likely to present with suicidal ideation than those with no schooling (aOR: 0.64, CI: 0.46 - 0.90). The odds of suicidal ideation were significantly related to both minimal alcohol consumption (aOR: 1.46, CI: 1.06 - 2.01) and significant alcohol consumption (aOR: 2.56, CI: 1.15 - 5.71) in comparison to abstainers. Factors not significantly associated with suicidal ideation included religion, epilepsy diagnosis, and urban versus rural residence.

Factors Associated with Mental Health Care-Seeking

We calculated mental health care-seeking among various subgroups, including: (1) all respondents; (2) respondents who reported depressive symptoms and/or suicidal ideation; (3) respondents who reported depressive symptoms only; and (4) respondents who reported suicidal ideation only. Generally speaking, the associations were similar across all subgroups (See Appendix Table 2 for details).

Among all respondents, females were significantly more likely to seek care for mental health than males (aOR: 1.42, CI: 1.06 - 1.89). Older individuals were more likely to seek care compared to those aged 26-35 years (ages 46-55 years aOR: 1.78, CI: 1.18 - 2.68; ages 56+ years aOR: 1.51, CI: 1.00 - 2.27). Compared to married individuals, those who were divorced were significantly more likely to have sought mental health care (aOR: 1.80, CI: 1.12 - 2.88). Individuals with no religious affiliation were less likely to have sought mental health care than Pentecostal parishioners (aOR: 0.64, CI: 0.42 - 0.97). Individuals with lower levels of SES were significantly less likely to seek care for mental health compared to high SES individuals (1st quintile SES aOR: 0.51, CI: 0.29 - 0.89; 2nd quintile SES aOR: 0.53, CI: 0.30 - 0.92). Rural residents were more likely to seek care than urban residents (aOR: 2.28, CI: 1.49 - 3.51).

Other explanatory factors significantly associated with mental health care-seeking among all respondents included some disability (aOR: 1.40, CI: 1.04 - 1.89), familial epilepsy diagnosis (aOR: 1.89, CI: 1.15 - 3.10), and injury in the past year (aOR: 1.54, CI: 1.07 - 2.21). Factors not significantly associated with mental health care-seeking included education, alcohol consumption, and injury from assault.

Table 4. Multivariable analyses of individuals completing a representative household survey in Sofala and Manica provinces, 2016

	Depressive Symptoms		Suicidal Ideation		Mental Health Care-seeking	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Sex[1]						
Male	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Female	1.4 (1.13 - 1.73)	0.002	1.46 (1.16 - 1.84)	0.001	1.37 (1.03 - 1.82)	0.030
Residence[2]						
Urban	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Rural	1.47 (1.08 - 1.99)	0.013	0.86 (0.62 - 1.18)	0.348	2.32 (1.52 - 3.55)	0.000
Level of School[3]						
No School	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

Basic	0.96 (0.75 - 1.24)	0.777	0.80 (0.62 - 1.03)	0.081	1.18 (0.84 - 1.66)	0.336
Higher	0.96 (0.70 - 1.32)	0.796	0.64 (0.46 - 0.90)	0.010	0.88 (0.57 - 1.36)	0.565
Age[4]						
26-35	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
18-25	0.86 (0.67 - 1.12)	0.265	1.10 (0.81 - 1.43)	0.633	1.11 (0.79 - 1.57)	0.541
36-45	1.09 (0.84 - 1.42)	0.502	1.60 (1.20 - 2.09)	0.001	1.33 (0.94 - 1.88)	0.109
46-55	1.14 (0.83 - 1.56)	0.429[4]	1.76 (1.27 - 2.44)	0.001	1.73 (1.16 - 2.58)	0.007
56+	1.83 (1.38 - 2.42)	0.000	1.62 (1.18 - 2.22)	0.003	1.57 (1.06 - 2.33)	0.024
Marital Status[6]						
Married	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Divorced/Separated	1.80 (1.24 - 2.62)	0.002	1.77 (1.20 - 2.60)	0.004	1.75 (1.10 - 2.78)	0.018
Widowed	2.00 (1.40 - 2.86)	0.000	1.73 (1.20 - 2.48)	0.003	1.00 (0.61 - 1.64)	0.991
Single	1.23 (0.67 - 2.26)	0.511	1.00 (0.49 - 2.08)	0.990	0.98 (0.41 - 2.31)	0.955
Religion[6]						
Pentecostal	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Catholic	1.06 (0.79 - 1.42)	0.715	0.78 (0.56 - 1.10)	0.163	0.96 (0.64 - 1.42)	0.826
Muslim	1.11 (0.49 - 2.48)	0.806	0.73 (0.25 - 2.12)	0.565	1.06 (0.36 - 3.12)	0.923
Zione	1.09 (0.81 - 1.47)	0.553	1.09 (0.80 - 1.49)	0.568	1.27 (0.88 - 1.85)	0.198
Anglican	1.30 (0.61 - 2.77)	0.503	0.61 (0.21 - 1.76)	0.363	0.75 (0.23 - 2.46)	0.638
Johan Masowe/Johan Maranga	0.42 (0.13 - 1.40)	0.159	1.10 (0.45 - 2.72)	0.833	0.71 (0.19 - 2.68)	0.617
No religion	0.72 (0.53 - 0.97)	0.033	0.91 (0.67 - 1.22)	0.528	0.64 (0.42 - 0.97)	0.036
Other Christian	0.62 (0.35 - 1.09)	0.098	1.09 (0.65 - 1.83)	0.739	1.01 (0.53 - 1.92)	0.971
Not sure	0.49 (0.06 - 3.82)	0.499	0.67 (0.09 - 4.76)	0.685	1.18 (0.16 - 8.87)	0.870
Other	1.56 (0.94 - 2.58)	0.086	1.08 (0.61 - 1.92)	0.792	0.96 (0.46 - 2.00)	0.917
SES[5]						
5th quintile	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
1st quintile (poorest)	0.65 (0.43 - 0.98)	0.041	1.44 (0.91 - 2.28)	0.118	0.51 (0.29 - 0.88)	0.015
2nd quintile	0.70 (0.47 - 1.04)	0.079	1.31 (0.83 - 2.05)	0.242[5]	0.47 (0.27 - 0.81)	0.007
3rd quintile	0.79 (0.54 - 1.15)	0.216	1.39 (0.90 - 2.13)	0.136	0.64 (0.39 - 1.07)	0.087
4th quintile	0.82 (0.60 - 1.14)	0.236	1.45 (1.01 - 2.07)	0.045	0.99 (0.64 - 1.52)	0.951
Alcohol[6]						
Never	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Once a month or less	1.31 (0.97 - 1.77)	0.081	1.46 (1.06 - 2.01)	0.019	1.06 (0.70 - 1.60)	0.783
2-4x per month	1.19 (0.77 - 1.84)	0.432	1.42 (0.90 - 2.23)	0.133	1.48 (0.88 - 2.51)	0.143
2-4x per week	1.58 (0.96 - 2.59)	0.073	1.63 (0.96 - 2.77)	0.073	0.95 (0.46 - 1.97)	0.894
4 or more per week	0.80 (0.31 - 2.11)	0.658	2.56 (1.15 - 5.71)	0.022	1.99 (0.76 - 5.21)	0.162
Overall disability[6]						
<= 12	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
13 - 24	1.00 (0.81 - 1.23)	0.994	1.16 (0.92 - 1.46)	0.201	1.37 (1.03 - 1.82)	0.033
25 - 36	1.02 (0.63 - 1.67)	0.922	2.04 (1.29 - 3.23)	0.002	1.50 (0.81 - 2.75)	0.196
>= 37	2.89 (1.64 - 5.09)	0.000	1.64 (0.85 - 3.18)	0.143	2.01 (0.93 - 4.32)	0.074
Epilepsy[6]						
No epilepsy	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

Epilepsy	2.4 (1.62 - 3.55)	0.000	1.37 (0.87 - 2.17)	0.170	2.01 (1.24 - 3.24)	0.004
Any Injury[6]						
No injury	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Injury	1.62 (1.21 - 2.13)	0.001	1.62 (1.20 - 2.18)	0.002	1.55 (1.09 - 2.20)	0.016
Assault Injury[6]						
No injury from assault	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Injury from assault	1.49 (0.71 - 3.12)	0.289	2.08 (1.01 - 4.32)	0.048	1.75 (0.73 - 4.18)	0.208

[1] Adjusted for age, SES, education, residence
[2] Adjusted for age, SES, education, sex
[3] Adjusted for SES, sex, residence
[4] Adjusted for SES, residence
[5] Adjusted for age, sex, education, residence
[6] Adjusted for age, sex, education, SES, residence

Discussion

Prevalence of Depressive Symptoms, Suicidal Ideation, and Care-seeking

One out of every five (19%) respondents self-reported depressive symptoms in the past year and one out of every six (16%) reported thoughts of suicide or self-harm in their lifetime. These prevalence estimates are somewhat higher than previous research in LMICs. For example, a study conducted in 18 countries found that the average 12-month prevalence of depression in LMICs was 5.9%; however, estimates ranged from 3.8% to 10.4% (7). Similar to the average prevalence of depression in the cross-national study, a nationally representative household survey in South Africa found that 4.9% of respondents experienced a depressive episode in the past 12 months (41). With regard to suicide, a cross-national study conducted in 17 countries found that the average lifetime prevalence of suicidal ideation was 9.2%; however, estimates ranged from 3.1% to 12.4% in LMICs (8). And a community-level study conducted in Nigeria found that the weighted prevalence of suicidal ideation was 7.3% (42). As depicted, our prevalence estimates of 19% depressive symptoms and 16% suicidal ideation are higher than existing literature from other LMICs. This may partly be explained by our definition of depressive symptoms, which is not based on a validated screening tool and may have

overestimated the true prevalence of depression. An additional challenge to these comparisons is the scant evidence regarding prevalence or rates of suicidal ideation globally.

It is reasonable to infer that conflict is an underlying cause of these high prevalence estimates. There is a significant amount of previous research suggesting that war-affected and post-disaster regions have a higher prevalence of depressive symptomatology and suicidal ideation (43–48). Mozambique endured a prolonged anti-colonial struggle and subsequent extended proxy war with apartheid South Africa that led to nearly three decades of political instability, war, death, and displacement that fragmented the health system, traumatized the population, and left the country one of the poorest in the world. In addition to this, residents of Central Mozambique continue to experience violence and unrest due to the ongoing RENAMO guerrilla insurgency against the FRELIMO supported national government.

Despite the high burden of self-reported mental health issues in our survey, only 9.8% of respondents had ever sought care for a mental health problem, including only 26.5% of the respondents who reported depressive symptoms or suicidal ideation. Low proportion of respondents who reported depressive symptoms or suicidal ideation in the last month received any treatment for their mental health problem (32.8% and 10.5% respectively). Similar to a study conducted in Sofala province, these findings suggest a large treatment gap for common mood disorders, such as depression (19).

We found that the vast majority (85.8%) of mental health care-seeking was for depressive symptoms, yet previous research indicates mood disorders represent a very low proportion (less than <4%) of yearly consultations at facilities across Sofala province (19). Perhaps the apparent differences in these findings are due to the fact that individuals receiving treatment for depression in our study may not be consulting formal psychiatry. It would not be surprising for

individuals to seek community resources over clinical care, especially in settings where the formal mental health system is nascent and focusing primarily on severe mental illness (49).

Our findings that over 70% of individuals with depressive symptoms and/or suicidal ideation did not seek any allopathic or non-allopathic mental healthcare highlights the urgent need for community-level implementation science to close the mental health treatment gap in Mozambique. Multifaceted and multi-level implementation approaches are needed, including improving community-level screening for common mood disorders, the integration of mental healthcare within the primary care system, and stigma reduction.

Factors Associated with Depressive Symptoms and Suicidal Ideation

The socio-demographic factors associated with depressive symptoms and/or suicidal ideation were mostly consistent with previous literature, and included female gender, being unmarried, and older age individuals (7,21–24). Epidemiologic research indicates that being female is associated with a twofold increased risk of a lifetime diagnosis of major depressive disorder, as well as an increased risk of suicidal ideation (7,22,31,50). We found similar patterns in our study – although our study found a female to male ratio of 1.4:1 for depressive symptoms and 1.5:1 for suicidal ideation.

Our study was also in line with previous research showing that low levels of social support, caused by being single, divorced, or widowed, can result in social isolation and increased potential for development of suicidal ideation or depression (21,29). Widowhood and divorce are well recognized as stressful life events that precipitate depression or suicidal ideation. Our associations with widowhood and divorce were predominately driven by women; in stratified analyses, associations between marital status and depressive symptoms and suicidal

ideation were much stronger among women than men (See Appendix Table 3 for results stratified by gender). These findings suggest that the social consequences of divorce and widowhood may have larger effects for females compared to males in Central Mozambique. Last, these findings are consistent with the limited research in LMICs that has suggested an increasing prevalence of depression with age (23,24), and that old age is a risk factor for suicide deaths (27).

Both self-reported depressive symptoms and suicidal ideation were strongly associated with a history of injury and injury by assault in the past year. In our study population, 10% of respondents experienced any injury in the past year, of which 14% were injuries by assault. There is limited research in LMICs on the relationship between injury and depression or suicidal ideation. However, substantial evidence in HICs demonstrates a strong relationship between traumatic physical injury and subsequent depression and/or suicidal ideation (51,52). Recovery from physical trauma is emotionally challenging, and can have many impacts on health and well-being, including employment and ability to carry out general physical activities (53). These physical and emotional consequences of trauma can significantly impact the mental health of individuals. This process of recovering from physical trauma may be particularly difficult in low-resource settings like Central Mozambique where a loss of employment or persistent disability could result in catastrophic difficulties for maintaining household income.

Coinciding with the downstream impact of injuries on mental health, higher overall disability scores were significantly associated with lifetime suicidal ideation and self-reported depressive symptoms. These results concur with the published literature that adults with disability have a significantly higher incidence of depression than the general population (54,55). Given the cross-sectional nature of this study, it is not possible to disentangle whether depressive

symptoms and suicidal ideation preceded disability, or if disability preceded suicidal ideation and depressive symptoms. Regardless, the strong association between depressive symptoms and disability suggests the face validity of our question to represent some measure of clinically-important depressive symptomatology, and suggests there is a large number of individuals with depression-related function impairment who may benefit from clinical treatment interventions.

Our finding that lower SES was associated with lower levels of self-reported depressive symptoms and that higher quintiles of SES was significantly associated with suicidal ideation bears additional discussion. Given that low SES populations experience more adverse living circumstances than their counterparts, this subpopulation tends to have higher rates of depressive symptoms and suicidal ideation. Our observation is contrary to most of the published literature, which predominantly finds an inverse relationship between increasing levels of SES and common mental disorders (56,57). For example, a systematic review of 115 studies in LMICs found that only 8% of the community-based studies reported a negative association between levels of poverty and common mental disorders (56).

Our observed association between SES and depressive symptoms and suicidal ideation may be attributed to our measurement of SES. We used Principle Component Analysis, and then disaggregated the study population into five wealth quintiles. Given the high rates of poverty in Sofala and Manica provinces, it is possible that the majority of our study sample is poor. Therefore, individuals in the higher wealth quintile may represent the 'working poor' who feasibly experience heightened distress, as they are busy maintaining regular employment, but remain in relative poverty, potentially unable to save money or support their families.

In comparison to abstainers, alcohol consumption led to elevated levels of depressive symptoms and suicidal ideation. These associations were especially strong for suicidal ideation,

where both minimal alcohol consumption and significant alcohol consumption were statistically significant. We found 46% increased odds of suicidal ideation associated with minimal alcohol consumption compared to no alcohol consumption, and 156% increased odds of suicidal ideation associated with significant alcohol consumption compared to no alcohol consumption. These findings concur with previous research, which indicates that excessive alcohol consumption and depression commonly co-occur and that alcohol misuse predisposes to suicidal behavior (58–60), though we are not able to determine from our data whether alcohol consumption predated mental health symptoms. When stratified by gender, females generally had stronger associations between alcohol consumption and depressive symptoms or suicidal ideation than men (See Appendix Table 3 for results stratified by gender).

Factors Associated with Mental Health Care-seeking

In the present study, we found that being female was significantly associated with mental health care-seeking. This appears to coincide with the literature, which states that women are generally more likely to seek care for depression than males (61). We also found that older age groups (46-55 years and +56 years) had increased odds of mental health care-seeking. These findings also coincide with the literature, which has found middle-aged persons more likely to seek help for depression than other age groups (61). However, this research is primarily from HICs and may not be representative of LMIC settings.

Contrary to initial hypotheses, rural residents were significantly more likely to seek care for mental health than urban residents. This association was also significant among the subset of respondents who reported depressive symptoms and/or suicidal ideation. Given the shortage of mental health professionals in Mozambique and that psychiatric technicians are predominately

located at district-level health facilities, it is counterintuitive that rural residents were more likely to seek mental health care. This finding can be explained by the fact that our care-seeking question did not specify if this care was allopathic, non-allopathic, or another informal care provider. It is likely that many individuals reporting mental health care-seeking utilized non-allopathic community providers, given previous work in Haiti and Nigeria where a majority of community members reported they would use community resources over allopathic clinical care if suffering from mental distress (49,62,63). Furthermore, this association could also be partially attributed to the fact that rural residents were considerably more likely to have a mental health problem, with 72% of all reported mental health problems from rural respondents.

Lastly, respondents with lower SES (1st and 2nd quintiles) were significantly less likely to seek care for mental health. These findings coincide with the literature, which states that socio-economic status is one of the most significant determinants of health-seeking behavior (64,65). Low SES populations have less money available to pay for health care, including medical expenses and transport to health facilities. Consequently, these financial barriers inhibit low SES populations from accessing health care, including mental health services.

Study Limitations

This study has a number of important limitations. First, as a cross-sectional community household survey, only associations can be inferred between explanatory and outcome variables; we cannot infer the temporal direction between these associations. Second, as mentioned previously, the depressive symptoms outcome variable was a single non-validated survey question that cannot be interpreted as a clinical diagnosis of depression. We recognize this question lacks specificity, but believe it is highly sensitive and able to capture a general

understanding of depressive symptoms in the study population. Third, several subdistricts of Sofala and Manica provinces were excluded from data collection due to ongoing violent civil conflict. Unfortunately, the exclusion of these subdistricts negatively impacts the representativeness of our sampling frame. It is important to also mention a few strengths of this study, namely, this study is the first community-level assessment of depressive symptoms, suicidal ideation, and mental health care-seeking in Mozambique. It includes a relatively large sample and relied on an up-to-date sampling frame that used satellite imagery to enumerate households.

Conclusions

There is a high prevalence of depressive symptoms (19%) and suicidal ideation (16%) in Central Mozambique. Treatment gaps exceed 70% for those suffering from these common mental health conditions. Urgent investments are needed to develop community-based approaches to scale-up access to care and treatment for common mental disorders, such as community-level screening and integration of mental health services within the primary care system. There were substantial similarities between our findings and research in LMICs regarding factors associated with depressive symptoms and suicidal ideation, including women, rural residents, older individuals, low education individuals, and unmarried individuals. Limited resources in LMICs should be targeted towards these populations. Additionally, suicide prevention efforts across LMICs need significant funding given the estimated high prevalence of individuals with current or last-month suicidal ideation.

Notes

Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical Approval and Consent to Participate

The study was approved by the Institutional Bio-Ethics Committee of the National Institute of Health in Mozambique. All survey respondents provided written informed consent. In cases where participant could not read or write, he or she provided a thumbprint.

APPENDIX.

Table 1. Prevalence of Mental Health Care-seeking among 3080 individuals completing a representative household survey in Sofala and Manica provinces, 2016

Description	N	Total	Percentage
Proportion of respondents who sought care for mental health (yes/no) out of total number of respondents	303	3080	9.8%
Proportion of respondents who sought care for mental health (yes/no) out of total number of respondents who identified a mental health problem	303	962	31.5%
Proportion of respondents who sought care for mental health (yes/no) out of total number of respondents who identified depressive symptoms or suicidal ideation	237	896	26.5%
Proportion of respondents who sought care for depressive symptoms out of total number of respondents who sought care	260	303	85.8%
Proportion of respondents who sought care for suicidal ideation out of total number of respondents who sought care	19	303	6.27%
Proportion of respondents who were treated for mental health (yes/no) out of total number of respondents	265	3080	8.6%
Proportion of respondents who were treated for depression (yes/no) out of total number of respondents who identified period of sadness or loss of energy that lasted more than 2 weeks.	194	591	32.8%
Proportion of respondents who were treated for suicidal ideation (yes/no) out of total number of respondents who identified thoughts of suicide or self-harm in the last month.	19	181	10.5%

Table 2. Mental Health Care-seeking: Multivariable analyses of individuals completing a representative household survey in Sofala and Manica provinces, 2016

	Care-seeking among Depressive Symptoms and Suicidal Ideation		Care-seeking among Depressive Symptoms Only		Care-seeking among Suicidal Ideation Only	
	aOR	p-value	aOR	p-value	aOR	p-value
Sex[1]						
Male	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Female	1.07 (0.75 - 1.52)	0.710	1.12 (0.74 - 1.69)	0.586	1.07 (0.63 - 1.83)	0.798
Urban or Rural[2]						
Urban	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Rural	1.78 (1.13 - 2.79)	0.012	1.38 (0.84 - 2.27)	0.204	2.01 (0.99 - 4.07)	0.054
Level of School[3]						
No School	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Basic	0.96 (0.64 - 1.46)	0.858	1.00 (0.62 - 1.61)	0.99	0.72 (0.41 - 1.27)	0.256
Higher	0.75 (0.44 - 1.28)	0.288	0.71 (0.39 - 1.31)	0.271	0.65 (0.29 - 1.42)	0.279

Age[4]						
26-35	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
18-25	1.04 (0.67 - 1.63)	0.856	1.10 (0.66 - 1.83)	0.717	1.21 (0.61 - 2.41)	0.583
36-45	1.21 (0.78 - 1.87)	0.396	1.36 (0.82 - 2.24)	0.229	1.35 (0.72 - 2.54)	0.356
46-55	1.31 (0.78 - 2.22)	0.313	1.66 (0.91 - 3.00)	0.097	1.13 (0.52 - 2.42)	0.760
>56	1.18 (0.74 - 1.89)	0.489	1.22 (0.72 - 2.05)	0.461	0.94 (0.42 - 2.07)	0.872
Marital Status[6]						
Married	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Divorced/Separated	1.51 (0.87 - 2.63)	0.145	1.27 (0.65 - 2.47)	0.482	2.37 (1.11 - 5.06)	0.025
Widowed	0.72 (0.41 - 1.28)	0.265	0.64 (0.34 - 1.20)	0.162	1.20 (0.53 - 2.72)	0.654
Single	0.83 (0.26 - 2.62)	0.754	0.95 (0.27 - 3.29)	0.932	1.28 (0.24 - 6.86)	0.771
Religion[6]						
Pentecostal	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Catholic	0.92 (0.55 - 1.52)	0.732	0.59 (0.33 - 1.04)	0.067	2.06 (0.95 - 4.47)	0.068
Muslim	0.63 (0.13 - 3.04)	0.564	0.57 (0.11 - 2.99)	0.503	2.18 (0.20 - 23.84)	0.523
Zione	1.21 (0.76 - 1.94)	0.426	1.00 (0.58 - 1.72)	0.998	1.75 (0.90 - 3.40)	0.102
Anglican	0.55 (0.12 - 2.63)	0.456	0.48 (0.10 - 2.39)	0.37	1.31 (0.12 - 14.63)	0.827
Johan Masowe/ Johan Maranga	0.72 (0.14 - 3.71)	0.698	N/A	N/A	2.33 (0.40 - 13.69)	0.348
No religion	0.66 (0.39 - 1.12)	0.128	0.75 (0.41 - 1.38)	0.355	0.85 (0.40 - 1.82)	0.682
Other Christian	1.12 (0.46 - 2.72)	0.801	1.38 (0.47 - 4.06)	0.558	1.65 (0.53 - 5.14)	0.39
Not sure	N/A	N/A	N/A	N/A	N/A	N/A
Other	0.76 (0.33 - 1.77)	0.522	0.70 (0.28 - 1.76)	0.446	0.65 (0.13 - 3.13)	0.59
SES[5]						
5th quintile	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
1st quintile	0.56 (0.29 - 1.08)	0.083	0.70 (0.34 - 1.44)	0.328	0.53 (0.20 - 1.42)	0.209
2nd quintile	0.55 (0.29 - 1.04)	0.067	0.57 (0.28 - 1.17)	0.125	0.58 (0.22 - 1.53)	0.272
3rd quintile	0.76 (0.42 - 1.36)	0.349	0.87 (0.45 - 1.68)	0.682	0.42 (0.16 - 1.08)	0.071
4th quintile	1.03 (0.61 - 1.72)	0.923	1.13 (0.63 - 2.03)	0.682	0.93 (0.42 - 2.04)	0.847
Alcohol[6]						
Never	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Once a month or less	0.62 (0.37 - 1.05)	0.078	0.66 (0.37 - 1.20)	0.174	0.48 (0.21 - 1.07)	0.074
2-4x per month	1.08 (0.55 - 2.12)	0.822	1.50 (0.68 - 3.31)	0.318	1.03 (0.38 - 2.82)	0.953
2-4x per week	0.78 (0.32 - 1.92)	0.595	0.79 (0.31 - 2.03)	0.625	1.46 (0.56 - 4.70)	0.522
4 or more per week	1.31 (0.38 - 4.57)	0.671	2.83 (0.45 - 17.64)	0.265	1.43 (0.26 - 7.71)	0.678
Overall disability[6]						
<= 12	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
13 - 24	1.23 (0.86 - 1.75)	0.264	1.29 (0.86 - 1.92)	0.216	1.57 (0.89 - 2.77)	0.121
25 - 36	1.19 (0.58 - 2.44)	0.632	1.53 (0.63 - 3.70)	0.346	1.18 (0.42 - 3.34)	0.752
>= 37	1.02 (0.41 - 2.54)	0.968	0.73 (0.27 - 2.03)	0.551	0.57 (0.07 - 4.27)	0.581
Epilepsy[6]						
No epilepsy	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Epilepsy	1.51 (0.81 - 2.81)	0.192	1.06 (0.55 - 2.07)	0.856	0.78 (0.26 - 2.40)	0.671
Any Injury[6]						

No injury	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Injury	1.17 (0.75 - 1.83)	0.476	1.35 (0.82 - 2.22)	0.245	0.92 (0.48 - 1.78)	0.805
Assault Injury[6]						
No assault injury	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Assault injury	0.76 (0.24 - 2.39)	0.644	0.76 (0.19 - 3.03)	0.696	0.89 (0.17 - 4.58)	0.891

[1] Adjusted for age, SES, education, residence
[2] Adjusted for age, SES, education, sex
[3] Adjusted for SES, sex, residence
[4] Adjusted for SES, residence
[5] Adjusted for age, sex, education, residence
[6] Adjusted for age, sex, education, SES, residence

Table 3. Multivariable analyses of individuals completing a representative household survey in Sofala and Manica provinces, 2016 stratified by gender

	Depressive Symptoms		Suicidal Ideation		Mental Health Care-seeking	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Marital Status[1]						
Female						
Married	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Divorced/Separated	1.96 (1.32 - 2.92)	0.001	1.74 (1.15 - 2.62)	0.008	1.93 (1.17 - 3.18)	0.010
Widowed	2.33 (1.55 - 3.50)	0.000	1.54 (1.02 - 2.33)	0.040	1.17 (0.67 - 2.06)	0.576
Single	1.85 (0.88 - 3.88)	0.106	1.30 (0.55 - 3.10)	0.549	0.77 (0.23 - 2.62)	0.680
Male						
Married	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Divorced/Separated	1.12 (0.31 - 3.94)	0.876	1.82 (0.52 - 6.41)	0.353	1.58 (0.35 - 7.20)	0.551
Widowed	0.42 (0.05 - 3.67)	0.435	0.72 (0.09 - 5.67)	0.759	0.95 (0.12 - 7.73)	0.962
Single	0.87 (0.29 - 2.63)	0.806	0.54 (0.13 - 2.37)	0.418	2.03 (0.57 - 7.22)	0.272
Alcohol[1]						
Female						
Never	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Once a month or less	1.74 (1.15 - 2.64)	0.009	1.63 (1.06 - 2.51)	0.025	0.90 (0.50 - 1.62)	0.733
2-4x per month	2.35 (1.15 - 4.80)	0.019	2.07 (0.99 - 4.32)	0.053	1.14 (0.42 - 3.12)	0.792
2-4x per week	2.50 (1.04 - 6.02)	0.040	0.57 (0.16 - 1.99)	0.377	0.66 (0.15 - 3.00)	0.590
4 or more per week	0.68 (0.15 - 3.16)	0.627	3.34 (1.00 - 11.17)	0.050	1.31 (0.27 - 6.32)	0.737
Male						
Never	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Once a month or less	1.05 (0.67 - 1.65)	0.820	1.40 (0.86 - 2.29)	0.175	1.42 (0.78 - 2.56)	0.248
2-4x per month	0.90 (0.52 - 1.56)	0.705	1.27 (0.69 - 2.31)	0.442	2.05 (1.09 - 3.88)	0.027
2-4x per week	1.62 (0.89 - 2.96)	0.117	2.55 (1.37 - 4.75)	0.003	1.25 (0.53 - 2.94)	0.612
4 or more per week	0.97 (0.29 - 3.25)	0.965	2.03 (0.65 - 6.35)	0.223	2.61 (0.74 - 9.20)	0.137

[1] Adjusted for age, sex, education, SES, residence

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