





RESEARCH ARTICLE

Measuring the psychosocial wellbeing of Rohingya mothers in Cox's Bazar, Bangladesh: Psychometric properties of an MHPSS assessment battery [version 1; peer review: 1 approved with reservations]

Amanda Nguyen ¹, Anvita Bhardwaj², Kh Shafiur Rahaman³, Suzit Barua³, Karine Le Roch ⁴, Molly Lasater², Matthew Schojan², Catherine Lee², Kim Berg², Sarah M Murray²

¹School of Education and Human Development, University of Virginia, Charlottesville, VA, 22904, USA

²Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, 21205, USA

³Action Against Hunger, Cox's Bazar, Bangladesh

⁴Action contre la Faim, Paris, France

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Abstract

Background: Psychosocial research in humanitarian settings has been historically dominated by a focus on distress and disorder. As such, there is a need to establish the validity of instruments for a broad range of psychosocial outcomes, particularly among highly affected and under-represented populations. The current study describes the adaptation and testing of multiple psychosocial instruments among displaced Rohingya mothers in Bangladesh.

Methods: We used baseline data from 600 mothers of malnourished children aged 2 and under enrolled in an intervention study in Cox's Bazar, Bangladesh. Instruments assessed distress (International Depression Symptom Scale [IDSS] and Kessler-6 [K-6]); functional impairment (World Health Organization Disability Assessment Schedule [WHODAS]); subjective wellbeing (global Satisfaction With Life [SWL] and Personal Wellbeing Index [PWI]); and, coping (Brief COPE and locally developed coping items). Instruments were piloted and refined, then used for data collection by Bangladeshi-Rohingya interviewer pairs. We conducted exploratory factor analysis, evaluated internal consistency, examined construct validity through correlation with other scales, and used regression models to explore demographic factors associated with psychosocial health.

Results: Both the WHODAS and coping items fit 2-factor models; other scales were unidimensional. Cronbach's alphas ranged from .76 to .90 for the refined scales. With the exception of coping, scale correlations supported construct validity; separate measures of the same

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1. **Pieter Ventevogel** , United Nations High Commissioner for Refugees, Geneva, Switzerland

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construct were highly correlated, distress and impairment were moderately correlated, and both were inversely correlated with wellbeing. Correlates of poorer psychosocial health included relative socioeconomic disadvantage, current pregnancy, and being unmarried.

Conclusions: Most of the standard psychosocial assessment tools performed adequately, but they did not appear to fully capture local experiences and included items of little local relevance. Findings highlight the need for further mixed methods research to develop a rich battery of instruments with cross-cultural validity, particularly for positive outcomes such as coping which was particularly challenging to assess.

Keywords

MHPSS, psychosocial, psychometrics, measurement, humanitarian, Rohingya, Bangladesh

Corresponding author: Amanda Nguyen (ajnguyen@virginia.edu)

Author roles: **Nguyen A:** Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Methodology, Project Administration, Resources, Software, Supervision, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Bhardwaj A:** Conceptualization, Formal Analysis, Validation, Writing – Original Draft Preparation, Writing – Review & Editing; **Rahaman KS:** Data Curation, Investigation, Project Administration, Supervision, Writing – Review & Editing; **Barua S:** Data Curation, Investigation, Software, Writing – Review & Editing; **Le Roch K:** Funding Acquisition, Investigation, Project Administration, Supervision, Writing – Review & Editing; **Lasater M:** Methodology, Supervision, Writing – Review & Editing; **Schojan M:** Funding Acquisition, Methodology, Software, Supervision, Writing – Review & Editing; **Lee C:** Funding Acquisition, Methodology, Supervision, Writing – Review & Editing; **Berg K:** Methodology, Writing – Review & Editing; **Murray SM:** Conceptualization, Funding Acquisition, Methodology, Project Administration, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing

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Introduction

The myriad ways in which culture shapes both experiences and expressions of mental wellbeing and distress have been increasingly recognized, leading to cautions against an assumption that psychosocial measures are equally valid across a range of cultures and contexts.¹ While there has been increased attention to culturally and contextually specific measurements of distress within global mental health research,²⁻⁴ recent reviews have highlighted that there is less consensus on how to best measure other key mental health and psychosocial domains (e.g., wellbeing, coping, social behavior, and social connectedness).^{5,6} This discrepancy in the focus of psychosocial measurement has also been raised in calls for greater conceptual clarity when considering both clinical and social-environmental intervention models,⁷ while efforts such as the Inter-Agency Standing Committee (IASC)'s Common Monitoring and Evaluation Framework have catalyzed new progress in evaluation.⁸ To improve the evidence-base for prevention and promotion programming targeting a broader array of psychosocial outcomes among highly impacted populations, increased attention to their measurement is needed.⁶ Even as the IASC has recently released updates to the Monitoring and Evaluation (M&E) Framework that include guidance on means of verification,⁹ there is a continued need to disseminate findings on the validity, reliability, feasibility, and relevance of the most commonly used measurement tools in under-studied populations to advance both programming and research.¹⁰

Refugees often reside in a complex environment that makes measurement even more difficult.¹¹ Spurred by ethnic violence in 2017, nearly a million Rohingya forcibly displaced from Myanmar have taken refuge in Cox's Bazar Bangladesh - dubbed the world's largest refugee settlement - where they remain highly dependent on humanitarian aid and are living in overcrowded, difficult conditions with serious impacts on health and wellbeing.¹² Both prior exposure to traumatic events as well as current stressors related to food insecurity, mobility, and safety concerns are highly prevalent and associated with poor mental health in this population.¹³ A previous needs assessment within Northern Rakhine State, Myanmar, found that approximately a third of all Rohingya adults screened by the humanitarian organization *Action contre La Faim*, reported extreme levels of stress, and half of adults who underwent a full psychosocial evaluation reported suicidal ideation.^{14,15}

Given the magnitude of need for mental health and psychosocial support (MHPSS) for displaced Rohingya people, there is an urgent need to grow our inventory of valid tools for needs assessment and program evaluation. This is particularly needed for sub-groups who are at higher risk of poor mental health outcomes or for whom standardized instruments may perform differently, such as pregnant and parenting mothers of young children.¹⁶ Yet, at present, only limited information is available on the psychosocial wellbeing of the Rohingya population in Cox's Bazar.¹⁷ Language barriers that already complicate or delay provision of critical services¹⁸ could also complicate attempts to adapt or develop new measures. The Rohingya dialect, which is unwritten, has a vast vocabulary for emotions, behaviors, and idioms of distress, yet they are often not translated well, could vary between established migrants and more recent arrivals,¹⁷ and few MHPSS personnel in Bangladesh know the Rohingya dialect.^{17,18} These challenges point to a need to explore the psychometrics of common measures of mental wellbeing in this population.

Current study

The purpose of the current study was to adapt, translate, pilot, and assess the psychometric properties of a collection of instruments for use with displaced Rohingya mothers enrolled in an intervention study in Cox's Bazar, Bangladesh. A second aim of this study was to explore demographic characteristics associated with psychosocial health among a sample of mothers accessing nutrition treatment services for their children (i.e., women not necessarily seeking MHPSS support).

Methods

Setting

This study was carried out in Rohingya settlements in Cox's Bazar, Bangladesh, where the study's operational partner, Action Against Hunger (*Action contre la Faim*; ACF), has provided critical humanitarian services through a number of Integrated Nutrition Centers (INCs) since 2017. As a core feature of their holistic approach to supporting child wellbeing, ACF also offered maternal psychosocial support at these INCs, including the Baby Friendly Spaces (BFS) program. BFS is a low-intensity psychosocial support intervention aimed at promoting maternal and child wellbeing and improving care practices among mothers of children under age two who are receiving nutritional treatment for acute malnutrition. During the study period, the BFS program completed approximately 50-100 intakes of mother-child dyads per month at each of the 10 included INCs. Resident populations across INC catchment areas were generally comparable, with the exception of length of time in displacement across camps; some camps primarily hosted people who were displaced in the 1990s and others from the more recent 2017 influx. For this study, we prioritized INCs located in camps hosting more recent arrivals. Data were collected from November, 2021 through January, 2022.

Participants

This paper uses baseline data from a clustered randomized controlled trial (RCT) of the BFS program collected among a sample of 600 Rohingya mothers who were newly enrolling in BFS services at 10 participating INCs. RCT eligibility criteria included being a mother, age 18 or older, of a child under two years of age identified as suffering from moderate or severe acute malnutrition without complication by ACF as a part of their routine programming. Mothers who had cognitive impairment or psychosis that would preclude participation in program activities, as well as mothers of children with severe developmental disabilities or severe malnutrition with complications, were excluded. Additionally, while mothers who received individual counseling from a counselor or psychologist within ACF remained eligible, anyone receiving referral care outside of ACF for more severe mental health or protection needs (in accordance with standard ACF protocols) were excluded.

Measure selection and adaptation

Measures were chosen to assess multiple indicators of person-focused mental health and psychosocial wellbeing as outlined in the IASC Common M&E Framework for MHPSS in emergencies.⁸ As this study was undertaken as one of five projects involved in the USAID-funded Health Evaluation and Applied Research Development (HEARD) learning collaborative of related MHPSS studies,¹⁹ key research domains and assessment instruments were aligned for consistent use across projects. Thus, selection prioritized existing, standardized instruments with demonstrated prior utility in trauma-affected populations across multiple cultures and contexts.

Prior to launching the study, all instruments were translated into Bengali language with independent back-translation (English-Bengali). Following reconciliation, the Bengali versions were further translated and back-translated to create a version in the Chittagonian Bengali dialect that is widely spoken in Cox's Bazar and has a substantial degree of mutual intelligibility with the Rohingya dialect (which has no standard written form). Following these initial translations and back translations, ten Chittagonian Bengali-speaking interviewers from the Cox's Bazar district who had conversational fluency in the Rohingya dialect were trained in the full assessment battery. In partnership with Rohingya volunteers, the team engaged in collaborative decision-making about standardized phrasing in the Rohingya dialect for any items in which the Chittagonian dialect did not properly reflect Rohingya terms. Ten data collector pairs (comprised of a Bangladeshi interviewer and Rohingya volunteer; see procedures below) each subsequently piloted the instruments with 1-2 Rohingya mothers recruited from the BFS program at the same INCs that would be involved in study recruitment. After noting all feedback, the Bangladeshi interviewers met together with the research team to make collective recommendations on instrument revisions to clarify wording, reduce redundancy, remove problematic items, align response options, and shorten the overall survey.

Psychological distress was measured using two separate scales. To align across the HEARD learning collaborative, we used the Kessler 6-item scale (K-6), a standardized measure of general distress that has been used in diverse settings.²⁰ Responses are based on frequency of experience over a 2-week recall period, with a 5-point Likert type response option of "none", "a little", "some", "most", and "all" of the time. We supplemented this primary instrument with the International Depression Symptom Scale (IDSS), a 29-item measure of depression developed to reflect symptoms that were commonly reported in a global review of qualitative studies on depression and showed reliable cross-cultural performance in quantitative analyses.²¹ The IDSS has subsequently been validated, refined, and tested among four distinct groups of people from Myanmar,²¹⁻²⁴ though not with Rohingya people. Responses are typically provided on a 4-point response scale, but for this administration we revised the response scale to match the K-6. After piloting, we reduced the IDSS from 29 to 12 items by removing items that were redundant to the K-6 and ones that were removed during a prior validation of a 15-item Myanmar-wide short version (e.g., items related to weight, appetite, and sleep, as well as a number of items describing heart-related symptoms).^{23,24} Three somatic items from the IDSS (headache, stomach ache, and other bodily aches) that were not included in the Myanmar-wide short version were retained on an exploratory basis due to the potential relevance in this population. Both the IDSS and K-6 were scored by taking the average of all contributing items to generate scale scores ranging from 0-4, with higher scores indicating greater distress. Given the initial redundancy between K-6 and IDSS items, we also explored the psychometric properties of a combined score using items from both scales, again calculated on the 0-4 score range.

Functional impairment was measured using the 12-item version of the WHO Disability Assessment Schedule 2.0 (WHODAS), a widely used assessment of health and disability developed to be applicable across a range of cultures and contexts²⁵ and used previously with displaced Rohingya people.²⁶ The WHODAS assesses six domains of functioning: cognition, mobility, self-care, getting along/social interactions, life activities, and participation. The WHODAS is typically administered by asking how much difficulty the respondent has had carrying out various activities in the past month, but we adjusted the recall period to two weeks to align with other scales on the assessment battery. Response options included "none", "mild", "moderate", "severe", and "extreme or cannot do". Scores were calculated by taking the average of all contributing items for a range of 0-4, with higher scores indicating greater functional impairment.

Subjective wellbeing was measured using items recommended by the Organization for Economic Co-operation and Development (OECD),²⁷ including a single-item rating of global Satisfaction With Life (SWL) that is widely used internationally and the 8-item Personal Wellbeing Index (PWI).²⁸ Frequently administered with the PWI, the SWL item asks “Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole these days?” The PWI has one item for each of seven core life domains (e.g., health, safety, and personal relationships) and an optional item on religion, which we included. Previous research with Rohingya people has used similar question stems, i.e., asking “how satisfied” the respondent is with personal relationships and support from friends.¹³ Both the SWL item and the PWI used the same 0-10 response scale, accompanied by the image of a ladder with ten rungs that correspond to the ratings with 0 at the bottom (i.e., “no satisfaction at all”) and ten at the top (i.e. “completely satisfied”). After piloting, one item “*what you are achieving in life*” was removed, as the question was not clear or meaningful to respondents. The PWI was scored by taking the average of all contributing items for a range of 0-10, with higher scores indicating greater subjective wellbeing.

Coping strategies were assessed using the Brief COPE,²⁹ a 28-item instrument that has been translated and validated in numerous languages,^{30–32} and which is suggested as a means of verification in the IASC M&E framework.⁹ The Brief COPE assesses a broad range of coping strategies, such as denial, humor, active coping, and use of instrumental and emotional support. Responses were provided on a 4-point scale regarding how frequently each strategy has been used, ranging from 0 “I haven’t been doing this at all” to 3 “I’ve been doing this a lot”, with a 2-week recall period. The Brief COPE has previously been used to generate three overarching coping styles of problem-focused, emotion-focused, and avoidant coping. However, studies have shown the factor structure of the Brief COPE to vary across samples; for example, in a previous maternal sample the instrument consisted of two separate sub-scales: active coping and disengaged coping.³³ For the current study, the items on the original Brief COPE were supplemented with several items depicting additional coping strategies found to be relevant locally through qualitative research with Rohingya adults (e.g., “*thinking about a better future for the children*”).¹³ After piloting, feedback regarding redundancy, item irrelevance, and respondent fatigue led us to remove some items resulting in a 24-item scale that retained 18 items from the Brief COPE and six locally developed coping items. Scores were generated by taking the average of contributing items for a range of 0-3, with higher scores indicating more frequent use of the included coping strategies.

Data collection

As part of their programmatic intake, women enrolling in the BFS program were screened for study eligibility by BFS providers using the inclusion/exclusion criteria listed above. Eligible participants were informed of the study, and those who indicated an interest in study participation were referred to a trained data collector who obtained oral informed consent and administered the assessment interview. We used an oral consent process due to low literacy levels in the target population. As described above, these interviewers were native Chittagonian Bengali speakers who were also proficient in Rohingya, and who were additionally accompanied by a Rohingya volunteer to facilitate comfort and understanding. As such, consent was obtained by the interviewer with the volunteer present as a witness, and assessment interviews were conducted in Rohingya, the participants’ native language. Baseline data collection lasted between 1-2 hours and was completed prior to the participant engaging in BFS program activities. Data were recorded in KoBo Toolbox³⁴ using a handheld tablet. As consent was obtained at the same time as the interview, consent was also documented in Kobo Toolbox.

Ethical approval

This study was approved by the Institutional Review Board of the Institute of Health Economics (approval number IHE-IRB/DU/2021/33/Final) at the University of Dhaka.

Analyses

Analyses were conducted in Stata 17.0.³⁵ Descriptive analyses included cross-tabulations of demographic variables and histograms of individual item distributions. We then examined each scale’s factor structure using exploratory factor analysis (EFA). An exploratory rather than confirmatory approach was used due the dearth of prior instrument validation research with this population, the substantial revisions made to some of the instruments prior to data collection that could impact factor structure, and prior evidence for different factor structures for some instruments.^{33,36} Because item responses were categorical, we first generated and examined polychoric correlation matrices for the items on each instrument. We determined the number of factors to extract based on number of eigenvalues over 1 and Horn’s parallel analysis for principal components. Factor models used iterated principal factor estimation with promax rotation. Items were retained based on high factor loadings (>.4) and low uniqueness. Where there was ambiguity in factor structure, decisions were made based on parsimony and meaningful interpretation. Once refined, scale scores were calculated and summarized to examine sample distributions, and each scale’s internal consistency was assessed using Cronbach’s alpha (α).

We then evaluated construct validity by examining correlations between scales, hypothesizing that different indicators of similar domains (e.g., K-6 and IDSS, both measures of distress) would be highly correlated; indicators of unique but related domains (e.g., IDSS and WHODAS, measuring distress and functional impairment) would be moderately correlated; and, indicators of positive wellbeing (e.g., PWI) would be negatively correlated with distress but positively correlated with each other. Lastly, we examined correlates of psychosocial health by regressing each scale (as separate models) onto a consistent set of demographic characteristics in multiple linear regression models with cluster-robust standard errors to account for clustering. Due to low missingness (e.g., <1%), listwise deletion was used.

Results

A total of 600 Rohingya mothers, ranging in age from 18 to 46, were enrolled in the study and completed baseline assessments. Sample characteristics are reported in [Table 1](#). Women had been living in the camp anywhere from 1-34 years (mean = 5.7, SD = 4.2). The vast majority of women were married (95.8%) and did not work outside the home (96.3%). Most also had no (74.3%) or limited (some primary; 20.5%) formal education. Women reported having anywhere from 1 to 9 children (mean = 3.2, SD = 1.7). Their index child (the child for whom they were receiving ACF supports and attending the BFS program) ranged in age from 6-24 months (mean = 11.4, SD = 4.5) and was more often female (65.5%) than male. Eleven percent (n = 66) of women were currently pregnant. Only 21% of women reported that their family ate meat on at least a weekly basis; 55% reported monthly meat consumption, and 24% less than once per month. The full raw data can be found under *Underlying data*.⁴⁸

Exploratory factor analysis

International Depression Symptom Scale. Parallel analysis identified two eigenvalues above 1, although the second was marginal (adjusted: 1.03) and fell below that of the simulated value in Horn's analysis. To explore potential

Table 1. Sample characteristics (N = 600).

	<i>Mean (SD) or %</i>
Mother's Age in Years	25.2 (4.9)
Years living in camp	5.7 (4.2)
Number of Children	3.2 (1.7)
Child Sex	
Male	34.5%
Female	65.5%
Child Age in Months	11.4 (4.5)
Education	
None	74.3%
Some Primary	20.5%
Completed Primary	5.2%
Marital Status	
Married	95.8%
Other	4.2%
Employment Status	
No employment	96.3%
Any employment	3.7%
Household Meat Freq.	
Less than monthly	23.7%
Monthly	55.8%
Weekly	20.5%
Pregnant	
No	89.0%
Yes	11.0%

Table 2. Exploratory factor analysis of the IDSS-12.

Item	Factor 1	Factor 2	Uniqueness
1. feel sad	.67		.47
2. feel no interest in things/less interest in daily activities	.66		.45
3. feel lonely	.68		.55
4. feel tired, low in energy or slowed down	.45	.33	.50
5. worry too much about things	.68		.54
6. experience headaches ^{a,b}	--	.58	.56
7. experience stomach aches ^{a,b}	--	.69	.59
8. feel other bodily aches and pains ^{a,b}	--	.65	.56
9. feel you were thinking too much	.77		.38
10. have difficulty concentrating	.85		.36
11. have difficulty doing your usual activities at home or work	.79		.37
12. have thoughts of wanting to kill yourself ^b	.36		.82
Correlation between F1 and F2	.61		

^aItems not included in Myanmar-Wide Short Instrument.

^bItems removed from final scale scores.

multidimensionality, we fit a 2-factor EFA model. Factor loadings and uniqueness are provided in Table 2. Most items loaded highly onto a single factor that accounted for 84% of the variance, with only the three exploratory somatic items loading onto the second factor. As these items were excluded from prior short versions of the IDSS in Myanmar, we exclude these items. Additionally, the item assessing recent thoughts of self-harm had high uniqueness (.82) with no substantial loading onto either factor. In prior use of the Myanmar short instrument this item has been retained for clinical purposes but not factored into scale scores; we opted to do the same for the current study. Thus, the final IDSS scale score was comprised of eight items (IDSS-8) with high internal consistency ($\alpha = .87$).

Kessler 6-item Scale. Parallel analysis of the K-6 identified only one eigenvalue above 1. In a single-factor model, all six items had satisfactory factor loadings (.57-.69) and satisfactory internal consistency ($\alpha = .78$).

Combined IDSS/K6. Using the items retained from the separate IDSS and K-6 EFAs, parallel analysis of the combined items supported a single factor structure that accounted for nearly 94% of the variance. Factor loadings for contributing items ranged from .55 to .79, and internal consistency for the 14-item combined scale was high ($\alpha = .90$).

WHO Disability Assessment Schedule 2.0. Parallel analysis identified three adjusted eigenvalues over 1, although the 3rd was marginal (1.01) and fell below the simulated value. The first two factors together accounted for 95% of variance. As such we fit a 2-factor EFA (Table 3). Six unique items loaded on each factor sufficiently, and internal consistency of the two subscales were .73 and .78, respectively. Factor 1 was comprised of items reflecting aspects of self-care (e.g., washing your whole body) and social interaction (e.g., joining in community activities), and appeared to present less difficulty (mean = .37, SD = .44), whereas Factor 2 was comprised of more task-oriented items (e.g., standing, walking, household activities) for which a higher level of impairment was reported (mean = .78, SD = .63). However, the factors were moderately correlated ($r = .49$), and internal consistency was improved for the full scale ($\alpha = .81$); as such, we opted to explore the relative contribution of each factor to the overall scale score and construct validity, but retained the single full-scale score for regression analysis.

Personal Wellbeing Index. Parallel analysis clearly supported a single factor model with only one eigenvalue over 1 and X% of the variance explained. The six standard items all loaded highly, with factor loadings ranging from .61 to .78. The optional item assessing satisfaction with religion did not load at or above .4 and had high uniqueness (.96) and was thus excluded. Cronbach's alpha with that item excluded was .85.

Brief COPE and Local Coping Items. Parallel analysis for the adapted Brief COPE (inclusive of locally developed items) indicated four adjusted eigenvalues greater than one, although two of these fell at or below those of the randomly generated set. We first fit 4- and 3-factor models, yet each of these models produced one factor with only a single sufficiently loading item. Thus, we fit a more parsimonious 2-factor (shown in Table 4) in which standard COPE items

Table 3. Exploratory factor analysis of the WHODAS-12.

Item	Factor 1	Factor 2	Uniqueness
1. Standing for long periods such as 30 minutes	--	.66	.62
2. Taking care of your household responsibilities	--	.68	.46
3. Learning a new task, for example, learning how to get to a new place	.65	--	.52
4. Joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can	.77	--	.38
5. How much have you been emotionally affected by your health problems	--	.53	.61
6. Concentrating on doing something for ten minutes	--	.60	.50
7. Walking a long distance such as a kilometer [or equivalent]	--	.70	.55
8. Washing your whole body	.54	.32	.43
9. Getting dressed	.67	--	.33
10. Dealing with people you do not know	.75	--	.56
11. Maintaining a friendship	.63	--	.46
12. Your day-to-day work/school	--	.68	.44
Correlation Between F1 and F2	.49		

Table 4. Exploratory factor analysis of the brief COPE and local coping items.

Item	Factor 1	Factor 2	Uniqueness
1. concentrating your efforts on doing something about the situation you are in ^a	.64	--	.59
2. taking action to try to make the situation better ^a	.60	--	.62
3. refusing to believe that it has happened	.63	--	.64
4. saying things to let your unpleasant feeling escape ^a	.62	--	.64
5. getting help and advice from other people ^a	.54	--	.73
6. criticizing yourself.	.45	--	.76
7. trying to come up with a strategy about what to do ^a	.82	--	.35
8. getting comfort and understanding from someone ^a	.61	--	.66
9. giving up the attempt to cope	.50	--	.68
10. looking for something good in what is happening ^a	.63	--	.58
11. making jokes about it	--	.36	.72
12. doing something to think about it less (Take your mind off of it) ^a	.60	--	.67
13. accepting the reality of the fact that it has happened ^a	.43	--	.75
14. trying to find comfort in your religion or spiritual beliefs ^b	--	.79	.37
15. learning to live with it ^a	.67	--	.52
16. blaming yourself for things that happened	--	--	.93
17. praying or meditating; participating in religious practices ^{*,b}	--	.78	.43
18. Doing acts of service [*]	--	--	.92
19. Helping to solve disputes/arguments [*]	--	.40	.76
20. Working or earning money (e.g., household chores, daily tasks, or job/occupation) [*]	--	--	1.00
21. Thinking about a better future for the children ^{*,b}	--	.67	.56
22. Practicing good hygiene (washing, cutting nails, etc) ^{*,b}	--	.85	.31
23. Participating in physical activities (e.g., sports, exercise, walking, etc) [*]	--	--	.90
Correlation Between F1 and F2	.31		

*Taken from locally developed items reported in Riley et al. (2017).

^aContributes to final originally sourced scale composition.

^bContributes to final locally developed scale composition.

loaded on Factor 1 and locally developed items on Factor 2, with the exception that finding comfort in religion (a standard item) loaded with the locally developed items. A number of items did not load on either factor (e.g., substance use, making jokes). The internal consistency of Factor 1 items (standard COPE) was satisfactory ($\alpha = .84$) and all contributing items had positive item-rest correlations; this was unexpected, given that the items reflected a blend of presumably adaptive (e.g., getting comfort, accepting reality) and maladaptive (e.g., criticizing yourself, giving up) strategies which would make a cumulative score not hold utility. Given this, we further examined scale psychometrics using theoretical or previously demonstrated subscales (e.g., emotion-focused, problem-focused, avoidant, adaptive, maladaptive), none of which produced satisfactory scale properties (results not shown). We then examined the internal consistency of only those theoretically *adaptive* items loading onto Factor 1, and were able to identify a theoretically useful 10-item subscale of adaptive Brief COPE items (i.e., “B-COPE”, $\alpha = .81$). A similar effort to identify a maladaptive subset was unsuccessful (e.g., 3-items, $\alpha = .47$). Using Factor 2, we were able to generate a second 4-item subscale of locally derived items (i.e., “L-Cope”) after excluding “solving disputes”, which had low factor loading and high uniqueness. Removal of that item increased the subscale’s internal consistency from $\alpha = .74$ to $\alpha = .76$. We then re-ran the parallel analysis and EFA using only those items retained across the two scales, and items continued to clearly organize themselves across the two distinct factors. As the factors were only minimally correlated, ($r = .24$), we opted to treat these as two separate constructs for analysis.

Construct validity

Descriptions of each of the final scales, including the number of contributing items, internal consistency, possible and observed score ranges, and sample distributions are reported in Table 5. Distress and functional impairment were relatively low, with moderate subjective wellbeing ratings. Comparing score distributions among like constructs, the Myanmar-specific IDSS items had a slightly higher mean relative to the K-6 (1.03 vs. .77). The two subjective wellbeing scores performed relatively similarly, as evidenced by similar means (6.89 vs. 6.67). There was a larger variation between the two measures of coping, with scores indicating more frequent use of strategies included in the local coping scale (mean = 2.3) relative to the Brief COPE items (mean = 1.06).

Correlations between scores, as shown in Table 6, aligned with our hypotheses aside from coping. For example, the IDSS and K-6 (i.e., measures of distress) were highly correlated with each other ($r = .71$), and both moderately correlated with total functional impairment (IDSS: $r = .65$; K-6: $r = .58$), although these correlations appeared to be driven largely by WHODAS Factor 2 (r range .61 to .70) rather than Factor 1 (r range .31 to .34). PWI scores, reflecting a composite score of satisfaction with various life domains, were likewise positively correlated with a global rating of life satisfaction ($r = .68$). Both measures of subjective wellbeing were negatively correlated with both measures of distress and functional impairment (r range: -.35 to -.44). However, the two coping measures were not highly correlated with each other ($r = .27$) and had seemingly divergent relationships with other scales. For example, the Brief COPE items appeared to be more highly – and positively – correlated with functional impairment and distress (r range from .26-.38), with very low – but negative – correlations with subjective wellbeing ($r = -.09$ and $-.17$). The local coping scale had lower positive correlations with distress, but also slight positive correlations with subjective wellbeing ($r = .09$ and $.17$).

Table 5. Optimized scale properties.

	No. of items	Possible range	Observed range	Mean (SD)	Cronbach's α
IDSS	8	0-4	0-3.5	1.03 (.71)	.87
K-6	6	0-4	0-3.5	.77 (.62)	.77
IDSS/K-6	14	0-4	0-3.5	.92 (.63)	.90
WHODAS	12	0-4	0-3	.57 (.46)	.81
WHODAS F1	6	0-4	0-2.7	.37 (.44)	.73
WHODAS F2	6	0-4	0-3.7	.78 (.63)	.78
SWL	1	0-10	0-10	6.89 (2.20)	--
PWI	6	0-10	.67-10	6.67 (1.58)	.85
B-COPE	10	0-3	0-2.9	1.06 (.54)	.81
L-COPE	4	0-3	.75-3	2.30 (.64)	.76

IDSS = International Depression Symptom Scale; K-6 = Kessler 6-Item; WHODAS = World Health Organization Disability Assessment Schedule; SWL = Satisfaction with Life; PWI = Personal Wellbeing Index; B-COPE = Brief COPE; L-COPE = Local Coping Items.

Table 6. Correlation between scales.

	IDSS	K-6	IDSS/K-6	WHODAS	WHODAS F1	WHODAS F2	SWL	PWI	B-COPE
IDSS	1.0								
K-6	.72	1.0							
IDSS/K-6	.96	.89	1.0						
WHODAS	.62	.58	.65	1.0					
WHODAS F1	.31	.33	.34	.78	1.0				
WHODAS F2	.68	.61	.70	.90	.43	1.0			
SWL	-.35	-.38	-.39	-.41	-.35	-.34	1.0		
PWI	-.40	-.39	-.43	-.45	-.36	-.40	.68	1.0	
B-COPE	.35	.37	.38	.26	.14	.28	-.17	-.09	1.0
L-COPE	.20	.14	.19	-.01	-.22	.14	.18	.09	.27

Demographic correlates

Adjusted associations between demographic characteristics and scale scores are reported in Table 7. Controlling for other factors, demographic characteristics most strongly and consistently associated with psychosocial outcomes included household meat consumption, pregnancy status, and marital status. Relative to mothers from households with the least access to meat, mothers from households eating meat on either a monthly or more frequent basis reported significantly lower distress (β range from $-.18$ to $-.30$, most $p < .05$) and significantly higher subjective wellbeing (β range from $.75$ to 1.85 , all $p < .05$). Mothers who were currently pregnant also reported significantly higher distress (β range from $.18$ to $.22$, most $p < .05$) and lower wellbeing (SWL: $\beta = -.47$; PWI: $-.32$), though not all estimates were not statistically significant at $p < .05$. Likewise, the small number of unmarried mothers in the sample reported marginally significant but substantially higher distress (β range from $.51$ to $.53$) and functional impairment ($\beta = .36$), and lower subjective wellbeing (SWL: $\beta = -1.42$; PWI: -1.09). Other characteristics were less associated with distress and wellbeing, but meaningfully associated with other outcomes. For example, mothers with higher educational attainment reported lower functional impairment (completed primary: $\beta = -.23$, $p < .01$) and higher use of coping strategies (any primary: $\beta = .31$; completed primary: $\beta = .44$; both $p < .01$). Length of time in displacement had a small but positive association both with indicators of distress (all $\beta = .02$, $p < .05$) and coping ($\beta = .01$ and $.03$, $p < .05$). Other correlates of coping strategies were less consistent and largely not significant.

Discussion

MHPSS research in humanitarian settings has historically been dominated by a narrow focus on distress-oriented outcomes, particularly depression and post-traumatic stress. This focus has facilitated the availability of well-tested assessment tools for these outcomes, with demonstrated validity across a range of cultures and contexts,³⁷ that have helped create a relatively strong evidence base for the treatment of distress with psychotherapy. To build a similar evidence base for a broader range of prevention and promotion interventions, there is a great need for progress in establishing instrument validity and utility for the psychosocial outcomes that should more often be directly targeted by those interventions, such as subjective wellbeing, functioning, and coping. Further, there is a critical need to test these instruments that are underrepresented in psychometric studies to determine where and how to balance use of standardized tools that support comparability across studies with the need for capturing meaningful experiences that are highly contextual.

This study, conducted with a community-based, non-clinical sample of displaced Rohingya mothers, provides a valuable illustration of this tension. The included distress and wellbeing instruments generally showed remarkable consistency with both theoretical expectations and prior performance. For example, our finding that the three exploratory somatic items (headache, stomach ache, and other bodily aches) did not load together with the core IDSS items from the Myanmar-Wide Short Version aligns with prior research among different ethnic groups in Myanmar,^{23,24} demonstrating the consistency of this instrument across populations. The IDSS and K6 were also highly correlated, items had good internal consistency as a single scale, and both measures aligned with hypothesized expectations about their relationships with functional impairment and subjective wellbeing. This consistency in performance likely reflects the long history of research that has informed the development of these distress-based measures;²¹ we note that in fact the IDSS typically does include items similar to those on the K-6, and the use of both in this study – and resulting removal of redundant IDSS items – was due to outcome alignment across the broader learning collaborative. However, the items retained on the IDSS did appear to be more sensitive to maternal distress than the K-6 as evidenced by the higher mean scores.

Table 7. Associations between demographic variables and baseline scale scores.

	IDSS	K-6	IDSS/K-6	WHODAS	SWL	PWT	B-COPE	L-COPE
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
Mother's Age	.01 (.01) [†]	.00 (.01)	.01 (.01)	-.00 (.00)	-.01 (.02)	.02 (.02)	.01 (.01)	.00 (.01)
Years living in camp	.02 (.01) [*]	.02 (.01) ^{**}	.02 (.01) ^{**}	-.00 (.01)	-.01 (.03)	-.01 (.02)	.01 (.01) [*]	.03 (.01) [*]
Number of Children	.03 (.02)	.01 (.02)	.02 (.02)	.02 (.01)	-.09 (.08)	-.14 (.07) [†]	.00 (.02)	.03 (.03)
Child Sex								
Male	REF	REF	REF	REF	REF	REF	REF	REF
Female	.05 (.05)	.02 (.04)	.04 (.04)	.10 (.02) ^{**}	.15 (.21)	.03 (.07)	.12 (.05) [*]	.01 (.06)
Child Age	.01 (.01)	-.00 (.01)	.00 (.01)	-.00 (.00)	.02 (.02)	-.01 (.02)	-.00 (.00)	.02 (.01)
Education								
None	REF	REF	REF	REF	REF	REF	REF	REF
Some Primary	.10 (.07)	.09 (.06)	.10 (.07)	.05 (.10)	-.42 (.35)	-.12 (.27)	.31 (.09) ^{**}	-.04 (.13)
Completed Primary	.05 (.12)	.11 (.13)	.08 (.11)	-.23 (.06) ^{**}	.17 (.64)	.33 (.59)	.44 (.15) ^{**}	.19 (.16)
Marital Status								
Married	REF	REF	REF	REF	REF	REF	REF	REF
Other	.51 (.29)	.53 (.29) [†]	.52 (.29)	.36 (.17) [†]	-.142 (.65) [†]	-.109 (.48) [†]	.32 (.17) [†]	.23 (.14)
Employment Status								
No employment	REF	REF	REF	REF	REF	REF	REF	REF
Any employment	.40 (.18) [†]	.17 (.11)	.30 (.14) [†]	.30 (.12) [*]	.08 (.28)	.03 (.22)	-.03 (.17)	.09 (.20)
Household Meat Freq.								
Less than monthly	REF	REF	REF	REF	REF	REF	REF	REF
Monthly	-.21 (.10) [†]	-.18 (.07) [*]	-.20 (.08) [*]	-.03 (.06)	1.13 (.29) ^{**}	.75 (.28) [*]	-.09 (.09)	.16 (.17)
Weekly	-.30 (.11) [*]	-.28 (.07) ^{**}	-.29 (.08) ^{**}	-.15 (.08)	1.85 (.32) ^{**}	1.24 (.20) [†]	-.18 (.09) [†]	.37 (.23)
Pregnant								
No	REF	REF	REF	REF	REF	REF	REF	REF
Yes	.22 (.07) [*]	.18 (.10) [†]	.20 (.08) [*]	.08 (.05)	-.47 (.24) [†]	-.32 (.16) [†]	.02 (.06)	.16 (.09) [†]

^{**} $p < .01$.
^{*} $p < .05$.
[†] $p < .10$.

The subjective wellbeing measures, likewise, were well correlated with one another and findings support their construct validity. Additionally, that the magnitude of correlation between measures of subjective wellbeing and distress was relatively moderate, supporting conceptualization of subjective wellbeing as a distinct construct rather than simply the inverse of distress.³⁸ Yet, the higher variation on the global SWL rating may indicate that the domain-based PWI is failing to capture certain aspects of life among the Rohingya in Cox's Bazar that they are factoring into their perceptions of wellbeing. Moreover, the PWI item on satisfaction with what achievements in life seemed so irrelevant and difficult to understand during piloting that it was not recommended for use. It is thus plausible that a scale developed based on locally sourced domains of relevance would hold notable variations from standard instruments; such work would be valuable in the future.

Similar to the PWI, the WHODAS also performed satisfactorily but not without some questions regarding the overall utility and optimal scale composition in this population. The WHODAS is one of the most common assessments of functional impairment worldwide,³⁹ with good evidence for reliability and validity across a range of cultures, supporting use of full and comparable scale scores when possible. Yet there is also evidence that it is a multidimensional instrument for which the factor structure may vary, suggesting that different factors may be driving overall scores across different groups.³⁶ In this study, it appeared that a subset of role or task-oriented items (walking, standing, household tasks, daily school, or work) for which impairment was higher loaded onto a separate factor and drove the relationships between distress and functional impairment, whereas basic self-care and social engagement were less impaired and less closely related to distress. This may reflect the influence of a community-based sample with relatively low rather than clinical levels of distress and impairment. It is noteworthy that the women in this study were recruited from a program seeking to improve child's health and development by improving caregiver functioning; that role or task-oriented items were more likely to be impaired aligns with this theoretical approach. That tasks of daily living are particularly context- and role-driven, locally developed tools that value contextual relevance over cross-cultural comparability are likely to be particularly useful.⁴⁰

The most problematic assessment we encountered was that of coping. Coping strategies, like expectations for functioning, are likely to be highly dependent on cultural beliefs and practices, as well as what is feasible and accessible in a given setting.⁴¹ Whereas we sought to include standard items from the Brief COPE, multiple items were found to be irrelevant or simply not endorsed and thus removed, while the remaining standard items did not cohere together in meaningful ways. While we pragmatically identified a subset of "adaptive" items that appeared to have good internal consistency, its relationship with other constructs, particularly temporal relationships that we could not account for in cross-sectional data, was unclear. For example, do observed positive correlations between coping and distress potentially support validity as the presence of distress necessitates leveraging coping strategies, or would construct validity be supported if coping and distress were *inversely* related because coping protects from distress? How are similar positive relationships between coping and both distress and subjective wellbeing accounted for? The endorsement of strategies included on the COPE was relatively limited compared to items added from local qualitative research¹³ these latter items reflected a combination of physical, mental, and spiritual self-care strategies that were highly endorsed, but seemingly irrespective of other characteristics and thus potentially less sensitive to change. Moreover, some locally reported coping strategies also seemed to conflate coping and functioning (e.g., solving disputes, practicing good hygiene); as improved coping is likely to be a key intermediate outcome for many psychosocial interventions.⁷ As such, there is a critical need to improve the conceptualization and measurement of coping in humanitarian settings, which our findings suggest will require in-depth qualitative research that seeks to understand how participants conceptualize the relationship between coping and distress and the types of strategies with the most relevance and utility in a given context.

Beyond scale psychometrics, the current study also identified factors associated with the measured psychosocial outcomes. The Rohingya community in Bangladesh faces substantial political and societal opposition to integration.⁴¹⁻⁴³ This reception, paired with a rapid influx of newly displaced Rohingya that have further strained relations and resources in recent years, has contributed to stressful very stressful living conditions.¹² Within this context, among food-insecure mothers with limited education or employment opportunities, key risk factors associated with poorer psychosocial health included relative socioeconomic disadvantage, current pregnancy, and being unmarried. These findings align with previous research indicating that displaced Rohingya women are especially vulnerable and even more so if they are separated, widowed or divorced due to numerous reasons ranging from poorer economic opportunities to increased gender-based violence.^{44,45} Recalling that these women were all mothers to children aged 6-24 months, that current pregnancy emerged as a clear risk factor may indicate a lack of women's empowerment in reproductive health and planning. Also related to female empowerment, higher educational attainment was associated with less functional impairment and greater use of coping strategies, consistent with previous studies amongst other refugee groups.^{41,46} While employment may have been expected to follow a similar pattern, this was not shown in our data potentially due to restrictions on employment in the camps such that very few women reported employment, and it is possible that women

seeking such opportunities do so in the absence of other supports. Gender preferences favoring male children may further explain why this sample – presenting for child malnutrition – reflected a higher proportion of female children and why having a female child in some cases appeared to be associated with poorer maternal psychosocial health.⁴⁷

Limitations

A key limitation of this study is a lack of formative qualitative work that would have helped to better refine instruments and potentially explain difficult findings. That said, instruments were piloted and refined with careful consideration to the interview process and, for the most part, did show good psychometric properties when used. This study also relied on a convenience sample of mothers enrolled in a longer intervention study, which imposed some inclusion restrictions that would not have otherwise been included (e.g., excluding women referred to outside support for severe distress or suicidality). Thus, this study likely failed to capture the full range of distress that would be observed in a representative community-based sample which could alter the observed factor structures, but does represent a population that could be targeted with prevention and promotion interventions. Lastly, we took an exploratory approach to factor analysis given the changes made to the instruments and the limited prior research with this population; future research can build upon this work to take a more confirmatory approach.

Conclusions

Among a group of displaced Rohingya mothers seeking nutrition treatment for their malnourished young children, a set of standard assessment tools performed adequately to assess a range of psychosocial outcomes but did not appear to fully capture local experiences. Some items included on standard measures were seldom endorsed, suggesting less relevance. Most critically, both standard and locally developed coping items showed weak evidence of construct validity and utility. Testing and reporting on the validity of outcome instruments intended for use in program evaluation and intervention research is a critical step in addressing current knowledge gaps regarding the effectiveness of many commonly implemented, broadly supportive psychosocial programs that do not necessarily target mental illness. Findings highlight the need for further mixed methods research to develop a rich battery of instruments with cross-cultural validity, particularly for positive psychosocial wellness outcomes.

Data availability

Underlying data

OSF: Measuring the psychosocial wellbeing of Rohingya mothers in Cox's Bazar, Bangladesh: Psychometric properties of an MHPSS assessment battery, <https://doi.org/10.17605/OSF.IO/AMDF2>.⁴⁸

This project contains the following underlying data:

- HEARD BFS Baseline Psychometrics Limited Dataset.csv

Extended data

OSF: Measuring the psychosocial wellbeing of Rohingya mothers in Cox's Bazar, Bangladesh: Psychometric properties of an MHPSS assessment battery, <https://doi.org/10.17605/OSF.IO/AMDF2>.⁴⁸

This project contains the following extended data:

- HEARD BFS Baseline Questionnaire.pdf

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

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Pieter Ventevogel 

Public Health Section, United Nations High Commissioner for Refugees, Geneva, Switzerland

General impression

This paper describes an exercise to validate a series of mental health questionnaires that were used in an intervention research among Rohingya refugee mothers in Cox's Bazar in Bangladesh. The rationale of the research is that much humanitarian mental health research (and its instruments) focusses on 'negative outcomes' (symptoms of mental disorders) with less attention to measures of well-being. The authors looked at a range of measures in a sample of 600 Rohingya women and analyze their psychometric properties. This is by itself a valuable exercise and I agree with the authors that much mental health research in humanitarian settings is done with questionnaires that have not been validated for the contexts. The authors are to be lauded for their work.

The manuscript is well written and logically set up.

However, I have various suggestions to strengthen the manuscript which I will describe below.

Introduction

1. The second sentence and its references for ("While there has been increased attention to culturally and contextually specific measurements of distress within global mental health research²⁻⁴") seem to be a bit haphazard. References 2 and 3 are not even about low-income settings, let alone about humanitarian settings. Can this be tailored to humanitarian settings? There is by now a substantive body of research in such contexts.
2. The second and third paragraphs that describe what is known about mental health and psychosocial wellbeing of Rohingya is incomplete. The essential reference to Riley et al 2017¹ needs to be completed with more recent data such as Riley et al 2020². I also find it remarkable that the authors cite two papers by authors from Action Against Hunger (ACF) among Rohingya in Myanmar, but do not mention the research work by ACF in Cox's Bazar^{3,4} which is even more relevant.

3. The authors cite the overview paper by Tay et al to state that there is a lack of information on Rohingya MHPSS, but seem to have overlooked the dozens of papers on this topic in a special issue of Intervention several of which address more in detail several of the issues the authors mention such as challenges with the language of the Rohingya and community perceptions around mental health ^{5,6}.
4. While I generally agree that the use of unvalidated questionnaires is a major impediment for mental health research among Rohingya, there have been some (minor) efforts to explore the psychometric properties of instruments, see for example the work of Mahmuda et al 2019 which contains a section on the adaptation of psychometric tools in the Rohingya dialect ⁷.
5. Rohingya in Bangladesh fulfill all definitions of refugees and the humanitarian documents such as the Refugee Response Plan clearly acknowledge this. The manuscript however avoids referring to Rohingya as 'refugees', instead resorting to euphemisms such as 'Rohingya forcibly displaced from Myanmar' or 'displaced Rohingya people' or even worse 'migrants'. I strongly recommend the authors to correct this and use the term refugees.

Methods

1. In the description of the setting, the authors suggest that ACF has provided critical humanitarian services in Cox's Bazar since 2017. This is not correct. In fact, ACF is one of the longest serving humanitarian agencies in Cox's Bazar with a track record that starts long before 2017.
2. Measure selection and adaption. I find the process of instrument adaptation quite confusing. I understand that the English version were first translated into standard Bangla, which was subsequently adapted to the Chittagonian dialect and then somehow adapted into Rohingya. I am aware of the challenges around writing the Rohingya language but I do not understand why these procedure was chosen. Could the authors not better have worked directly with Rohingya refugees instead of taking all these tedious steps of translation and then adapting and then again adapting?
3. The chosen instruments are an acceptable battery of questionnaires. But I find it questionable how these questionnaires were modified. One of the instrument, the IDSS contains 29 items in the original English version. I do not quite understand how and why the authors ended up with a 12-item version, deleting 17 items. They also talk about a 15-item version that was used in Myanmar, but the Rohingya version was not merely a further reduction because it also added items that had been deleted in the Myanmar version. And the authors apparently also deleted items that were similar to those in the K-6. I find this confusing and wonder whether perhaps all this acrobatics leads to a questionnaire that is so far removed from the original that it has become another scale. Are the authors sure this is still the IDSS? I doubt it and believe this needs serious reflection in the discussion section.
4. Similar concern apply to the Brief Cope which was originally a 28-item questionnaire. Ten items were removed and six new ones were added, leading to a 24-item news scale. Can we call this the Brief Cope? I think not and it could better be given a different name, which somehow the authors do by considering the scale as consisting of two independent subscales.

Results

1. This seems generally sound but I am not an expert in these matters. Some minor things: can the authors make sure the language around significance is correct. They write in the section 'demographic correlates' that that in a subgroup the distress is 'marginally significant but substantially higher'. That seems not correct. If the result is not significant it cannot be a substantial difference.

Discussion

1. Is to the point and clear. I would doubt however their opening sentence 'MHPSS research in humanitarian settings has historically been dominated by a narrow focus on distress-oriented outcomes, particularly depression and post-traumatic stress. This focus has facilitated the availability of well-tested assessment tools for these outcomes, with demonstrated validity across a range of cultures and contexts.' This may be true for some settings, it is certainly not the case for the Rohingya context, where there has been quite some research with pathology-focussed questionnaires (such as the Patient Health Questionnaire for depression) while these have not been validated ^{1,2,8,9,10,11,12,13,14} which makes it hard to distinguish frank disorder from adaptive distress as I and colleagues have argued for the Afghan context ¹⁵ as have others elsewhere ¹⁶. In my view there is a major need to do a clinical validation of such symptom-focussed tools to gauge how adequately they measure depression and other mental disorders. That would require validation against a clinical gold standard. So I would suggest the authors adapt their discussion and conclusion by arguing for the development of 'grounded' tools that are derived with bottom-up qualitative approaches, as well as clinical validation of tools that are meant to measure clinical constructs.

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Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Refugee mental health, global mental health, humanitarian mental health and psychosocial support

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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