Variation in the Prevalence and Risk Factors of Anxiety and Depression among NCD Clinic Attendees in Rural Rwanda: A Cross-Sectional Study

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•Non-communicable diseases (NCDs) and mental health disorders are intricately linked.

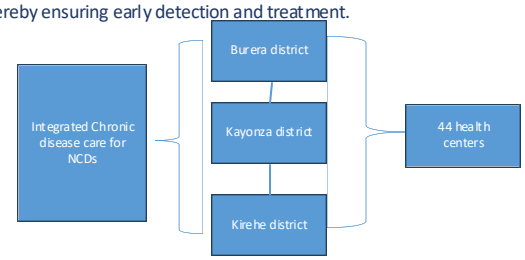
•48% of people living with NCDs in Low- and Middle-Income Countries (LMIC) are diagnosed with common mental disorders (CMDs).

•Mental health conditions act as both precursors and consequences of NCDs.

•Risk factors include tobacco use, physical inactivity, unhealthy diets, and harmful alcohol consumption. Addressing this dual burden demands integrated care models.

•Individuals diagnosed with NCDs (diabetes, hypertension, Asthma) receive care through an integrated chronic disease care model at the level of health centers.

•Understanding the prevalence of CMDs such as depression and anxiety among people living with NCDs can play a significant role in formulating policies aimed at integrating screening for mental health disorders into NCD care at health facilities, thereby ensuring early detection and treatment.



Study Design: Cross-sectional survey using validated instruments.

Setting: 40 PIH supported health facilities in Burera, Kayonza, and Kirehe districts respectively. Screening, diagnosis, treatment and follow-up care for NCDs is offered at the sites since 2005.

Participants: Adults aged 18 years or older living with diabetes, hypertension, asthma or comorbidity; managed at a PIH supported health center.

Sampling: Study sample (n=595) was drawn from a population (N=14,418) of enrollees with adjustments to account for differences in population proportions by site:

- Burera district: 282 (47.4%)
- Kayonza district: 104 (17.5%)
- Kirehe district: 209 (35.1%)

Data collection: Participants were recruited during drug refill appointments. Those who consented to the study were administered the survey using the Research Electronic Data Capture (Redcap) web-based application from 6th – 31st May 2024.

The Ministry of Health permitted the study. Ethics approval was received from the University of Global Health Equity Institutional Review Board (UGHE IRB).

Instruments: Previously validated tools (Kinyarwanda versions) were used:

- PHQ-9 for depression
- GAD-7 for anxiety.

Analysis: Descriptive statistics were used to describe the study sample and to estimate prevalence of anxiety, depression and comorbidities. Binary logistic regression was used to determine risk factors for anxiety and depression, with statistical significance set at p-value < 0.05 (SPSS v20).

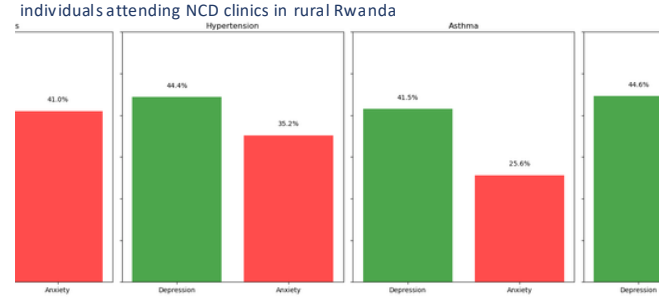
Characteristics of Study Participants

•Overall, 595 participants, mean age 63 [27-100, SD=12.5] were surveyed
•A majority of the participants were female (79.7%)
•Over half (57.6%) of participants had no formal education, 59.8% were married or cohabiting and 89.7% were employed
•All participants reported having health insurance coverage.

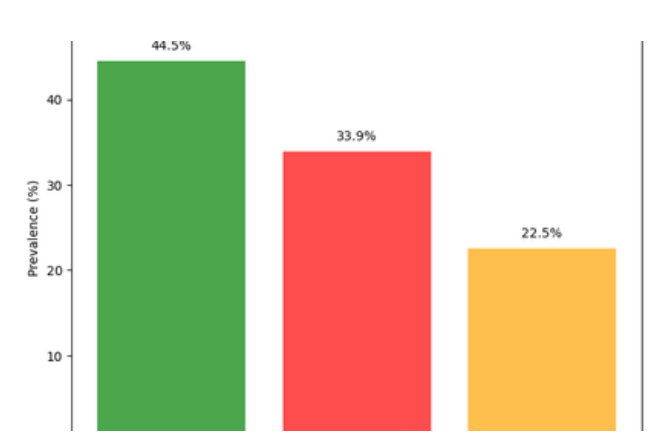
Prevalence of NCDs

•446 (75%) of the participants had hypertension, 71 (12%) had asthma, 30 (5%) had diabetes and 48 (8%) had comorbid conditions (diabetes and hypertension).

Figure 1: Prevalence of diabetes, hypertension, asthma, comorbidities among individuals attending NCD clinics in rural Rwanda



•Of 595 participants, 265 (44.5%) had depression (95% CI: 40.5-48.6%), 202 (33.9%) had anxiety (95% CI: 30.1-37.9%) and 137 (23%) had both depression and anxiety.



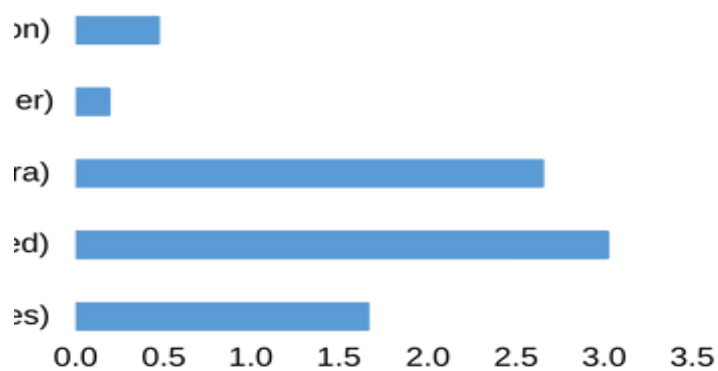
Risk factors associated with depression and anxiety among individuals attending NCD clinics in rural Rwanda

•Participants with no formal education were more likely to report depression and anxiety compared to those with primary education (aOR = 2.08; 95% CI = 1.27, 3.33, p = 0.004) and those with secondary/higher education (aOR = 5.00; 95% CI = 1.12, 25.00, p = 0.035) respectively).

•Unemployed participants were more likely to report depression and anxiety compared to the employed (aOR = 3.03; 95% CI=1.62 - 5.67], p < 0.001).

•Participants with history of trauma were more likely to report depression and anxiety than those who with no history of trauma (aOR = 1.67; 95% CI = 1.09 - 2.56, p = 0.019).

Figure 3: Risk factors associated with depression and anxiety among individuals attending NCD clinics in rural Rwanda.



•High prevalence of depression and anxiety among rural Rwanda NCD patients, similar to Sub-Saharan Africa [42%–48%], Asia [37–44%], and high-income countries.

•Higher levels of education (primary/secondary) were associated with lower odds of having depression and anxiety. Similar findings were observed in studies conducted in India, Germany, and Ethiopia.

•Residents of districts with poor housing characteristics were more likely to suffer from depression and anxiety. This is consistent with studies that have linked neighbourhood deprivation to mental health risks.

•Unemployment tripled the likelihood of having depression and anxiety consistent with studies linking financial insecurity to stress and mental disorders.

•Past trauma increased the likelihood of having depression and anxiety by 67%, aligning with evidence that trauma perpetuates panic, helplessness, and mental health decline.

•Overall, there were variations in the prevalence of depression and anxiety and their risk factors across districts. Participants from Burera had significantly higher odds of depression than those from Kirehe and Kayonza.

Study limitations

•Measurement bias: Depression and anxiety were assessed using PHQ-9 and GAD-7 tools, risking recall and social desirability biases. This was mitigated by training data collectors prior to data collection.

•Past trauma data relied on participant recall, potentially leading to under-reporting due to recall bias.

•The study was conducted in a rural setting, therefore generalizability to urban populations may be limited.

The findings underscore the urgent need to integrate mental health screening and interventions into routine NCD care to address the dual burden of chronic physical and mental health conditions and improve patient outcomes.
Future research and policy efforts must prioritize the development and evaluation of context-specific integration strategies, particularly in underserved rural settings.

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