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Brief mental health screening of adults attending a free medical outreach clinic in Lima Peru reveals high psychological distress and thoughts of self harm

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Short Report

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Brief mental health screening of adults attending a free medical outreach clinic in Lima Peru reveals high psychological distress and thoughts of self harm

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Abstract

Background: Short-term global health outreach experiences rarely include mental health screening despite substantial unmet need. We assessed anxiety, depression, sleep disturbance, and self-harm ideation among adults attending a pop-up free medical clinic in Lima, Peru.

Methods: Adults completed a Spanish-language, locally modified six-item PHQ-4 comprising the four validated PHQ-4 items and two locally added items assessing sleep disturbance and self-harm ideation. We calculated standard PHQ-4 screening outcomes, internal consistency, and the association between overall distress and self-harm ideation.

Results: Of 257 adult clinic patients, 205 completed screening (79.7%). Anxiety and depression screens were positive in 42.4% and 36.6%, respectively; 35.6% had moderate-to-severe distress, and 27.3% screened positive for both conditions. The core scale showed good internal consistency (Cronbach's $\alpha = 0.81$). Self-harm ideation was reported by 16.1% and was more common among patients with moderate-to-severe distress than among those below that threshold (34.2% vs. 6.1%; OR = 8.1, 95% CI 3.4-19.1, $p < .001$). Poor sleep was reported by 60.5%.

Conclusions: Brief screening identified substantial psychological distress and clinically meaningful self-harm ideation in a short-term primary care outreach setting. Mental health and safety screening may be feasible and informative in similar programs when paired with a clear local referral pathway.

Keywords: PHQ-4; global mental health; suicide screening; free clinic; Peru; humanitarian medicine

Introduction

Depression and anxiety disorders are among the leading contributors to disability worldwide, and, in many low- and middle-income countries, routine psychiatric screening capacity remains limited outside specialty mental health. In Peru, the Ministry of Health recorded 247,171 diagnosed cases of depression in 2022, three-quarters of them in

women, and the Pan American Health Organization estimates that approximately 5% of the regional population experiences depressive symptoms at any given time (Basauri-Delgado et al., 2025). A nationally representative health survey of Peruvian adults using the PHQ-9 found that 3.9% screened positive for moderate and 2.5% for severe depressive symptoms (Hernández-Vásquez et al., 2020).

Suicide risk detection is another unaddressed problem. A large majority of people who die by suicide were never seen by a mental health professional. By contrast, the majority had contact with a primary or general medical care provider in the weeks beforehand (Agency for Healthcare Research and Quality, n.d.). This has correctly motivated calls to embed brief suicide-risk screening into non-psychiatric, primary care medical encounters rather than restricting it to specialty mental health settings. The final item of the widely used PHQ-9, for instance, functions as a single-item passive suicidal-ideation screen precisely because of this logic (Rural Health Information Hub, n.d.). By this same logic, this question should be embedded into the short-term, pop-up free medical clinics which are a common model of humanitarian outreach in underserved urban areas of Latin America, especially by medical schools and non-profit medical organizations from the United States. However, appropriate mental health screening integration is still lacking in the majority of these trips. Additionally, the literature on mental health care in GHOE lags behind mental health literature in the domestic primary care setting. A systematic review of the GHOE literature found that despite decades of activity, published empirical evidence remains sparse and heavily procedural: nearly 80% of published GHOE studies concern surgical trips, and very few report systematic patient-level outcomes data beyond case counts (Caldron et al., 2015; DeCamp et al., 2018; Sykes, 2014). So, even though thousands of these trips occur annually that each draw hundreds of un- or under-insured patients for acute physical complaints, they rarely incorporate any mental health or safety screening, something that is considered basic standard of care domestically. Peru is among the most commonly reported GHOE destinations for U.S.-based sponsoring organizations (Catholic Health Association of the United States, 2014) and remains an active site of ongoing GHOE research: a 2026 study of a short-term mission clinic in a Lima district, for instance, described patient encounters spanning general medicine, obstetrics, pediatrics, and psychiatry, evidence that mental health need is already surfacing on these trips even when it is not the focus of study (Chen et al., 2026). To our knowledge, however, no published GHOE study conducted in Peru has systematically screened for or reported on psychological distress or self-harm ideation among the patients which such missions serve. The Patient Health Questionnaire-4 (PHQ-4) is a validated ultra-brief, easy-to-administer, combined anxiety–depression screener, developed and standardized in a U.S. primary-care population (Kroenke et al., 2009) that has

since demonstrated adequate sensitivity and specificity in Peruvian hospital populations (Villarreal-Zegarra et al., 2023) and been adapted and standardized directly for Peruvian samples, including a Quechua-speaking community in Puno (Carranza Esteban et al., 2024). It has also been standardized in general-population samples in Germany (Löwe et al., 2010) and Colombia (Kocalevent et al., 2014) and in a psychiatric-outpatient sample in South Korea (Kim et al., 2021) together providing a same-instrument benchmark against which a new PHQ-4 sample can be meaningfully compared. This study describes the prevalence and severity of anxiety, depressive, sleep, and self-harm-ideation symptoms among patients attending a pop-up free clinic in Lima, Peru. We also sought to use these scores to better inform mental health personnel and referrals needed for this community. Upon secondary use review of the anonymized scores, we wanted to publish our data and benchmark the core PHQ-4 total score against published community, primary-care, and psychiatric-outpatient samples, including two Peruvian ones as well as evaluate the internal consistency of the core PHQ-4 items in this field setting. We also tested whether self-harm ideation clustered with overall symptom severity, as would be expected if the added item behaves coherently alongside a validated instrument. In doing so, we aim to contribute exactly the kind of systematic, patient-level mental health awareness that has historically been found lacking in the broader GHOE literature.

Methods

Setting and design

This was a cross-sectional screening survey embedded in a short-term pop-up free medical clinic operating in Lima, Peru, from 10–14 March 2025, organized by the study team's medical school and student-led medical organization. The clinic provided general outpatient primary care to walk-in patients from the surrounding community in Lima, Peru. The clinic was hosted for 5 weekdays from the hours of 8AM-5PM at a local church in the peri-urban hill communities surrounding Lima. Professional Spanish-language translators assisted medical students and physicians in the clinical encounter.

Participants

Adult patients (age > 18) presenting to the clinic during the operating period were administered the PHQ-4 by clinic staff after the patient provided verbal consent to complete the form. The goal was to have universal mental health screening at this clinic, all 257 adult patients were approached, however only 205 forms were brought by the study

team due to underestimates about how many patients would be seen over the course of the 5 days. Participants were allowed to participate regardless of Spanish literacy, professional Spanish translators assisted patients who were unable to read or write in Spanish in filling out the PHQ form. (79.7% completion rate)

Instrument

Participants completed a Spanish-language, paper-based, locally modified version of the PHQ-4. The instrument retained the four standard PHQ-4 items. Two assess anxiety (feeling nervous, anxious, or on edge; not being able to stop or control worrying) and two assess depression (little interest or pleasure in doing things; feeling down, depressed, or hopeless) each rated 0 ("not at all") to 3 ("nearly every day") over the prior two weeks. Two additional items were appended using the same two-week window and 0–3 response format: item 5 assessed sleep disturbance ("felt that you slept poorly") and item 6 assessed self-harm ideation ("have you thought about harming yourself"). All references to the PHQ-4 in our study refer to the first 4 questions of our questionnaire. The added items were developed by the study team in response to common complaints and perceived need from a previous medical mission trip to Latin America and have not been independently validated. These two appended questions were analyzed at the item level rather than being incorporated into the validated PHQ-4 scoring algorithm.

Scoring

Following standard PHQ-4 convention, the anxiety subscale was calculated as the sum of items 1–2 (range 0–6, positive screen ≥3, corresponding to the validated GAD-2 cutoff), and the depression subscale as the sum of items 3–4 (range 0–6, positive screen ≥3, corresponding to the validated PHQ-2 cutoff). The four-item total (range 0–12) was classified into the published PHQ-4 severity bands: normal (0–2), mild (3–5), moderate (6–8), and severe (9–12) (Kroenke et al., 2009). Items 5 and 6 were analyzed descriptively at the item level.

Ethics

This was a retrospective review of PHQ-4 data collected during a short-term GHOE. The goal of the PHQ-4 administration was to improve care, not to explicitly do research. Secondary use of the anonymized screening records was reviewed by the Texas A&M University Institutional Review Board (IRB) through the Division of Research, Human Subjects Research Protection Program (HRPP), which issued an exempt determination (protocol number

STUDY2025-0975, determined 11/24/2025 under 45 CFR 46.104). Identification of acute suicidal ideation in patients of the clinic was immediately followed up with referral to local medical professionals at a nearby emergency room.

Statistical analysis

Item- and scale-level responses were summarized descriptively. Proportions are reported with Wilson score 95% confidence intervals. Internal consistency of the four core items was assessed with Cronbach's α, with a 95% confidence interval derived from 2,000 bootstrap resamples. Inter-item and corrected item-total Pearson correlations were computed for the core four items. The association between overall distress category (moderate–severe vs. normal–mild on the 4-item total) and self-harm-ideation endorsement (any vs. none on item 6) was tested with a χ^2 test and confirmed with Fisher's exact test; the odds ratio and its 95% confidence interval were calculated using the Woolf logit method. All tests were two-sided with $\alpha = 0.05$. Analyses were conducted in Python (pandas, scipy.stats).

Results

Two hundred five patients completed the modified PHQ-4 during the study period. Two hundred and fifty seven adult patients were approached with only 205 adult patients agreed to fill out the PHQ-4. (79.7% completion rate)

Item-level responses

At any level, feeling nervous or anxious and poor sleep were the most frequently endorsed symptoms (62.9% and 60.5%, respectively). Self-harm ideation was endorsed least often but remained clinically important: 16.1% of patients reported thoughts of self-harm on at least several days during the prior two weeks.

Screening prevalence

Using standard PHQ-4 cutoffs, 87 patients (42.4%, 95% CI 35.9–49.3) screened positive for anxiety and 75 (36.6%, 30.3–43.4) screened positive for depression; 56 patients (27.3%, 21.7–33.8) met both criteria simultaneously. On the four-item total, 73 patients (35.6%, 29.4–42.4) fell in the moderate-to-severe range, and only 36 patients (17.6%) reported no symptoms across all four core items. 82.4% (76.6–87.0) endorsed at least mild symptoms on one or more core items.

Severity distribution

Across the four standard PHQ-4 severity bands, 37.1% of patients scored in the normal range, 27.3% in the mild range, 22.0% in the moderate range, and 13.7% in the severe range. Thus, 35.6% scored in the combined moderate-to-severe range.

Comparison with published PHQ-4 samples

Because the PHQ-4 is scored identically across studies (a 0–12 total from the same four items), mean total scores can be compared directly across samples even when instruments used for other national or regional prevalence figures differ. Comparisons with five published PHQ-4 samples, including two from Peru, showed that our patients' mean total score (4.30, SD 3.34) was higher than a Peruvian community sample of Quechua-speaking adults in Puno (2.89, SD 2.62) (Carranza Esteban et al., 2024), higher than general-population samples from Colombia (1.27) (Kocalevent et al., 2014) and Germany (1.76) (Löwe et al., 2010) and higher than the original U.S. primary-care standardization sample (2.50, SD 2.80) (Kroenke et al., 2009), but lower than a South Korean psychiatric-outpatient sample (6.52, SD 3.45) (Kim et al., 2021). Our clinic sample thus falls in an intermediate position: more symptomatic than general-population and primary-care benchmarks, including the only other published Peruvian PHQ-4 sample, but below a dedicated psychiatric-outpatient benchmark. This is a pattern consistent with a general-medical population that includes a meaningful subgroup of serious, unaddressed psychological distress without approximating a psychiatric clinical sample.

Internal consistency and item structure

The four core items showed good internal consistency (Cronbach's $\alpha = 0.81$, bootstrap 95% CI 0.76–0.85), with corrected item-total correlations ranging from 0.50 (item 3) to 0.72 (item 4). The inter-item correlation pattern was consistent with the intended two-factor anxiety/depression structure: the two anxiety items (1 and 2) correlated most strongly with each other ($r = 0.62$, $p < .001$), the two depression items (3 and 4) similarly ($r = 0.53$, $p < .001$), while cross-factor correlations were comparatively lower (e.g., items 1 and 3, $r = 0.34$, $p < .001$). The sleep item (5) correlated moderately with the four-item total ($r = 0.61$), while the self-harm-ideation item (6) correlated more weakly ($r = 0.37$).

Extending to the full six-item modified instrument, internal consistency was not diminished by the addition of the sleep and self-harm items (α = 0.83, bootstrap 95% CI 0.78–0.86). Item-deletion on the six-item pool showed that removing any of the four core items or the sleep item reduced α (by 0.01–0.07), consistent with each contributing positively to the scale's coherence; item 6 was the sole exception, with its removal raising α slightly (to 0.84) and its corrected item-total correlation being the lowest of the six (r = 0.38). Because the item is already part of the well-validated PHQ-9, this result does not support its removal from our modified instrument, especially given the important clinical value that it provides.

Self-harm ideation and overall distress severity

Self-harm ideation was strongly concentrated in the most symptomatic patients. Among the 73 patients with moderate-to-severe distress on the four-item total, 25 (34.2%) endorsed some level of self-harm ideation, compared with 8 of 132 patients (6.1%) below that threshold ($\chi^2(1) = 25.6$, $p < .001$; Fisher's exact $p < .001$). The odds of endorsing self-harm ideation were approximately eight times higher among patients with moderate-to-severe psychological distress (OR = 8.1, 95% CI 3.4–19.1). Frequent self-harm ideation (item 6 ≥2, i.e., more than half the days or nearly every day) was reported by 8 patients (3.9%, 95% CI 2.0–7.5), including 2 patients (1.0%) who endorsed it nearly every day.

Sleep disturbance and psychiatric symptomatology

Poor sleep (item 5) correlated with all four core PHQ-4 items individually (r = 0.34–0.57, all $p < .001$), most strongly with feeling down or hopeless (item 4, r = 0.57) and least strongly with anhedonia (item 3, r = 0.34). It correlated slightly more with the anxiety subscale (r = 0.57) than the depression subscale (r = 0.52), and with the four-item total, r = 0.61 ($p < .001$) a strong association for a single item measured against a four-item sum. Poor sleep also correlated with self-harm ideation (item 6), though more modestly (r = 0.31, $p < .001$; Spearman ρ = 0.33). Moderate-to-severe sleep disturbance (item 5 ≥2) was associated with a substantially higher rate of self-harm ideation than mild or absent sleep disturbance (31.1% vs. 7.6%; $\chi^2(1) = 17.6$, $p < .001$; OR = 5.5, 95% CI 2.4–12.3). A partial correlation between sleep disturbance and self-harm ideation, controlling for the four-item distress total, was attenuated by roughly 60% but remained positive (partial r = 0.12 vs. raw r = 0.31), indicating that most, though not all, of the sleep–ideation association is accounted for by shared general psychiatric distress rather than an independent relationship.

Discussion

In our retrospective PHQ-4 analysis, over a third of patients attending a short-term, primary care pop-up clinic in Lima screened positive for moderate-to-severe anxious-depressive symptoms, and roughly 1 in 6 reported some degree of self-harm ideation sometime in the prior two weeks, all of this detected entirely incidentally to the physical complaints that had brought them to the clinic. The PHQ-4 total score can be benchmarked directly against differently-instrumented national prevalence figures and, in doing so, our patients demonstrated extreme need. Their mean scores exceeded every published general-population and primary-care PHQ-4 sample we identified, including a community sample of Quechua-speaking adults in Puno (4.30 vs. 2.89) (Carranza Esteban et al., 2024). This finding is surprising on its own but the consistency of the elevation across two independent same-instrument Peruvian comparisons, and across anxiety, depression, sleep, and self-harm-ideation items alike, suggests that this population carries a burden of psychological distress well beyond what many short-term GHOE primary care teams are expecting and are prepared for.

The self-harm-ideation item correlated positively with the validated core items, and its endorsement rate rose roughly eight-fold among patients with moderate-to-severe distress. This is unsurprising as it is essentially the same question from the PHQ-9 but appended to the PHQ-4, and it's use and validity in the PHQ-9 has already been well studied, making its inclusion in the PHQ-4, especially in populations at risk for mental health issues, vital. This convergence, together with the established fact that most people who die by suicide had recent primary care rather than psychiatric contact (Agency for Healthcare Research and Quality, n.d.) supports our main thesis of adding this single self-harm question to an already-brief screening instrument in GHOE primary clinics where dedicated mental health visits are unlikely to occur otherwise. This finding is especially important considering the standard that most GHOE trips hold themselves to. Many trips strive to achieve the same standard of care abroad as they would at home and, in keeping with modern standard of care, these trips should begin to integrate mental health screening such as with the ultra-brief PHQ4.

While less impactful in terms of mortality, our sleep item was the second most commonly endorsed symptom in the entire instrument and may offer a particularly accessible and less-stigmatized entry point for opening a conversation about psychological wellbeing during a brief medical encounter. Our findings regarding the inclusion of sleep in our modified PHQ-4 are consistent with a broader shift in how the sleep–psychopathology relationship is understood in the greater literature. While once treated primarily as a symptom of depression and anxiety, a substantial of body

prospective literature now treats insomnia as an independent risk factor. A meta-analysis of 34 cohort studies totaling over 172,000 participants found that insomnia predicted incident depression with a pooled relative risk of 2.27 (95% CI 1.89–2.71) (Li et al., 2016) closely replicating earlier meta-analytic estimates (OR 2.60, 95% CI 1.98–3.42) (Baglioni et al., 2011). Subsequent work has extended this beyond insomnia specifically to hypersomnia, sleep apnea, and circadian misalignment, each independently and dose-dependently predicting incident depression, contributing to a reframing of insomnia as developmental part of psychopathology rather than a downstream symptom of any single disorder (Hertenstein et al., 2023). Item 5's correlational structure in our own sample is broadly consistent with this framing. It tracked general anxious-depressive symptomatology closely ($r = 0.61$ with the four-item total) which was as strongly as, or sometimes even more strongly than, some of the core items track one another. This is consistent with sleep disruption functioning as a sensitive marker of psychological distress rather than a narrow or isolated complaint, especially in communities such as Lima, Peru where mental health struggles have been historically stigmatized (Castro Cuba Torres et al., 2013; Robillard, 2010). Its relationship with self-harm ideation was comparatively modest ($r = 0.31$), and most of that association was attenuated after accounting for overall distress (partial $r = 0.12$), suggesting sleep disturbance is better understood as a marker of psychiatric burden rather than as an independent suicidality signal (Geoffroy et al., 2021; Harris et al., 2020; Pigeon et al., 2012). In practice, this reinforces the sleep item's value as a low-stigma entry point for opening a conversation about mental wellbeing during a brief medical encounter, but emphasizes it should never replace the sometimes awkward, but nevertheless necessary, question about self-harm.

To our knowledge, this is the first report to describe the use of an PHQ-4 administered opportunistically within a short-term GHOE trip pop-up clinic in Latin America. The core instrument retained good psychometric coherence ($\alpha = 0.81$) showing this approach is both feasible and informative for similar outreach programs, most of which currently screen for physical but not psychological or safety concerns. This psychometric coherence was upheld even with the addition of two questions (one of them already standard in the PHQ-9) of self-harm and sleep disturbance.

Mental health and safety screening has been essentially absent from the GHOE evidence base to date, leaving many GHOE planners with very little information about what to expect for their team in-country. Within Peru specifically, community-based research in Lima's peri-urban shantytowns has independently documented a substantial burden of self-reported depression: 12% in a 2012 cluster-randomized survey of a Lima shantytown (Heitzinger et al., 2014) using passive self-report of prior diagnosis rather than active symptom screening. Our considerably higher screen-positive rate (36.6%) is consistent with the well-established pattern that active screening detects more distress than

passive self-reported diagnosis, particularly in populations with limited prior access to mental health care and when mental health stigma exists (Castro Cuba Torres et al., 2013; Robillard, 2010). Our findings fit alongside a small but growing body of Lima-based community health research rather than as an isolated data point. Finally, a contemporaneous 2026 report of a short-term mission clinic in Lima explicitly notes psychiatric consultations occurring alongside general medical care (Chen et al., 2026) showing that mental health need is beginning to be encountered and addressed on Peru-based GHOEs of exactly this kind. So, we hope this study serves as a call to action for other GHOE trip coordinators to consider adding universal adult mental health screening to their GHOE trip. To the authors, it seems that such a great mental health burden and need, especially with regards to self-harm, should embolden all planners of such aid trips to engage in such screening and partner with local mental health providers to help save lives through such screening.

Limitations

Several limitations should be considered when interpreting these findings. First, the sample was a convenience sample drawn from a single clinic site over five days; it is not representative of the general population of Lima or Peru, and likely over-represents individuals who were already symptomatic, help-seeking, or facing concurrent physical health stressors. While this is the relevant population for this specific screening questionnaire, it limits generalizability beyond similar clinic settings. Second, this dataset could not be linked to demographic or clinical information (age, sex, presenting complaint) collected separately during the same clinic, which precluded subgroup or adjusted analyses. Future plans linking future screening data to a de-identified patient index would allow substantially richer analysis. Third, items 5 and 6 are locally developed, non-validated single items rather than components of a validated instrument such as the PHQ-9, the Pittsburgh Sleep Quality Index, or the Columbia-Suicide Severity Rating Scale. They lack established clinical cutoffs and cannot capture ideation frequency nuance, plan, intent, or prior attempts. Finally, the cross-sectional, single-timepoint design cannot establish the persistence, course, or causal ordering of the symptoms observed.

Conclusions

A brief, locally modified PHQ-4 administered to all consenting adult patients during a five-day pop-up free medical clinic in Lima, Peru identified a substantial burden of anxious-depressive symptoms and a clinically meaningful rate of self-harm ideation, concentrated among the most symptomatic patients. These findings suggest that brief, low-cost

mental health and safety screening is both feasible and informative when embedded in short-term humanitarian medical outreach and support the systematic integration of such screening into similar clinic models when paired with a clear, pre-specified referral pathway for patients who screen positive.

Declarations:

Ethics approval and consent to participate
This study was approved by the Texas A&M University Institutional Review Board (IRB), through the Division of Research, Human Subjects Research Protection Program (HRPP), which determined on 11/24/2025 that the research meets the criteria for exemption under 45 CFR 46.104. The protocol number for this approval is STUDY2025-0975. The study was conducted in accordance with the relevant guidelines and regulations set forth by the Texas A&M University IRB, the U.S. Federal Policy for the Protection of Human Subjects (45 CFR 46), and the Declaration of Helsinki. Informed consent was obtained from all participants. Consent was given verbally before the screening form was administered as part of routine clinical care, and this study is a secondary analysis of the anonymized screening records.

Consent for publication
Not applicable. This manuscript contains no individual person's identifiable data.

Clinical trial registration
Not applicable. This study is not a clinical trial.

Data availability
The data that support the findings of this study are available from Texas A&M University's Christian Medical Association, but restrictions apply to the availability of these data and so are not publicly available. The data are, however, available upon request and with the permission of the TAMU CMA.

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