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Food insecurity, mental distress and suicidal ideation in rural Africa: Evidence from Nigeria, Uganda and Ghana

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Abstract

Background: In sub-Saharan Africa, mental and substance-related disorders account for 19% of all years lived with disability, yet the intersection between poverty and mental distress is poorly understood since most psychiatric research is conducted in high-income countries.

Aims: To examine the prevalence of and associations between food insecurity, mental distress and suicidal ideation in three rural village clusters in sub-Saharan Africa.

Method: Cross-sectional multivariate analysis of sociodemographic variables associated with mental distress and suicidal ideation in three countries. The sample included 1,142 individuals from three rural village clusters in Nigeria ($n = 380$), Uganda ($n = 380$) and Ghana ($n = 382$). Food insecurity was measured based on the number of months in the previous year that the respondent's family reported being 'unable to eat two square meals per day'. Mental distress was assessed using the Kessler non-specific psychological distress scale (K6) and suicidal ideation was measured using an item from PRIME-MD. Other sociodemographic variables included gender, age, literacy and occupation.

Results: The prevalence of individuals with moderate or severe mental distress in Nigeria, Uganda and Ghana were higher than previously reported in the literature: 35.5%, 30.8% and 30.4%, respectively, and suicidal ideation rates were 29.7%, 21.3% and 10.9%. No differences were observed in mental distress between men and women in any of the sites. Being a farmer (vs student or other) was protective for mental distress in two sites (Uganda and Ghana) but no other social indicators, such as age, gender, literacy and food insecurity, were significantly associated

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with mental distress. Risk for suicidal ideation differed across sites: it was associated with food insecurity in Nigeria, female gender in Uganda, and older age in Uganda.

Conclusions: Mental distress and suicidal ideation were highly prevalent in three settings of extreme poverty across all groups, in ways that were not always consistent with the global literature. These findings suggest that more research is needed in to better understand the social etiology of mental distress in sub-Saharan Africa.

Keywords

Common mental disorders; LMICs; mental health; poverty; social determinants; sub-Saharan Africa

Introduction

Nearly, a third of all years lived with disability (YLD) can be attributed to mental disorders (Vigo, Thornicroft, & Atun, 2016). In sub-Saharan Africa, mental and substance use disorders account for 19% of all YLDs (Whiteford et al., 2013). Despite this, fewer than 15% of people in low-income countries with common mental disorders receive treatment (Anthes, 2016). Whereas there is an estimated 52.3 mental health providers per 100,000 in high-income countries, in Africa, this ratio is only 1.4 per 100,000 population (World Health Organization [WHO], 2015a). When treatment is provided in low-income settings, it is often below minimum standards due to a combination of stigma, low mental health literacy and limited services available. Furthermore, individuals with mental illness are frequently subjected to significant human rights abuses (WHO, 2016b). The two most common types of mental illness globally are depressive and anxiety disorders (Vigo et al., 2016). Because of the high comorbidity between depressive and anxiety symptoms (Lamers et al., 2011), in the present study, we examined them concurrently, employing the broader construct of mental distress, an often-utilized proxy for common mental disorders. Such an approach is additionally consonant with concerns that conceptual equivalence of discrete mental illnesses may not translate between cultures (Kleinman, 1987; Patel, 1998; Sweetland, Belkin, & Verdelli, 2014).

Little is known about mental distress in Sub-Saharan Africa since the majority of existing evidence comes from high-income countries. A recent review and meta-analysis of the global prevalence of common mental disorders found only eight studies from five African countries that met the inclusion criteria of (1) having been conducted among national or regional general population samples, (2) using clinical diagnostic interviews and (3) published between 1980 and 2013 (Steel et al., 2014). According to this meta-analysis, which included 174 prevalence studies from 63 countries, approximately 17.6% of individuals among the eight studies conducted in five sub-Saharan African countries met criteria for a mood, anxiety and/or substance use disorder during the previous 12 months and the pooled prevalence was 12.4% (Steel et al., 2014). This review indicates that prevalence can vary widely between settings, which could either reflect true variation or issues of measurement, such as cultural differences in reporting (Sweetland, Belkin, & Verdelli, 2014). In the World Mental Health Survey Initiative, 12-month prevalence of mood disorders in 18

countries ranged from 1.1% to 9.7%; for anxiety disorders, the range was from 3.0% to 19.0% (Kessler et al., 2009).

Even less is known about suicidal ideation, attempts, or completion rates in Sub-Saharan Africa. Suicide is the second leading cause of death among 15- to 29-year-olds worldwide, three-quarters of which are estimated to occur in low- and middle-income countries (LMIC) (WHO, 2015b). Global suicide rates also vary widely: from 0.4 to 44.2 per 100,000, with a global average of 11.4 per 100,000 (WHO, 2014). Men are twice as likely to die by suicide than women (WHO, 2014), while women may be more likely to have suicidal ideation, plans and attempts (Nock et al., 2008). Data from high-income countries (HICs) suggest greater risk for rural populations, possible risk factors include less access to mental health care (WHO, 2015a), socioeconomic decline and stigmatization of mental illness (Hirsch, 2006). Though a recent review of suicidal behavior in Africa estimated a low incidence of 3.2 per 100,000 population, this is likely a significant underestimation (Mars, Burrows, Hjelmeland, & Gunnell, 2014). According to the review, fewer than a third of African countries had reported regional or national suicide incidence data. Furthermore, a majority of the reported data was derived from hospital records, which may not be a reliable data source, especially in settings where much of the population has little or no access to the health care system. Social and cultural factors may have also contributed to underreporting, particularly in settings where suicidal behavior is illegal. According to 2012 WHO (2014) data, age-standardized suicide rates per 100,000 in the 3 countries included in this study – Ghana, Nigeria and Uganda – were 3.1, 6.5 and 19.5, respectively. Given that suicidal behavior is often preceded by suicidal ideation, more data about ideation in sub-Saharan Africa are needed.

The lack of evidence on mental health from Africa, home to many of the worlds' lowest income countries, occurs despite growing interest in the mutually reinforcing relationship between poverty and mental disorders (WHO, 2007). Poverty increases risk for psychiatric disorders and distress, and the associated disability (e.g., not being able to work) may further exacerbate poverty in a vicious cycle (WHO, 2007). On the other hand, positive mental health is associated with better productivity and earnings, employment, educational achievement, health and quality of life (WHO, 2010). A review including 115 studies conducted in LMIC found that approximately three-quarters of the studies showed positive associations between poverty and depressive, anxious and somatoform symptoms, though some indicators of poverty exhibited a stronger relationship with these symptoms, inviting conclusions that a more precise examination of poverty indicators is warranted (Lund et al., 2010).

Food insecurity, defined as inadequate access to safe and nutritious food (WHO, 2017), has emerged as a poverty indicator of interest. Often cited for its adverse effect on health, a recent review of measures used to assess various dimensions of poverty found this indicator to have a strong and consistent association with common mental disorders (Lund et al., 2010). Indeed, positive associations between food insecurity and suicidal ideation are documented in HIV/AIDS patients in Uganda, postnatal mothers' mental distress levels in Nepal and South Africa, and mental distress in a rural population in Zambia (Clarke et al., 2014; Cole & Tembo, 2011; Dewing, Tomlinson, le Roux, Chopra, & Tsai, 2013; Kinyanda,

Hoskins, Nakku, Nawaz, & Patel, 2012). Explanations for this consistent relationship are both biological and social. For instance, qualitative data from Ethiopia have elucidated how food is an integral part of social ceremonies (e.g. funerals and hosting others), leading to stigma and feelings of shame when unable to entertain or participate in these events (Hadley, Stevenson, Tadesse, & Belachew, 2012). Participants in Burkina Faso have described feeling alienated from others and decreased household cohesion due to difficulties accessing food (Nanama & Frongillo, 2012). At a biological level, undernutrition can also contribute to or exacerbate depressive symptoms (Rao, Asha, Ramesh, & Rao, 2008). In non-human primates, adolescents with mothers who have experienced food insecurity exhibited reduced behavioral responsiveness to novel, stressful situations. However, there were no differences between non-human primate mothers who had and had not experienced food insecurity, suggesting that the effects of experiencing food insecurity may lessen with age, but re-emerge inter-generationally (Kinnally et al., 2013). Despite emerging research, the relationship between experiencing food insecurity and mental distress remains understudied (Compton, 2014). Even fewer studies have documented the relationship between food insecurity with suicidal ideation in a non-clinical population, particularly in Sub-Saharan Africa, which bears a disproportionate amount of malnourished and inadequately fed people due to low economic development and poor infrastructure (The Economist Intelligence Unit, 2014).

The purpose of this study was to examine the prevalence of and associations between food insecurity with mental distress and suicidal ideation in three settings of extreme poverty in rural Africa. The study uses 2006 baseline data from three village clusters of the Millennium Villages Project (MVP), an integrated, community-led, rural development program administered by the Earth Institute at Columbia University and Millennium Promise (MVP, 2016). The sites include Ruhira, in Southwestern Uganda, Pampaida in the Northern state of Kaduna in Nigeria and Bonsaaso in the Amansie-West district of the Ashanti region. MVP sites were purposively selected for the integrated rural-development program to represent distinct agro-agricultural zones and as settings of extreme poverty, defined as having a minimum of 20% of children malnourished. At the time of data collection, an estimated 60%–90% of residents in these village clusters earned less than \$1/day (MVP, 2016). Access to potable water in the Nigerian, Ugandan and Ghanaian sites, respectively, was 0% (compared to 59% nationally), 9% (compared to 66% nationally) and 41% (compared to 86% nationally) (MVP, 2016; The World Bank, 2016).

Methods

Sampling

A random group of 300 households were selected from each village cluster, from which 190 men and 190 women were selected for individual interviews.

Measures

Mental distress was assessed using the Kessler-6 (K6) non-specific psychological distress scale (Kessler et al., 2002) which consists of six items that ask individuals about symptoms associated with depression and/or anxiety. In HICs, this brief scale has demonstrated a high

predictive ability to identify probable cases of mental disorders, since evidence suggests that individuals with a range of mental conditions tend to load high on non-specific mental distress (Dohrenwend, Shrout, Ergi, & Mendelsohn, 1980). Questions include the following: ‘during the past 30 days, about how often did you feel ... 1) nervous?, 2) hopeless?, 3) restless or fidgety?, 4) so depressed that nothing could cheer you up?, 5) that everything was an effort?, and 6) worthless?’ Response options included a 5-point Likert-type scale ranging from ‘none of the time’ to ‘all of the time’. The sum of these six items was used to calculate an overall distress score ranging from 0 to 24. The K6 scale for non-specific psychological distress has been used in sub-Saharan Africa demonstrating moderate psychometric properties (Andersen et al., 2011).

Suicidal ideation was measured using an item from PRIME-MD (Spitzer, Kroenke, & Williams, 1999): ‘do you have thoughts that it would be better if you were dead or of hurting yourself?’ Responses were recorded on a 5-point Likert-type scale ranging from ‘none of the time’ to ‘all of the time’ and were dichotomized in our analyses to represent the presence or absence of any suicidal thoughts. Food insecurity along with several sociodemographic variables (gender, age, literacy and occupation) were included in the analyses. Food insecurity was measured based on the number of months in the previous year that the respondent’s family reported being ‘unable to eat two square meals per day’. Literacy was assessed by the affirmative response to two questions asked to the head of household: ‘can [name] read in any language’ and ‘can [name] write in any language?’ A negative response to either of these questions was considered ‘not literate’. Occupation was classified into three groups: farmer, student or ‘other’.

Statistical methods

In the absence of pre-established cut-off scores for these settings, we used the cut off scores suggested by Kessler et al. (2010) including four categories corresponding to no or mild symptoms (K6 = 0–7) and moderate or severe symptoms (K6 = 8 or higher). Two logistic regressions were performed using Mplus 7.4 (Muthen & Muthen, 2012) to test the association of mental health distress and suicidal ideation with social covariates. First, we imputed missing data using the Markov Chain Monte Carlo method. We used Weighted Least Square Mean and Variance adjusted (WLSMV) as the default estimator for binary variables. The estimates are probit coefficients which express the change in the outcome for a unit increase in the predictor. Internal reliability of the instrument was tested using ordinal alpha, which, compared to Cronbach’s alpha, produces more accurate estimation when Likert-type rating scales are analyzed (Zumbo, Gadermann, & Zeisser, 2007).

Results

Socio-demographic characteristics

The final sample included 1,142 individuals from three rural village clusters in Nigeria ($n = 380$), Uganda ($n = 380$) and Ghana ($n = 382$). The sociodemographic characteristics of each sample are included in Table 1. Though relatively balanced with regard to gender, the Uganda sample was significantly younger than Nigeria and Ghana, with 70.8% under the age of 34 and only one individual over the age of 50. This finding is not surprising given that

Uganda has the youngest population globally with almost 80% of its population being under age 30 and over 50% of its population being under age 15 (Population Secretariat, 2012). Literacy was higher in Ghana and Uganda (56.5% and 73.7%, respectively) than in Nigeria (17.4%). The majority of all samples was comprised of farmers though a slightly larger proportion of Nigerians fell into the 'other' category. The average number of months of food insecurity in the previous year in Nigeria, Uganda and Ghana were 0.48, 1.80 and 0.75, respectively.

Mental health outcomes

The prevalence of individuals with moderate or severe mental distress in Nigeria, Uganda and Ghana was 35.5%, 30.8% and 30.4%, respectively (see Table 2). The corresponding suicidal ideation rates were 29.7%, 21.3% and 9.7% (see Table 2). No differences were observed in mental distress between men and women in any of the sites; however, in Uganda, women had greater risk for suicidal thoughts ($\beta = 0.774, p < .001$) (see Table 3). In both Uganda and Ghana, being a farmer (versus student or other) was protective for mental distress ($\beta = -0.518, p < .05$ and $\beta = -0.862, p < .05$, respectively). No other social indicators, such as age, gender, literacy, occupation and food insecurity, were significantly associated with mental distress. K6 mental distress scores were significantly associated with suicidal ideation in all countries (Nigeria $\beta = 0.731, p < .001$; Uganda $\beta = 0.584, p < .001$; and Ghana $\beta = 0.350, p < .001$). The only risk factor for suicidal ideation in Nigeria was food insecurity ($\beta = -0.255, p < .05$), and in Ghana suicidal thoughts were associated with older age ($\beta = 0.218, p < .05$).

Discussion

Given the dearth of evidence examining the social risk factors associated with mental distress and suicidal ideation in sub-Saharan Africa, this study fills an important gap in the literature. Mental distress and suicidal ideation were very high in all three sites, but sociodemographic risk factors were not consistent with those often reported in the literature. Mental distress was double the rate previously found in a population-based study in Zambia (14.1%) (Chipimo & Fylkesnes, 2009) or among working adults in Ethiopia (17.7%) (Gelaye et al., 2012), but lower than rates found in three subpopulations in Ethiopia: university students (40.9%) (Dachew, Azale Bisetegn, & Berhe Gebremariam, 2015), Leprosy outpatients (52.4%) (Leekassa, Bizuneh, & Alem, 2004) and caregivers of people with severe mental illness (56.7%) (Sintayehu, Mulat, Yohannis, Adera, & Fekade, 2015). Rates were similar to a sample of tuberculosis patients (32.9%) and higher than for hospital outpatients (17.1%) in South Africa (Peltzer, Naidoo, et al., 2012; Peltzer, Pengpid, & Skaal, 2012).

Suicidal ideation was significantly higher than that shown in previous studies conducted in Nigeria and Uganda, and to our knowledge, this is the first study to assess suicidal ideation in Ghana. Nearly one third of Nigerians (29.7%) endorsed suicidal thoughts, nearly four times higher than rates observed in a recent population survey in Lagos state (7.3%) (Adewuya et al., 2016) almost 10 times higher than the 3.2% lifetime prevalence found among a nationally representative population study through the World Mental Health Survey

(Gureje et al., 2007). In Uganda, roughly one fifth (21.3%) reported suicidal ideation, which was consistent with the 20.5% of individuals in two districts of Northern Uganda (Ovuga, Boardman, & Wasserman, 2005) and higher than the 7.8% 'moderate to high risk for suicidality' observed among HIV outpatients in central Uganda (Kinyanda et al., 2012).

Interestingly, food insecurity was not associated with greater mental distress in any of the sites. This finding contrasts with several studies in the United States, Canada and France that found food insecurity to be associated with mental distress (Liu, Njai, Greenlund, Chapman, & Croft, 2014), suicidal ideation (Davison, Marshall-Fabien, & Tecson, 2015), and depression and suicidal ideation (Pryor et al., 2016), respectively. Two studies in Ethiopia also found greater mental distress among pregnant women in households experiencing food insecurity (Jebena et al., 2015) and higher symptoms of anxiety and depression among a random selection of adults with food insecurity (Hadley et al., 2008). Food insecurity was, however, a risk factor for suicidal ideation in Nigeria, consistent with findings from other settings (Davison et al., 2015; Dewing et al., 2013; Pryor et al., 2016). However, the relation between food insecurity and suicidal ideation was not observed in the other two sites. It could be that contextual circumstances and expectations regarding food insecurity play an important role on whether and how food insecurity impacts mental health. In Zambia, for instance, people experienced higher mental distress when faced with food shortages during the dry season, a time not typically characterized by problems accessing food (Cole & Tembo, 2011).

Several other expected differences were not observed in our sample. For example, although globally demographic distributions demonstrate that women tend to have greater risk for depression and anxiety, whereas men have greater risk for substance addiction and antisocial disorders (WHO, 2016a), no gender differences were observed in relation to mental distress in any site. Also, although elderly Nigerians in the World Mental Health Survey Initiative had greater risk for major depressive disorder, no differences by age were observed in our samples. These associations were observed with regard to suicidal ideation in one setting: women and older individuals had greater risk for suicidal ideation in Uganda. Being a farmer (versus student or other) was protective for mental distress in Uganda and Ghana.

There are several limitations to this study. First, as a cross-sectional assessment, it is not possible to establish causality. Second, because the targeted population was poor and rural, the sample was not representative of the general population. Third, since the socioeconomic survey (which was conducted at the household level) and health survey (done at the individual level) were not always conducted in the same households, there is some missing sociodemographic data. Given that the item used to assess suicidal ideation was a broad double-barreled question evaluating on the one hand passive thoughts of suicide ('it would be better if you were dead') or non-lethal self-harm ('... or of hurting yourself), and not directly whether the person had the explicit intent to kill him or herself may have distorted the reporting of this symptom. Finally, while the data are somewhat outdated, they still have value given the scarcity of research in this area.

The MVP sites, selected as contexts of extreme poverty relative to the LMIC settings they were in, showed high levels of measured distress and suicidality. These issues were not

addressed as part of the MVP package of interventions which focused more on closing agricultural, educational and economic productivity and key physical health (infectious disease and maternal-infant health) gaps. While this study confirmed the burden of mental distress in poor, rural areas in sub-Saharan Africa to be high, the lack of associations between sociodemographic variables and food insecurity with mental distress indicates that the mechanisms through which poverty and mental distress reinforce one another remain unclear, an important area for future research. For instance, though it is commonly believed that addressing poverty will necessarily improve mental health, in fact, more consistent evidence suggests that the opposite is true: treating mental disorders is associated with socioeconomic improvement (Lund et al., 2010).

Following the incorporation of mental health in the 2030 United Nations' Sustainable Development Goals, in April 2016, the WHO, World Bank and the US National Institute of Mental Health hosted a joint high-level meeting to make mental health a global development priority (The World Bank & WHO, 2016). In this meeting, the World Bank recognized that, 'each dollar invested in easily scalable mental health treatment and services for depression and anxiety returns about US\$4 in improved health and ability to work' (The World Bank & WHO, 2016). Integrated research platforms and data gathering efforts can establish how and in which ways incorporating mental health treatment in development programs may significantly improve both socioeconomic and health outcomes, providing a boost to further lift communities out of extreme poverty and enhance wellbeing.

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Table 1.

Population sociodemographics of Nigerian, Ugandan and Ghanaian rural villages.

	Nigeria (<i>n</i> = 380)		Uganda (<i>n</i> = 380)		Ghana (<i>n</i> = 382)	
Gender						
Male	141	37.1%	174	45.8%	182	47.6%
Female	145	38.2%	185	48.7%	195	51.0%
Missing	94	24.7%	21	5.5%	5	1.3%
Age						
13–34	200 (52.6%)		269 (70.8%)		220 (57.6%)	
35–49	93 (24.5%)		97 (25.5%)		102 (26.7%)	
50–64	58 (15.3%)		1 (0.3%)		23 (6.0%)	
>65 years	13 (3.4%)		0 (0.0%)		19 (5.0%)	
Missing	16 (4.2)		13 (3.4%)		18 (4.7%)	
Literacy						
Literate	66 (17.4%)		278 (73.7%)		216 (56.5%)	
Not literate	214 (56.3%)		72 (19.2%)		160 (41.9%)	
Missing	100 (26.3%)		27 (7.1%)		6 (1.6%)	
Occupation						
Farmer	189 (49.7%)		274 (72.1%)		293 (76.7%)	
Student	12 (3.2%)		0 (0.0%)		60 (15.7%)	
Other	83 (21.8%)		71 (18.7%)		23 (6.0%)	
Missing	96 (25.3%)		35 (9.2%)		6 (1.6%)	
Food insecurity						
Average number of months	0.48	<i>SD</i> = 0.96	1.83	<i>SD</i> = 3.19	0.75	<i>SD</i> = 1.17

Table 2.

Prevalence of mental distress suicidal ideation across sites.

	Nigeria (<i>n</i> = 380)	Uganda (<i>n</i> = 380)	Ghana (<i>n</i> = 382)
K6			
None or mild (score 0–7)	246 (64.7%)	263 (69.2%)	266 (69.6%)
Moderate or severe (score 8–24)	134 (35.3%)	117 (30.8%)	116 (30.4%)
Suicidal ideation			
No	267 (70.3%)	299 (78.7%)	303 (79.3%)
Yes	113 (29.7%)	81 (21.3%)	37 (9.7%)
Missing	0 (0%)	0 (0%)	42 (11.0%)

Table 3.

Social factors associated with mental distress.

	Nigeria		Uganda		Ghana	
	BETA	p-value	BETA	p-value	BETA	p-value
Food insecurity	0.177	0.074	0.133	0.498	-0.120	0.085
Female gender	0.184	0.387	-0.215	0.288	-0.198	0.139
Literate	-0.079	0.678	-0.410	0.220	0.152	0.301
Occupation: Farmer	-0.007	0.989	-0.518	0.017	-0.862	0.013
Occupation: Student	0.042	0.848	n/a	n/a	0.106	0.742
Age group	0.100	0.389	0.406	0.203	-0.139	0.059

K6

p<.05.