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MEASURING DEPRESSION AND ANXIETY IN SUB-SAHARAN AFRICA

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Abstract

Background—Despite being one of the leading causes of disability worldwide, fewer than 10% of depressed individuals in low-resource settings have access to treatment. Mounting evidence suggests that nonspecialist workers are capable of providing counseling and case management at the community level. They often use brief psychiatric screening instruments as clinical tools to identify cases and monitor symptoms over time. In order for such tools to be used in diverse settings, they must demonstrate adequate reliability and validity in addition to cross-cultural relevance. To be used to guide routine care they also need to be flexibly adapted and sensitive to change. The goal of this paper is to assess the cross-cultural validity of brief psychiatric screening instruments in sub-Saharan Africa, identify best practices, and discuss implications for clinical management and scale-up of mental health treatment in resource-poor settings.

Method—Systematic review of studies assessing the validity of screening instruments for depression, anxiety, and mental distress in sub-Saharan Africa using Medline and PsycINFO.

Results—Sixty-five studies from 16 countries assessing the validity of brief screening instruments for depression, anxiety, and/or mental distress.

Conclusions—Despite evidence of underlying universality in the experience of depression and anxiety in sub-Saharan Africa, differences in the salience, manifestation, and expression of symptoms suggest the need for the local adaptation of instruments. Rapid ethnographic assessment has emerged as a promising, low-cost, and efficient strategy for doing so.

Keywords

brief screening instruments; depression; anxiety; validity; cross-cultural; sub-Saharan Africa

INTRODUCTION

Depression is one of the leading causes of disability worldwide yet in many low-resource settings fewer than 10% has access to adequate treatment.^[1] Faced with this reality, in 2010, the U.S. National Institute of Mental Health launched the Grand Challenges in Global Mental Health initiative to build global consensus around research priorities for the next decade.^[2] Via this initiative, approximately 400 stakeholders from the clinical, policy, research, consumer, and advocacy communities worldwide collectively identified 25 priority research areas. Top among these were to increase case detection in routine primary health care settings and enhance the ability of lay workers to provide expert-supervised community-based treatment. Brief psychiatric screening instruments will be essential tools in these efforts, and therefore must be both reliable and valid across diverse contexts.

In many high-income countries, depression screening has become standard routine practice in primary care settings, wherein probable cases are identified for follow up. In settings with few mental health specialists, such tools have been used further as clinical proxies to enable lay workers to provide community-based care. Though historically an emphasis in epidemiology was placed on standardizing instruments to the greatest extent possible so as to optimize cross-cultural comparison, the new use of brief screening instruments as clinical tools necessitates a different level of local precision and relevance. These instruments now need to be sensitive enough not only to identify new cases but also to monitor improvement or worsening of symptoms over time so as to facilitate targeted management and follow up by nonspecialist workers across the care spectrum. This often requires adapting instruments to local contexts will be essential tools in these efforts, and therefore must be both reliable and valid across diverse contexts.

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In addition to demonstrating the basic reliability and validity required of any psychometric scale, when used cross-culturally there are a number of additional criteria that must be met. Flaherty et al.^[3] describe five essential characteristics needed in order to consider an instrument “culture free.” These include establishing linguistic, content, conceptual, technical, and criterion equivalence. Linguistic equivalence means there is confidence in the translation of an instrument and that it retains meaning across both cultures. The most common technique for this is “back translation” whereby the instrument is translated into a foreign language and then translated back into the original language, at which time any

inconsistencies are addressed. More sophisticated techniques involve multiple simultaneous translations in each direction and committees of bilingual individuals resolving any discrepancies.^[4] If there is sufficient evidence that the content of each item in a scale corresponds to phenomena present in both cultures then it is said to have content equivalence. Conceptual equivalence refers to the confidence that the same underlying construct is being measured across cultures. Technical equivalence refers to ensuring that the methods of administration are comparable across cultures. If one culture has more familiarity with a certain mode of instrumentation, such as self-assessment or Likert scales, this may create instrument bias, or systematic error that is unrelated to the underlying construct. Finally, that the meaning of results is interpretable across cultures, in reference to the norms of each, suggests criterion equivalence. All too often screening tools are used across diverse social, cultural, and linguistic contexts without having sufficiently established one or more of these types of equivalence, which can lead to misdiagnosis.

Although the mental health literature is filled with citations of instruments that have been “validated” across diverse settings, methods for establishing this confidence vary widely and there is an overall lack of consensus about best practices for establishing cross-cultural equivalence. This is further complicated by the rich diversity of languages and cultures across sub-Saharan Africa; an instrument used satisfactorily in one African setting may or may not have the same applicability in another setting, or with a different population, even within the same country.

The primary aims of this paper are to (1) identify studies that have assessed the validity of brief screening instruments for depression, anxiety and mental distress in sub-Saharan Africa, (2) compare and critically evaluate the methods used to assess cross-cultural equivalence, (3) identify best practices for improving the relevance, utility, and cross-comparability of brief screening instruments, and (4) consider the implications for clinical monitoring and scale up of mental health treatment in resource-poor settings.

METHODS

To identify relevant articles, systematic review of the MEDLINE and PsycINFO databases from 1970–2011 was conducted using the following terms: (1) depression, anxiety or distress; (2) scale, instrument, questionnaire, survey or measurement; (3) validity or psychometric; and (4) Africa or (each sub-Saharan African country). Additional studies were identified through the bibliographic references of these papers and through an early-annotated bibliography for mental health and psychiatry in Africa (Westley 1993). The search was limited to articles published in the English language; instruments used or tested only among children or adolescents were excluded.

RESULTS

Our search identified 65 studies from 16 countries that assessed the validity of brief screening instruments for depression, anxiety, and/or mental distress. Though this body of evidence spans a 40-year period, a majority of studies was conducted in the last decade (see Table 1). A variety of qualitative and quantitative methods were utilized to evaluate cross-

cultural equivalence of these instruments that will be summarized using the framework put forward by Flaherty et al.^[3]

LINGUISTIC EQUIVALENCE

The first step in adapting a brief screening instrument for a new setting is to ensure adequate translation and that respondents understand questions in intended ways. Several studies assessed this using a variety of qualitative methods such as protocol analysis^[5] wherein a small representative sample of individuals is asked to “think aloud” as they respond to instrument questions. The responses are recorded and then coded and analyzed to determine the degree to which questions are adequately translated and understood.

One of the most critical observations that emerged from these studies is the fact that in many African contexts, the words “depression” or “anxiety” do not have direct equivalents.^[6–10] In South Africa, several words are used to describe depression, which translate variously as “the spirit is down” (*umoya uphansi*), “the body is down” (*umzimba uphansi*), “the heart is sore” (*inhliziyi ibuhlungu*), and “not feeling well” (*ukupatheka kabi*).^[6] In Eritrea, some local idioms included “mental oppression” (*Chinquet*), “thinking too much” (*Hasab*), and “sighing” (*Ihihta*).^[11] Words or questions may also differ in connotation, relevance, or salience in one culture compared to another;^[5] in Lesotho, there are two or three words for “depression” that vary depending on the context.^[10] In many African settings, distress is often described behaviorally rather than cognitively, and expressed and/or experienced somatically.^[12–14] Emotions and worries are also frequently thought to relate to the heart, instead of the head, which may lead to misinterpretation of related questions.^[6,7]

Several other studies highlighted ways in which questions were not understood correctly either due to wording, connotation, or question structure.^[6,7,15–19] Kortmann^[15] had difficulties with the Amharic translation of the Self-Reporting Questionnaire (SRQ) in Ethiopia; more than one in four (26%) of affirmative responses proved invalid due to double-barreled questions, motivational biases, or a lack of conceptual congruity. Two items, “have you noticed any interference or anything else unusual with your thinking?” and “do you ever hear voices without knowing where they are coming from or which other people cannot hear?” are both long and have more than one question embedded within them, which made them difficult for respondents to understand and answer. Other respondents acknowledged falsely endorsing symptoms due to perceived secondary gain, such as the desire to avoid work or military service. Finally, multiple questions revealed conceptual ambiguity in the Ethiopian context. This became clear when many respondents spontaneously qualified a negative response to the question “do you feel unhappy?” with “no, because no one has died.” Similarly, the question about poor appetite was perceived to refer to availability of food rather than desire for it, the difficulty to make decisions to social freedoms as opposed to indecisiveness, and tearfulness to whether the individual had recently attended more funerals than normal. New mothers in Ethiopia had similar difficulties with the Edinburgh Postnatal Depression Scale (EPDS) that made reference to having symptoms “for no good reason.”^[20] HIV-positive adults in Kenya struggled with questions on the Patient Health Questionnaire (PHQ-9) that asked about changes in either direction (e.g. increases or decreases in appetite, sleep, psychomotor activity). Respondents

repeatedly asked, “Do you want both answers?”^[16] A majority also reported answering questions in reference to their HIV disease, as opposed to more generally.

Similar problems emerged in studies that sought to evaluate two clinical diagnostic instruments that have historically been used as “gold standards” against which to compare brief screening tools. In South Africa, two studies had difficulties conducting the Present State Examination (PSE) in Xhosa and Zulu. Gillis et al.^[7] found that respondents often misinterpreted questions when they lacked cultural relevance or were interpreted too concretely. Many respondents interpreted the question “are thoughts put in your head that you know are not your own?” to whether ideas had been suggested to them, as opposed to delusional thinking. The authors also found that local beliefs about spirits, ancestors, and sorcery made affirmative responses to questions intended to assess for delusions and psychosis difficult to interpret (e.g. “do you ever feel under the control of a force or power other than yourself?” or “is anyone deliberately trying to harm you?”). Bunting and Wessels^[6] struggled further in distinguishing between normal range of emotion and psychopathology, since individuals often endorsed symptoms even if they were experienced within a normative range. Assessing symptom severity necessitated asking individuals whether the emotional state was experienced “to the same degree as ordinary people or not.” Finally, a study in Egypt found difficulty conveying questions on the PSE to lower socioeconomic rural groups.^[18]

Another study evaluated the Comprehensive Psychopathological Rating Scale (CPRS). In Benin, Bertschy et al.^[21] explored local idioms using a method they call “cross-cultural back translation;” by asking the individual to describe each positively endorsed symptom and give concrete examples to confirm intended meaning. Several items proved more problematic than others including excess worry, hypochondriasis, and compulsive thoughts and rituals.

CONCEPTUAL EQUIVALENCE

Beyond the mere wording of questions, there is also a need to determine whether the phenomena of depression and anxiety are present and manifest comparably across cultures. Whereas evidence supports some universality in depressive or anxiety syndromes, in many settings there were significant differences in the salience and frequency of different types of symptoms compared to Western criteria. Such evidence suggests that it may be necessary to add, remove, or change items or adjust cut-off points in order for an instrument to be valid for use among different cultural groups.^[22,23]

In the 1970s in Senegal, Beiser et al.^[24,25] relied on native healers and village chiefs to identify symptoms of “illnesses of the spirit” which broke into four categories with considerable overlap with Western definitions of depression and anxiety but clustered slightly differently. Similarly, Peltzer^[26] interviewed individuals in Malawi who identified themselves as suffering from a “spirit disorder” to determine its ethnocultural etiology. Although partial overlap emerged between symptoms of “spirit disorder” and Western criteria for conversion disorder, depressive neurosis, and/or acute delusional state, the differences were such that it appeared to represent a unique culture-bound syndrome.

Several other studies found enough overlap in symptoms across cultures to be able to use existing Western instruments, but minor adaptations greatly enhanced their validity. In Tanzania, Kaaya et al.^[27] asked key informants comprised of village leaders, traditional healers, village health workers, and women identified as suffering from depression-like syndromes, to describe the main symptoms of depression and anxiety. Based on this qualitative investigation, the authors compiled a list of 30 locally identified symptoms, which were classified into six emotional, five behavioral, and 19 somatic symptoms. The authors used this information to locally adapt the Hopkins Symptom Checklist (HSCL). Using principal component analysis, the instrument revealed five key dimensions: social withdrawal, confusion, somatic symptoms, anxiety, and fatigue. Though many of the symptoms coincided with Western definitions of depression, one noteworthy difference emerged. Depressed mood, often considered a defining feature of Western criteria for depression, did not emerge as a discriminating factor in the Tanzanian sample. Somatic symptoms were common, and social withdrawal emerged as the most salient dimension of depression. Overall, the findings suggested the presence of an analogous syndrome to DSM-IV-defined depression in Tanzania, but that the experience and expression of it was sufficiently different to warrant local adaptation of Western instruments. Bolton^[28,29] employed similar methods to validate the HCSL in Rwanda and Uganda and found several local syndromes that closely resembled Western “depression,” but that differed enough to require local instrument adaptation.

Two studies sought to compare symptomatology across Western and African samples. One found that although there was a great deal of overlap in the core symptoms of depression between a Tanzanian and Californian sample, there were also considerable differences in the presentation and expression of them.^[30] The Tanzanian sample more strongly endorsed somatic and neurovegetative symptoms, whereas the Californian sample tended to cite more mood-related symptoms. In a similar study comparing depressive symptomatology of European and Beninese patients, there was overlap in 76.4% of the core depressive symptoms for each of the group but among the Beninese sample there was not a single symptom that was present in all patients.^[21] Likewise, a study examining the validity of the Taylor Manifest Anxiety Scale among two cultural groups in South Africa found only 20 of 50 items to be valid for both groups.^[31]

CONTENT AND FACTORIAL VALIDITY

Several studies used factor analysis and other statistical methods to assess the content validity of instruments. Methods took two forms: confirmatory and exploratory factor analysis. In the former, expected symptom clusters or dimensions were prespecified and statistical methods were used to confirm that items fell together in expected ways.^[12,32] The second approach, exploratory factor analysis, was somewhat more problematic. Since hypotheses were not stated a priori, it was easier for authors to fit any findings to the data. Two such studies of the CPRS in Benin and Ethiopia found dramatically different results, yet both interpreted the findings to support validity of the instrument. In Benin, five underlying factors emerged, four of five of which appeared to describe symptoms of major depressive disorder,^[21] whereas in Ethiopia only one underlying dimension emerged comprised of a combination of depressive, anxiety, and somatic symptoms.^[33] This same

phenomenon happened with a number of other studies of other instruments revealing between one and four factors, most of which were used to support the validity of the instruments.^[17,34–36]

TECHNICAL EQUIVALENCE

Technical equivalence is difficult to establish with brief screening instruments due to a combination of differences in literacy levels and cultural norms, both of which need to be considered in conducting cross-cultural research. For example, the validity of using Likert scales in settings with low levels of literacy is unclear.^[37] According to one Kenyan respondent, “‘a little’ and ‘quite a bit’ mean the same, so I just chose ‘a little bit’” (17, p. 430). In another Kenyan study, although respondents endorsed understanding the 2-week reference period in relation to the PHQ-9, most found it confusing to frame their responses in terms of the proportion of days (e.g. “more than half the days”).^[16]

Some evidence from Western countries suggests that people with less education may be more susceptible to response effects such as acquiescence, response order effects (primacy and recency), answering “don’t know,” endorsing the status quo, using mental coin flipping (giving random answers) and straight line answering (giving the same answer for all questions).^[38–41] Culture and socioeconomic status may also influence response styles with respect to central tendency, social desirability, or acquiescence.^[42,43] Responses may be further influenced by factors such as the interviewer’s gender, age, nationality, ethnicity, or class; the place or timing of the interview; the presence of other people; or by verbal and nonverbal behavior.^[5] It is not clear to what extent these factors may contribute to systematic bias in responses and reduce the overall validity of instruments across diverse settings.

CRITERION EQUIVALENCE

The most frequently used strategy for assessing criterion equivalence is to compare the ability of brief screening instruments to correctly identify probable cases (at various cut-off points) when compared to a diagnostic “gold standard,” a summary of which is presented in Table 2. The scales that were most commonly evaluated (in the order of frequency) include the Self-Reporting Questionnaire (SRQ), EPDS, General Health Questionnaire (GHQ), Hospital Anxiety and Depression Scale (HADS), Kessler mental distress scales (K6/10), Hopkins Symptom Checklist (HCSL), Becks Depression and Anxiety Scales (BDI and BAI, respectively), PHQ-9, Center for Epidemiological Studies Depression Scale (CES-D), Response Inventory for Stressful Life Events (RISLE-36), Standardized Assessment of Depressive Disorders (SADD), and Zung’s Self-rating Depression Scale (SDS). “Gold standards” included unstructured diagnostic interviews, Mini International Neuropsychiatric Interview (MINI), CPRS, PSE, Structured Clinical Interview for DSM-IV (SCID), Composite International Diagnostic Interview (CIDI), Clinical Interview Schedule (CIS), and in one case a local construct. The ability of the instruments to correctly identify “true cases” (sensitivity) ranged from 43 to 100%, whereas the corresponding ability of the instruments to correctly identify “noncases” (specificity) ranged from 38 to 99%. Numerous other studies explored convergent validity by comparing the correlation of scores on several

short screening instruments to other short instruments intended to measure similar constructs, such as self-esteem, quality of life, and suicidal ideation.^[8,30,44–59]

Only one study attempted to establish criterion equivalence of a Western instrument by using a local construct as the gold standard. Bolton^[28,p.69] describes a six-step method used to assess the local validity of the depression subscale of the HSCL in postgenocide Rwanda. The author relied on local knowledge (key informants and affected individuals) to identify local syndromes and used these as a “gold standard” against which to measure sensitivity and specificity of the HSCL. The steps included: (1) collecting ethnographic data on local perceptions of mental health; (2) analyzing these data for evidence that Western indicators of mental problems are appropriate; (3) using these data to adapt and translate existing questionnaires that measure these indicators; (4) testing the validity of these questionnaires and indicators; (5) using the resulting validated instrument in a community-based survey; and (6) analyzing the survey data to assess the local prevalence and characteristics of the selected mental health indicators and further test the validity and reliability of the instruments and indicators. To identify the local syndromes, interviewers asked key informants to name “all the problems that had resulted from the genocide,” and to describe each one. This process revealed three depression-like syndromes, within which virtually all of the major DSM-IV depression and post-traumatic stress disorder criteria were represented. The authors chose one of these disorders, *agahinda gakabije*, as the one that most closely resembled major depression even though it was locally described more like “grief,” as the local gold standard against which to validate the HSCL. The authors used key informants to identify cases and noncases, and included only those individuals for whom both the individual and the key informant agreed on the presence or absence of the syndrome. Although sensitivity was high, specificity was low; the majority of cases identified as suffering from *agahinda gakabije* were defined as having the disorder, whereas more than half of those classified as “noncases” were actually experiencing clinically significant distress that was not detected using the instrument.

One of the main challenges in comparing brief screening instruments to other standardized instruments is the high degree of variability in cut points across settings. Kortmann^[22] observed that cut points on the SRQ for use in Sudan differed by a factor of 2.5 when compared to a Colombian sample. Similar observations were made with respect to the PHQ-9 and SRQ in Ghana and Malawi when compared to Nigeria.^[45,52,60,61] Several studies even found varying optimal cut-points among different populations within the same country.^[22,62,63] Two studies in South Africa compared the same scale (K6) to the same gold standard (MINI) and found different cut-points were optimal for pregnant women (score 21.5) when compared to HIV positive adults (score 28).^[62,63]

DISCUSSION

Developing and validating brief psychiatric screening instruments is one of the priority research areas identified by global experts through the Grand Challenges in Global Mental Health initiative.^[2] These tools can be used to identify individuals experiencing clinically significant distress, introduce treatment, and monitor outcomes in diverse Sub-Saharan African settings. Whereas it is common to hear of instruments that have been “validated” in

a given language or setting, there is great variation in the methods used and, as such, the degree of confidence generated.

Over the past few decades, several instruments have been translated into African languages and their psychometric properties assessed. Despite some variability in the salience, manifestation and expression of symptoms across cultures, there is also considerable support for an underlying universality in the experience of depression and anxiety in Africa. At the same time, it is clear that minor problems in translation, wording, connotation, and question structure can lead to a form of instrument bias that can reduce their cross-cultural relevance, with clinical implications regarding case detection by non-specialists and inaccurate assessment of symptom progression. Historically, the most common strategy for instrument validation has been to evaluate the predictive capacity of short instruments to identify probable cases when compared to internationally accepted “gold standards” (criterion validity). Though valuable, the limitation to this approach is that the research focus in such studies is more whether instruments are “valid enough” for use across diverse social, cultural and linguistic settings, rather than exploring whether minor adaptations of the scale or its implementation (cut off scores) could enhance their local relevance and accuracy.

In recent years, several low-cost and efficient mixed-methods approaches have been utilized to adapt instruments to local settings.^[64,65] Though traditional qualitative methods are often considered too time and resource intensive to be feasible on a broad scale, several “rapid” methods have been demonstrated to be low cost, efficient, and potentially superior alternatives to the traditional approach see.^[5,14] Some examples of these techniques include free listing, card sorting, protocol analysis, and key informant interviews. “Free listing” is a method used to identify culturally local domains; respondents are asked to list all items/symptoms associated with a given domain. If the terms are listed on separate index cards, the researcher can then use “card sorting” wherein respondents are asked to rank and order the terms into meaningful subgroups or classifications.^[5] Rasmussen et al.^[14] used a card sorting methodology to mix standard Western elements with local terms which shows promise as a potentially portable and replicable strategy for balancing these purposes of adaptation and validation.

Another strategy that may improve both conceptual and technical equivalence of instruments in cross-cultural studies is the use of flexible interviewing techniques wherein respondents are permitted to ask questions and clarify the intended meaning of questions.^[33,66–69] It is already the case that in many African settings, short screening instruments intended for self-assessment are administered by non health professionals or lay interviewers due to low levels of literacy. Although standardized interviewing techniques (reading questions exactly as written) have historically been advocated as a means to reduce interviewer bias,^[70] some evidence suggests that using flexible or conversational interviewing approaches may actually improve accuracy of responses.^[66–69] This may be particularly true for respondents who, in addition to low literacy levels also have a different cultural lens through which to interpret and understand questions. Such methods serve both to identify problem items that require adjustment to more effectively communicate the intended meaning as well as maximize the accuracy of responses.

A growing body of evidence suggests that nonspecialist health workers are capable of providing effective counseling as well as case management for depression in low and middle income health settings.^[71,72] Brief instruments have emerged as a key element of these treatment delivery models in resource-poor settings, and are critical to the scale up of mental health care. In order for mental health treatment to be provided reliably and sustainably within the primary care system—a widely regarded necessary strategy regardless of setting—treatment functions can be very effectively divided along various tiers of a stepped care pathway in ways that enable nonspecialists to do the bulk of screening and triage, engagement, follow-up, monitoring, and counseling tasks that are key to successful care. Based on this evidence for collaborative care models to treat common disorders in higher income countries,^[72–74] Belkin et al.^[71] propose a five step implementation approach for large-scale mental health care scale up in lower resource settings. These steps include (1) assessing the context; (2) identifying priority care pathways that are linked with specific “skill packages”; (3) specifying decision supports, supervision, and triage rules to activate those care pathways; (4) using quality improvement practices; and (5) planning for sustainability and capacity building. In this framework, roles are delegated by function rather than professional designation (e.g. nurse, CHW), which allows flexibility for implementers to optimize existing care systems based on resources available in ways that are both context specific and scalable to support this kind of work.

Moving forward, the most valuable symptom scales will be those that are calibrated to identify, manage and track care needs and treatment response across the care spectrum. Sensitivity to change over time and sensitivity to clinically significant impairment is essential so as to alert and guide triage, treatment adjustment, and follow-up. Diagnostic specificity and validity is less crucial for these purposes. Therefore research on validation of measures and comparability of disorders across settings will need to interface more closely with efforts to improve delivery design in underresourced settings. Brief screening instruments need to be refined so that they can be used as valuable clinical management tools that broaden access to treatment by optimizing the potential of community health strategies to bridge treatment gaps worldwide.

CONCLUSIONS

Depression is the leading cause of disability worldwide yet in many African settings fewer than 10% of individuals have access to adequate treatment.^[1] One of the greatest barriers to closing the treatment gap worldwide is the dearth of mental health specialists, particularly in low-resource settings. Mounting evidence suggests that lay providers can be trained to provide basic mental health services at the community level. Brief screening instruments play a instrumental role in such care models by serving as clinical tools to facilitate case detection, symptom monitoring, and triage to a higher level of care as needed. A majority of brief screening instruments was developed in Western countries and therefore may be of questionable relevance in diverse social and cultural settings. Though evidence suggests some universality in the experience of depression and anxiety in sub-Saharan Africa when compared to high-income settings, there also appears to be some variation in the expression and salience of symptoms across contexts that may reduce the sensitivity of these instruments. Rapid ethnographic methods have emerged as an efficient and low cost strategy

through which instruments can be locally adapted to be maximally effective across diverse settings, as well as better equip them to be clinical tools for more accessibly designed systems of care.

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TABLE 1

Sixty-six cross-cultural validity studies in sub-Saharan Africa by time period and country

	1970s	1980s	1990s	2000– present	Total per country
South Africa	1	1	8	7	17
Nigeria		1	3	4	8
Uganda		2		6	8
Ethiopia		1	1	5	7
Kenya		1		3	4
Tanzania			1	3	4
Rwanda				3	3
Benin			1	1	2
Ghana		1		1	2
Malawi		1		1	2
Senegal	2				2
Zambia				2	2
Botswana				1	1
Burkina Faso				1	1
Eritrea				1	1
Zimbabwe				1	1
Total by decade	3	8	14	40	65

TABLE 2

Criterion validity

Scale	"Gold standard"	Sensitivity%	Specificity%	Cut-off	Population	Country	Reference
SRQ-10	Clinical interview	81	96	7	Primary care	Zambia	[75]
SRQ-20	SCID	80.8	66.2	8/9	New mothers	Malawi	[61]
SRQ-20	CPRS	95.8	90.9	5	Primary care	Nigeria	[60]
SRQ-20	CPRS	85.7	75.6	3	Women	Ethiopia	[20]
SRQ-20	CPRS	68.4	62	7	Women	Ethiopia	
SRQ-20	CPRS	77	63	6/7	New mothers	Ghana	[52]
SRQ-20	PSE	96	91	5	Primary care	Nigeria	[60]
SRQ-20	Clinical interview	100	71	4/5			
SRQ-20	Clinical interview	85	94	7	Primary care	Zambia	[75]
SRQ-24	Clinical interview	90	22	8/9	Psychiatric patients	Ethiopia	[22]
SRQ-24	Clinical interview	75	55	8/9	Medical patients		
SRQ-24	Clinical interview	100	71	4/5	Community		
SRQ-25	PSE	49	82	7/8	General population	South Africa	[76]
EDPS	CIDI	75	97	9	New mothers	Nigeria	[8]
EDPS	CPRS	76	36	5/6	New mothers	Ethiopia	[20]
		52.9	161.4	6/7			
EPDS	CPRS	79	75	6/7	New mothers	Ethiopia	[77]
EPDS	CPRS	78	73	10/11	New mothers	Ghana	[52]
EPDS	MINI	86.7	91.5	10	Pregnant women	Nigeria	[78]
EPDS	MINI	100	96.1	12			
EPDS	Clinical interview	88	87	11/12	New mothers	Zimbabwe	[79]
EPDS	Clinical interview	80	77	11/12	New mothers	South Africa	[47]
GHQ-12	CIDI	68	70	0/1	Primary care	Nigeria	[80]
GHQ-12	CIS	88	67	7/8	Primary care	Botswana	[81]
GHQ-12	PSE	86.9	80.9	3	Hospital and community	Nigeria	[60]
GHQ-12	PSE	83-91	78-83	3	Hospital and community	Nigeria	[44]
GHQ-12	Clinical interview	66	86	2	Primary care	Zambia	[75]

Scale	"Gold standard"	Sensitivity%	Specificity%	Cut-off	Population	Country	Reference
GHQ-30	PSE	89	77	5	Women	Nigeria	[82]
HADS (anxiety)	PSE	89.1	88.6	8	Hospital and community	Nigeria	[60]
HADS (anxiety)	PSE	85–93	87–91	8	Hospital and community	Nigeria	[44]
HADS (depression)	Clinical interview	71	95	8	Adolescents and young adults	South Africa	[83]
HADS (depression)	Clinical interview	43	96	10	Adolescents and young adults	South Africa	[83]
HADS (depression)	PSE	90.6	89.4	8	Hospital and community	Nigeria	[60]
HADS (depression)	PSE	90–92	87–91	8	Hospital and community	Nigeria	[44]
K6	Clinical interview	59	85	10	New mothers	Burkina Faso	[84]
K6	CPRS	84	83	4/5	New mothers	Ethiopia	[77]
K10	Clinical interview	59	91	14	New mothers	Burkina Faso	[84]
K10	CPRS	84	78	6/7	New mothers	Ethiopia	[77]
K10	MINI	73	54	21.5	Pregnant women	South Africa	[63]
K10	MINI	67	77	28	HIV+ adults	South Africa	[62]
HSL	SCID	89	80	1.06	HIV+ pregnant women	Tanzania	[85]
HSL	SCID	89	79	1.03			
HCSL-D	MINI	64%	74%	2.65	Adolescents and young adults	Uganda	[86,87]
HSCL-D	Local construct	94.7	38.2	—	General population	Rwanda	[29]
HSCL-D	Clinical interview	50	83	2.65	Adolescents and young adults	Uganda	[86,87]
PHQ-9	MINI	89.7	98.9	5	University students	Nigeria	[45]
PHQ-9	CPRS	94	75	4/5	New mothers	Ghana	[52]
PHQ-9	MINI	84.6	99.4	10	University students	Nigeria	[45]
BDI-21	Clinical interview	90	86	14	Adolescents and young adults	South Africa	[83]
BDI-21	Clinical interview	86	95	16			
CES-D	MINI	79.4	60.6	—	HIV+ adults	South Africa	[88]
CES-D	MINI	73%	—	22	TB and HIV patients	Zambia	[89]
RISLE-36	MINI	74.6	77.1	10	General population and university students	Uganda	[50]
RISLE-36	MINI	68.7	83.3	12	General population and university students	Uganda	[50]
SADD	Clinical interview	—	—	—	Psychiatric patients	Ghana	[90]
SDS	CIDI	63	96	0.75	New mothers	Nigeria	[8]