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Article

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Tambri Housen
Médecins Sans Frontières Holland, India Australian National University

Annick Lenglet
Médecins Sans Frontières Operational Centre Amsterdam, the Netherlands

Cono Ariti
London School of Hygiene and Tropical Medicine

Shabnum Ara
Médecins Sans Frontières Holland, India

Showkat Shah
University of Kashmir

Maqbool Dar and Arshad Hussain
Institute of Mental Health and Neurosciences, India

Altaf Paul and Zahoor Wagay
Médecins Sans Frontières Holland, India

Kerri Viney
Australian National University

Simon Janes
Médecins Sans Frontières Holland, India

Giovanni Pintaldi
Médecins Sans Frontières Operational Centre Amsterdam, the Netherlands

Corresponding author:
Tambri Housen, National Centre for Epidemiology & Population Health, Building 62 Mills Road, The Australian National University, Canberra, Australia.
Email: tambrihousen@mac.com

Abstract

The present study aimed to culturally adapt, translate, and validate the Hopkins Symptom Checklist-25 (HSCL-25) and the Harvard Trauma Questionnaire-Posttraumatic Stress Symptoms Checklist (HTQ-16) prior to use in a cross-sectional mental health population survey in the Kashmir Valley. Cultural adaptation and translation of the HSCL-25 and the HTQ-16 employed multiple forms of transcultural validity check. The HSCL-25 and HTQ-16 were compared against a "gold standard" structured psychiatric interview, the Mini International Neuropsychiatric Interview (MINI). Interviews were conducted with 290 respondents recruited using consecutive sampling from general medical outpatient departments in five districts of the Kashmir Valley. Receiver operating characteristics (ROC) analysis was used to estimate the cut point with optimal discriminatory power based on sensitivity and specificity. Internal reliability of the HSCL-25 was high, Cronbach's alpha (α) = .92, intraclass correlation coefficient (ICC) = 0.75, with an estimated optimal cut point of 1.50, lower than the conventional cut point of 1.75. Separation of the instruments into subscales demonstrated a difference in the estimated cut point for the anxiety subscale and the depression subscale, 1.75 and 1.57, respectively. Too few respondents were diagnosed with posttraumatic stress disorder (PTSD) during structured psychiatric interview, and therefore the HTQ-16 could not be validated despite the fact that high internal reliability was demonstrated (α = .90). This study verified the importance of culturally adapting and validating screening instruments in particular contexts. The use of the conventional cut point of 1.75 would likely have misclassified depression in our survey, leading to an underestimate of this condition.

Keywords

anxiety, depression, Harvard Trauma Questionnaire, Hopkins Symptoms Check List, instrument validation, posttraumatic stress disorder

Introduction

Conflict and natural disasters expose populations to significant psychological and social distress. Mental health and psychosocial care are recognised by the World Health Organization (WHO) as a fundamental component of the public health response to humanitarian emergencies and are increasingly being integrated into response measures (Inter Agency Standing Committee, 2007). In order to accurately determine who is most at risk of mental illness and to inform programme planning, it is vital that screening instruments for a range of mental health conditions are culturally adapted and validated (Inter Agency Standing Committee, 2007; WHO & United Nations High Comissioner for Refugees [UNHCR], 2013). The majority of screening instruments for signs of psychological distress have been developed for North American or European populations and have not necessarily been validated in a range of settings. In the absence of culturally appropriate tools, screening for mental health disorders and psychosocial

problems is difficult and the use of nonvalidated instruments in different cultural context generates inaccurate prevalence estimates of these conditions (Gelaye et al., 2013; Silove et al., 2008; Steel et al., 2009).

The Hopkins Symptom Checklist (HSCL-25) for depression and anxiety and the Harvard Trauma Questionnaire (HTQ-16) posttraumatic stress checklist have been frequently used in transcultural research, specifically in conflict-affected contexts (Jayasuriya, Jayasuriya, Tay, & Silove, 2016; Oruc et al., 2008; Roberts, Damundu, Lomoro, & Sondorp, 2009; Syed, Zachrisson, Dalgard, Dalen, & Ahlberg, 2008; Ventevogel et al., 2007). The HSCL-25 was originally designed by Parloff, Kelman, and Frank at Johns Hopkins University in the 1950s (Parloff, Kelman, & Frank, 1954). It was created specifically for detecting anxiety and depression in the primary care setting. The HTQ-16, one component of the Harvard Trauma Questionnaire, developed by Mollica et al. (1992), measures emotional symptoms associated with trauma. Derived from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria for posttraumatic stress disorder (PTSD), this 16-point checklist is often used in isolation as a screening instrument for signs and symptoms of PTSD (Ayazi, Lien, Eide, Swartz, & Hauff, 2014; Sheikh et al., 2015). These tools are used as screening instruments to facilitate detection of probable cases for referral to mental health professionals; however, they are not diagnostic tools. A clinical diagnosis can only be made by a psychiatrist following clinical assessment and interview (i.e., the gold standard).

Both tools use cut points to determine whether persons meet the criteria for anxiety, depression, and PTSD. Internationally recognised cut points exist for both tools; for the HSCL-25, a conventional cut point of 1.75 is currently used as a combined score measuring mental distress or as an individual cut point for anxiety or depression in South East Asian populations (Ghazali, Elklit, Balang, Sultan, & Chen, 2014). For the HTQ-16, a cut point of 2.5 has been the standard for studies conducted in Vietnam, Cambodia, Tibet, and Japan (Mollica et al., 1992; Mollica, McDonald, Massagli, & Silove, 2004). However, where transcultural validation has occurred, cut points have varied significantly across contexts (Oruc et al., 2008; Shoeb, Weinstein, & Mollica, 2007; Syed et al., 2008; Ventevogel et al., 2007), which underscores the importance of validation to establish culturally relevant cut points.

Following the partition of India in 1947, the Kashmir Valley has been subject to continual political insecurity and ongoing conflict. In 1989, an insurgency began leading to the displacement of over 150,000 Kashmiri Pandits (Sarkaria, 2009) and 27 years of militant and military activity (Human Rights Watch, 2006; Metcalf & Metcalf, 2012). By 2015, approximately 70,000 Kashmiris had lost their lives in the conflict and 8,000 people had been reported missing (International People's Tribunal of Human Rights and Justice in Indian-Administered Kashmir, 2015). The effect of prolonged exposure to violence on the psychological well-being of the population has been confounded by natural disasters such as the earthquake of 2005 and floods in 2014, in addition to livelihood factors such as poverty and unemployment (Chaada, Malhotra, Kaw, Singh, & Sethi, 2007; Hassan & Shafi,

2013; Margoob, Khan, Firdosi, Ahmad, & Shaukat, 2006; Mercy Corps, 2011; Mohiuddin & Hashia, 2012).

The impact that protracted conflict and natural disasters have had on the mental health of the Kashmiri population is increasingly recognised. The Institute of Mental Health and Neurosciences (IMHANS) in the valley's major city, Srinagar, has observed a rise in outpatient presentations for mental health issues from an average of 100 per week in 1980 to between 200 and 300 per day in 2013 (Hassan & Shafi, 2013). In addition, the number of suicide attempts increased by more than 250% between 1994 and 2012 (Shoib, Dar, Bashir, Qayoom, & Arif, 2012). Other studies report a high prevalence of traumatic experiences and associated symptoms of mental illness (Margoob, Firdosi, Banal, et al., 2006). However, the results of these studies are likely not to be representative of the whole Kashmir Valley population due to the fact that they relied on nonprobability sampling, small sample sizes, and the use of nonvalidated instruments, limiting the generalisability of results (Khan, 2013; Margoob, Firdosi, Banal, et al., 2006; Yaswi & Haque, 2008).

Given that research has shown that nonvalidated tools over or under estimate psychiatric symptomatology (Ventevogel et al., 2007), validation is an essential step in improving methodological rigour when conducting mental health research in conflict- and disaster-affected settings. It is also necessary for the correct identification, referral, and follow-up of individuals at risk of psychological problems. Validated tools can facilitate the identification of people at greatest risk for psychological morbidity. The primary aim of this study was to validate the HSCL-25 and the HTQ-16 for use in the Kashmiri population in order to obtain the culturally appropriate cut points for both instruments prior to use in a cross-sectional mental health population survey.

Ethical approval

Ethical approval was obtained from the Ethics Review Board (ERB) at the Government Medical College in Srinagar, Kashmir (ID 29/ETH/GMC/ICMR) and from the Médecins Sans Frontières (MSF) International ERB, Geneva (ID 1440).

Methods and materials

Screening instruments

The HSCL-25 is composed of 25 items with 10 items assessing symptoms of anxiety and a further 15 assessing symptoms of depression. Individuals rate each item using a 4-point Likert scale with mutually exclusive categories of response being: *never or no*, *sometimes*, *often*, *always*. Three scores are calculated from the responses; the anxiety score is the average of the 10 anxiety items and the depression score is the average of the 15 depression items. The total score is the average of all 25 items. The HTQ-16 is a checklist comprising 16 items rated on a 4-point Likert scale with

the same mutually exclusive categories as the HSCL-25. The PTSD score is calculated from averaging the scores of all 16 items (Mollica et al., 2004).

The Mini International Neuropsychiatric Interview (MINI) is a short structured diagnostic interview designed for epidemiological studies and based on the DSM-IV and the International Classification of Diseases (ICD-10; Sheehan et al., 1998). It is often used as the "gold standard" for the validation of other psychiatric scales (Akena et al., 2012; Sweetland, Belkin, & Verdeli, 2014). The MINI is a reliable and valid diagnostic instrument that has been successfully used by psychiatrists in the Kashmiri context (Margoob, Firdosi, Ali, et al., 2006; Margoob, Khan, et al., 2006). The administration of the interview takes about 15 minutes and has been validated against other standardised diagnostic interviews, including the Composite International Diagnostic Interview (CIDI) and the Structured Clinical Interview for DSM Disorders (SCID; Sheehan et al., 1998).

Cultural adaptation and translation of the screening instruments

The cultural adaptation and validation was conducted in four phases taken from sequences recommended by Brislin (1976), van Ommeren (1999), and Flaherty et al. (1998). In Phase 1, the HSCL-25 and HTQ-16 were examined by a group of bilingual experts, consisting of two Kashmiri clinical psychologists from MSF, four Kashmiri psychiatrists from IMHANS,[1] and the Head of the Department of Psychology at Kashmir University. The expert panel examined each item of the instruments in order to identify Kashmiri[2] equivalent terms for all items that could be easily understood by people of various socioeconomic and educational backgrounds, thereby ensuring semantic validity (Flaherty et al., 1998).

During Phase 2, content validity (Flaherty et al., 1998) was established during a free-listing exercise with a convenience sample of 40 members of the community, across varied socioeconomic groups, with an equal number of men and women. These individuals were selected in the proximity of the Kashmir University and were gardeners, cleaners, shop attendants, academics, students, drivers, and people from other socioeconomic groups. Commonly used terms to describe the symptoms of people suffering from "tension" or "*pareshani*"—the local terms used to refer to depression, anxiety, PTSD, and other forms of mental distress—were identified.

In Phase 3, the expert panel adapted the terms used in each screening instrument for comprehensibility, acceptability, relevance, and completeness (van Ommeren, 1999). All of the final terms were unanimously agreed upon and no extra items were added. The final draft of the Kashmiri version was submitted for back-translation by experts from the Translation Department at Kashmir University who had no previous knowledge of the original version. Using the back-translated version, the expert panel discussed any discrepancies, incorporating recommendations into the final versions of the instruments.

Once unanimous agreement was reached on the final Kashmiri version of the instruments, technical validity (Flaherty et al., 1998) was tested in Phase 4. This consisted of a pretest on a convenience sample of 20 individuals identified by

MSF counsellors in three different districts' clinics. Each individual was asked at the end of the screening interview for his or her feedback on its duration and ease of understanding. This feedback was used to incorporate further adaptations as deemed necessary.

Study population and recruitment

The study population consisted of adults (≥18 years) seeking care at general medical outpatient departments (OPDs) in the districts of Bandipora, Sopore, Srinagar, Pulwama, and Anantnag. These districts were selected to ensure representation from the northern and southern regions of the Kashmir Valley. Doctors in the respective general medical OPDs were asked to refer consecutive patients on the day the data collection team was present. Participants were excluded from the study if they had psychotic symptoms, a known prior confirmed diagnosis of depression or anxiety disorders, mental development disorder, were unable to or did not wish to provide informed consent, or chose to withdraw their consent.

   In their systematic literature review of validation studies, Akena et al. (2012) found that sample size varied from 61 to 649. The Institute for Health and Care Research recommends a sample size of at least 50–100 participants (Institute for Health and Care Research, 2014). Another review of psychiatric validation research by Eaton, Hall, Macdonald, and McKibben (2007) excluded studies with sample sizes less than 100. Based on these findings, a sample size of 300 (60 from each site) was considered appropriate for this study. All interviewees were asked if they were willing to return within a 2–3 day period for a repeat interview, data from the reinterview was used to assess test–retest reliability. A pretest on a sample of 40 primary visits in the psychiatric outpatient department was conducted to assess interrater reliability of the psychiatrists conducting the MINI interviews. A separate sensitivity analysis was conducted with 26 individuals presenting at IMHANS, newly diagnosed with depression and/or anxiety and/or PTSD, and not on treatment, who were asked to participate in the interviews prior to commencing treatment.

Consent

An information sheet and consent form were translated into Urdu and provided in both Urdu and English, as Urdu is the official language of the state of Jammu and Kashmir and is the primary language of written communication. The information sheet and consent form were both pretested prior to the start of data collection and administered orally in Kashmiri to illiterate participants. Written consent was sought from each participant prior to the commencement of the interview.

Data collection

Consenting participants underwent two interviews conducted by a trained Kashmiri clinician in the Kashmiri language. Kashmiri clinical psychologists

administered a standardised questionnaire, which included questions on demographic data and the culturally adapted and translated screening instruments. In order to elicit the most precise response on the Likert scales, questions were asked in two phases: asking if the respondent had experienced the problem and then probing to establish the frequency. A Kashmiri psychiatrist from IMHANS conducted a clinical interview using the MINI as the reference gold standard interview. The English version of the MINI interview was used and translated during interview to Kashmiri by the interviewing psychiatrist. In order to minimise systematic bias via the "learning effect," the order of interview administration was randomly assigned. The interviewing psychologist and psychiatrist were blinded to the others' findings.

The screening tools and demographics data were recorded on an electronic questionnaire ensuring 100% completion of questionnaires. Responses to the MINI interview were recorded on paper. De-identified data were uploaded to a secure server at the end of each data collection day. Results of the MINI interviews were added to the dataset manually at regular intervals during the data collection period.

Statistical analysis

We used Stata 13.1 for statistical analysis. A respondent was coded as a case of depression if the psychiatrist-administered MINI identified the individual as having current (past 2 weeks) major depressive episode/disorder (MDD). A respondent was coded as a case of anxiety if the psychiatrist-administered MINI identified the individual as having current (past 2 weeks) panic disorder, agoraphobia, obsessive-compulsive disorder, PTSD and/or generalised anxiety disorder. A respondent was coded as a case of PTSD if the psychiatrist-administered MINI identified the individual as having PTSD. Mean scores were estimated with standard errors and 95% confidence intervals (95% CI). Analysis was disaggregated by sex in order to identify possible differences in men and women. Independent t tests were used to compare the screening instrument scores between cases and noncases. Pearson's chi-square statistic was used to compare the DSM-IV MINI diagnoses between women and men. Differences were considered statistically significant at p value $< .05$.

Reliability

The internal consistency of the total scores of each of the scoring instruments was evaluated using Cronbach's alpha, where an alpha of 0.7 was considered to be an acceptable reliability coefficient and 0.9 or larger, excellent reliability (Santos, 1999). Interrater reliability was analysed using Cohen's kappa coefficient, values between 0.4 and 0.75 were considered as fair to good agreement (Kirkwood & Sterne, 2013). Overall test–retest reliability of the screening instruments was calculated using the intraclass correlation coefficient (ICC), where values above 0.65

indicated good reliability (Abeyasinghe, Tennakoon, & Rajapakse, 2012; Kirkwood & Sterne, 2013; Ventevogel et al., 2007).

Validity

Cut points for the HSCL-25 (overall and the subscales for anxiety and depression separately) and the HTQ-16 were estimated by comparing respondents' scores on these tools with their respective classifications following the MINI interviews (case for depression, case for anxiety, or case for PTSD). Sensitivity and specificity for each possible cut point were calculated and receiver operating characteristics (ROC) were constructed. The area under the curve (AUC) provided an indication of the diagnostic accuracy of the HSCL-25 and HTQ-16, with an AUC above 0.7 showing acceptable diagnostic accuracy (Swets, 1998). Optimal cut points were determined for those scores that had the highest specificity value, which was not higher than sensitivity. The Youden index was calculated as a function of sensitivity and specificity with an addition metric for finalising the cut point estimates; values over 50% were considered acceptable values of diagnostic accuracy (Zhou, Obuchowski, & McClish, 2011). Bootstrapping was then used to estimate the 95% CI for the cut points. A sensitivity analysis was conducted on cut point estimations comparing results from ROC curve, cut point command, Youden index, and the nearest to method (Appendix 1).

Positive and negative likelihood ratios (LRs) were calculated as a measure to determine the screening performance of the HSCL-25 and the HTQ-16. A LR greater than 1 is indicative that the test result is associated with the disease, the contrary being that a LR of less than 1 indicates the result is associated with an absence of disease (Kirkwood & Sterne, 2013). Positive and negative LRs of approximately 3 and 0.2, respectively, are considered acceptable in instruments for depression- and anxiety-related illnesses (Pignone et al., 2002).

Results

Participant characteristics

We invited 304 OPD patients to participate in the validation study. Nine persons refused to consent to the interviews (due to lack of time) and five persons withdrew consent after undergoing the first interview, stating lack of time as the reason. The final analysis included 290 individuals who were enrolled between February 16 and April 30, 2015. Of these, 21 returned for a reinterview within 1–3 days of the first interview.

Out of all respondents, 174 were female (60%). The mean age of participants was 36.28 ($SD = 0.78$; range: 18–75 years). Over 70% of all respondents were married and 18% of women and 21% of men reported having experienced a traumatic event. An overview of the demographic characteristics of our sample is displayed in Table 1.

Table 1. Characteristics of 290 people attending general medical outpatient departments in the Kashmir Valley, 2015.

Demographic variable	Male (n = 116)		Female (n = 174)		Total (n = 290)	
	n	%	n	%	n	%
Average age	38.7	–	34.7	–	36.3	–
Average household size	7.1	–	7.1	–	7.1	–
Marital status						
Not married	25	21.6	47	27.0	72	24.8
Married	87	75.0	118	67.8	205	70.7
Separated/divorced/widowed	4	3.7	9	5.2	13	4.5
Religion						
Muslim	115	99.1	174	100	289	99.7
Hindu	1	0.9	0	0	1	0.3
Education						
No formal schooling	26	22.4	62	35.6	88	30.3
Primary	7	6.0	14	8.1	21	7.2
Middle school	15	12.9	19	10.9	34	11.7
High school	22	19.0	24	13.8	46	15.9
12th grade/higher secondary	17	14.7	12	6.9	29	10.0
Tertiary	15	12.9	7	4.0	22	7.6
Vocational	6	5.2	5	2.9	11	3.8
Other	8	6.9	31	17.8	39	13.5
Main activity						
Employed	20	17.2	2	1.2	22	7.6
Contract worker	6	5.2	2	1.2	8	2.8
Self-employed	43	37.1	5	2.9	48	16.6
Unpaid work on family business	20	17.2	1	0.6	21	7.2
Student	14	12.1	21	12.1	35	12.1
Unemployed	7	6.0	3	1.7	10	3.5
Home duties	4	3.5	140	80.5	144	49.7
Too young/retired	2	1.7	0	0	2	0.7
Reported a traumatic event	24	21.4	31	18.3	55	19.6

Semantic validity

Items for which it was difficult to identify culturally equivalent concepts were Items 7 and 18 on the HSCL-25 and Items 5 and 9 on the HTQ-16. These items are associated with emotional reactions to experiences of psychological distress. For Item 7 on the HSCL-25, *feeling tense*, the Kashmiri term بے چینی was adopted to reflect a cognitive restlessness, irritability, and tension. The English term *tension*

is synonymous with stress and is used extensively in Kashmir. The English term "caught" in Item 18 of the HSCL-25, *feeling not free or caught*, in Kashmiri implies to physically catch someone. The Kashmiri conceptual equivalent, باسان زنہ مصیبتو نال وولمت, implies that the individual is surrounded by troubles and cannot escape this feeling. Item 5 on the HTQ-16, *unable to feel emotions*, was ambiguous when directly translated into Kashmiri; the conceptual equivalent phrase required the addition of examples to add clarity (باسان غم وِز غمہ تہ خوشی) وِز خوشی نہ چھو ما(توبہ مثلن) گڑھان محسوسے کینہہ. Item 9 on the HTQ-16, *feeling on guard*, when expressed in Kashmiri describes a   feeling   of   needing   to   be   ready   for   an   unknown   threat, باسان ہیو تیار خاطر خوفن انجان پان پَنن ہمیشہ.

Technical validity

During the pretest, respondents found it difficult to recall that they were only required to report on the previous 4 weeks, the addition of the text "in the past four weeks" before each item ensured that we only captured symptoms experienced during this time period.

Content validity

Item 5 on the HTQ-16, *unable to feel emotions,* was the most frequently misunderstood item during the pretest. The addition of examples added clarity and, during the validation interviews, no further misunderstandings were reported on this item. During the cultural adaptation, two potentially sensitive items were identified, Items 13 and 17 on the HSCL-25, the first of which asks about a decrease in sexual pleasure and the second asks about suicidal ideation. Despite the potential cultural taboo associated with both topics, respondents were open about experiencing both symptoms, 24% reported feeling decreased sexual pleasure and 14% reported having thoughts of ending their life in the previous 4 weeks.

Criterion validity

The mean score on the HSCL-Depression subscale was 1.52 ($SD = 0.44$) and the mean score on the HSCL-Anxiety subscale was 1.53 ($SD = 0.41$). Female respondents scored higher than males on the HSCL-Depression and HSCL-Anxiety subscales, with a significantly higher score only in the latter (see Table 2). The overall mean score for the HTQ-16 was 1.31 ($SD = 0.37$), with no significant differences between male and female respondents.

MINI interviews. Based on the psychiatrist-administered MINI, 81 (27.9%) persons met the DSM-IV criteria for major depressive disorder (MDD), 41 (14.1%) met the DSM-IV criteria for an anxiety disorder, and 10 (3.4%) met the DSM-IV criteria

Table 2. Comparison of mean scores of men and women (N = 290) on HSCL-25 and HTQ-16 attending general medical outpatients from five districts of the Kashmir valley.

Screening instrument	Males (n = 116) Mean score (SD)	Females (n = 174) Mean score (SD)	Difference [95% CI]	Difference p value*
HSCL- Depression subscale	1.48 (0.47)	1.54 (0.42)	0.06 [0.03, 0.17]	.277
HSCL- Anxiety subscale	1.40 (0.36)	1.62 (0.43)	0.22 [0.14, 0.32]	.001
HTQ-16	1.27 (0.34)	1.33 (0.39)	0.06 [0.02, 0.15]	.207

Note. HSCL = Hopkins Symptoms Check List, HTQ = Harvard Trauma Questionnaire, SD = standard deviation, CI = confidence interval.
*Independent t test.

Table 3. Criterion validity of screening instruments for 290 people attending general medical outpatients in the Kashmir Valley, 2015.

Screening instrument	MINI cases Mean score (SD)	Noncases Mean score (SD)	Difference [95% CI]	Difference p value*
HSCL-Depression subscale	1.89 (0.43)	1.37 (0.35)	0.52 [0.42, 0.61]	<.001
HSCL-Anxiety subscale	1.91 (0.40)	1.47 (0.38)	0.44 [0.32, 0.57]	<.001
HTQ-16	2.18 (0.55)	1.28 (0.32)	0.90 [0.69, 1.11]	<.001

Note. HSCL = Hopkins Symptoms Check List, HTQ = Harvard Trauma Questionnaire, MINI = Mini International Neuropsychiatric Interview, SD = standard deviation, CI = confidence interval.
*Independent t test.

for PTSD. Multiple psychopathologies were noted in 27 (9.3%) individuals who met the DSM-IV criteria for MDD and an anxiety disorder. Of the 81 respondents diagnosed with MDD, more women than men were diagnosed with this condition (34.1% and 19.1%, respectively; $p = .011$). Anxiety-related disorders were similar between males and females (13.3% and 15.6%, respectively; $p = .584$). The proportion of men and women diagnosed with PTSD was the same (3.5%) for each group.

The mean scores on the HSCL-25 depression and anxiety items and HTQ-16 were significantly higher for cases (determined by the MINI) than noncases ($p < .001$; see Table 3).

A total of 21 participants returned for reinterview. Interrater (Cohen's kappa) analysis showed high concordance among psychiatrists administering the MINI, with 87.5% agreement for MDD or an anxiety-related disorder. Cohen's kappa

could not be calculated for PTSD diagnosis due to too few observations (cases = 10). The ICCs for test–retest reliability of the HSCL-25 were high overall (ICC = 0.75, $p < .001$) for the anxiety (ICC = 0.79, $p < .001$) and depression subscales (ICC = 0.74, $p < .001$).

Reliability and item analysis. The Cronbach's alpha of the HSCL-25 was calculated to be 0.92 (for men and women), demonstrating high internal reliability. The most frequently endorsed items on the HSCL-25 were *headaches* (81%) and *heart pounding or racing* (66%) for the anxiety items (Items 1–10), and *sadness* (61%) and *feeling low in energy or slowed down* (74%) for the depression items (Items 11–25). Cronbach's alpha for the HTQ-16 was estimated at 0.90 overall (women = 0.90, men = 0.89). The most frequently endorsed items for the HTQ-16 were *difficulty sleeping* (42%) and *feel irritable* or *have outbursts of anger* (59%). Conversely, the least frequently endorsed items were *avoid activities that remind you of a traumatic event* (12%) and *unable to remember parts of the traumatic or hurtful event* (7%).

Cut points for HSCL-25 and HTQ-16 in Kashmir. The optimal cut point for maximising the sensitivity and specificity of the HSCL-25 Anxiety subscale was 1.75 (95% CI [1.64, 1.86]) and the Depression subscale, 1.57 (95% CI [1.47, 1.67]; see Table 4). The sensitivity analysis depicted in Appendix 1 (Table A1) showed consistency of cut point estimates across four different methods. A cut point was not estimated for the HTQ-16 due to too few observations classified by the MINI as a case for PTSD.

Different optimal cut points for men and women were noted. When analysed separately, the optimal cut points were lower for men than for women for depression and anxiety (see Table 4).

The positive and negative LRs were within the accepted values for the HSCL-25. The positive LR indicates that scoring above the stated cut point increases the probability of having a depressive/anxiety-related illness by 15–30%, while scoring below the Kashmiri cut point reduces the probability of having a depressive/anxiety-related illness by 25–35% (see Table 4).

The ROC analysis demonstrated good diagnostic accuracy, with AUC of 0.81 and 0.82 for the anxiety and depression subscales, respectively. The HSCL-25 showed similar performance among men and women with AUCs between 0.81 and 0.86 (see Table 4 and Figures 1 and 2).

Sensitivity analysis

Of the 26 individuals interviewed at IMHANS and newly diagnosed with depression and/or anxiety, the mean score on the HSCL-Anxiety subscale was 2.27 ($SD = 0.61$) and on the HSCL-Depression subscale was 2.03 ($SD = 0.50$). None of these individuals met the criteria for a diagnosis of PTSD, the mean score on the HTQ-16 was 1.60 ($SD = 0.10$).

Table 4. Properties of the HSCL-25 with different cut points for detection of psychopathology, Kashmir Valley, 2015.

Gender	Instrument/scale	Cut point[1]	Sensitivity	Specificity	LR+	LR−	PPV	NPV	AUC [95% CI]
Male	HSCL-Depression Scale	1.50	0.82	0.77	3.243	0.224	81.8	76.6	0.86 [0.79, 0.93]
(n = 116)	HSCL-Anxiety Scale	1.65	0.72	0.90	5.212	0.322	72.2	89.8	0.85 [0.74, 0.95]
Female	HSCL-Depression Scale	1.63	0.76	0.78	3.274	0.299	76.3	78.3	0.82 [0.76, 0.88]
(n = 174)	HSCL-Anxiety Scale	1.75	0.83	0.72	2.012	0.183	82.6	72.2	0.81 [0.72, 0.90]
Total	HSCL-Depression Scale	1.57	0.78	0.77	3.045	0.286	77.8	77.0	0.82 [0.79, 0.93]
(n = 290)	HSCL-Anxiety Scale	1.75	0.73	0.81	3.324	0.303	79.5	70.6	0.81 [0.74, 0.95]

Note. HSCL = Hopkins Symptoms Check List, LR + = positive likelihood ratio, LR − = negative likelihood ratio, PPV = positive predictive value, NPV = negative predictive value, AUC = area under the curve, CI = confidence interval.
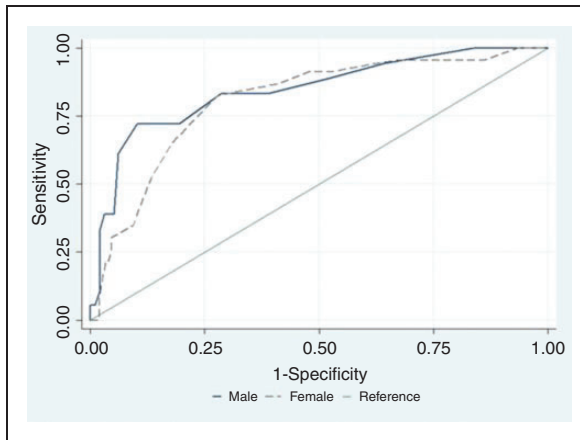[1]Cut point as determined by the Youden index.

Figure 1. Receiver operating curve of the classification of an anxiety disorder for the HSCL-25 for men and women represented by the solid line and dashed line, respectively. AUC for men is 0.85, and for women, 0.81.
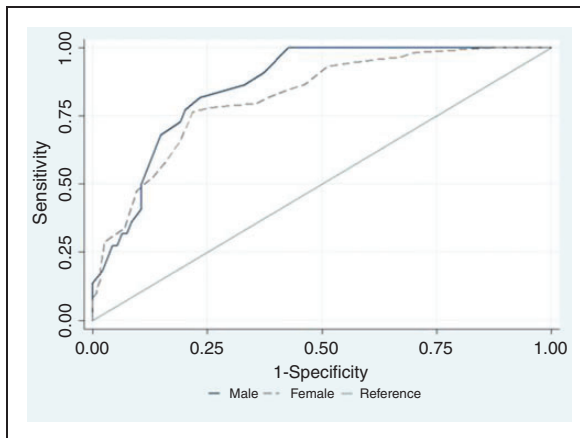

Figure 2. Receiver operating curve of the classification of a depressive disorder for the HSCL for men and women represented by the solid line and dashed line, respectively. AUC for men is 0.86, and for women, 0.82.

Discussion

We aimed to establish the psychometric properties of the HSCL-25 and HTQ-16 to detect depression, anxiety, and PTSD, as defined by the DSM-IV, in the Kashmiri population using a transcultural validation approach. When compared with the MINI (administered by a psychiatrist), the HSCL-25 demonstrated high internal

consistency, reliability, and validity for detection of depression and anxiety-related disorders among hospital outpatients in the Kashmir Valley. Therefore, we feel that the validated cut point for the Kashmiri HSCL-25 and its subscales have sufficient psychometric properties for identifying individuals with depression and anxiety-related symptoms in the primary care setting in the Kashmir Valley.

Due to the low prevalence of PTSD in our study sample (3.5%), the sample size was insufficient to estimate a Kashmiri-specific cut point for the HTQ-16. The low prevalence of PTSD in our sample is likely a reflection of the way in which we asked about past traumatic experiences. We asked one question on whether the respondent had experienced a hurtful or traumatic event but did not specify beyond this, thus limiting our ability to identify or quantify past traumatic experiences. The HTQ-16 continues to be one of the most utilised international tools to establish PTSD in conflict-affected populations and, thus, further research with a larger sample and more specific questions related to traumatic experiences is required in order to validate a Kashmiri cut point for PTSD (Oruc et al., 2008; Ventevogel et al., 2007).

Separating the HSCL-25 into two subscales for anxiety and depression, the optimal cut point maximising sensitivity without compromising specificity whilst retaining acceptable positive and negative likelihood ratios for anxiety, replicate the conventional standard of 1.75 (Hinton, Chen, Tran, Newman, & Lu, 1994; Mollica, Wyshak, DeMarneffe, Khuon, & Lavelle, 1987). The estimated cut point for the Depression subscale was substantially lower with a cut point of 1.57. Use of the conventional cut point of 1.75 for depression will lead to an excess of false negative results and a subsequent underestimation of the prevalence of depression-related symptoms in this population. Our findings support cultural adaptation and validation as an essential step in the cross-cultural use of international screening tools.

When analysed separately for men and women, the estimation of cut points for the HSCL subscales were lower for men than women. This is consistent with findings from a validation study of the HSCL-25 in Afghanistan, which also reported lower cut points for men than women (Ventevogel et al., 2007). Ventevogel et al. suggest the difference in men and women may be due to gender-specific interpretations of psychologically oriented questions, such as questions about "feeling sad" or "crying often." Differences in male and female emotional expression, and what is socially acceptable as an expression of mental distress, may have led men to underreport some symptoms in order not to feel ashamed in front of the interviewer (Miller et al., 2006; Ventevogel et al., 2007). The presence of cultural values and factors influencing the endorsement of specific symptoms of depression has been discussed by other authors (Gelaye et al., 2013). The cultural adaptation and translation of the screening instruments minimises this bias but does not eliminate it. Gender variations will need to be considered in the practical implementation of these tools. Ignoring these differences could lead to a lower negative predictive value in females than males. Further research is required to explore gender differences in the experience and manifestation of psychological distress in Kashmiris.

These culturally adapted and validated screening instruments can be used by professionals working in mental health, by those in the primary health care setting, and in cross-sectional population surveys to estimate the burden of mental distress. A challenge with using screening tools for depression and anxiety is the possibility of including respondents with subsyndromal illness as false positive diagnoses, but as these individuals may also benefit from follow-up, this is not viewed as a disadvantage (Pignone et al., 2002). Pignone et al. conducted a meta-analysis of randomised trials of depression screening in the primary care setting and concluded that screening and feedback reduce the risk of persistent depression (Pignone et al., 2002). The WHO has strongly advocated for the introduction of mental health in primary health care (WHO & UNHCR, 2013), with research reporting successful implementation of primary care mental health programs (Cohen et al., 2011; Patel et al., 2013); however, few primary care workers know how to recognise an individual with mental health issues. The culturally adapted HSCL-25 and HTQ-16 can be used by Kashmiri primary health care workers to identify individuals who may require psychological or psychiatric review in a timely manner.

The strength of this study was the employment of rigorous methodological approaches in the cultural adaptation and translation of the screening instruments. The methods presented in this paper could be used in other settings.

Limitations

Our study identified Kashmiri equivalents to the expression of mental distress that are part of the Western constructs of DSM-IV. We therefore may not have identified cultural concepts of psychological distress, which differ from those defined by the DSM-IV criteria. As highlighted by Kohrt et al. (2013), better understanding of cultural concepts of distress can identify cultural biases in psychiatric diagnostic criteria. There is a need for robust ethnographic research aimed at the creation of indigenous mental health screening instruments capturing the local idioms of distress.

The transcultural validity of the MINI diagnostic interview and DSM-IV classification was not assessed, and the MINI was not pretranslated into Kashmiri. The use of Kashmiri psychiatrists fluent in both English and Kashmiri and familiar with the Kashmiri expressions of emotional distress facilitated a minimal level of cultural competency in the clinical assessment and diagnosis. Additionally, the MINI has been widely used by Kashmiri psychiatrists (Margoob, Firdosi, Ali, et al., 2006; Margoob, Khan, et al., 2006) and the four psychiatrists involved in this study had used the instrument in prior research in Kashmir. Interrater reliability scores showed high diagnostic concordance between psychiatrists.

Finally, the sample for this research was drawn from general medical OPDs and our sample reflects people with common healthcare-seeking behaviour. However, this does not represent a major limitation because the screening tools likely will be used in a health-seeking population in order to recognise signs of mental distress and possible need for referral.

Conclusion

Our findings demonstrate that the HSCL-25 is a valid and reliable instrument to detect DSM-IV major depressive disorder and anxiety-related disorders in the population of the Kashmir Valley. This instrument was used in a cross-sectional population survey in the latter part of 2015 to estimate prevalence of depression and anxiety-related symptoms in the Kashmir Valley.

Notes

1. IMHANS is the only psychiatric hospital in the Kashmir Valley.
2. Urdu has been chosen by the Indian state as the official language for the Kashmir Valley, however, the majority of the population speak Kashmiri as their mother tongue and Kashmiri is the primary language of oral communication. When asking people about sensitive issues it is more appropriate to ask such questions in their mother tongue as it establishes rapport and allows the interviewee to freely express themselves (Filep, 2009; Tsang, 1998).

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Tambri Housen, MPH&TM, MAE, PhD, is an epidemiologist and Research Fellow at the National Centre for Epidemiology and Population Health at the Australian National University. This research was carried out during her tenure with Médecins Sans Frontières as the National Epidemiologist in India. Her research interests include translational mixed methods research to inform policy and research promoting evidence-based practice in the international health care context.

Annick Lenglet, MSc, is an Epidemiology Advisor for Médecins Sans Frontières in Amsterdam, the Netherlands. Ms Lenglet's research interests lie in physical and mental health of people in situations of humanitarian needs. Her published works focus on mental health and surgical interventions in areas of conflict and surveillance and response to infectious disease outbreaks.

Cono Ariti, BSc(Hons) MSc, is a Lecturer in Public Health at Cardiff University and honorary Assistant Professor in Medical Statistics at the London School of Hygiene and Tropical Medicine. Mr Ariti is an applied statistical researcher whose areas of interest include mental health in emergency settings, health services research, and clinical epidemiology. Mr Ariti also teaches statistics to public health and healthcare researchers as part of the MPH degree at Cardiff University and as faculty for the European Educational Programme in Epidemiology.

Shabnum Ara, MA, Mphil Clinical Psychology, is a certified clinical psychologist and a PhD candidate at the Department of Psychology, University of Kashmir. She has 3 years of experience in the field of mental health and worked with Médecins Sans Frontières, India as clinical psychologist.

Shawkat Ahmad Shah, PhD, is the Head of the Department of Psychology at University of Kashmir. Dr Shawkat studies mental health in relation to the Kashmir imbroglio. Currently he is supervising researchers in the field of social, community, organisational, and counselling psychology. He is also the Principal Investigator for an ICSSR-funded project pertaining to community psychology. Apart from this, he has 16 years of teaching and research experience in the field of psychology and has published extensively in fields such as psychometrics, organisational behaviour, counselling psychology, and community psychology.

Mohamad Maqbool Dar, MD, Psychiatry, is the head of the Department of Psychiatry at the Government Medical College in Srinagar, Kashmir. He has extensive experience as a clinician, mentor, and educator in psychiatry in Kashmir. His specific fields of interest are schizophrenia and spirituality.

Arshad Hussain, MD, Psychiatry, is the Head of Unit and Professor of Psychiatry in the Department of Psychiatry at Government Medical College, Srinagar. He is currently the Principal Investigator of a study titled "Genetic Polymorphisms in Circadian System Genes in Bipolar and Seasonal Affective Disorders in Kashmiri Population." His published works focus on trauma, mood disorders, and metabolics and mental health.

Mohd Altaf Paul, PhD, is currently working as Assistant Professor in the Department of Psychology, Government Degree College Kulgam, Jammu and Kashmir. Dr Altaf is licensed clinical psychologist from the Rehabilitation Council of India and professional member of the Indian Association of Clinical Psychology. He has worked in various mental health departments and treated different patient groups by applying nonpharmacological treatment methods. His published work focuses on mental health research in the conflict-prone population of Kashmir.

Zahoor Ahmad Wagay, MA, MPhil Clinical Psychology, is a certified clinical psychologist. Zahoor Ahmad Wagay provides a range of mental health services for various socioeconomic, cultural, and ethnic groups and has first-hand experience dealing with PTSD, depression, and obsessive compulsive disorder among people from conflict hit areas. He is currently working as a clinical psychologist with Médecins Sans Frontières in Kashmir, India. His published works focus on mental health issues such as posttraumatic stress disorder and coping, stress-related disorders, and depression.

Kerri Viney, RN, MPH, Grad Dip Applied Epi, PhD, is a Sidney Sax Research Fellow at the Department of Public Health Sciences, Karolinska Institute and the Research School of Population Health at Australian National University. Dr Viney

researches tuberculosis, patient costs, access to health care, and operational research capacity building. She is currently the Principal Investigator of the Australian Tuberculosis Risk Factor Survey and is working with staff from three countries in the Asia-Pacific region and the World Health Organization on tuberculosis patient cost studies. Her published works focus on the programmatic management of tuberculosis, tuberculosis patient costs, the association between communicable and noncommunicable diseases, operational research capacity building, and access to health care.

Simon Janes, MMBS, MPH&TM, FACRRM, is the former Medical Coordinator of the MSF OCA India mission, serving from July 2013 to December 2016. He currently works in community medicine in Australia.

Giovanni Pintaldi, Dr in Psychology, psychotherapist, was the Mental Health Advisor for Médecins Sans Frontières in Amsterdam, the Netherlands for the duration of the present work. Dr Pintaldi's research interests lie in understanding mental health manifestations in cross-cultural and humanitarian emergency contexts. His published work focuses on mental health interventions implemented by humanitarian organisations in humanitarian emergency settings.