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Scale properties of an ethnographically-grounded idioms of distress screener in rural Haiti: Association with depression, anxiety, and risk factors

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_____

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By

Bonnie N. Kaiser

M.A., Emory University, 2012
B.A., University of Notre Dame, 2008

Thesis Committee Chair: Michael Kramer, PhD

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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## Abstract

Scale properties of an ethnographically-grounded idioms of distress screener in rural Haiti: Association with depression, anxiety, and risk factors
By Bonnie N. Kaiser

Psychiatric instruments have limitations cross-culturally due to variations in conceptualizations and communication of mental distress. I evaluated a locally-developed screening tool for measuring mental distress in rural Haiti. I employed mixed methods to develop the Kreyòl Distress Idioms (KDI) screening tool. I piloted the KDI in an epidemiologic survey (N=408) and assessed it using principal components analysis (PCA) and comparison with the Beck Depression Inventory and Beck Anxiety Inventory (BDI, BAI). Linear regression was used to identify risk factors. PCA extracted four components: 1) lack of control over thoughts and behaviors; 2) worry and rumination, 3) somatic indicators of anxiety; and 4) fatigue and foreshortened future. The KDI correlated with the BAI (r=0.67) and BDI (r=0.52). Factors associated with KDI score included female gender, older age, alcohol consumption, traumatic exposures, and having a household member with mental distress. Belief that disasters cause distress was associated with higher KDI scores, whereas belief that interpersonal relationships cause distress was associated with lower scores. Associations with BDI and BAI scores and established predictors of mental distress support convergent and external validity of the KDI. The KDI provides a more ethnographically-valid measure for mental distress in Haiti than culturally-adapted psychiatric instruments.

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***Introduction***

The development of culturally-appropriate mental health instruments is central to efforts of accurately assessing the burden of mental illness worldwide (Betancourt, Bass, et al., 2009; Bolton & Tang, 2002b; Bolton, Wilk, & Ndogoni, 2004; Kohrt et al., 2008; Kohrt et al., 2011b; Weaver & Kaiser, 2014). Much global mental health research has found that concepts, language, and measures used in Western countries are not synonymous with descriptive categories in other cultural settings (Breslau, 2000; Kirmayer, 2007; Kohrt & Hruschka, 2010; van Ommeren et al., 1999). Recognizing these shortcomings, researchers have advocated ethnographically-grounded approaches to assessment, including drawing upon local idioms of distress, adapting/validating screening tools, and examining the impacts of mental distress on social and economic functioning (Bass et al., 2012; Betancourt, Bass, et al., 2009; Bolton & Tang, 2002b; Hinton, Hinton, Eng, & Choung, 2012; Hinton & Hinton, 2002; Kohrt & Hruschka, 2010; Nichter, 2010).

However, there remains disagreement as to the relative utility of culturally-adapted versus locally-developed screening tools (Desjarlais, Eisenberg, Good, & Kleinman, 1995; Kaiser, Kohrt, Keys, Khoury, & Brewster, 2013; Kohrt et al., 2011b; Mezzich et al., 1999; Phan, Steel, & Silove, 2004; van Ommeren et al., 1999; Weaver & Kaiser, 2014). The adaptation of psychometric instruments may increase validity and provide consistent and more comparable measurements across cultures (De Jong & Van Ommeren, 2002; van Ommeren et al., 1999). At the same time, the application of "universal nosological assumptions" impairs accurate identification of nuanced interpretations of mental distress and is disingenuous to the complexity of health problems in multicultural societies (Mezzich et al., 1999). Recognizing these trade-offs, some authors have advocated a combined approach, using psychiatric constructs and idioms of distress in tandem (Hinton, Lewis-

Fernández, & Pollack, 2009; Kaiser et al., 2013; Weaver & Kaiser, 2014). This thesis describes the development of an instrument to assess mental distress in rural Haiti by drawing upon idioms of distress. Instrument performance is evaluated based on psychometric properties, comparison to established Western screeners, and assessment of associated risk factors.

*Measurement in global mental health*

The increasing recognition of core symptoms of common mental disorders around the world has largely driven the movement for addressing mental illness in developing countries (Patel & Prince, 2010; WHO, 2008). At the same time, presentations of mental illness differ by setting, in particular whether somatic, emotional, or psychological expressions are paramount (Desjarlais et al., 1995). Recognition of mental illness is further complicated by varying expectations of normal or acceptable behavior (Desjarlais et al., 1995; Good, Subandi, & Good, 2007; Miller, 2000). Largely due to such variability in expectations and experiences, strict translation of screening instruments has been found to be insufficient in multiple settings (Betancourt, Speelman, Onyango, & Bolton, 2009; Bolton, Neugebauer, & Ndogoni, 2002b; Jordans, Komproe, Tol, & De Jong, 2009; Jordans, Ventevogel, Komproe, Tol, & de Jong, 2008; Kinzie, 1982; Kohrt et al., 2011a; Suarez-Mendoza, Cardiel, Caballero-Uribe, Ortega-Soto, & Marquez-Marin, 1997; van Ommeren et al., 1999; Zheng, Wei, & Lianggue, 1988).

Helping to account for such challenges, the incorporation of qualitative and specifically ethnographic techniques into research aimed at developing survey instruments and interventions is well-established (Campbell et al., 2000; Moreau, Hassan, Rousseau, & Chenguiti, 2009; Onwuegbuzie, Bustamante, & Nelson, 2010; Waldram, 2006). The joint

statement on *Mental Health and Psychosocial Support in Crisis in Conflict*, put forth by the collaborative Mental Health Working Group, emphasizes the need for locally salient instruments, as mere translation of measures used in Western settings does not capture cultural understandings and constructs (Allden et al., 2009). The Inter-Agency Standing Committee (IASC) reaffirms this stance in the particular context of Haiti: "Well integrated mental health and psychosocial supports that build on existing capacities and cultural norms reach more people and are more likely to be sustained once humanitarian aid engagement ceases" (IASC, 2010, p. 1).

There are advantages to each approach: using locally-developed measures and transculturally adapting existing measures. As Kohrt and colleagues (2011a) have recently discussed, the choice of approach depends on the context, as well as research and clinical needs to be addressed. In some settings, they point out, transculturally adapting and validating existing measures is advantageous to communicate findings to international audiences who may support funding for mental health service development. Furthermore, adapting standardized instruments for depression and anxiety can be advantageous when considering implementing treatment approaches tailored toward these disorders, as exemplified in the recent mhGAP program (WHO, 2008). Ultimately, an integrated local and standardized screening approach may be optimal to achieve multiple goals in improving mental health research and care.

Recognizing the shortcomings of mere translation and the challenges of establishing criterion-related validity – which typically entails diagnosis by a psychiatrist – Van Ommeren and colleagues outline a method of cultural adaptation of screening tools (van Ommeren et al., 1999). This approach avoids many of the problems with establishing criterion-related validity, namely that it is time-consuming, expensive, and impractical if the required

personnel and training are not available (van Ommeren, 2003). The alternate method draws upon lay and professional individuals, both those who are and are not bilingual (van Ommeren et al., 1999). The approach focuses on establishing multiple forms of equivalence as instrument items are reviewed and adapted for a new setting. An item is considered to demonstrate semantic equivalence if it is comprehensible. An item has technical equivalence – meaning that the method and impact of evaluation remains consistent – if it is acceptable according to participants and is assessed in a similar manner. Finally, an item exhibits content equivalence if it is relevant to local experiences. After changes are made to adjust for non-equivalence, the final form of the item is compared between the original and the translation to assess completeness, or the extent to which the item assesses its intended content fully. By evaluating comprehensibility, acceptability, relevance, and completeness, the method assesses and adjusts for potential threats to validity in the process of adapting a pre-existing instrument to a new setting.

An alternative to adaptation is development of new instruments rooted in local constructs. Such approaches often draw on a range of qualitative techniques, including key informant interviews, focus groups, and pile sorts (Kaiser et al., 2013; Miller et al., 2006; Rasmussen, Katoni, Keller, & Wilkinson, 2011). Bolton and colleagues have demonstrated that in a relatively quick period of time (2-3 weeks), local instruments can be developed that are reliable, consistent with local mental health constructs, and able to account for substantial variance in functional impairment (Betancourt, Bass, et al., 2009; Bolton, Neugebauer, & Ndogoni, 2002a; Bolton & Tang, 2004; Bolton et al., 2004).

One of the benefits of a focus on local perceptions, particularly in guiding instrument development, is that locally salient ways of categorizing experience are the starting point for evaluating distress and well-being (Dunn & Janes, 1986). In contrast,

applying a Western psychiatric measure cross-culturally could be devoid of meaning; while indicating that an individual endorsed a certain percentage of items on a scale, that number may not map onto any discrete forms of experience such as distress versus non-distress (Kohrt & Hruschka, 2010). Instead, screening tools should identify those who have a locally salient collection of symptoms, along with functional impairment, and are suffering: in other words, those in need of care (Bolton, 2001a; Bolton et al., 2003; Bolton et al., 2002b; Desjarlais et al., 1995). Considering these locally-specific variables, the notion of taking Western measures as a starting point would seem to some to be inadequate.

Several scholars have argued that psychiatric disorders are themselves cultural conventions, which largely define appropriate forms and expressions of suffering (Kirmayer, 2002; Nguyen & Peschard, 2003; Scheper-Hughes & Lock, 1987). Notions of the person are central to experiences of mental health and ill-health, making ethnophysiology and ethnopsychology – particularly local conceptions of the person, the body, and its function – important drivers of local manifestations, treatment-seeking, and course of illnesses (Kirmayer, 2002; Kohrt & Hruschka, 2010; Kohrt & Harper, 2008; WHO/PAHO, 2010). For example, Kohrt and Hruschka (2010) explain how experiences of trauma in Nepal differ based on ethnophysiological categories of brain-mind, heart-mind, body, soul, and social status. Researchers have identified several forms of mental illness that are unique to particular cultural settings and expressed through idioms of distress (Kirmayer, 2002).

Experiences of mental illness appear to share basic symptomology and common disorders, but with largely variable manifestations, presentations, and unique illness categories across cultural settings (Desjarlais et al., 1995; Kirmayer, 2007; Mezzich et al., 1999). Considering the desire to achieve comparability and provide appropriate interventions, the best approach to identifying and measuring mental disorders would appear to be a

combination of adapting Western instruments (Bolton, 2001a; van Ommeren et al., 1999); exploring additional nosologies, symptoms, and expressions that an adaptation-only approach would have missed (Kleinman, 1988; Kohrt & Hruschka, 2010); and examining risk factors and impacts, including function impairment (Bolton & Tang, 2002a).

*Idioms of distress*

Idioms of distress have long been recognized as particularly salient ways of communicating suffering in a given context, often through somatic expressions (Nichter, 1981; Rubel, 1964). These idioms represent not only a different language for describing symptomology, but also a system of making sense of suffering in connection to notions of the person, expectations about feelings and behavior, and causes of illness and misfortune (Kirmayer, 2002; Kohrt & Hruschka, 2010; Nichter, 1981). Thus, local idioms, while lacking power for direct cross-cultural comparison based on shared categories, are ideal to identify individuals who fall into local categories of distress.

Idioms have proven useful cross-culturally for facilitating appropriate identification and response to local forms of suffering. In the Sri Lankan context, locally-identified idioms of distress quantitatively predicted functional impairment above and beyond the widely-used PTSD symptom scale and Beck Depression Inventory (Jayawickreme et al., 2012). There are multiple examples of the use of idioms of distress to provide appropriate, non-stigmatizing mental health care (Hinton and Hinton 2002, Kohrt and Harper 2008, Kohrt and Hruschka 2010). Successful interventions for the idiom "thinking too much" have included the use of locally relevant training materials that utilize existing idioms of distress and the incorporation of traditional healers and community leaders in the design of the interventions (Abbas et al. 1994).

In Haiti, several idioms of distress that indicate recognizable illness syndromes have been identified, such as *sezisman* (seized-up or shocked), *move san* (bad blood), *reflechi twòp* (thinking too much), and *pèdisyon* (arrested pregnancy) (Coreil, Barnes-Josiah, Augustin, & Cayemittes, 1996; Farmer, 1988; Kaiser et al., 2014; Kiev, 1961; Mazzeo & Hoover, 2010; Murray, 1976). Hinton and Lewis-Fernández (2010b) differentiate between idioms of distress as "illness syndromes" and idioms of "life distress" or "psychosocial functioning," with the latter two indicating general life distress, as well as impaired social or work functioning. Little work has explored Kreyòl idioms of distress that represent such experiences of cognitive, emotional, and somatic suffering and impairment (Kaiser et al., 2013; Kaiser et al., 2014; Keys, Kaiser, Kohrt, Khoury, & Brewster, 2012). These idioms, while lacking cross-cultural comparative power, are better suited for communicating distress using locally-relevant symptoms. By incorporating context-specific distress symptoms into medical language and health assessment techniques, healthcare communication, quality of care and linkage, and patient satisfaction should improve (Abramowitz, 2010; Hinton & Lewis-Fernández, 2010b; Keys et al., 2012; Kohrt & Hruschka, 2010; Nichter, 2010).

*Mental health in Haiti*

Several studies have explored depression in Haiti, but these have been limited to specific populations and convenience samples. Moreover, most published studies of depression in Haiti reflect pre-earthquake levels of severity. Among a convenience sample of 258 hospital patients in Haiti, Martsolf (2004a), found that 54% met the criteria for major depression using the Center for Epidemiologic Studies – Depression (CES-D) scale. Further research among people living with HIV in Haiti found that most depressive symptoms on the Hopkins Symptom Checklist were endorsed by 45 – 75% of individuals (Fawzi et al.,

2010). These psychometric instruments were not validated for use in Kreyòl with Haitian populations, and therefore one cannot confirm that these individuals suffered from clinical depression. Nevertheless, these findings make an important contribution by suggesting a high burden of depressive symptomatology among medically ill Haitians.

In these studies, identified risk factors for depression included: emotional and physical abuse, low socioeconomic status, psychological symptoms of other individuals in the household, and being HIV-positive (Fawzi et al., 2010; Martsolf, 2004b). More research is needed using representative samples to accurately describe the population risk profile of depression in Haiti.

In the Central Plateau, colleagues and I have identified a number of idioms of "life distress" or "psychosocial functioning," which indicate distressing cognitive, emotional, and somatic sensations (Hinton & Lewis-Fernández, 2010a). Through ethnographic work, we have begun to characterize these idioms, including their contextual meanings and links to ethnopsychology (Kaiser et al., 2013; Keys et al., 2012). Through exploring their use by patients in the primary care setting, we found that Haitian clinicians often interpret these idioms in limited ways, assuming a physical causation and providing treatment accordingly. As a result, the nuances of the idioms were lost, including references to emotional and psychological suffering. Recognizing their multiple interpretations and exploring these idioms in greater depth will provide clinicians and other care providers with a means of gaining greater insight into patients' needs and the ultimate causes of their ill-health (Keys et al. 2012).

This thesis reports on the use of these idioms of distress to develop a local measure of mental distress. I examine the utility of this ethnographically-grounded measure of mental distress through assessing its structure and psychometric properties, comparing its

performance with transculturally-translated instruments for depression and anxiety, and determining risk factors for mental distress. The ultimate goal of the study is to develop a relevant, valid, and easy-to-administer screening tool for evaluating mental distress during the clinical encounter in rural Haiti.

### *Methods*

This thesis presents research conducted by two multidisciplinary teams of graduate students with Emory's Global Health Institute in 2010-2011. Research was centered primarily in the communal section of Lahoye, which had an estimated adult population of approximately 7,500 in the 2009 census (IHSD, 2009). Between May and June 2010, we implemented a mixed-methods study to develop culturally-appropriate mental health screening tools for use in Haiti's Central Plateau. Instrument development included both adaptation of existing screening tools and development of novel tools. Through combined use of these methods, we aimed to develop tools that were both ethnographically valid and able to communicate results with international audiences (Kohrt et al., 2011b). In May and June 2011, we conducted an epidemiologic study to test these screening tools and identify risk factors associated with mental distress and symptoms of depression and anxiety in the local setting. In this thesis, I describe the development and testing of the localy-developed Kreyòl Distress Idioms (KDI) scale, compare it to locally-adapted screening tools for depression and anxiety, and examine risk factors associated with mental distress using the KDI. The adaptation of the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) and development of the Kreyòl Function Assessment (KFA) have been described elsewhere (Kaiser et al., 2013).

*Setting*

Haiti makes up one-third of the island of Hispaniola, with the Central Plateau situated at the border with the neighboring Dominican Republic. Among Haiti's population of 9.8 million, 80% lived in rural areas in 2005, but this likely increased following the 2010 earthquake and subsequent internal displacement (PRB, 2010). Haiti is commonly cited as the poorest country in the Western Hemisphere and is ranked 154 out of 177 countries on the Human Development Index (UNDP, 2010). Its history of political instability, vast inequality between the controlling elite class and majority poor, and minimal investment in infrastructure have led to a lack of adequate economic, legal, and medical protections to counter vast health and livelihood concerns (Desrosiers & St Fleurose, 2002; WHO/PAHO, 2010).

While there is overlap in expected tasks, livelihood is largely sex-differentiated, as males *travay la tè* (work the land), while females *fè kòmes* (do commerce) and care for the family and home (Miller, 2000). Approximately three-fourths of the population has some primary school education, but the majority cannot read or write (WHO/PAHO, 2010). While everyone speaks Kreyol, a small minority also speak French or Spanish, due to the proximity to the Dominican Republic.

Regarding impact of the 2010 earthquake, the Central Plateau sustained little direct or structural damage. However, some areas of the Central Plateau saw significant increases in population size due to internally displaced persons. Additionally, many people we spoke with had family members killed or directly impacted by the earthquake, and several were helping to house displaced family or friends. Despite these devastating and far-reaching impacts, participants made it clear that the earthquake represents one among many challenges that impact mental health and ill-health.

Lahoye was chosen as the research site because of the presence of a non-governmental organization (NGO) that was interested in providing mental health services. The NGO partners with American medical schools and Haitian healthcare personnel to provide year-round medical care in several communes in the Central Plateau. While there are three hospitals within a two-hour drive from the research site, the time and resources required to reach these healthcare services by foot, horseback, or motorcycle puts them firmly out of reach for the majority of rural Haitians. Instead, they rely on small clinics, many run by NGOs. At the time of the research, the town of Lahoye had a small clinic with one doctor, one nurse, two auxiliary nurses, and one lab technician. The clinic was hosted by a private school but has since moved to a permanent building. Approximately once per week, clinic staff conducted mobile clinics, visiting each zone in the communal section once every three months. During the single day of healthcare provision for the zone, dozens of patients would line up, with several often being turned away at the end of the afternoon when rains began. In addition to than utilizing formal biomedical care, people could also purchase medicines and herbal remedies within the weekly markets or draw upon a range of traditional supports, including *hougan*-s[1] and *manbo*-s (Vodou priests and priestesses), *doktè fey*-s (herbalist), and religious leaders (Brodwin, 1992; Desrosiers & St Fleurose, 2002).

*Instrument development*

Development of the Kreyòl Distress Idioms (KDI) screening tool was based on ethnographic data collection and pilot testing. Identification of potential idioms of distress drew on multiple qualitative methods: (i) participant observation with four case studies identified by community members to be experiencing mild to moderate mental distress; (ii)

[1] This thesis utilizes the standard convention of adding –s to indicate plural Kreyol words, rather than –*yo*, the plural indicator in Kreyol.

approximately 60 hours of observant participation in hospital, clinic, and mobile clinic settings; (iii) 31 in-depth interviews with community leaders, religious and traditional healers, and healthcare providers; and (iv) 11 focus group discussions with community members (see Appendix 1). From these various forms of data collection, 43 potential idioms of interest were identified, representing somatic, emotional, cognitive, and psychological experiences that seem to indicate mild to moderate mental ill-health or associated sequelae.

These 43 idioms of distress were then discussed with two Haitian clinicians and in a focus group discussion with lay community members. Following these conversations, items were removed from the list if they seemed to be caused solely by physical illnesses, were thought to be nearly universal experiences (i.e. not specific enough), or were not well understood. Additionally, when multiple idioms of distress seemed to represent very similar experiences, only the best understood item was kept. The remaining 17 items were developed into a screening tool that was piloted among 97 participants. Based on the pilot study, four more items were removed because they were infrequently endorsed and seemed to be potentially stigmatizing concepts. See Kaiser et al. (2013) for full description of sampling strategy, idiom selection, and pilot testing.

*Survey implementation*

The final 13-item KDI was applied as part of a 408-person epidemiologic survey between May and June 2011. The cross-sectional household survey included each of the four culturally-appropriate screening tools (BDI, BAI, KDI, and KFA). For each screener, participants were asked to indicate the extent to which they experienced each item during the previous two weeks on a 5-item Likert scale from "never" to "all the time." Because of low

literacy levels in the study region, questions were read aloud, and visuals depicting extent of difficulty or length of time were used to aid in responding.

In addition to the four screening tools, the survey included demographic information and potential risk factors for mental distress. These included daily stressors, a socioeconomic status (SES) scale (sum of items owned, of the following: tin roof, bicycle, motorcycle, television, radio, cement house, latrine, electricity, telephone), traumatic experiences associated with the 2010 earthquake, other traumatic experiences, social supports, care-seeking behavior, and perceptions of mental illness. Components of the epidemiologic survey have been described in greater detail elsewhere (Wagenaar, Hagaman, Kaiser, McLean, & Kohrt, 2012; Wagenaar, Kohrt, Hagaman, McLean, & Kaiser, 2013). Surveys were conducted by trained Haitian research assistants (RAs) and took approximately one hour to complete. RAs underwent one week of didactic and supervised practical training in survey data collection, ethics and confidentiality, and referral to mental healthcare providers.

Participants were identified through a modified version of the WHO "random walk" protocol (WHO, 1991). Data were collected in 13 of the 17 zones of Lahoye, with the other zones considered too dangerous to access during the rainy season. Four RA days were used to collect surveys in each zone. Household identification began from the locally-recognized center of the zone, then proceeded in opposite directions with RAs visiting each *lakou* (household compound) encountered. Data are not available regarding the age structure of the Central Plateau, so research assistants selected participants by rotating among age categories: 18-30, 31-50, or 51+. Additionally, research assistants alternated by sex. Surveys were double-entered into Excel and crosschecked for consistency.

This study was approved by Emory University's Institutional Review Board and the Haitian Ministry of Health. All study participants verbally consented prior to survey data

collection. No compensation was provided for participation. Participants reporting current suicidal ideation received secondary evaluation by a counselor and were referred for psychosocial services if appropriate.

*Analysis*

To explore the structure of the KDI, principal components analysis (PCA) was performed with the 13 screener items. PCA was performed using the correlation matrix, with principle components extraction and Promax rotation. Kaiser's rule was used to select components, with those having an eigenvalue of approximately 1.0 or greater retained. Variables were considered to load on a component if they had a factor loading of 0.40 or greater.

Psychometric properties of the KDI were also assessed. Internal consistency was assessed using Cronbach's alpha, and the influence of each item was assessed by calculating the resulting Cronbach's alpha if that item were to be removed. Correlations between KDI sum scores, KDI component scores, and BDI and BAI scores were evaluated using Pearson coefficients. To assess potential association of individual idioms of distress with the BDI and BAI scores, Spearman correlation coefficients were calculated. Spearman coefficients were chosen due to their robustness to violations of normality. To assess significant differences in BDI and BAI mean scores between low (0-1) and high (2-4) endorsers of each idiom of distress, t-tests were used. Bonferroni corrections were made to adjust for multiple Spearman correlation and t-tests with the BDI and BAI.

To assess potential risk factors for mental distress, a multivariable linear regression model was constructed. To account for missing values, scores on the KDI were calculated using mean imputation, with mean scores on answered items multiplied by 13 for a potential

range of 0 to 52. As a sensitivity analysis, I ran regression models before and after imputation. Mean imputation was also conducted for the BDI and BAI instruments. The imputed sum score on the KDI was treated as a continuous dependent variable. Variables considered for inclusion in the model were: age, sex, marital status, education, literacy, income, distance to work, amount of land, religion, number of children, household size, alcohol use, distance to and type of water source, previous residence, care-seeking preferences, SES scale score, trauma related to 2010 earthquake, general trauma, reported household mental illness, perceptions of causes of mental illness, and social supports (see Appendix 2).

Backward elimination procedures ($\alpha$ to stay=0.05) were used to arrive at final models. T-tests were used to assess significance of predictor variables ($\alpha$=0.05). For significance of group predictors (religion, education, water source, and perceived primary cause of mental distress), chunk F-tests were used. The fit of the linear model was evaluated using residual diagnostics, partial residual plots, Cook's distance, and variance inflation factors.

## ***Results***

### *Sample*

Overall, there was a 98% response rate among those approached to complete the survey, with a total of 408 respondents. Missing data were rare in the KDI, with 96% of respondents answering all items. For the BDI, 89% of observations were complete, with 8% missing one item, and for the BAI, 93% of observations were complete, with 6% missing one item. Table 1 shows the demographic and behavioral characteristics of the sample. Mean age was 40, and 57% of the sample had not received any schooling. Of ten traumatic events inquired about on the survey, respondents had experienced an average of 2.7, with the most

common being flood (74%), hurricane (61%), and death in the immediate family (53%). Additionally, 46% of the sample experienced the death of a family member due to the 2010 earthquake.

**Table 1: Demographic and behavioral characteristics of survey respondents (N=408)**

| Characteristic | n (%) unless noted |
|---|---|
| Age | Mean (SD): 40.3 (14.1) |
| Sex | |
| Female | 202 (49.5) |
| Male | 206 (50.5) |
| Marital status | |
| Married | 146 (35.8) |
| Cohabiting (not married) | 156 (38.2) |
| Single | 65 (15.9) |
| Widowed | 31 (7.6) |
| Divorced | 9 (2.2) |
| Education | |
| No school | 233 (57.4) |
| Some primary school | 59 (14.5) |
| Finished primary school | 89 (21.8) |
| More than primary school | 25 (6.1) |
| Ever drinks alcohol | 77 (19.0) |
| Someone in household suffers from stress, unhappy heart (*kè pa kontan*), or sadness that makes life difficult | 256 (62.7) |
| Number of traumatic events experienced | Mean (SD): 2.7 (1.1) |
| Flood | 300 (73.7) |
| Hurricane | 248 (60.8) |
| Death in immediate family (not exclusively due to earthquake) | 217 (53.3) |
| Life-threatening illness | 159 (39.0) |
| Robbed | 77 (18.9) |
| Large fire | 38 (9.3) |
| Vehicular accident | 30 (7.4) |
| Attacked with weapon | 23 (5.7) |
| Sexual violence | 15 (3.7) |
| Military/combat violence | 12 (3.0) |
| Endorsed causes of mental distress (not mutually exclusive) | |
| Thinking too much | 349 (85.8) |
| Lack of activity | 292 (71.7) |
| Disasters | 252 (61.8) |
| Family and friend relationships | 228 (56.0) |
| Bad luck | 93 (22.9) |
| Spirits | 39 (9.6) |
| Alcohol | 16 (3.9) |
| Score on Kreyòl Distress Idioms screener | Mean (SD): 20.4 (10.5) |
| Score on culturally-adapted Beck Depression Inventory | Mean (SD): 20.4 (11.4) |
| Score on culturally-adapted Beck Anxiety Inventory | Mean (SD): 16.1 (10.6) |

Approximately 63% of the sample reported having a household member with mental distress (sadness, unhappy heart [*kè pa kontan*], or stress) that impairs daily functioning. When asked what could cause mental distress, the most endorsed responses were "thinking too much" (86%), lack of activities (72%), disasters (62%), and family and friend relationships (56%). Mean score on the KDI after mean imputation was 20.4 (standard deviation, SD: 10.5), and the Cronbach's alpha for the scale was very high ($\alpha$=0.86).

*Principal components analysis*

PCA extracted four components with an eigenvalue of approximately 1.0 or greater (see Table 2a). Component 4 was included because its eigenvalue (0.96) is very close to 1.0. Together, these four components explain 66% of the variance in KDI scores. Table 2b shows how each idiom of distress loaded on the top four components.

The first component consists of items associated with lack of control of one's thought processes and behavior. The items include feelings of being vulnerable, weak, "on edge," forgetful, and overwhelmed (see Table 3). Two of these idioms (*dekontwole* and *pèdi bon anj*) directly refer to loss of control of one's body and inability to complete tasks, though the first is short-term and the other more lasting. This component is approximately equally correlated with the BDI and BAI (Table 4). The subsequent two components consist of items that are conceptually and empirically indicative of anxiety, with component 2 being nonsomatic items such as worry and rumination, and component 3 being somatic indicators of anxiety, such as quickened heartbeat and bodily aches. Finally, component 4 appears to indicate fatigue, thoughts of death, and dread. This component is more strongly associated with BDI than BAI score.

**Table 2: Principal components analysis of items on the Kreyòl Distress Idioms screener**

**2a: Total variance explained by top components[a]**

| Component | Eigenvalue | % of Variance | Cumulative % |
|---|---|---|---|
| 1 | 5.0 | 38.1 | 38.1 |
| 2 | 1.5 | 11.3 | 49.5 |
| 3 | 1.2 | 8.9 | 58.3 |
| 4 | .96 | 7.4 | 65.7 |

a. Components extracted using principal components analysis with Promax rotation. Only components with an eigenvalue of approximately 1.0 or greater are shown.

**2b: Factor loadings in rotated component pattern matrix[a]**

| Idiom of distress | Literal translation | Approximate meaning | Component | | | |
|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| Pèdi bon anj | Lost good angel | Enervating spirit briefly departs body, loss of control, weakness, vulnerability | .91 | | | |
| Tèt cho | Hot head | Being "on edge", nerve-wracking, reactive | .79 | | | |
| Tèt pa la | Head not there | Forgetfulness, absent-mindedness, poor concentration | .65 | | | |
| Dekontwole | Loss of control | Loss of control, weakness, feeling overwhelmed | .49 | | | |
| Reflechi twòp | Thinking too much | Persistent rumination, diminished affect, social isolation | | .99 | | |
| Tèt chaje | Loaded head | Worry, preoccupation, feeling overwhelmed but still in control | | .69 | | |
| Kè sere | Tight/bound heart | Shock, sadness, pity | | .50 | | |
| Tèt vire | Spinning head | Dizziness, vertigo, unusual behavior | | .46 | | |
| Kè fè mal | Heart hurts | Sadness, pity, epigastric pain (reflux) | | | .86 | |
| Tèt fè mal | Head hurts | Headache, variety of physical or non-physical causes | | | .77 | |
| Kè bat fò | Heart beating strong | Racing heartbeat, surprise | | | .71 | |
| De la la | *No equivalent* | Lack of energy, fatigue, depressed mood | | | | .96 |
| Santi m prale | "I think I am going" | Thoughts of death, fear, dread, feeling overwhelmed | | | | .88 |

a. Components extracted using principal components analysis with Promax rotation. Only factor loadings with an absolute value equal to or greater than 0.40 are shown.

**Table 3: Translated items that load significantly on each component[a]**

| 1. Loss of control of thoughts/behavior | 2. Worry, rumination | 3. Somatic anxiety | 4. Fatigue, foreshortened future |
|---|---|---|---|
| Lost good angel (loss of control) | Thinking too much | Heart hurts (sadness, reflux) | De la la (lack of energy) |
| Hot head ("on edge") | Loaded/charged head (worry) | Headache | I think I am going (fear/dread, sometimes of dying) |
| Head not there (forgetfulness) | Tight/bound heart (shock) | Racing heart | |
| Loss of control (overwhelmed) | Spinning head (dizziness) | | |

a. Components extracted using principal components analysis with Promax rotation on 13-items Kreyòl Distress Idioms screener.

**Table 4: Correlations[a] among screening tools and components extracted in principal components analysis[b]**

| | Kreyòl Distress Idioms | Beck Depression Inventory | Beck Anxiety Inventory | Component 1: "Losing Control" | Component 2: "Worry/Rumination" | Component 3: "Somatic Anxiety" | Component 4: "Fatigue, Foreshortened Future" |
|---|---|---|---|---|---|---|---|
| **KDI** | | .52 | .67 | .79 | .79 | .71 | .70 |
| **BDI** | | | .50 | .52 | .41 | .24 | .38 |
| **BAI** | | | | .56 | .53 | .50 | .37 |
| **Comp 1** | | | | | .53 | .41 | .43 |
| **Comp 2** | | | | | | .36 | .36 |
| **Comp 3** | | | | | | | .41 |

a. All correlations significant at the $\alpha$=0.001 level.
b. Components extracted using principal components analysis with Promax rotation on 13-items Kreyòl Distress Idioms screener.

**Table 5: Association of individual idioms of distress with depression and anxiety scores[a]**

| | | Beck Depression Inventory | | | Beck Anxiety Inventory | | | |
|---|---|---|---|---|---|---|---|---|
| **Idiom and Translation** | **Score on idiom** | **Spearman ϱ[b]** | **Mean (sd)** | **p (t-test)[c]** | **Spearman ϱ[b]** | **Mean (sd)** | **p (t-test)[c]** | **N** |
| *Dekontwole:* | 0-1 | .43 | 16.6 (8.9) | <.001 | .50 | 12.6 (8.7) | <.001 | 404 |
| Loss of control, overwhelmed | 2-4 | | 26.3 (12.3) | | | 21.9 (11.1) | | |
| *De la la:* | 0-1 | .34 | 16.2 (10.0) | <.001 | .30 | 13.2 (9.4) | <.001 | 406 |
| Lack of energy, fatigue | 2-4 | | 22.9 (11.4) | | | 18.1 (10.9) | | |
| *Kè bat fo:* | 0-1 | .26 | 18.9 (10.6) | ns | .42 | 11.4 (8.2) | <.001 | 403 |
| Racing heart | 2-4 | | 21.1 (11.8) | | | 18.7 (10.9) | | |
| *Kè fè mal:* | 0-1 | .19 | 18.6 (11.4) | ns | .36 | 11.9 (9.8) | <.001 | 407 |
| Heart hurts (sadness, reflux) | 2-4 | | 21.0 (11.3) | | | 17.9 (10.5) | | |
| *Kè sere:* | 0-1 | .33 | 17.4 (10.9) | <.001 | .34 | 12.8 (9.7) | <.001 | 405 |
| Tight/bound heart (shock, sadness) | 2-4 | | 22.8 (11.3) | | | 19.0 (10.6) | | |
| *Pèdi bon anj:* | 0-1 | .31 | 18.8 (10.4) | <.001 | .49 | 14.2 (9.1) | <.001 | 407 |
| Lost good angel (loss of control) | 2-4 | | 28.3 (12.9) | | | 26.5 (12.1) | | |
| *Reflechi twòp:* | 0-1 | .30 | 15.5 (8.9) | <.001 | .42 | 10.5 (7.0) | <.001 | 405 |
| Thinking too much | 2-4 | | 22.5 (11.7) | | | 18.7 (11.0) | | |
| *Santi m prale*: | 0-1 | .35 | 16.6 (9.7) | <.001 | .37 | 12.3 (8.6) | <.001 | 406 |
| "I think I am going" (fear, dread) | 2-4 | | 23.3 (11.8) | | | 19.3 (11.1) | | |
| *Tèt chaje*: | 0-1 | .36 | 16.9 (9.4) | <.001 | .45 | 12.2 (8.7) | <.001 | 402 |
| Loaded head (worry, preoccupation) | 2-4 | | 23.7 (12.1) | | | 20.1 (11.0) | | |
| *Tèt cho*: | 0-1 | .39 | 18.8 (10.3) | <.001 | .36 | 15.0 (9.9) | <.001 | 405 |
| Hot head ("on edge") | 2-4 | | 32.8 (12.3) | | | 25.2 (10.7) | | |
| *Tèt fè mal*: | 0-1 | .16 | 21.1 (12.8) | ns | .38 | 11.4 (9.2) | <.001 | 406 |
| Headache | 2-4 | | 20.2 (11.1) | | | 17.1 (10.7) | | |
| *Tèt pa la*: | 0-1 | .33 | 18.2 (10.2) | <.001 | .39 | 13.5 (8.9) | <.001 | 405 |
| Head not there (forgetfulness) | 2-4 | | 25.1 (12.6) | | | 22.1 (11.8) | | |
| *Tèt vire*: | 0-1 | .36 | 17.0 (9.7) | <.001 | .53 | 12.0 (8.7) | <.001 | 407 |
| Spinning head (dizziness) | 2-4 | | 24.0 (11.9) | | | 20.8 (10.7) | | |

a. Assessed using culturally-adapted Kreyòl Beck Depression Inventory and Beck Anxiety Inventory.

b. Spearman correlations are between scores on individual idiom and BDI or BAI screener, all treated as continuous variables. After Bonferroni correction, a p-value of <0.0039 is considered statistically significant. All correlations were statistically significant.

c. p-values indicated are for t-tests of mean score difference between those with low (0-1) and high (2-4) endorsement of each idiom. After Bonferroni correction, a p-value of <0.0039 is considered statistically significant.

*Comparison to depression and anxiety*

Both the BDI and BAI were moderately positively correlated with the KDI, with a higher correlation seen for the BAI (BDI: r=0.52; BAI: r=0.67; see Table 4). Correlations between individual idioms of distress and BDI and BAI scores were generally strong (see Table 5). All t-tests of differences in mean BAI scores between low (0-1) and high (2-4) endorsers of individual idioms of distress were significant. However, several idioms were not associated with different mean scores on the BDI between low and high endorsers. These idioms of distress also had low correlation with the BDI: *kè bat fo* (racing heart, r=0.26), *kè fè mal* (heart hurts, r=0.19), and *tèt fè mal* (headache, r=0.16).

**Table 6: Multivariable linear regression model for Kreyòl Distress Idioms total score among rural Haitians (N=402, $r^2$= .30)[a]**

| Variable | aβ (95% CI)[b] | p |
|---|---|---|
| Sex (female = 1) | 3.7 (1.9, 5.5) | <.001 |
| Age (10 year increase) | 1.2 (.56, 1.8) | <.001 |
| Ever drinks alcohol | 4.8 (2.4, 7.1) | <.001 |
| Has household member with mental illness | 5.8 (3.9, 7.8) | <.001 |
| Number of traumatic events experienced[c] | 1.5 (.68, 2.2) | <.001 |
| States that disasters can cause mental distress | 3.7 (1.8, 5.6) | <.001 |
| States that family and friend relationships can cause mental distress | -3.2 (-5.0, -1.4) | <.001 |

a. Missing: N=6 due to 2 missing information on household member with mental distress, 2 missing information on ever drinks alcohol, 1 missing age, and 1 missing KDI scale.
b. aβ: adjusted parameter estimate; 95% CI: 95% confidence interval.
*c.* Traumatic events inquired about include: flood, hurricane, fire, life-threatening illness, attacked with weapon, sexual violence, death in family, robbery, and vehicular accid*Factors associated with KDI score*

In the multivariable linear regression model (Table 6), females scored on average 3.7 points higher than males on the KDI (p<.001). A 10-year increase in age was associated with an additional 1.2 points on the KDI (p<.001), while ever drinking alcohol was associated with an increase of 4.8 points (p<.001). Number of traumatic events experienced and having a household member with mental distress were both significantly associated with higher

KDI score (aβ=1.5 and 5.8, respectively; p≤.003). Among the perceived causes of mental distress, two were associated with KDI score: those endorsing that relationships can cause mental distress scored on average 3.2 points lower (p<.001), while those stating that disasters can cause mental distress scored 3.68 points higher (p<.001). Imputing did not meaningfully change the magnitude or significance of associated factors.

## ***Discussion***

*Instrument properties*

The Kreyòl Distress Idioms (KDI) screener was developed through ethnographic methods for use in Haiti's Central Plateau. The KDI's Cronbach's alpha suggests high internal consistency. Correlations between individual idioms and BDI and BAI scores suggest that most of the idioms are empirically conceptually closer to anxiety, as is the full KDI. However, PCA suggests four relatively distinct components (loss of control; worry/rumination; somatic anxiety; fatigue and foreshortened future), some of which are more strongly associated with depression than others. For example, components 1 (loss of control) and 4 (fatigue and foreshortened future) have similar correlations to BDI and BAI scores, and these idioms appear to have conceptual overlap with depression and anxiety. Component 4 consists of *de la la* (fatigue, lack of energy) and *santi m prale* (fear/dread, thoughts of death). Component 4 is more consistent with mood and somatic symptoms of depression. A study of depression among Haitian immigrant women in the U.S. describes similar physical symptoms, such as weakness (*feblès*) and faintness and stomach problems (*gaz*) (Nicolas et al., 2007). Component 1 raises questions regarding panic attacks; however, further phenomenological research is necessary to explore this potential association.

In contrast, components 2 and 3 are conceptually and empirically more similar to anxiety. These two components are more strongly correlated with BAI than BDI score. Additionally, none of the idioms of distress in component 3 had significantly different mean BDI scores between low and high endorsers, but they were all significantly different in reference to BAI. These three idioms of distress – *kè bat fo* (racing heart), *kè fè mal* (heart hurts), and *tèt fè mal* (headache) – indicate somatic experiences suggestive of autonomic arousal associated with anxiety, including some elements of hyperarousal. However, these idioms may dually refer to mental ill-health and somatic experiences that have physical pathology (Kaiser et al., 2013; Keys et al., 2012). Additionally, Nicolas et al. (2007) cite such symptoms as manifestations of depression. Collectively, these findings suggest that idioms of distress in component 3 are non-specific in regards to any single biomedical category.

One item, *reflechi twòp* (thinking too much), loads quite strongly on component 2 (factor loading = 0.99), which includes idioms of distress indicative of worry. This is the only idiom of distress representing a locally-salient illness syndrome that the authors have identified (Kaiser et al., 2014). *Reflechi twòp* refers to intense rumination, diminished affect, and social isolation, sometimes in response to personal loss. It is often the manifestation of prolonged sadness and is thought to sometimes lead to *fou* (literally "crazy," psychosis) if allowed to occur for an extended period. Like the overall KDI, this idiom is more strongly correlated with BAI than BDI score but certainly shares features with both depression and anxiety (Kaiser et al., 2014). Therefore, considering the lack of appropriate terminology to reference mental illness, this idiom perhaps represents the most effective means of communicating such mild to moderate mental disorders in Haiti's Central Plateau. Furthermore, it is perceived to be a risk factor for psychosis and thus represents a potential space for psychosocial intervention to prevent progression to more severe disorder. One

possible hypothesis based on our data and similar findings in other settings is that the anxiety reflected in component 2 can progress to the feelings of lack of control in component 1 and ultimately to *fou* (Hinton, Pich, Marques, Nickerson, & Pollack, 2010).

Versions of "thinking too much" have been reported in distressed populations in many settings globally (Kaiser et al., in review), including Zimbabwe (Patel, Simunyu, & Gwanzura, 1995), Ghana (Avotri & Walters, 1999), Sudan (Rasmussen et al., 2011), Uganda (Betancourt et al., 2011; Bolton, 2001b), among South Asians living in Britain (Fenton & Sadiq-Sangster, 1996)(Fenton & Sadiq-Sangster, 1996) and the US (Hinton, Reiss, & de Jong, in press; Karasz, 2005), and previously among Haitians (as *moun yo panse anpil*; Bolton, Surkan, Gray, & Desmousseaux, 2012). Future mental healthcare provision in Haiti could explore successful interventions for "thinking too much" in other settings (Abas, Broadhead, Mbape, & Khumalo-Sakatukwa, 1994).

*Risk factors*

These idioms of distress collectively appear to be conceptually similar to depression, generalized anxiety, and panic disorder. The demographic and behavioral characteristics associated with KDI score include: female sex, age, having a household member with mental distress, ever drinking alcohol, number of traumatic events experienced, and endorsing that disasters can cause mental distress. In contrast, endorsing that family and friend relationships can cause mental distress was associated with lower KDI score.

The observed association of mental distress with female sex and age is consistent with much literature in both high and low-and-middle-income countries (LMICs) (Cochrane, 1993; Kohrt & Worthman, 2009; Paykel, 1991; Thapa & Hauff, 2005; Wilhelm, Parker, Geerligs, & Wedgwood, 2008). Female sex and age have also been linked to higher rates of

depression and PTSD among adolescents and adults who survived the 2010 Haitian earthquake (Cenat & Derivois, 2014, 2015). The increased symptom burden among those with a household member suffering from mental distress is similar to findings among convenience samples of medically-ill patients in Haiti (Martsolf, 2004a; Smith Fawzi et al., 2010). The strong association of alcohol use with mental distress is unsurprising, as this association has been demonstrated in numerous studies using Western psychiatric measures (Kinyanda, Waswa, Baisley, & Maher, 2011; Olsø, Gudde, Wullum, & Linaker, 2012; Regier et al., 1990; Sullivan, Fiellin, & O'Connor, 2005; Vijayakumar, Kumar, & Vijayakumar, 2011). Likewise, empirical links between trauma and mental distress are solid, as confirmed in hundreds of studies, including those in LMICs (Norris et al., 2002; Porter & Haslam, 2005). Findings from a study of Haitian immigrants in the United States also describe witnessing a traumatic event as being a frequent cause of *sezisman* (Nicolas, DeSilva, Grey, & Gonzalez-Eastep, 2006). Furthermore, trauma related to the 2010 Haitian earthquake has been found to be significantly associated with translated PTSD and depression instruments in other large epidemiological studies (Cenat & Derivois, 2014, 2015; Cerda et al., 2013). These demonstrated associations of the KDI with several well-established predictors of mental distress provide strong evidence of convergent validity of this construct.

The association of perceived causes of mental distress with increased symptom burden should not be surprising, considering the rich literature on explanatory models and health outcomes (Kleinman, 1988; Kohrt, Hruschka, Kohrt, Panebianco, & Tsagaankhuu, 2004; Weiss, 1997). Such associations have been found in Haiti's Central Plateau when measuring depressive symptoms (Wagenaar et al., 2012). In our sample, 62% of participants agreed that disasters potentially cause mental distress, while 56% endorsed that family and friend relationships could cause mental distress. It has been suggested that holding an

external locus of control, characterized by a belief that factors outside the self primarily drive wellbeing, is associated with greater psychiatric distress (Baker, 1990; Konstantareas & Lampropoulou, 1995; Punamaki, 1990; Ward & Rana-Deuba, 2000). In our sample, attributing distress to disasters was associated with an increase in KDI score, while attributing distress to relationships was associated with decreased distress. The opposite directions of association with mental distress could be a reflection of differing loci of control within our sample and should be further explored.

Since the completion of this study, researchers with Zanmi Lasante/Partners in Health have developed and locally validated a depression screener for use in Haiti's Central Plateau and Artibonite (Rasmussen et al., 2015). The Zanmi Lasante Depression Symptom Inventory draws on a combination of idioms of distress from the KDI and items from standard depression screeners, adapted for use in Haiti. I consider the ZLDSI as a powerful example of the value of in-depth ethnographic research, such as that which informed development of the KDI, for informing the development and validation of culturally appropriate clinical tools.

*Strengths and limitations*

The use of an ethnographically-grounded measure of mental distress is a strength of this study and enables identification of risk factors for locally-meaningful distress. Furthermore, the use of culturally-adapted measures of depression and anxiety allows for cross-cultural comparison to Western psychiatric constructs without relying on such constructs as the only measure of distress. However, the BDI and BAI Kreyòl versions used here were transculturally translated and adapted, but they were not validated against a clinical gold standard of major depressive disorder and generalized anxiety disorder. Therefore, the

associations between the KDI scores and BDI and BAI scores cannot be used diagnostically or interpreted as an association between the idioms and a clinical disorder. Still this represents a step beyond other studies of mental distress in Haiti that refer to translated versions of Western instruments. Future research should compare performance of various Kreyòl measures (e.g. CES-D, BDI, KDI, ZLDSI, PHQ-9) to determine which tool works best for different purposes (e.g., screening, treatment evaluation, epidemiological studies). Given regional and socio-economic variation and variation in usage of idioms of distress across Haiti, it would be crucial to establish norms and psychometric properties of the KDI among urban and higher SES populations to compare with our findings from a rural, low SES population.

Field research was facilitated through a local healthcare organization, and some respondents may have endorsed symptoms in order to access services. We sought to minimize this effect by hiring and training local research assistants to administer the survey. Additionally, results should be considered in their regional context. Endorsements of certain idioms of distress and their explanatory meanings are potentially subject to geographic variation, particularly when comparing rural to urban populations. Linear regression analyses are intended to be exploratory and hypothesis-generating. Lastly, limitations of the sampling frame have been discussed elsewhere (Wagenaar et al., 2012).

### *Conclusion*

Research has suggested a large burden of mental disorder in Haiti, including in the Central Plateau (Cenat & Derivois, 2014, 2015; Cerda et al., 2013; Kaiser et al., 2013; Martsolf, 2004a; Smith Fawzi et al., 2010; Wagenaar et al., 2012). However, one of the challenges to addressing this burden is more fully characterizing the forms and extent of

mental health problems, as well as identifying those most in need of intervention. Recognizing this significant burden, there is a need for culturally-relevant screening tools to inform research and surveillance, as well as for clinical and community identification of individuals in need of mental healthcare. This research contributes to addressing such recognized needs by developing and testing an ethnographically-grounded idioms of distress screener. The Kreyòl Distress Idioms (KDI) is a local screening tool for identification of mental distress in Haiti's Central Plateau.

This study contributes to debates over whether culturally-adapted or locally-developed screening tools should take precedence in global mental health measurement (Desjarlais et al., 1995; Kaiser et al., 2013; Kohrt et al., 2011b; Mezzich et al., 1999; Phan et al., 2004; van Ommeren et al., 1999; Weaver & Kaiser, 2014). In particular, I show that it is possible to develop a genuinely local tool using ethnographic methods and then to test the utility of this tool for the purpose of research and intervention. Significantly, the KDI consists entirely of relevant idioms of distress drawn from the local context, yielding high ethnographic validity and providing strong potential for improved communication and comprehensibility locally. Additionally, this study has demonstrated that the ethnographically-grounded KDI has high convergent validity, correlating strongest with culturally-adapted measures of anxiety. Finally, factors associated with KDI symptomology were consistent with risk profiles previously found for depression in the same study region, as well as common risk factors in other countries. For these reasons, I argue that the KDI may be more valid and appropriate for evaluating mental ill-health in rural Haiti than screening tools developed from Western contexts and then culturally-adapted.

At the same time, I demonstrate that locally-developed tools like the KDI can be used in tandem with culturally-adapted tools, like the Beck Depression Inventory (BDI) and

Beck Anxiety Inventory (BAI) to develop a more holistic picture of forms of mental distress. In this way, a hybrid approach that combines culturally-adapted tools and locally-developed tools might be the most promising approach for reconciling goals of cross-cultural communication and ethnographic validity within global mental health research (Weaver & Kaiser, 2014).

Further research and clinical validation are necessary to assess the utility of employing the KDI as a screening tool during the clinical encounter in rural Haiti. In particular, several items correlated with both the BDI and BAI but do not seem to be sufficiently discriminant in terms of identifying particularly mental health problems. In fact, these idioms of distress might equally reference somatic complaints arising from physical disorder (Keys et al., 2012). Future research should explore whether these idioms of distress should be removed from the screening tools or whether other adjustments are needed to facilitate their use in terms of communication of mental distress in clinical and community contexts.

Furthermore, although the strategies used to develop the KDI provide for ethnographic validity – in other words, we can be relatively certain that the screening tool measures what we intend to measure in locally-relevant ways – it has not undergone a clinical validation process. Because biomedical mental healthcare in Haiti draws on Western diagnostic categories, it is important to consider how such screening tools can best communicate with biomedical diagnostic categories. The strong associations of idioms of distress on the KDI with the diagnostic categories of depression and particularly anxiety suggest that there is overlap between these conceptual categories. However, further research, including a clinical validation process, would be necessary to fully evaluate the KDI's utility in a clinical setting. In the meantime, it appears that the KDI could be useful for initial

assessment in clinical and community settings, by drawing on locally-relevant terminology to identify those at risk of mental disorder. This assessment could be conducted in tandem with use of Western screening tools like the BDI or BAI and/or could suggest the need for further evaluation and potential diagnostic assessment.

It is hoped that this research will encourage the use of similar strategies in other settings, with attention paid not only to cross-cultural communication and diagnostic validity but equally to issues of ethnographic validity and local priorities. Such research should not occur in a vacuum but must always be linked to efforts to provide mental healthcare, which should likewise be based on local priorities and needs.

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# Appendices

## Appendix 1: Characteristics of participants in qualitative data collection (interviews, focus group discussions, and case studies)

**Interview participants**

| Profession | Number, Sex | Location |
|---|---|---|
| *Community leaders* | | |
| UN mental health professional | 1 M | Port-au-Prince |
| Adjunct mayor | 1 M | Large town |
| Communal section leader | 1 M | Small town |
| NGO mental health services director | 1 M | Small town |
| NGO administrative director | 1 F | Large town |
| Nurse (Community Task Team) | 1 F | Large town |
| Farmer, carpenter | 1 M | Large town |
| Community Health Workers | 2 M | Rural community |
| *Traditional healers and religious leaders* | | |
| Hougan-s (Vodou priests) | 2 M | Large town |
| Baptist pastor | 1 M | Large town |
| Catholic priest | 1 M | Large town |
| Evangelical pastor | 2 M | Large town, Rural community |
| Seventh Day Adventist pastor | 1 M | Rural community |
| *Biomedical providers* | | |
| Hospital director | 1 F, 1 M | City |
| Medical doctors | 2 F, 1 M | Port-au-Prince, City, Large town |
| Psychologists | 2 F, 1 M | Port-au-Prince, City, Large town |
| Social workers[a] | 1 F, 3 M | City, Small town |
| Auxiliary nurses[a] | 2 M | Large town |
| Student nurse[a] | 1 F | Large town |

a. Indicates employee of host non-governmental organization (NGO)

**Focus group discussion (FGD) participants**

| Participants | Topic | Number, Sex | Age |
|---|---|---|---|
| *FGDs to culturally adapt screening tools* | | | |
| Community members | Beck Depression Inventory | 8 M | 31-68 |
| Community members | Beck Depression Inventory | 7 F | 18-44 |
| Community members | Beck Depression Inventory | 9 M | [a] |
| Community members | Beck Depression Inventory | F[a] | [a] |
| Community members | Beck Anxiety Inventory | 14 M | 23-70 |
| Community members | Beck Anxiety Inventory | 10 F | 17-57 |
| *Other FGDs* | | | |
| Community health workers | Challenges and resources in community | [a] | [a] |
| Health Promoters | Challenges and resources in community | 6 F, 1 M | 22-40 |
| Community leaders | Emotion mapping | [a] | [a] |
| Members of Protestant church | Idioms of distress | [a] | [a] |

a. Indicates missing information

**Case study participants**

| Name[a] | Profession | Sex | Age | Education | Symptoms[b] | Visits[c] | Setting |
|---|---|---|---|---|---|---|---|
| Elaine | Migrant labor in Port-au-Prince | F | 43 | Some nursing school | "Thinking too much," paranoia, sees things others can't | 5 | Rural area |
| Jacques | Farming | M | 25 | Some primary | Hears noises, talks to self, runs away from home | 4 | Rural area |
| Marie | Taking sewing lessons | F | 20 | Some primary | Bizarre behavior, runs away from home | 4 | Small town |
| Michel | Migrant labor in Port-au-Prince | F | 24 | Some primary | Trouble sleeping, abdominal pain, headache, sadness | 5 | Small town |

a. Names have been changed to protect confidentiality
b. Symptoms refer to mental health symptoms as identified by community stakeholder who made referral
c. Number of visits made to interview case study participant and his/her family

## Appendix 2: Detailed list of variables considered for inclusion into linear regression model

| Variable | Question | Question format | Answer Choices |
|---|---|---|---|
| Age | What age are you? | Write-in | N/A |
| Sex | Are you a woman or a man? | Circle one | Female, male |
| Marital status | What is your marital status? | Multiple choice | Single, cohabiting, divorced, widowed, married |
| Number of children | How many children live in this household (Kreyòl: *Lakou*) | Write-in | N/A |
| Household size | How many people total (adults and children) live in this household (Kreyòl: *Lakou*) | Write-in | N/A |
| Education | How much education do you have? | Multiple choice | No formal schooling, some primary, finished primary, some high school, finished high school, finished graduate/professional |
| Literacy | Can you read? | Binary | Yes/no |
| Religion | What is your religion? | Multiple choice (choose as many as apply) | Catholic, Protestant, Baptist, Episcopal, Vodou, no religion, other (write-in) |
| Income | How many *goud* (Haitian currency) do you make each month? | Write-in | N/A |
| Travel time to work | How much time does it take to arrive at your work? | Multiple choice | Do not work, 0-15 minutes, 15-30 minutes, 30-60 minutes, 1-2 hours, more than 2 hours |
| Land | How much plots of cultivatable land do you personally own? | Write-in | N/A |
| SES scale | Do you have? | Multiple choice (choose as many as apply) | Tin roof, bicycle, motorcycle, television, radio, cement house, latrine, electricity, telephone |
| Previous residence | Have you ever lived in any of the following places?<br>Have you ever worked in any of the following places? | Multiple choice (choose as many as apply) | Thomonde, Hinche, Port-au-Prince, another area of Haiti (specify), Dominican Republic, other country (specify) |
| Source of drinking water | Where do you get your water for drinking? | Multiple choice | River, well, spring, covered well, pipe/tap, other (write-in) |

| | | | |
|---|---|---|---|
| Distance to drinking water | How much time does it take to get drinking water and return to your house? | Multiple choice | 0-15 minutes, 15-30 minutes, 30-60 minutes, 1-2 hours, more than 2 hours |
| Care seeking behavior | The last time you were sick where did you go for help? | Multiple choice | Family, friends, Vodou priest, Vodou priestess, church pastor or priest, hospital or clinic, community health worker, NGO, chief of community, herbal healer, did not go anywhere, other (write-in) |
| Care seeking behavior | How much time does it take for you to get to a hospital or clinic? | Multiple choice | Never go to doctor, 0-15 minutes, 15-30 minutes, 30-60 minutes, 1-2 hours, more than 2 hours |
| Care seeking behavior | Have you ever been to a Vodou priest for help (treatment)? | Binary | Yes/no |
| Trauma related to earthquake | Which of the following did you experience regarding the earthquake? | Multiple choice (choose as many as apply) | I was in a town hit by the earthquake, I was injured/hurt, a family member of mine was killed, new people moved into my house |
| General trauma | Which of the following have you *ever* experienced? | Multiple choice (choose as many as apply) | Been attacked with a weapon (gun, knife, machete), had possessions stolen, been in a machine (car, motorcycle) accident, experienced large-scale violence (war, violent protest), been affected by a large fire, had a large flood in house or farm, had someone die in my family, had a life-threatening illness, have been raped |
| Reported household mental illness | Does anyone in your household suffer from sadness, unhappy heart, or stress that makes life difficult? | Binary | Yes/ no |
| Stigma towards mental illness | If someone suffers from sadness, unhappy heart, or stress that makes life difficult, is it their fault? | Multiple choice | Never, sometimes, always |
| Perceived causes of distress | What is capable of causing sadness, unhappy heart, or stress that makes like difficult? | Multiple choice (choose as many as apply) | Spirits, alcohol or drugs, thinking too much, problems with family or community members, disasters, bad luck, lack of activities, other (write-in) |
| Perceived causes of distress | What is the most likely cause of sadness, unhappy heart, or stress that makes like difficult? | Multiple choice | Spirits, alcohol or drugs, thinking too much, problems with family or community members, disasters, bad luck, lack of activities, other (write-in) |

| | | | |
|---|---|---|---|
| Alcohol use | Do you drink alcohol? | Binary | Yes/no |
| Care and household help | Do you have someone who can… | Binary (yes/no) | Care for you if sick, go to the market or buy food for you, loan you money if you need it (not from bank), make food for you, give you advice |