Mental Health Knowledge, Perceived Risk, and Perceived Stigma Among Community Health Workers in Haiti, Malawi, and Rwanda: a cross-sectional study

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Abstract

Background

Community health workers (CHWs) are key to disseminating mental health information and facilitating care in underserved population where stigma is common. This study assessed perceived risk, stigma, and mental health knowledge among CHWs in Haiti, Malawi, and Rwanda.

Methods

Between June and September 2023, we conducted a cross-sectional, in-person survey to collect data on mental health knowledge, perception and risk among 525 adult CHWs working in rural communities served by Partners In Health in Haiti, Malawi, and Rwanda. CHWs reported perceived risk for mental and physical illnesses relative to peers of similar age and sex. We used the Mental Health Knowledge Schedule (MAKS) and Stigma-9 Questionnaire (STIG-9). Descriptive statistics summarized demographic characteristics and responses which were compared by sex, country, and perceived risk.

Results

We enrolled 525 CHWs were enrolled with equal representation from Haiti, Malawi, and Rwanda. Most study participants were female (56.8%) and 35.4% were between 40 to 49 years. CHWs perceived their risk of developing mental illness to be similar to their risk of developing physical illnesses, with women reporting higher perceived risks for anxiety and depression compared to men. Participants from Haiti perceived they were at lower risk of suicidal ideation compared to their peers. The average MAKS score was 43.8 /60, with no significant differences by country ($p = 0.189$) or sex ($p = 0.366$)The most common knowledge gaps included failing to classify drug addiction as a mental illness, mistakenly classifying grief and stress as mental illnesses, and underestimating the prevalence of help-seeking behaviors and desire to be employed among individuals with mental health illness. The average STIG-9 score was 26.1/27, with women indicating slightly higher perceived stigma in all three countries. CHWs who perceived themselves to be at higher risk of mental illness exhibited lower knowledge about mental health and perceived higher levels of stigma in their communities.

Conclusions

This study highlighted specific mental health knowledge gaps among CHWs and indicated persistent perceived stigma towards those with mental illness in the communities where CHWs work. There is a need for targeted interventions to increase mental health knowledge among CHWs and reduce stigma towards mental illness in LMICs.

Introduction

For the past 20 years, mental disorders have consistently ranked as one of the leading causes of years lived with disability globally, with over 970 million individuals living with mental disorders in 2019(1).

Eighty-two percent of individuals living with mental disorders live in low- and middle-income countries (LMICs)(2). Despite the substantial burden of mental disorders in LMICs, those living in LMICs are substantially less likely to be able to access treatment for mental illness, with treatment rates for common mental disorders often falling below 20%(3, 4).

Although this mental health “treatment gap” is often attributed to a lack of relevant health services, there is increasing evidence that stigma, lack of knowledge regarding mental disorders, and lack of awareness of treatment options also play substantial roles(5, 6). Global research indicates that lack of perceived need, knowledge deficits, and pervasive stigma significantly impede access to mental health services(7–11).These barriers may feed into each other. For example, stigma is often fueled by a lack of knowledge, including the idea that individuals with mental health disorders lack reasonable judgment and are violent and dangerous(11, 12).

One possible avenue for addressing knowledge, attitudinal, and stigma-related barriers to accessing mental health treatment is leveraging community health workers (CHWs) as trusted sources of health information. In most LMICs, CHWs are integrated into the communities they serve and bridge the gap between primary healthcare facilities and the community by providing various preventive, promotional, and clinical health services(13). Several previous studies have investigated the possibility of integrating CHWs into community-based mental health interventions and generally reported positive results(14). However, CHWs themselves have also sometimes been identified as having low knowledge about mental disorders and negative attitudes toward individuals with mental illness(15–17). At the same time, the substantial workload placed on CHWs can leave them vulnerable to mental illnesses such as depression, anxiety, and burnout, especially during the COVID-19 pandemic(18). Community member’s stigma regarding mental illness can also impact CHWs ability to interact with those with mental illness and even lead to discrimination against the CHW for providing mental health services (19).

Our study aims to assess perceptions of risk of mental illness, mental health knowledge, and perceived mental health stigma among CHWs in Haiti, Malawi, and Rwanda. Our study additionally delves into the difference in perceived risk for mental health between male and female CHWs within each country. This study helps to contribute to the limited body of research on mental health knowledge and perceptions among CHWs in LMICs and can help us develop more effective approaches for ensuring the well-being of people with mental health conditions in settings.

Methods

Study setting

This cross-sectional study analyzes baseline data gathered as part of a larger randomized trial assessing the effectiveness of using a text message-based intervention to help CHWs address misinformation related to COVID-19 and mental health. This study was conducted in three countries with diverse political and social settings supported by Partners In Health (PIH): Haiti, Malawi, and Rwanda. PIH is a non-profit

organization supporting health care delivery in collaboration with local governments, Ministries of Health (MOHs), and healthcare institutions in Haiti (Central Plateau), Malawi (Neno district), and Rwanda (Burera, Kayonza, and Kirehe districts) since 1987, 2005, and 2015, respectively. All #three countries supported by PIH with active CHW programs were invited to participate; these three countries were included because of their interest in the proposed CHW intervention.

As described in Table 1, CHWs in each of the three countries were already engaged in providing some mental health services before the intervention, although mental health services were not the primary focus of any program. The intervention involved sending 5,100 CHWs weekly text messages over the course of 12 months. Each participating CHW was randomized to either receive messages focusing on COVID-19 or messages focused on mental health topics. This analysis pertains to the baseline data only.

Table 1
Description of the CHW programs in Haiti, Malawi, and Rwanda

	Haiti	Malawi	Rwanda
Region	Central Plateau and Aribonite	Neno District	Burera, Kayonza, Kirehe Districts
Eligible CHWs in Catchment Area	400	1,200	3,500
Origin and Focus of CHW Program	In 1986, the Haitian Ministry of Health, in collaboration with PIH, initiated a national CHWs Program(20), which is now managed and supported by PIH at the sites level in central plateau and the Lower Artibonite. CHWs are instrumental in delivering essential primary healthcare services, focusing on primary healthcare. Notably, they play a crucial role in monitoring and providing support to patients with tuberculous (TB) and HIV(21,22).	Ministry of Health in partnership with the PIH, implemented a care model centered around a CHW program(23). The primary role of CHWs was to offer assistance and companionship to those seeking healthcare services for TB and HIV at healthcare facilities(23–25).	Started in 1995 by the Ministry of Health post-genocide against the Tutsi(26). Their primary aim was to tackle prevailing challenges related to healthcare accessibility and the shortage of healthcare professionals that were in the country(27).
CHWs Role in Mental Health Care	In the aftermath of the 2010 earthquake, the Haitian government, in conjunction with PIH, launched a Community Mental Health Program. This initiative aimed to enhance the availability and accessibility of mental health services by training non-specialist in both mental health and neurological disorders(28). CHWs are central to community-based mental health care. Their responsibilities involve identifying potential cases within the community, facilitating referrals to health facilities, and conducting initial screenings. They also conduct community	In 2016, the CHWs received training aimed at improving mental health services within the community. This training equips primary health workers with the skills necessary to better support and provide mental health services to individuals who need them, thereby improving access and care at the local level(25, 29, 30). CHWs in Malawi provide services such as screening for mental health illnesses, linkage to care, and psychosocial support at the community level(31, 32).	In response to mental health service needs, Rwanda introduced its national Community-based Mental Health program in 2007(33, 34). CHWs are trained to identify signs of mental illness, to do home visits, and refer patient to their nearest health facilities(33).

	Haiti	Malawi	Rwanda
	education, stigma reduction, and patient follow-up, ensuring continuity of care within the community(28).		

Study design and population

Our study reports on data collected during the baseline period of the parent randomized control trial. We sampled a total of 525 CHWs (175 CHWs per country). CHWs were selected from 11 facilities in Haiti, 14 facilities in Malawi, and 25 facilities in Rwanda. Eligible participants were CHWs aged 18 years and older actively working in communities served by PIH-supported health facilities in rural Haiti, Malawi, and Rwanda. Each health facility provided a list of CHWs and their contact information as of July 2023. From each country list, 205 CHWs were randomly selected (175 + 30 backups). Out of the 205 CHWs, the study team contacted the first 175 CHWs in order to appear on the list. If a selected CHW refused to participate in the study, the team went on to enroll the next listed CHW. If fewer than 175 CHWs were recruited from the initial list, the country team contacted additional CHWs beyond the 175th position until the sample size was met. A team of data collectors would then contact the CHWs to schedule appointments, indicating the day and time for them to meet at the nearest health facility for data collection.

Data collection

Data collection occurred between June and September 2023. Enumerators gathered data using the REDCap software installed on tablets. Interviews lasted between 30 to 90 minutes and included questions about CHWs' demographics, such as age, sex, COVID-19-related questions, and mental health-related questions, including perceived risk, mental health knowledge, and perceived stigma. Questionnaires were administered verbally in the local languages, Haitian Creole in Haiti, Chichewa in Malawi, and Kinyarwanda in Rwanda.

Perceived risk

To assess perceived risk, participants were asked, *"Compared to most people your age and sex, how would you rate your likelihood of developing _____."* for list of mental health and physical conditions(35, 36). The perceived risk of developing each illness was evaluated using a 5-point Likert scale, ranging from "much lower than average risk" (1) to "much higher than average risk" (5). This measure of perceived risk was selected because it has been demonstrated to be more strongly associated with actual risk factors for illness(37). Some conditions were country specific: questions about Ebola were only asked to CHWs in Rwanda, questions about typhoid and suicidal ideation were only directed to

participants in Haiti, and questions regarding hypertension were only asked to participants in Haiti and Rwanda.

Mental Health Knowledge Schedule

To assess knowledge of mental health, we used the Mental Health Knowledge Schedule (MAKS) questionnaire, which includes 12 questions to assess knowledge and stigma towards mental health conditions(38). Responses were measured using a 6-point Likert scale, ranging from (1) “strongly disagree” to (5) “strongly agree”, with an additional option for (6) “don’t know.” Prior to analysis, responses of “don’t know” were re-coded as a neutral response and items 6, 8, and 12 were reverse-coded, per instructions(38). The MAKS total score was calculated as the sum of points obtained for each of the 12 items such that a high total score corresponds to greater knowledge(38). In case of missingness, the missing item was imputed by the person-specific mean.

Stigma-9 questionnaire

Perceived mental health stigma was measured using the nine item Stigma-9 (STIG-9) questionnaire(39). Study participants were presented with nine statements regarding their perceptions of what most people think, and were asked to rate them using a 4-point Likert scale, ranging from disagree (0) to agree (3), with higher agreement indicating greater perceived stigma. Statements such as, “*Most people consider taking the opinion of someone who has been treated for mental health illness to be dangerous*,” and *“Most people or employees do not even take a look at an application from someone who has been treated for mental health illness”* were included. The STIG-9 total score was calculated as the sum of points obtained for each of the nine statements. In case of missingness, the missing item was imputed by the person-specific mean. A higher STIG-9 score indicated stronger perceived stigma.

Conceptual framework

Our analytic approach was guided by the Mental Illness Stigma Framework, which categorizes stigma according to two distinct perspectives(40). The first perspective, “the stigmatized,” encompasses the societal attitudes and perceptions of individuals with mental health illness. The second perspective, “the stigmatizer,” refers to the views and beliefs held by those who could potentially engage in stigmatizing behavior toward individuals with mental illness. Researchers describe the stigmatizer’s perspective as consisting of three key mechanisms: knowledge (stereotypes), attitudes (prejudice), and behavior (discrimination)(38, 40). Both the stigmatizer and the stigmatized experience perceived stigma, which refers to the extent to which an individual perceives stigmatizing attitudes or behaviors towards those with mental illness in their broader society. In our analysis and in line with previous literature(40), we have conceptualized perceived risk of mental illness as indicating the extent to which a CHWs aligns with a “stigmatizer” or a “stigmatized” perspective. In particular, CHWs who reported a ‘higher than average’ or ‘much higher than average’ risk for either depression or anxiety were classified as having a high-

perceived risk, which we conceptualized as aligning with the perspective of the stigmatized from the Mental Health Illness framework, while those who stated a 'much lower than average', 'lower than average', of 'average' risk for both conditions were classified as having a low-perceived risk, which we conceptualized as aligning with the perspective of stigmatizers. Furthermore, the MAKS total score measures knowledge (stereotyping); and the STIG-9 score measures perceived stigma towards individuals with mental health conditions.

Data analysis

Statistical analysis was performed using STATA v15.1. Descriptive statistics for demographic characteristics were reported in strata defined by country and sex and compared using Chi-square tests. The distribution of CHWs' perceived risk from mental and physical illnesses reported for each county and by sex were visualized using boxplots. We reported means and standard deviations for the MAKS score and its individual statements as well as the STIG-9 score and its individual components for the overall population of CHWs and within strata defined by sex and country. We assessed differences between female and male CHWs across countries or country-specifically using the Wilcoxon rank-sum test and by country using Kruskal-Wallis tests. We compared MAKS and STIG-9 scores between those who had high and low perceptions of risk of developing mental health conditions using the Wilcoxon rank-sum test.

Ethics

The study obtained ethical approval from Harvard Internal Review Board (IRB#11-1339), the Malawi National Committee on Research in the Social Sciences and Humanities (IRB# 11/22/694), the Haiti Zanmi Lasante Institutional Review Board (IRB# 11082022), and the Rwanda National Research Ethics Committee (IRB# 00001497). All CHWs provided written informed consent before study participation. Data was de-identified and securely stored.

Results

Demographics of respondents

Of the 525 CHWs surveyed, most were female (n = 298, 56.8%) and the highest proportion were between 40 to 49 years old (n = 186, 35.4%) (Table 2). The distribution of both age and sex varied significantly across countries ($p < 0.001$). Among 497 respondents with complete data on education, all had attended school, but we observed significant variations in the highest level of education completed by country ($p < 0.001$). Overall, nearly half (n = 248, 49.9%) of participants completed secondary school, with Haiti reporting 87.1% (n = 148) completing secondary school. In Malawi and Rwanda, the majority of CHWs reported that they had only completed primary school (Malawi: n = 97, 57.4%; Rwanda n = 130, 82.3%).

Table 2
Demographics of respondents (N = 525)

	Total (N = 525)		Haiti (N = 175)		Malawi (N = 175)		Rwanda (N = 175)		p-value
	n	%	n	%	n	%	n	%	
Sex									< 0.001
Male	227	43.2	109	62.3	58	33.1	60	34.3	
Female	298	56.8	66	37.7	117	66.9	115	65.7	
Age (years), categorized									< 0.001
18–39	168	32.0	29	16.6	69	39.4	70	40.0	
40–49	186	35.4	66	37.7	62	35.4	58	33.1	
50–59	128	24.4	57	32.6	32	18.3	39	22.3	
>=60	43	8.2	23	13.1	12	6.9	8	4.6	
Attended school[1]	497	100.0	170	100.0	169	100.0	158	100.0	---
Highest level of school attended[1]									< 0.001
Primary	234	47.1	7	4.1	97	57.4	130	82.3	
Secondary	248	49.9	148	87.1	72	42.6	28	17.7	
Higher	15	3.0	15	8.8	0	0.0	0	0.0	

[1]Data on education level was only available among CHWs who were retained at midline (N = 497).

Risk perception of mental health conditions

Figure 1 depicts the CHWs' perceived risk of developing various mental and physical illnesses relative to people of the same age and sex by country. In general, CHW's perceived risk for mental illness was aligned with their perceived risk for other physical conditions. CHWs from Haiti and Rwanda reported that they had a median lower-than-average risk of developing anxiety and depression than their peers and similarly reported a median lower-than-average or much-lower-than-average perceived risk of developing all physical diseases other than hypertension, for which they reported median average risk. CHWs from Malawi reported they had a median average perceived risk of both anxiety and depression compared to their peers and they also reported median average perceived risk for most other physical diseases. For self-perceived risk of suicidal ideation, which was asked only among CHWs from Haiti, CHWs reported a median much lower risk of suicidal ideation than their peers.

Questions about Ebola were only asked to CHWs in Rwanda, questions about typhoid and suicidal ideation were only directed to participants in Haiti, questions regarding hypertension were only asked to CHWs in Haiti and Rwanda.

Figure 2 illustrates CHWs self-perceived risk of mental illness by sex in Haiti, Malawi, and Rwanda. In all three countries, women's median self-perceived risk for anxiety was greater than men's, but the difference was not statistically significant ($p = 0.286$, $p = 0.052$, and $p = 0.158$, in Haiti, Malawi, and Rwanda, respectively), and in Malawi and Rwanda, women also reported higher self-perceived risk of depression, but difference was not statistically significant in Malawi $p = 0.218$ and the difference was statistically significant in Rwanda ($p = 0.049$). In Haiti, median self-perceived risk of suicidal ideation was the same for both men and women; however, the overall distribution of perceived risk for women skewed towards higher risk.

Haiti: N = 174; Malawi N = 175; Rwanda: N = 175. Participants in Malawi and Rwanda were not asked about the perceived risk of suicidal ideation.

Mental Health Knowledge

The MAKS total mean score was 43.8 out of a theoretical maximum of 60 with no statistically significant associated by sex ($p = 0.366$) or across countries ($p = 0.189$, Table 3). The five items that were mostly likely to be answered incorrectly included identifying that drug addiction is a mental illness (3.9), correctly affirming *"Most people with mental health problems want to have paid employment" (2.9)*, identifying that grief is not a mental illness (2.2), rejecting that "*Most people with mental health problems go to a healthcare professional to get help*" (1.6), and identifying that stress is not a mental illness (1.6). In general, responses from men and women within the same country were more similar to each other than responses from CHWs in different countries.

Table 3
Mental health knowledge schedule (MAKS) among CHWs by country and sex. Cells give mean and (std) (N = 525)

	Total	Rwanda		Malawi		Haiti		p-value by sex[1]	p-value by country[2]
		Male	Female	Male	Female	Male	Female		
	N = 525	N = 60	N = 115	N = 58	N = 117	N = 109	N = 66		
Most people with MH problems want to have paid employment	2.9 (1.5)	2.9 (1.3)	2.7 (1.2)	2.7 (1.8)	2.6 (1.7)	3.3 (1.6)	3.2 (1.6)	0.042	0.001
If a friend had a MH problem, I know what advice to give them to get professional help	4.7 (0.7)	4.9 (0.4)	4.9 (0.4)	4.5 (0.9)	4.7 (0.7)	4.7 (0.9)	4.8 (0.7)	0.668	< 0.001
Medication can be an effective treatment for people with MH problems	4.5 (1.0)	4.8 (0.5)	4.7 (0.8)	4.4 (1.1)	4.1 (1.4)	4.6 (1.0)	4.6 (0.8)	0.156	< 0.001
Psychotherapy can be an effective treatment for people with MH problems	4.6 (1.0)	4.8 (0.7)	4.7 (0.8)	4.6 (1.0)	4.5 (1.0)	4.4 (1.1)	4.5 (1.0)	0.491	0.006
People with severe MH problems can fully recover	4.3 (1.2)	4.7 (0.9)	4.7 (0.7)	4.6 (0.8)	4.6 (0.9)	3.7 (1.5)	3.6 (1.4)	0.019	< 0.001
Most people with MH problems go to a healthcare professional to get help	1.6 (1.0)	1.3 (0.7)	1.1 (0.4)	1.4 (0.7)	1.5 (0.9)	2.0 (1.4)	2.0 (1.4)	0.132	< 0.001
Depression	4.4 (1.1)	4.4 (1.0)	4.3 (1.0)	4.6 (1.0)	4.4 (1.3)	4.5 (1.0)	4.4 (1.1)	0.043	0.007

[1]Gives p-value for a Wilcoxon rank-sum test comparing all men to all women. [2]Gives a Kruskal-Wallis test comparing the three countries. MH = mental health

	Total	Rwanda		Malawi		Haiti		p-value by sex[1]	p-value by country[2]
		Male	Female	Male	Female	Male	Female		
	N = 525	N = 60	N = 115	N = 58	N = 117	N = 109	N = 66		
Stress	1.6 (1.1)	1.5 (0.9)	1.7 (1.0)	1.5 (1.1)	1.7 (1.4)	1.6 (1.0)	1.8 (1.2)	0.193	0.533
Schizophrenia	4.9 (0.5)	5.0 (0.1)	4.9 (0.3)	4.9 (0.5)	5.0 (0.4)	4.7 (0.7)	4.8 (0.4)	0.003	< 0.001
Bipolar disorder (manic-depression)	4.3 (1.1)	4.0 (1.1)	3.9 (1.2)	4.6 (0.8)	4.4 (1.1)	4.5 (0.8)	4.2 (1.3)	0.069	< 0.001
Drug addiction	3.9 (1.4)	4.3 (1.1)	4.2 (1.1)	3.2 (1.7)	3.2 (1.7)	4.0 (1.4)	4.3 (1.1)	0.389	< 0.001
Grief	2.2 (1.4)	1.9 (1.1)	2.0 (1.2)	2.5 (1.8)	2.5 (1.7)	1.9 (1.3)	2.3 (1.5)	0.093	0.067
Total MAKS score	43.8 (3.7)	44.5 (2.8)	43.9 (3.1)	43.6 (3.7)	43.2 (4.0)	43.8 (4.1)	44.3 (4.4)	0.366	0.189

[1]Gives p-value for a Wilcoxon rank-sum test comparing all men to all women. [2]Gives a Kruskal-Wallis test comparing the three countries. MH = mental health

Mental health stigma

Table 4 presents the results of the perceived stigma associated with mental illness, as measured by the STIG-9 questionnaire, among CHWs across three countries. The average total STIG-9 mean score was 26.1 out of a theoretical maximum of 27 with higher scores suggesting a stronger perceived stigma. Stigma differed significantly by both country ($p < 0.001$) and sex ($p = 0.004$). Female CHWs perceived higher levels of stigma compared to their male counterparts in Malawi (28.4 female versus 26.7 male), Haiti (28.3 female versus 25.3 male), and Rwanda (24.4 female versus 23.5 male). CHWs were most likely to agree with the statements, "*I think that most people hesitate to do business with someone who has been treated for a mental illness"* (total mean = 2.0, std = 1.2; p-value by sex < 0.002; p-value by country < 0.001) and *"I think that most people hesitate to entrust their child with someone who has been treated for a mental illness*(total mean = 2.3, std = 1.1; p-value by sex < 0.001; p-value by country < 0.001), with statistically significant difference by sex and countries. Although CHWs expressed strong agreement with the statement, "*I think that most people take the opinion of someone who has been treated for mental illness less seriously"* (total mean = 2.0, std = 1.2), this difference was seen across countries ($p < 0.013$), not between men and women ($p < 0.142$).

Table 4
Stigma 9 questionnaire (Stig-9) CHWs' by country and sex as measured by the. Cells give mean and (std). (N = 525)

I think that most people…	Total	Rwanda		Malawi		Haiti		p-value by sex[1]	p-value by country[2]
		Male	Female	Male	Female	Male	Female		
	N = 525	N = 60	N = 115	N = 58	N = 117	N = 109	N = 66		
Take the opinion of someone who has been treated for MI less seriously	2.0 (1.2)	2.3 (1.1)	2.0 (1.1)	1.8 (1.4)	1.7 (1.4)	2.2 (1.1)	2.4 (0.9)	0.142	0.013
Consider someone who has been treated for a MI to be dangerous	1.9 (1.3)	1.6 (1.3)	1.7 (1.2)	1.7 (1.4)	2.0 (1.3)	1.9 (1.1)	2.3 (1.1)	0.102	0.005
Hesitate to do business with someone who has been treated for a mental illness	2.0 (1.2)	1.7 (1.3)	1.9 (1.1)	2.1 (1.3)	2.4 (1.1)	1.8 (1.1)	2.3 (1.1)	0.002	< 0.001
Think badly of someone who has been treated for a MI	1.9 (1.3)	1.7 (1.3)	1.6 (1.3)	2.3 (1.1)	2.4 (1.1)	1.4 (1.2)	1.8 (1.2)	0.018	< 0.001
Consider MI to be a sign of personal weakness	1.7 (1.3)	1.2 (1.3)	1.4 (1.3)	1.8 (1.4)	1.8 (1.3)	1.8 (1.2)	1.9 (1.1)	0.663	< 0.001
Hesitate to entrust their child with someone who has been treated for a MI	2.3 (1.1)	1.9 (1.3)	2.4 (1.0)	2.2 (1.3)	2.6 (0.9)	2.0 (1.1)	2.2 (1.1)	< 0.001	< 0.001
Do not even take a look at an application from someone who	1.9 (1.2)	1.5 (1.3)	1.7 (1.2)	2.1 (1.3)	2.1 (1.2)	1.7 (1.1)	2.2 (1.1)	0.131	0.001

[1]Gives p-value for a Wilcoxon rank-sum test comparing all men to all women. [2]Gives a Kruskal-Wallis test comparing the three countries. MI = mental illness

I think that most people…	Total	Rwanda		Malawi		Haiti		p-value by sex[1]	p-value by country[2]
		Male	Female	Male	Female	Male	Female		
	N = 525	N = 60	N = 115	N = 58	N = 117	N = 109	N = 66		
has been treated for MI									
Do not enter into a relationship with someone who has been treated for a MI	1.8 (1.2)	1.2 (1.2)	1.2 (1.2)	2.0 (1.3)	2.2 (1.1)	1.8 (1.1)	2.2 (1.0)	0.238	< 0.001
Feel uneasy when someone who has been treated for a MI moves into the neighborhood	1.7 (1.3)	1.4 (1.3)	1.5 (1.3)	1.7 (1.4)	2.1 (1.3)	1.6 (1.2)	1.9 (1.3)	0.002	< 0.001
Total STIG-9 score	26.1 (7.1)	23.5 (7.5)	24.4 (7.5)	26.7 (7.4)	28.4 (6.3)	25.3 (6.3)	28.2 (6.9)	0.004	< 0.001

[1]Gives p-value for a Wilcoxon rank-sum test comparing all men to all women. [2]Gives a Kruskal-Wallis test comparing the three countries. MI = mental illness

Relationship between perceived risk, mental health knowledge, and stigma

Table 5 presents a comparison of mental health knowledge and perceived stigma between CHWs who report a higher perceived risk of developing mental illness, which we conceptualized as aligning with the “stigmatized” perspective, and those with a lower perceived risk of developing mental illness, which we aligned as aligning with the “stigmatizer” perspective. Overall, the average MAKS score showed no significant difference between the groups (43.9 stigmatizer group versus 43.6 stigmatized group, $p = 0.453$). However, the stigmatized group reported lower levels of knowledge for several individual items, including knowing what advice to give to a friend seeking professional help for a mental health problem (4.6 stigmatized group versus 4.8 stigmatizer group, $p \leq 0.001$), knowing that people with severe mental health problems can fully recover (4.2 stigmatized group versus 4.4 stigmatizer group, $p = 0.039$), knowing that medication is an effective treatment for mental health issues (4.3 stigmatized versus 4.6 stigmatizer group; $p = 0.019$) and knowing that drug addiction is a mental health issue (3.7 stigmatized group versus 4.0 stigmatizer group; $p = 0.0042$). For the STIG-9 questionnaire, the total perceived stigma score was significantly higher in the stigmatized group compared to the stigmatizer group (27.0 versus 25.6, $p = 0.011$). The stigmatized group perceived significantly more societal hesitation to do business

with someone treated for mental illness (2.2 versus 1.9, p = 0.001), more negative societal attitudes toward thinking badly of someone treated for mental illness (2.0 versus 1.8, p = 0.011), greater reluctance to enter into a relationship with someone treated for mental health problems (1.9 versus. 1.7, p = 0.024), and greater feelings of unease when someone treated for mental illness moves into the neighborhood (2.0 versus 1.6, p = 0.001).

Table 5
Comparison of mental health knowledge schedule (MAKS) and perceived stigma (STIG-9) by perceived risk of developing mental health conditions (N = 518)

	Lower to average risk N = 340	Higher than average risk N = 178	p-value[1]
MAKS			
Most people with MH problems want to have paid employment	2.9 (1.5)	2.9 (1.6)	0.995
If a friend had a MH problem I know what advice to give them to get professional help	4.8 (0.7)	4.6 (0.8)	0.001
Medication can be an effective treatment for people with MH problems	4.6 (0.9)	4.3 (1.2)	0.019
Psychotherapy can be an effective treatment for people with MH problems	4.6 (1.0)	4.6 (0.8)	0.191
People with severe MH problems can fully recover	4.4 (1.2)	4.2 (1.2)	0.039
Most people with MH problems go to a healthcare professional to get help	1.5 (1.0)	1.7 (1.1)	0.103
Depression	4.4 (1.1)	4.5 (1.1)	0.068
Stress	1.6 (1.0)	1.7 (1.3)	0.632
Schizophrenia	4.8 (0.5)	4.9 (0.4)	0.471
Bipolar disorder (manic-depression)	4.2 (1.1)	4.4 (1.1)	0.061
Drug addiction	4.0 (1.4)	3.7 (1.6)	0.042
Grief	2.2 (1.4)	2.2 (1.5)	0.477
MAKS total score	43.9 (3.6)	43.6 (3.8)	0.453
STIG-9: I think that most people…			
Take the opinion of someone who has been treated for MI less seriously	2.1 (1.2)	2.0 (1.3)	0.679
Consider someone who has been treated for a MI to be dangerous	1.8 (1.2)	1.9 (1.3)	0.193
Hesitate to do business with someone who has been treated for a MI	1.9 (1.2)	2.2 (1.1)	0.001
Think badly of someone who has been treated for a MI	1.8 (1.3)	2.0 (1.2)	0.011

[1][1]Gives p-value for a Wilcoxon rank-sum test. MI = mental illnesses; MH = mental health

	Lower to average risk N = 340	Higher than average risk N = 178	p-value[1]
Consider MI to be a sign of personal weakness	1.6 (1.3)	1.7 (1.3)	0.236
Hesitate to entrust their child with someone who has been treated for a MI	2.2 (1.1)	2.3 (1.1)	0.160
Do not even take a look at an application from someone who has been treated for MI	1.9 (1.2)	1.9 (1.2)	0.372
Do not enter into a relationship with someone who has been treated for a MI	1.7 (1.2)	1.9 (1.2)	0.024
Feel uneasy when someone who has been treated for a MI moves into the neighborhood	1.6 (1.3)	2.0 (1.3)	0.001
Total STIG-9 score	25.6 (7.1)	27.0 (7.3)	0.011

[11]Gives p-value for a Wilcoxon rank-sum test. MI = mental illnesses; MH = mental health

Discussion

The present study assessed perceived risk of mental illness, mental health knowledge, and stigma among CHWs based on a cross-sectional study in Haiti, Rwanda and Malawi. Overall, our findings suggest that CHW perceive that their risk of developing mental illness is similar to their risk of developing other physical diseases. As reported in previous literature(41), we consistently observed that women perceived a higher likelihood for developing anxiety and depression than men. While CHWs generally perceived themselves to be at similar risk for mental and physical disease, perceived risk of suicidal ideation among CHW in Haiti relative to their peers was extremely low. Previous research from Haiti have reported a prevalence of suicide ideation of 65% and suggested that political instability and economic difficulties in Haiti have increased suicidal ideation, especially among women who have experienced non-partner sexual violence(42–44). Our findings of low perceived risk of suicidal ideation among CHWs could be due to several factors. First, higher stigma surrounding suicide could lead to under-reporting of self-perceived risk. Second, high levels of risk in the general population could lead CHWs to perceive that they are at lower risk relative to many of their peers, even if they are at elevated risk overall. Third, the majority of our sample from Haiti was male, and this demographic imbalance could explain why they reported a lower perceived risk of suicidal ideation than expected based on the literature.

CHWs generally reported a moderate level of mental health knowledge. Their average MAKS score (43.8) falls at the upper end of the range of MAKS scores reported from similar studies conducted in LMICs among frontline health workers or other community members (21.9–44.2)(45–50). However, we note that the three lowest scoring items were also the three reverse coded items. This finding may suggest evidence for “yes bias” or "acquiescence response style," which is a phenomenon where respondents tend to provide positive responses, regardless of the content of the question(51). Previous research has

suggested that the MAKS scale may be vulnerable to this sort of bias since the majority of its questions are phrased in a single direction where a positive response indicates a correct answer(52). Furthermore, acquiescence response style is a culturally-dependent phenomenon that is known to be inversely associated with wealth(53). It may, consequently, be more common in low-income countries such as Haiti, Malawi, and Rwanda than in the high-income settings where MAKS was originally developed (54). The two remaining low-scoring items likely reflect genuine negative stereotyping against those with mental illness. Most people disagreed that, “people with mental problems want to have paid employment,” which suggests a potential underestimation of the capabilities and desires of individuals with mental health conditions to engage in meaningful employment and is consistent with previous research regarding the perceived ability of people with mental health conditions to engage in productive societal roles(55). Similarly, a large proportion of respondents did not view drug addiction as a mental illness, which may suggest that study participants view drug addiction as a character flaw rather than a medical condition(56).

Study participants also reported a moderately high level of stigma towards individuals with mental health illnesses, with a mean score of 26.1. These findings are slightly higher than a previous study using the STIG-9 among professionals in Nigeria, which documented lower perceived stigma with mean score of 14.8(57). It is important to recognize that our study measured perceived stigma, not discrimination or prejudice, and that perceiving higher levels of stigma in their community does not necessarily imply that CHWs are personally engaged in stigmatizing behaviors towards others. Our study results also demonstrated that female participants perceived slightly higher levels of stigma compared to their male counterparts across all three countries and that CHWs who perceived themselves to be at higher risk of mental illness were significantly less likely to have correct knowledge on three out twelve items on the MAKS scale and also to perceive higher levels of stigma towards people with mental illness in their community. This co-occurrence of lower knowledge, higher perceived risk, and higher perceived stigma may suggest a situation in which a lack of information about mental illness leads to greater fear of mental illness at both the individual and societal level, especially among female CHWs. However, it is also possible that some of the CHWs who perceive themselves to be at higher risk of mental illness, especially female CHWs, actually have a personal history of mental illness and are therefore more sensitive to stigmatizing attitudes or behaviors in society. This interpretation is aligned with the overall Mental Illness Stigma Framework, which outlines that perceived stigma impacts “stigmatized” individuals who have experienced mental illness and “stigmatizing” individuals who have not experience mental illness; however, the extent to which these groups perceive stigma in their society is shaped by their personal experiences of mental illness(40).

This study has several limitations. First, all of our findings are from PIH-supported districts, which have established a community-based mental health program interventions(28, 58, 59). Therefore, these CHWs may have higher-than-average exposure to information about mental illness, and our findings may not be generalizable to all communities in Haiti, Malawi, or Rwanda. Second, as previously noted, the MAKS questionnaire may suffer from “yes bias,” which means it may be difficult to distinguish true knowledge from acquiescence response for positively worded statements. Third, although we assessed perceived

stigma, we did not directly assess the extent to which the CHWs themselves discriminated against or held prejudicial attitudes towards people with mental illness. In the context of our larger study, which is designed to use informational text messages to increase knowledge, combat stigma, and promote health service utilization, asking about perceived stigma rather individual discriminatory behaviors or beliefs has the benefit of mitigating social desirability bias and capturing community-level effects of the intervention. However, as noted above, measures of perceived stigma should not be misinterpreted to reflect personal beliefs or individual behaviors.

Despite these limitations, this study is one of few studies to assess risk perception, mental health knowledge, and perceived stigma among CHWs across three LMICs. As frontline providers, CHWs play a pivotal role in shaping public perceptions and facilitating access to care. Our findings underscore the importance of addressing persistent knowledge gaps, particularly around the desire for employment among people with mental health illness and understanding substance use disorders as mental health conditions. They also point to a pressing need for perceived stigma reduction interventions that equip CHWS to both model and promote inclusive, supportive community attitudes towards individuals living with mental illness.

Declarations

Ethics approval and consent to participate

All procedures performed in this study followed the ethical principles outlined in the 1964 Declaration of Helsinki. This study obtained ethical approval from Harvard Internal Review Board (IRB# 11-1339), the Malawi National Committee on Research in the Social Sciences and Humanities (IRB# 11/22/694), the Haiti Zanmi Lasante Institutional Review Board (IRB# 11082022), and the Rwanda National Research Ethics Committee (IRB# 00001497). All participants involved in the study provided informed consent prior to implementation.

Consent for publication

Not applicable.

Availability of data and materials

Access to datasets used and/or analyzed for this study must be requested to the corresponding author.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

Conceptualization and methodology: MC, JCM, DAB, JCM, BHG. Data collection: TM, KD, FG, TN, TN, AU, SM, AA, NB, BC, FM; Implementation: TM, SAJ, KD, FG, EB, NB, MC, FM, BHG. Data cleaning and analysis: TM, SAJ, SA. Manuscript preparation of original draft: TM, SAJ, SA, KB, EB, FM, BHG. Writing-review & editing: TM, SAJ, SA, KD, FG, TN, AU, SM, AA, EB, NB, BC, MC, DAB, FM, BHG. All authors read and approved the final manuscript.

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Figures

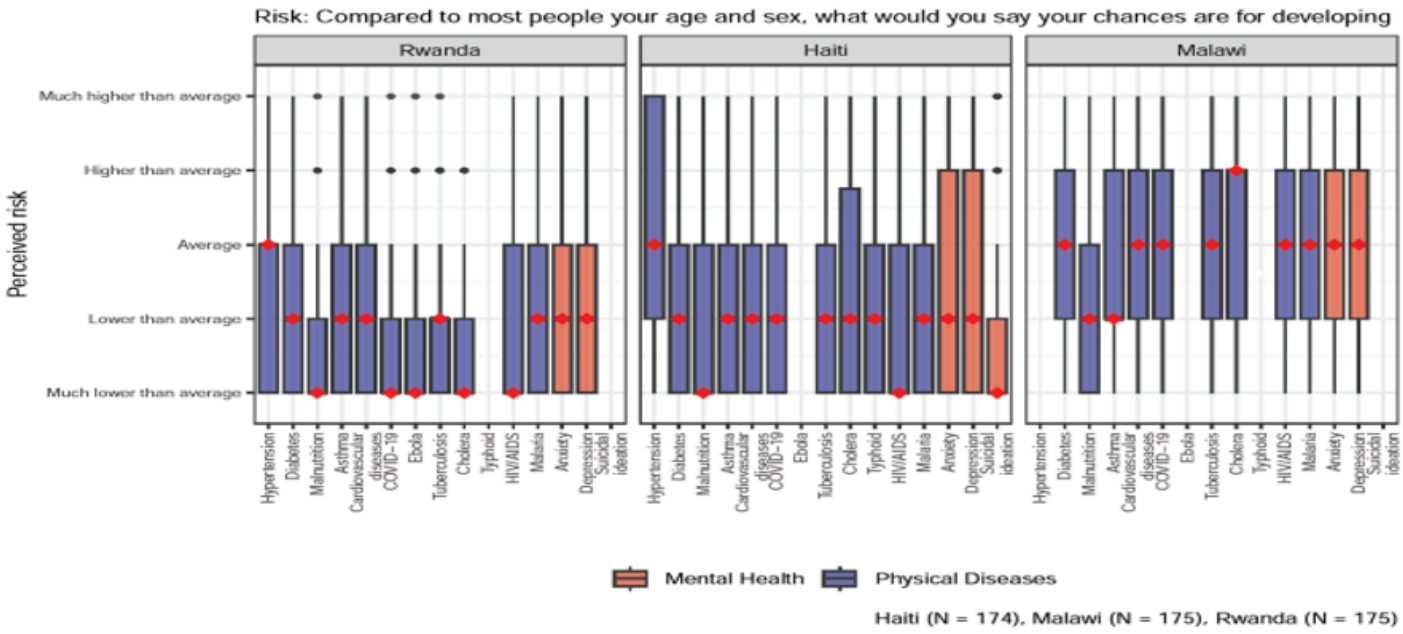

Figure 1

Risk perception of mental health conditions relative to other health conditions across countries (N=524)

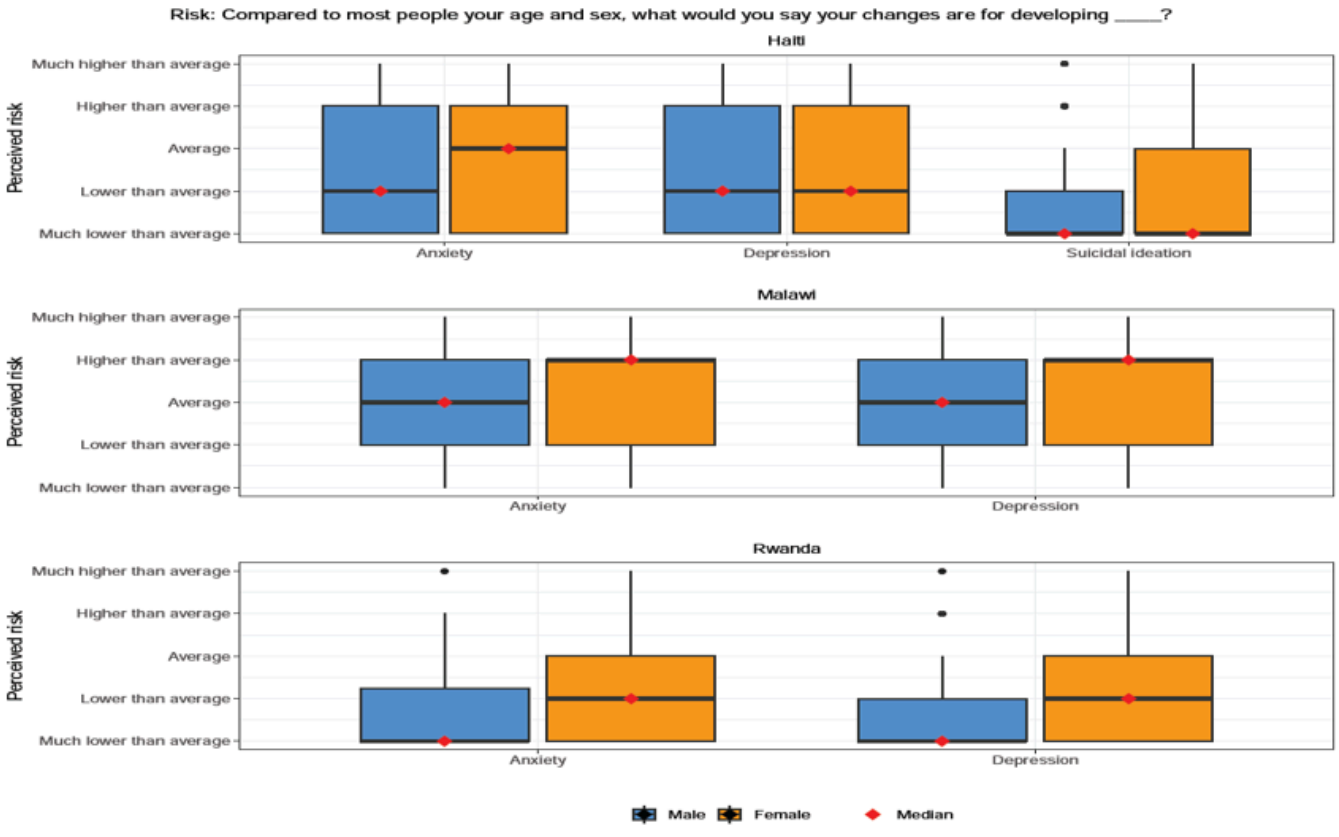

Figure 2

Risk perception of mental health conditions by country and sex (N=524)

Haiti: N=174; Malawi N=175; Rwanda: N=175. Participants in Malawi and Rwanda were not asked about the perceived risk of suicidal ideation.