Psychological distress among a population-representative sample of residents of four slum neighborhoods in Port-au-Prince, Haiti

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Abstract

Background—Almost one billion people live in slum environments across low- and middle-income countries. Little is known about the mental health status of slum residents or its associations with living conditions.

Methods—A cross-sectional, population-representative survey was conducted among 892 adults in four slum communities in Port-au-Prince. Psychological distress was assessed with the Kessler Psychological Distress Scale (K-6). Log-binomial regression modeled the association of

sociodemographic variables, living conditions, and material hardship and severe psychological distress [SPD].

Results—Eighty-six percent of adults reported psychological distress (24% severe and 62% moderate). Reliance on an outdoor drinking water source (versus bottled water) and a pit toilet (versus a flush toilet) were marginally positively associated with SPD (adjusted prevalence ratio [aPR]=1.42, 95% confidence interval [CI]: 1.00–2.02 and aPR=1.74, 95% CI: 0.96–3.15, respectively). The prevalence of SPD was higher among women (versus men, aPR=1.66, 95% CI: 1.26–2.19), residents who had foregone healthcare to afford food (versus those who had never done so, aPR=1.60, 95% CI: 1.16–2.45), and persons who drank alcohol at least twice a week (versus monthly or less, aPR=1.73, 95% CI: 1.22–2.45).

Limitations—Data were cross-sectional and lacked information on potential risk factors such as exposure to trauma.

Conclusions—Psychological distress was highly prevalent and associated with poor living conditions. Prospective studies on the mechanisms through which slum living conditions are associated with psychological distress are needed. Research should also assess the feasibility and acceptability of different implementation strategies to increase access to mental health screening and treatment for slum residents.

Keywords

psychological distress; slum; Haiti; material hardship

Introduction

Almost one billion people live in slum environments across low- and middle-income countries (Lilford et al., 2017) and the number is estimated to reach two billion by 2030 (UN-Habitat, 2003). The physical and social environment of slums has been associated with poor physical health, including high risk of communicable diseases and risk of injury from fire, natural disasters, or crime. Little is known, however, about the mental health of individuals living in slums (Lilford et al., 2017).

Mental and substance use disorders are the leading cause of years lived with disability globally (Global Burden of Disease 2016 Collaborators, 2017). In non-slum settings, mental disorders have been associated with multiple aspects of the physical and social environment, including economic, neighborhood, environmental, and sociocultural domains (Lund et al., 2018). Research from India and Bangladesh has found poor mental health to be associated with living conditions common to slum environments, including poor sanitation and housing quality, flooding risk, population density, high water cost, and sleeping sitting up or outside (Gruebner et al., 2012; Mullick and Goodman, 2005; Subbaraman et al., 2014).

Research into the mental health of slum residents in Haiti has largely focused on the aftermath of the devastating 2010 earthquake (Cerda et al., 2013). The mental health of the general population of slum residents in Haiti has received less attention, even though 74% of Haiti's urban population is estimated to live in slum settings (The World Bank, 2017). This study examines the prevalence of psychological distress and its associations with

sociodemographic factors and living conditions in a population-representative sample of residents of four Port-au-Prince slum communities.

Methods

Setting

From July to October 2016, GHESKIO (Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections) collaborated with Cornell University, City University of New York, and University of Minnesota, on a demographic and health survey in four of these neighborhoods: Village (Cité) de Dieu, Cité Plus, Cité l'Eternel, and Martissant Littoral.

Study design

Design of this cross-sectional survey has been described in detail elsewhere (McNairy et al., 2019; Tymejczyk et al., 2018). Using cluster area random sampling, 111 geospatial waypoints were selected across the four neighborhoods based on the estimated population density of each neighborhood. At each waypoint, fieldworkers surveyed five nearest households. Two adults were randomly selected among each household's residents for an additional survey. Verbal consent was obtained from participants.

Data collection

Household surveys included questions on household composition, living conditions, and mortality. Individual surveys covered sociodemographics, healthcare utilization, and risk factors for noncommunicable diseases. Surveys were conducted in Haitian Creole.

Outcome

Psychological distress was assessed for the preceding 30-day period using the six-item Kessler Psychological Distress Scale (K-6), which screens for serious mental illness, defined as having at least one 12-month DSM disorder, other than a substance use disorder, and having serious impairment (Kessler et al., 2003). This scale, originally developed for community surveys in the United States, has since been used and validated in a variety of countries (Furukawa et al., 2008; Furukawa et al., 2003). However, to the authors' knowledge, it has not been validated in Haiti.

Scores range from 0 to 24. Scores between 0 and 4 were coded as no or low psychological distress, scores between 5 and 12 - as moderate psychological distress, and scores between 13 and 24 - as severe psychological distress (SPD) (Kessler et al., 2003). A cutoff of 13 has been shown to be predictive of serious mental illness. Moderate psychological distress, using scores between 5 and 12, has demonstrated utility in identifying a more moderate level of psychological distress which still necessitates mental health treatment and causes impairments in functioning (Prochaska et al., 2012). The K6 has been shown to have better discriminatory capacity than the General Health Questionnaire-12 in detecting DSM-IV mood and anxiety disorders, and to be correlated with the Patient Health Questionnaire-2 and the Patient Health Questionaire-9 (Furukawa et al., 2003; Staples et al., 2019; van Heyningen et al., 2018).

Covariates

Sociodemographic variables included self-reported age, sex, education (highest level of school attended: none, primary, secondary, or higher), employment status (having paid work versus not), relationship status (cohabitating or married; single; widowed, divorced, or separated, with the latter three categories combined for analysis), and whether individual spent more than a month at a time away from home in the past year.

Healthcare access—Participants were asked if they had sought health care in the past year; whether they had needed, but had not received healthcare at any point in the preceding six months; and whether they had ever gone without healthcare to afford food.

Substance use—Participants who reported smoking on some or all days were coded as current smokers. Frequency of alcohol use was reported as never, monthly or less, 2–4 times a month, 2–3 times a week, or 4 or more times a week. For analysis, categories were combined into at least twice a week, 2–4 times a month, and monthly or less.

Living conditions—Information was collected on housing tenure (ownership by a household member or not), drinking water source (tap inside the home, bottled or other treated water, shared tap outside the home, or other outside source, including rainwater), and type of toilet (shared or unshared flush or pit toilet, bucket, or another outdoor option, with open-ended answers including bag and stream). For analysis, drinking water source was classified as tap inside the home, bottled or other treated water, and outside water sources. Toilet type was categorized as flush, pit, or other outdoor toilet.

Statistical Analysis

Prevalence of SPD was calculated overall and stratified by sex. Log-binomial regression was used to assess correlates of SPD, including sociodemographic characteristics, living conditions, healthcare access, and substance use status. All variables with bivariate p-values <0.20 were included in initial multivariable models, and eliminated by backward selection until all remaining variables had p-values <0.05. A parsimonious model was favored in consideration of possible low cell counts across uncommon categories. Housing tenure, drinking water source, and type of toilet were retained in the model to examine associations between living conditions and SPD. Analyses were weighted for complex survey design and non-completion, and accounted for waypoint and household-level clustering.

Results

Of 545 randomly selected households, 525 (96.3%) participated in the household survey, and 894 of 993 (90.0%) randomly selected adults participated in the individual survey. Psychological distress data were available for 892 (99.8%) of them.

The median age among adults was 28 years old (interquartile range: 22–39), 58.4% were female, and 36.0% had no more than primary education. (Table 1) Forty percent of residents had moved to the community within the three years prior and 62.9% of ever-migrants came from elsewhere in metropolitan Port-au-Prince. Sample characteristics have been described in detail elsewhere (McNairy et al., 2019; Tymejczyk et al., 2018).

Prevalence of psychological distress

Psychological distress was present among 86.5% of adults, with 24.1% (95% confidence interval [CI]: 20.4%−27.9%) experiencing SPD and 62.4% (95% CI: 57.5%−67.4%) experiencing moderate psychological distress. Prevalence of SPD was higher among women (26.7%, 95% CI: 21.5%−31.8%) than men (20.6%, 95% CI: 14.9%−26.3%).

Factors associated with severe psychological distress

Female sex and increasing age were independently associated with higher prevalence of SPD (adjusted prevalence ratio [aPR] female versus male = 1.66, 95% CI: 1.26–2.19; aPR for 5-year increase in age = 1.07, 95% CI: 1.02–1.12). Prevalence of SPD was also higher among residents who had ever foregone healthcare to afford food (versus those who had never done so, aPR=1.60, 95% CI: 1.16–2.20) and persons who drank alcohol at least twice a week (versus monthly or less, aPR=1.73, 95% CI: 1.22–2.45). (Table 2)

Using an outdoor drinking water source (versus bottled or treated water) and using a pit toilet (versus a flush toilet) were marginally positively associated with SPD (aPR=1.42, 95% CI: 1.00–2.02 and aPR=1.74, 95% CI: 0.96–3.15, respectively).

Discussion

A quarter of residents had severe psychological distress (SPD) and almost two-thirds had moderate psychological distress. SPD prevalence was particularly high among women and persons of lowest socioeconomic status, as approximated by education, living conditions, and healthcare access.

Our findings are broadly consistent with prior research from Haiti and slum settings. Studies following the 2010 earthquake reported the prevalence of major depressive disorder among survivors as 26% to 46% (Cenat et al., 2015). Among slum residents in India and Colombia, a quarter were at high risk of having or found to have a common mental disorder (Puertas et al., 2006; Subbaraman et al., 2014).

SPD in our study was more prevalent among women and older residents, consistent with a 2012 study from Haiti's Central Plateau, in which older age and female sex were associated with a higher Beck Depression Inventory score (Wagenaar et al., 2012). The association with female sex is worth further exploration, as urban areas in Haiti (Institut Haïtien de Statistique et d'Informatique, 2015) and across Latin America (Chant and McIlwaine, 2015) are majority female. Ethnographic research has also identified gender-specific relationships between social and environment stressors and mental health among slum residents in Mumbai (Parkar et al., 2003). Further research can elucidate the gendered experience of living in slums and its impact on mental health, including potential mediators, such as intimate partner violence.

The association between SPD and increasing age is notable given the relative underrepresentation of elderly individuals in the slum communities compared to the overall population of Haiti (Institut Haïtien de l'Enfance (IHE) and ICF, 2018). Physical or psychological strain of living in a slum community may be associated with increased or

early mortality or out-migration among older adults, as well as psychological strain among those remaining in these communities.

The association between frequent alcohol use and SPD in our study is consistent with previous research in Haiti, in which alcohol use was linked with suicidal ideation (Wagenaar et al., 2012), and with broader literature supporting high co-occurrence of alcohol misuse and mental health disorders (Lai et al., 2015). Because the current data are cross-sectional, the timing of alcohol use in relation to SPD is unknown. Frequent alcohol use may serve as a strategy to manage SPD or it could lead to it, particularly if frequent alcohol use is stigmatized.

Consistent with research from slum settings in India and Bangladesh (Gruebner et al., 2012; Mullick and Goodman, 2005; Subbaraman et al., 2014), poor living conditions and material hardship were associated with SPD. This highlights that even among an overall disadvantaged population, gradients of everyday adversity may be linked with poor mental health. Poor sanitation in particular may negatively influence mental health through concerns about privacy and safety, especially among women and girls (Sclar et al., 2018). However, interpretation of findings related to drinking water is complicated in this setting. Many households reported purchasing bottled or treated water, which is expensive, and unlikely to serve as the main source of drinking water. Since community water taps are distributed fairly uniformly across the surveyed neighborhoods, purchasing water may represent both a degree of choice, and an added hardship, if the expense displaces other needs. Moreover, access to community taps, and shops and trucks selling water alike, may be disrupted at times of conflict or violence. Targeted research on the intricacies of water access can help elucidate this complex set of choices and decisions.

Recognizing the growing gap in global mental health treatment, the World Health Organization has developed the Mental Health Gap Action Programme Intervention Guide with evidence-based diagnostic and treatment guidelines to be adapted for local use by non-specialized providers (World Health Organisation, 2016). Strategies to increase access to mental health services, such as task-shifting and task-sharing, should be considered for implementation in slum communities. It is also important to ensure access to healthcare for physical concerns, which is similarly lacking in disadvantaged communities. Given the high prevalence of risk factors for poor physical health, such as hypertension and poor diet (Tymejczyk et al., 2018), bidirectional associations between poor mental health status and conditions such as cardiovascular disease (Chaddha et al., 2016) may fuel co-occurring physical and mental health crises.

A major strength of this study is its multi-stage design with random participant selection, providing the first population-representative estimate of SPD for residents of slum communities in Haiti. The results also add to the limited body of evidence on mental health status of Haitians outside of a natural disaster context.

Among limitations, the cross-sectional study design prevents causal inference and limits the understanding of SPD development. Lack of detailed migration history and data on exposure to trauma precluded examination of factors which may be of particular importance in slum

settings. Little is known about the health effects of intra-urban migration, common in these communities (Tymejczyk et al., 2018). It is unclear how duration of slum exposure may interact with frequency of moves, possibly linked to traumatic push factors such as eviction, loss of housing due to a natural disaster, and violence in original community, all reported by migrants in our study. Interpersonal and collective violence can affect mental health (Lund et al., 2018), and residence in an informal slum setting, with limited protection by formal state structures, may exacerbate such effects. Violence and unrest, which periodically intensify in these Port-au-Prince communities, may impact mental health both directly and through its effects on the healthcare system and economic opportunity (Global Burden of Disease 2016 Collaborators, 2017).

In conclusion, severe and moderate distress affected 86.5% of slum residents. Greater understanding of the mechanisms through which living conditions interplay with SPD among largely female slum residents is needed. Strategies to expand access to mental health screening and treatment, for example by non-specialized providers, should be identified and evaluated. Multilevel interventions to address underlying social and environmental factors that contribute to SPD, such as poor, sanitation should be implemented and the impact of such interventions on residents' mental health should be assessed.

Acknowledgments

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Highlights

- Most adults in four Port-au-Prince slum communities reported psychological distress.

- Female sex and older age were linked with severe distress.

- Other correlates included frequent alcohol use and inability to afford healthcare.

- Severe distress was also associated with poor sanitation and access to drinking water.

Table 1.

Characteristics of adult residents of four slum communities in Port-au-Prince (N=894).

Variable	Level	N (%)
Sociodemographic		
Sex	Male	350 (41.6%)
	Female	544 (58.4%)
Age	Median (IQR)	28 (22–39)
	18–34	567 (65.7%)
	35–54	263 (24.8%)
	55+	64 (9.5%)
Highest school level attended	None	68 (7.3%)
	Primary	286 (28.7%)
	Secondary	461 (54.1%)
	Higher	78 (9.9%)
Household has experienced death in the past year	Yes	42 (4.1%)
	No	852 (95.9%)
Healthcare access		
Sought care in past year	Yes	304 (35.6%)
	No	592 (64.4%)
Didn't receive needed care in past 6 months	Yes	235 (26.3%)
	No	659 (73.7%)
Ever went w/o healthcare to afford food	Yes	221 (27.1%)
	No	673 (72.9%)
Substance use		
Current smoker	Yes	68 (7.2%)
	No	826 (92.8%)
Alcohol use	At least twice week	148 (17.7%)
	2–4 times a month	172 (19.8%)
	Monthly or less	574 (62.5%)

IQR: interquartile range

Table 2.

Factors associated with severe psychological distress.

		N (%)	PR (95% CI)	aPR (95% CI) (N=884)
Sociodemographic				
Sex	Male	350	ref	ref
	Female	544	1.30 (0.96–1.74)	**1.66 (1.26–2.19)**
Age	5-year increase	884	**1.07 (1.02–1.12)**	**1.07 (1.02–1.12)**
Highest school level attended	None	68	ref	
	Primary	286	0.97 (0.61–1.53)	
	Secondary	461	0.68 (0.43–1.08)	
	Higher	78	**0.25 (0.11–0.54)**	
Relationship status	In a relationship	427	1.43 (0.93–2.22)	
	Single	370	ref	
	Widowed, divorced, or separated	97	1.44 (0.84–2.48)	
Works for pay	Yes	567	ref	
	No	324	0.88 (0.61–1.28)	
Away from home for over 1 month at a time in the past year	Yes	187	ref	
	No	707	1.29 (0.92–1.79)	
Household has experienced death in the past year	Yes	42	1.25 (0.73–2.15)	
	No	852	ref	
Living conditions				
Household member owns dwelling	Yes	421	1.15 (0.87–1.53)	1.13 (0.84–1.5)
	No	469	ref	ref
Drinking water source	Bottled or treated water	306	ref	ref
	Tap inside the home	47	1.04 (0.51–2.13)	1.02 (0.53–1.95)
	Tap outside the home, other outdoor source, or rainwater	541	**1.46 (1.01–2.13)**	**1.42 (1.00–2.02)**
Type of toilet	Flush	157	ref	ref
	Pit	694	**1.85 (0.97–3.53)**	1.74 (0.96–3.15)
	Other outdoor	39	1.24 (0.51–3.04)	1.04 (0.44–2.48)
Healthcare access				
Sought care in past year	Yes	304	1.00 (0.76–1.32)	
	No	589	ref	
Didn't receive needed care in past 6 months	Yes	235	**1.38 (1.00–1.89)**	

		N (%)	PR (95% CI)	aPR (95% CI) (N=884)
	No	659	ref	
Ever went without healthcare to afford food	Yes	221	**1.65 (1.18–2.32)**	**1.60 (1.16–2.20)**
	No	673	ref	ref
Substance use				
Current smoker	Yes	68	1.07 (0.66–1.71)	
	No	826	ref	
Alcohol use	At least twice a week	148	1.36 (0.97–1.9)	**1.73 (1.22–2.45)**
	2–4 times a month	172	0.77 (0.47–1.26)	0.89 (0.55–1.44)
	Monthly or less	574	ref	ref

PR: crude prevalence ratio; aPR: adjusted prevalence ratio; CI: confidence interval