

# Cross-cultural adaptation and validation of the self-reporting questionnaire among HIV+ individuals in a rural ART program in southern Uganda

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**Background:** HIV treatment programs are in need of brief, valid instruments to identify common mental disorders such as depression.

**Aim:** To translate and culturally adapt the Self-Reporting Questionnaire (SRQ-20) for use in Uganda and to investigate its psychometric properties in this setting.

**Methods:** Following an initial translation of the SRQ-20 from English to Luganda, key informant interviews and focus-group discussions were used to produce a culturally adapted version of the instrument. The adapted SRQ-20 was administered to 200 HIV-positive individuals in a rural antiretroviral therapy program in southern Uganda. All study participants were also evaluated by a psychiatric clinical officer with the Mini International Neuropsychiatric Interview (MINI). Receiver-operating-characteristic analysis was used to examine the sensitivity and specificity of the SRQ-20 compared to the clinical diagnosis generated by the MINI.

**Results:** The prevalence estimates of any depressive disorder and current depression were 24% (n = 48) and 12% (n = 24), respectively. The SRQ-20 scores discriminated well between subjects with and without current depression based on the MINI, with an area under the curve of 0.92, as well as between subjects with and without any current or past depressive disorder, with an area under the curve of 0.75. A score of 6 or more had 84% sensitivity and 93% specificity for current depression, and 75% sensitivity and 90% specificity for any depressive disorder.

**Conclusion:** The SRQ-20 appears to be a reliable and valid screening measure for depression among rural HIV-positive individuals in southern Uganda. The use of this screening instrument can potentially improve detection and management of depression in this setting.

**Keywords:** depression, HIV/AIDS, Self-Reporting Questionnaire, cross-cultural adaptation and validation, Uganda

## Introduction

Since 2005, the expansion of antiretroviral therapy (ART) programs with increased ART provision in rural areas in sub-Saharan Africa has led to more research on mental health problems of HIV-positive individuals. In several sub-Saharan African studies, HIV-positive individuals using ART have been screened with various depression-screening instruments, resulting in rates of depression symptoms ranging from 14% to 81%.<sup>1-8</sup> A few studies have assessed study participants further with diagnostic interviews. Six studies report on rates of current *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV)-defined major depression ranging from 14% to 34.9%.<sup>9-15</sup> Studies from Uganda estimate rates of depression symptoms ranging from 30% to 54%.<sup>16-18</sup>

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This variation in rates of depression may be explained by a variety of issues. The studies describing prevalence of depression in sub-Saharan Africa utilize a range of instruments to screen for depression symptoms. These instruments range from ultrashort questionnaires consisting of two or three questions<sup>2</sup> to standard questionnaires consisting of more than 15 items.<sup>4</sup> The British National Clinical Practice Guidelines on management of depression in primary and secondary care<sup>19</sup> recommend that ultrashort tests should only be used when there are sufficient resources for second-stage assessment of those who screen positive. In low-resource settings like sub-Saharan Africa, it may not be cost-effective to use ultrashort screening tools because resources would then be needed for further evaluations on individuals who do not actually need them. A system of further evaluations should be in place to assure accurate diagnosis, effective treatment, and follow-up if patients are to benefit from screening for depression. Although this may come with additional costs of putting in place a referral system or training HIV care providers in screening and recognizing mental health problems, the benefits of sustaining and maintaining optimal levels of adherence to ART in such a low-resource setting may offset those costs.

In addition to thinking about the length of the measure and costs associated with its implementation, the lack of locally validated instruments may result in misclassification of cases and noncases. The use of only screening measures to diagnose depression brings the issue of case ascertainment into question and may explain why there is a wide variation in prevalence rates of depression in some HIV-positive populations in sub-Saharan Africa.<sup>20,21</sup> To reduce the rate of false positives or negatives, screening measures should ideally be followed by diagnostic interviews for all individuals. Also, this would enable us to distinguish between unipolar and bipolar depression.

Although depression is not more prevalent among rural versus urban HIV-positive populations in Uganda,<sup>22</sup> there is less access to comprehensive mental health services in rural areas.<sup>23</sup> Consequently, those in rural areas experience higher levels of mental-disorder comorbidities. Screening for depression does not exist in the majority of rural ART programs in Uganda. This is problematic because depression results in poor adherence to ART leading to HIV disease progression and the emergence of drug-resistant strains of the HIV virus.<sup>24,25</sup> Therapy for severe depression coupled with advanced HIV disease would be very costly for rural populations in Uganda, who survive on less than a dollar per day. Therefore, there is urgent need for early detection

of depression that can be addressed through adapted talk therapies.<sup>26,27</sup>

To assist with the goal of establishing a method for early detection, in this study we describe the translation and cultural adaptation of a commonly used mental health screening instrument, the Self-Reporting Questionnaire (SRQ-20), from English to Luganda. We also report on psychometric evaluation of this instrument and validation against a clinician-administered structured interview among HIV-positive individuals in a rural ART program in southern Uganda.

## Methods

### Study setting

Translation and adaptation of the SRQ-20 questionnaire were conducted at the Butabika National Referral Hospital antiretroviral therapy (ART) program, located in the Ugandan capital, Kampala. In 2005, the hospital received support from the Global Fund to Fight AIDS, Tuberculosis and Malaria through the Ugandan Ministry of Health to start their ART program. This ART program runs a clinic every Wednesday, where new and continuing patients receive clinical assessments depending on their presenting problems. To date, over 1000 HIV-positive individuals have initiated ART in this program.

Pilot testing, validity, and reliability testing were conducted in the Mitiyana hospital Mildmay HIV clinic, the site of subsequent research using the screening instruments. This hospital is situated in Mubende district in rural southern Uganda, a region that has ethnic homogeneity among its population and social stability. The Mitiyana hospital is the largest in the district and serves as a referral center for five other health centers in the district. The Mildmay HIV clinic was set up in this hospital in 2006 to offer comprehensive HIV treatment services.

### Study measures

#### The Self-Reporting Questionnaire

The SRQ-20, a brief questionnaire that can be self- or interviewer-administered, is designed to screen for common mental disorders.<sup>28</sup> This questionnaire is recommended by the World Health Organization for screening common mental disorders such as depression in developing countries like Uganda. It has been successfully translated into at least 20 languages in several developing countries, with acceptable measures of reliability and validity.<sup>29,30</sup> It has been described as a time- and cost-efficient instrument.<sup>28</sup>

The SRQ consists of 20 items designed to identify common mental disorders, including depression and

anxiety disorders. The time span for each item refers to the individual's feelings over the past 30 days. A score of 1 indicates that the symptom was present during the past month; a score of 0 indicates the symptom was absent, with a maximum possible score of 20.

### The Mini International Neuropsychiatric Interview depression module

The Mini International Neuropsychiatric Interview (MINI)<sup>31</sup> is a diagnostic structured interview that was developed for DSM-IV psychiatric disorders. It is organized in diagnostic sections. Using branching-tree logic, the MINI has two screening questions per disorder. Additional symptoms within each disorder section are asked only if the screening questions are positively endorsed. The psychometric properties of the MINI have not been described in Uganda; however, its depression diagnostic section has been translated and locally adapted in Luganda and previously used in this setting.<sup>23</sup> The depression diagnostic section consists of two screening questions, seven additional questions related to depression symptoms, and one question related to functional impairment. The two screening questions ask about the presence of depressed mood and loss of interest in daily activities over a period of 4 weeks in the recent past.

If either one of the questions was positively endorsed by a study participant, the clinician asked additional questions to explore for both current (the 4 weeks prior to the interview) and lifetime major depression. If neither of the screening questions were endorsed, the clinician asked additional questions to explore the presence of lifetime major depression. A diagnosis of current major depression was made if a study participant positively endorsed five or more questions related to depression symptoms and the one question related to functional impairment over the 4-week period prior to the interview. A diagnosis of lifetime major depression was made if a study participant positively endorsed five or more questions related to depression symptoms and the one question related to functional impairment beyond a 4-week period prior to the interview.

### Translation and adaptation process

Initial translation of the SRQ-20 was conducted by clinically experienced mental health workers at the Butabika National Referral Hospital whose native language is Luganda and whose second language is English. To ensure semantic equivalence, the SRQ-20 items were translated and back-translated while making sure that the meaning of each item was the same after translation.<sup>32</sup> The translated questionnaire

was distributed to male and female key informants: two psychiatrists, four psychiatric nurses, three clinical psychologists, eight mental health service users (patients), and three laypersons. Next, in-depth interviews were conducted with these key informants regarding whether the translated SRQ-20 items retained the original meaning and whether the local expressions of depression symptoms were used in the wording of the items.

In light of the information provided by the key informants, the translated questionnaire was revised. The revised translation was back-translated into English by a second translator and compared with the original version. An item in the questionnaire was considered problematic if the back-translation of that item did not have the same meaning as that of the original item. Problematic items were noted for discussion by the research team.

As a next step in cultural adaptation of the instrument, we convened a focus group of ten HIV-positive patients using ART at the Butabika Hospital outpatient center. Research assistants explained study procedures, and all ten participants provided informed consent. The ten participants were grouped into five pairs, and each pair was asked to read the items in the Luganda questionnaires and to note down problems of comprehension, language, and cultural relevance. For those who could not read, the research assistant read out the questionnaires. Each pair's remarks were discussed between the research team and translators, with further adjustments made as outlined in the results section below. The final Luganda version of the SRQ-20 (available from the first author) was pilot-tested among a different group of ten HIV-positive patients attending the Butabika Hospital ART program and ten such patients at the Mitiyana district hospital Mildmay HIV clinic. No further adjustments to the translated and adapted questionnaire were deemed necessary based on the feedback from these groups.

### Validity and reliability testing

Two hundred HIV-positive individuals were recruited from the Mitiyana hospital Mildmay HIV Clinic over a 5-week period. On a given clinic day, research assistants worked with clinic staff to obtain a register of clients who had come to the clinic on that day. The clients would be seated in the waiting area waiting for their turn to see the HIV care provider. Names of clients were called out ten at a time, and they were asked to identify themselves by a show of hands. These clients were individually approached by research assistants (at the level of nursing assistant), who explained study procedures, determined eligibility, and then obtained

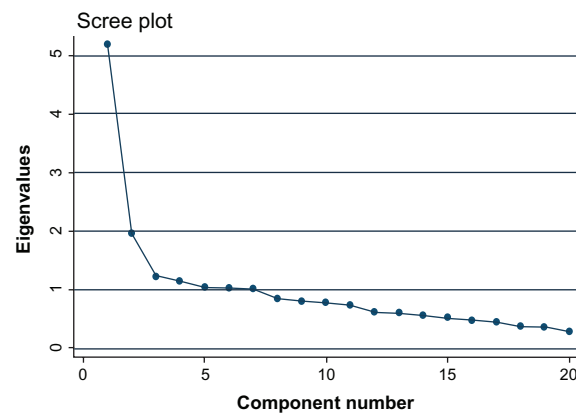
informed consent. Each client who gave informed consent was referred to a psychiatric nurse interviewer, who administered the Luganda-version SRQ-20. After this interview, the client was referred to a psychiatric clinical officer (PCO) with diploma-level training in clinical psychiatry, who administered the gold-standard diagnostic interview – the MINI depression and mania modules. The diagnostic interview was aimed at detecting current (the 4 weeks prior to the interview) and lifetime major depression or bipolar depression. The PCO was blinded to the results of the SRQ-20 interview. For this study, two psychiatric nurses were available to administer the SRQ-20, and two PCOs were available to administer the MINI. All interviewers were trained before data collection by the study's principal investigator. Training included basic research ethics, the reading and discussion of the instrument, and role-playing exercises. The principal investigator also reviewed and coded all records from the interviews.

To evaluate test–retest reliability of the Luganda version of the SRQ-20, study participants who lived within 5 km of the clinic were requested to return within 1 week for retesting by the same psychiatric nurse. This request was made of all study participants fitting this criterion until a sample size of 30 was reached. All study participants asked to return for reevaluation agreed to do so. The reevaluation was completed within a 2-week period. To evaluate interrater reliability of the Luganda version of the SRQ-20, the first 20 study participants were interviewed by the two psychiatric nurses at separate times on the same day.

The research protocol was approved by the Makerere University College of Health Sciences Research Ethics Committee and the Johns Hopkins University Institutional Review Board as well as the Uganda National Council of Science and Technology.

## Data analysis

To assess interrater reliability and test–retest reliability, we computed Cohen's kappa values.<sup>33</sup> Kappa is a reliability statistic that corrects for chance agreement. Kappa values of 0.40–0.60 are conventionally considered to represent moderate agreement, and values of 0.60–0.80 to represent good agreement.<sup>34</sup> The internal consistency of the Luganda-version SRQ-20 was assessed using Cronbach's alpha coefficient. To assess for construct validity, we performed principal-component analysis with varimax rotation. Factors with eigenvalues over 1.0 were then extracted. The optimal number of factors to be selected was chosen using the scree-plot method<sup>35</sup> (see Figure 1). To assess criterion validity of the Luganda-version SRQ-20, receiver-operating-characteristic



**Figure 1** Scree plot representing the eigenvalues of components obtained in a principal-component analysis of the Self-Reporting Questionnaire in 200 HIV-positive individuals attending a rural antiretroviral therapy program in southern Uganda.

analysis was performed using the MINI clinical assessment as the comparison criterion. The Stata (College Station, TX) 10 software package was used for all statistical analysis.

## Results

### Translation and adaptation

#### The Self-Reporting Questionnaire

A number of SRQ-20 items needed to be fully revised to capture the idioms of distress in this population (see Appendix). The items concerning poor digestion (item 7), ability to think clearly (item 8), crying more than usual (item 10), difficulty in making decisions (item 12), and daily work suffering (item 13) presented considerable problems in translation. Many subtle changes had to be made to these items to increase comprehension and relevance to the local population. For terms like 'poor digestion,' 'daily work suffering,' and 'trouble thinking clearly,' there were no exact substitutes in colloquial Luganda. Focus-group participants suggested that the various events that would indicate poor digestion, such as constipation, bloating, and heartburn, be included in this question to make it more easily understood by the study participants. The question 'Is your daily work suffering?' was rephrased to make it more understandable while retaining the original meaning.

The SRQ item 'Do you have trouble thinking clearly?' (item 8) was replaced by an item capturing 'thinking too much,' as our prior research into the expressions of depression by the local Baganda population had revealed that depression is often regarded as an illness of thoughts.<sup>36</sup> An individual with depression is referred to as 'thinking too much' and not regarded as having problems 'thinking clearly.' Focus-group participants suggested that this SRQ-20 item explore this cultural expression of depression.

The items concerning crying more than usual (item 10) and difficulty in making decisions (item 12) were straightforward. However, it was noted that these items were not culturally appropriate. Study participants said that in the local culture, it is taboo for men to cry. All male study participants assured us that no man would admit to crying. The men said that they do experience excessive sadness and may feel like crying, but they cannot cry. The translated version of this item considered this cultural taboo. Although the back-translated item deviated considerably from the original item, we decided to maintain the back-translated item because it was considered a more culturally acceptable question for both sexes.

Women, especially in rural areas, are often not as involved in decision-making, and some women participants of the focus group suggested that the item on decision-making might be irrelevant for female study participants. It was suggested that a better option might be to ask if they found it difficult to make routine housework decisions. Therefore, SRQ-20 item 12 was replaced by an item asking about decisions on household chores.

## Criterion validity and reliability testing

### Demographic information

Of the 200 individuals enrolled in the quantitative validation study, 33% were men and 67% were women. The mean ages of the men and women participants were 41.7 years (standard deviation [SD] = 11.1) and 39.1 years (SD = 12), respectively. Forty-two percent were peasant farmers, and 60% had attained partial primary education. The study population was poor, with 83% earning less than 75,000 Uganda shillings, which is equivalent to earning less than a dollar a day. Table 1 summarizes demographic characteristics of this study population.

### Reliability testing of the SRQ-20

Cronbach's alpha coefficient for the SRQ-20 was 0.84, which indicates a high level of homogeneity among items of the SRQ-20. Test-retest reliability was moderate, with 85% agreement between the first and second assessments (kappa = 0.48, SD = 0.16,  $P = 0.001$ ). The two psychiatric nurses had 85% agreement with the SRQ-20 (kappa = 0.63, SD = 0.22,  $P = 0.002$ ).

### Construct validity of the SRQ-20

Principal-component analysis found two factors with an eigenvalue above 1, accounting for 87.1% of total variance. Specifically, factor 1 accounted for 67.6% of the total variance, while factor 2 accounted for 19.5% of the total variance.

**Table 1** Sociodemographic characteristics of HIV-positive individuals attending a rural antiretroviral therapy program in southern Uganda

Variable	Number (n = 200)	Percentage
Gender		
Male	66	33.00
Female	134	67.00
Age (years)		
18–20	5	2.50
21–30	36	18.00
31–40	75	37.50
41–50	47	23.50
>50	37	18.50
Marital status		
Single	36	18.00
Married	79	39.50
Separated/divorced	43	21.50
Widowed	42	21.00
Education level		
No formal education	43	21.50
Primary education	120	60.00
Secondary education and above	37	18.50
Occupation		
Unemployed	51	25.50
Peasant farmer	84	42.00
Self-employed	54	27.00
Civil servant	10	5.00
Income		
Earn more than a dollar per day	34	17.00
Earn less than a dollar per day	166	83.00

Item loading above 0.4 was used as a standard for allocating items to factors (Table 2). The subscales based on these two factors had good internal consistency as assessed by Cronbach's alpha (subscale based on factor 1,  $\alpha = 0.78$ ; subscale based on factor 2,  $\alpha = 0.72$ ).

Factor 1 was comprised of nine items (items 8, 10–16), these being questions about trouble thinking clearly, crying more, loss of interest in things, difficulty in making decisions, inability to enjoy daily activities, daily work suffering, inability to make decisions, and inability to play a useful part in life. This factor accurately described depressive symptoms, so it was named 'depression.'

Factor 2 was comprised of eight items (items 2, 3–6, 18–20), these being questions about persistent headaches, feeling easily frightened, hands shaking, poor sleep, feeling nervous, tense, and worried, becoming easily tired, and uncomfortable feelings in the stomach. This factor more closely described anxiety symptoms, so it was named 'anxiety.'

### Criterion validity of the SRQ-20

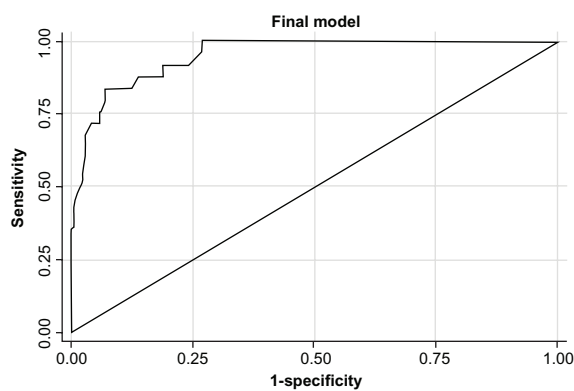
The SRQ-20 had excellent discriminatory power (Figure 2) for subjects with current depression (n = 24), as ascertained

**Table 2** Factor loadings using rotated varimax principal-component analysis of Self-Reporting Questionnaire items

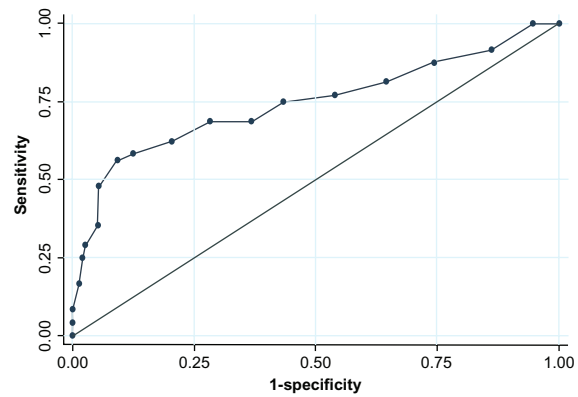
Component	Factor 1	Factor 2
1. Do you often have headaches?	–	0.49
2. Is your appetite poor?	–	–
3. Do you sleep badly?	–	0.57
4. Are you easily frightened?	–	0.57
5. Do your hands shake?	–	0.48
6. Do you feel nervous, tense, or worried?	–	0.52
7. Is your digestion poor?	–	–
8. Do you have trouble thinking clearly?	0.45	–
9. Do you feel unhappy?	0.40	–
10. Do you cry more than usual?	0.54	–
11. Do you find it difficult to enjoy your daily activities?	0.80	–
12. Do you find it difficult to make decisions?	0.46	–
13. Is your daily work suffering?	0.55	–
14. Are you unable to play a useful role in life?	0.66	–
15. Have you lost interest in things?	0.50	–
16. Do you feel that you are a worthless person?	0.40	–
17. Has the thought of ending your life been on your mind?	–	–
18. Do you feel tired all the time?	–	0.44
19. Do you have uncomfortable feelings in your stomach?	–	0.47
20. Are you easily tired?	–	0.56

**Note:** Factor loadings below 0.4 were suppressed during the rotational matrix analysis.

with MINI, with an area under the curve of 0.95, but only fair discriminatory power (Figure 3) for those with any depression (current and in the past; n = 48), with an area under the curve of 0.75. The area under the curve for detecting any depression (current and in the past) was similar between males (0.72) and females (0.73), those with primary or less education (0.73) and secondary education or more (0.83), subjects younger than 50 years old (0.75), and those who were 50 years and



**Figure 2** Receiver-operating-characteristic (ROC) curve of the locally adapted Luganda version of the Self-Reporting Questionnaire for detection of a current depressive episode ascertained using the Mini International Neuropsychiatric Interview in 200 HIV-infected individuals in a rural antiretroviral therapy program in southern Uganda. **Note:** Area under ROC curve = 0.9517.



**Figure 3** Receiver-operating-characteristic (ROC) curve of the locally adapted Luganda version of the Self-Reporting Questionnaire for detection of any depression (current and in the past) within 200 HIV-infected individuals in a rural antiretroviral therapy program in southern Uganda. **Note:** Area under ROC curve = 0.7456.

older (0.73). The optimal cutoff point of  $\geq 6$  scores had a sensitivity of 84% and a specificity of 93% for current depression and a sensitivity of 75% and specificity of 90% for any depression. Table 3 shows sensitivity and specificity of the SRQ-20 at different cutoff points for detecting current depression and any depression (current and in the past). Current or any depression ascertained by the MINI was not associated with any sociodemographic characteristic.

## Discussion

In this study, we translated and adapted into Luganda the SRQ-20 screening instrument for depression and assessed its psychometric properties, including test–retest and interrater reliability and also construct and criterion validity. In the translation of the SRQ-20 from English to Luganda, some words and/or phrases were difficult to translate, and as such required the use of alternative conceptually equivalent terms. Some questions like ‘Do you cry more than usual?’ were culturally offensive to men because in the local Buganda culture, it is a firmly held attitude that men should not cry. The challenges we experienced in translating the SRQ-20 to Luganda are not unique; similar challenges have been noted in previous attempts to translate Western-developed instruments into other languages for use in other cultural settings.<sup>37</sup> Nevertheless, this exercise is important, because research has shown that culture affects the presentation of most mental disorders.<sup>38</sup> There is evidence that the use of culturally adapted measures of mental health problems enhances the detection and diagnosis of these problems.<sup>39–41</sup>

Overall, five items in the original version of the SRQ-20 were adapted to suit the local culture. We found the locally adapted Luganda version of the SRQ-20 to be a reliable

**Table 3** Sensitivity and specificity of the Self-Reporting Questionnaire at different cutoff points in detecting current depression and any depression ascertained by the Mini International Neuropsychiatric Interview

Diagnosis	Cutoff	Sensitivity (%)	Specificity (%)	Predictive values		% of cases correctly classified
				Positive	Negative	
Current depression	≥5	84.00	89.14	52.50	97.50	91.50
	≥6	84.00	93.14	59.38	96.43	92.00
	≥7	76.00	94.29	64.29	95.93	92.00
	≥8	72.00	94.21	68.00	95.40	91.50
	≥9	72.00	95.40	68.00	95.43	92.50
	≥10	72.00	96.00	68.00	96.00	93.00
Any depression	≥4	83.33	75.66	51.95	93.50	77.50
	≥5	77.08	86.84	64.91	92.31	84.50
	≥6	75.00	90.13	70.59	91.95	86.50
	≥7	68.75	90.13	68.75	90.13	85.00
	≥9	56.25	93.42	72.97	87.12	84.50

and valid screening instrument for current major depression and any depression (current and in the past) among rural HIV-positive populations in southern Uganda. In keeping with findings from a previous study,<sup>42</sup> principal-component analysis revealed that depression symptoms accounted for the largest portion of the total variance. At a cutoff point of  $\geq 6$  scores, the measure was able to correctly identify true cases of current depression and true noncases 84% and 93% of the time, respectively. At the same cutoff point, the measure was able to correctly identify true cases of any depression and true noncases 75% and 90% of the time, respectively.

The optimal cutoff point of the SRQ-20 has been found to differ among countries. Among non-HIV-positive populations, some studies<sup>38,42,43</sup> report an optimal cutoff point of 6/7, and others<sup>44,45</sup> have used the 7/8 cutoff point. Previously in Uganda, the translated but not locally adapted SRQ-20 was used to screen for depression among general hospital patients. At a cutoff point of 5, the measure attained a sensitivity of 80% and a specificity of 74%.<sup>46</sup>

A few depression-screening instruments that have been validated among HIV-positive populations in sub-Saharan Africa have yielded lower values of sensitivity and specificity. Spies et al<sup>10</sup> report that the Kessler-10 screening instrument for current depression attained only 67% sensitivity and 77% specificity among HIV-positive individuals in South Africa. Their study population spoke three different local languages, and the local adaptation of the Kessler-10 was not described. It is possible that the local adaptation of the SRQ-20 may have enhanced its sensitivity and specificity.

Demographic and socioeconomic factors have also been shown to affect the choice of the cutoff point in non-HIV-positive populations. Results of previous studies suggest

that females, the elderly, and poorly educated people tend to overreport symptoms on the SRQ-20 compared to a diagnostic interview.<sup>29,44,45,47</sup> However, in this study the validity of the SRQ-20 was not affected by gender, age, or education status. The areas under the receiver-operating curve for current major depression and any depressive disorder did not differ as a function of age, gender, or education status, suggesting that it can be confidently used in our heterogeneous group of patients. Furthermore, none of the sociodemographic characteristics was associated with current major depression or any depression. This is in contrast to what has been reported regarding depression in non-HIV-positive populations, where the elderly and females tend to have higher rates of depression.<sup>47</sup> If corroborated in future studies from this setting, our findings suggest that the epidemiology and pathophysiology of depression in HIV-positive individuals may be different from that of depression in non-HIV-positive populations.

There are three other noteworthy findings from this study that warrant further investigation. First, the most frequently endorsed symptoms on the SRQ-20 in this study population were somatic complaints. Depressed individuals were more likely to endorse somatic complaints than nondepressed individuals. Also, depressed individuals were more likely to endorse somatic symptoms than depression symptoms. This finding adds strength to a previous finding that among the Baganda, depression is often expressed as somatic complaints.<sup>36,48</sup> Thus, elimination of somatic symptoms from instruments screening for depression among the Baganda may lower the sensitivity of the screening instrument. Also, measures such as Kessler-10 that focus on psychological symptoms of mental disorders may underestimate the prevalence of mental health problems in these settings. Second, 14.5% of those with any depressive disorder were diagnosed

with bipolar depression, suggesting that screening for depression needs to be followed by diagnostic interviews in order to differentiate unipolar from bipolar depression – conditions that require different treatments. Third, having a current major depression was associated with a past history of major depression. This finding suggests that a past history of depression should alert the clinicians to monitor their patients for recurrent depression symptoms. The cross-sectional nature of this study and the relatively small sample size limit our interpretation of this finding. We plan to investigate this finding further using case-control and prospective study designs in the future.

This study has some limitations. First, the use of the MINI diagnostic interview as the gold standard may not be appropriate, because its psychometric properties have not been determined in Uganda. However, the interviewers were clinicians who exercised their clinical judgment in interpreting the participants' responses to the MINI questions. Second, study findings may not be generalizable to the entire population of HIV-positive individuals. Because of our recruitment strategy through clinics and inclusion criteria (HIV-infected, outpatients, and currently on ART), participants in this study may have had different physical, psychological, and behavioral characteristics than populations not connected to a clinic and/or not currently on ART. Lastly, all our study participants were outpatients at the time of evaluation. Although it is encouraging that we observed no differences in SRQ-20 performance by age, gender, or educational status, it would be beneficial to evaluate this measure among inpatient HIV-positive populations so as to ensure that its psychometric properties are stable across severity levels.

Because depression is common among rural HIV-positive populations and has been associated with increased morbidity and mortality,<sup>49–52</sup> systematic screening for depression symptoms should be considered in all HIV-positive individuals. The patient or the health-care provider may erroneously consider symptoms of depression as expected physical effects of HIV, or these symptoms may be missed in the context of a busy clinic. We feel that the 20 brief question items in the SRQ-20 can easily be administered to patients as they wait their turn to see the doctor, thus enhancing case finding and treatment of depression in ART programs in Uganda.

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## Disclosure

The authors report no conflicts of interest in this work.

## References

1. Do NT, Phiri K, Bussmann H, Gaolathe T, Marlink RG, Wester CW. Psychosocial factors affecting medication adherence among HIV-1 infected adults receiving combination antiretroviral therapy (cART) in Botswana. *AIDS Res Hum Retroviruses*. 2010;26(6):685–691.
2. Etienne M, Hossain M, Redfield R, Stafford K, Amoroso A. Indicators of adherence to antiretroviral therapy treatment among HIV/AIDS patients in 5 African countries. *J Int Assoc Physicians AIDS Care (Chic)*. 2010;9(2):98–103.
3. Peltzer K, Friend-du Preez N, Ramlagan S, Anderson J. Antiretroviral treatment adherence among HIV patients in KwaZulu-Natal, South Africa. *BMC Public Health*. 2010;10:111.
4. Kagee A, Martin L. Symptoms of depression and anxiety among a sample of South African patients living with HIV. *AIDS Care*. 2010;22(2):159–165.
5. Kaharuzza FM, Bunnell R, Moss S, et al. Depression and CD4 cell count among persons with HIV infection in Uganda. *AIDS Behav*. 2006;10(Suppl 4):S105–S111.
6. Poupard M, Ngom Gueye NF, Thiam D, et al. Quality of life and depression among HIV-infected patients receiving efavirenz- or protease inhibitor-based therapy in Senegal. *HIV Med*. 2007;8(2):92–95.
7. Amberbir A, Woldemichael K, Getachew S, Girma B, Deribe K. Predictors of adherence to antiretroviral therapy among HIV-infected persons: a prospective study in southwest Ethiopia. *BMC Public Health*. 2008;8:265.
8. Cohen MH, Fabri M, Cai X, et al. Prevalence and predictors of posttraumatic stress disorder and depression in HIV-infected and at-risk Rwandan women. *J Womens Health (Larchmt)*. 2009;18(11):1783–1791.
9. Myer L, Seedat S, Stein DJ, Moomal H, Williams DR. The mental health impact of AIDS-related mortality in South Africa: a national study. *J Epidemiol Community Health*. 2009;63(4):293–298.
10. Spies G, Kader K, Kidd M, et al. Validity of the K-10 in detecting DSM-IV-defined depression and anxiety disorders among HIV-infected individuals. *AIDS Care*. 2009;21(9):1163–1168.
11. Myer L, Smit J, Roux LL, Parker S, Stein DJ, Seedat S. Common mental disorders among HIV-infected individuals in South Africa: prevalence, predictors, and validation of brief psychiatric rating scales. *AIDS Patient Care STDS*. 2008;22(2):147–158.
12. Adewuya AO, Afolabi MO, Ola BA, et al. Relationship between depression and quality of life in persons with HIV infection in Nigeria. *Int J Psychiatry Med*. 2008;38(1):43–51.
13. Marwick KF, Kaaya SF. Prevalence of depression and anxiety disorders in HIV-positive outpatients in rural Tanzania. *AIDS Care*. 2010;22(4):415–419.
14. Olley BO, Seedat S, Stein DJ. Persistence of psychiatric disorders in a cohort of HIV/AIDS patients in South Africa: a 6-month follow-up study. *J Psychosom Res*. 2006;61(4):479–484.



15. Lawler K, Mosepele M, Seloiwe E, et al. Depression among HIV-positive individuals in Botswana: a behavioral surveillance. *AIDS Behav.* 2009;15(1):204–208.
16. Nakimuli-Mpungu E, Mutamba B, Othengo M, Musisi S. Psychological distress and adherence to highly active anti-retroviral therapy (HAART) in Uganda: a pilot study. *Afr Health Sci.* 2009;9 Suppl 1:S2–S7.
17. Weidle PJ, Wamai N, Solberg P, et al. Adherence to antiretroviral therapy in a home-based AIDS care programme in rural Uganda. *Lancet.* 2006;368(9547):1587–1594.
18. Nakasujja N, Skolasky RL, Musisi S, et al. Depression symptoms and cognitive function among individuals with advanced HIV infection initiating HAART in Uganda. *BMC Psychiatry.* 2010;10(1):44.
19. Kendrick T, Peveler R. Guidelines for the management of depression: NICE work? *Br J Psychiatry.* 2010;197:345–347.
20. Maj M, Satz P, Janssen R, et al. WHO neuropsychiatric AIDS study, cross-sectional phase II. Neuropsychological and neurological findings. *Arch Gen Psychiatry.* 1994;51(1):51–61.
21. Shacham E, Reece M, Ong'or WO, Omollo O, Basta TB. A cross-cultural comparison of psychological distress among individuals living with HIV in Atlanta, Georgia, and Eldoret, Kenya. *J Int Assoc Physicians AIDS Care (Chic).* 2010;9(3):162–169.
22. Musisi S, Kinyanda E. Emotional and behavioural disorders in HIV seropositive adolescents in urban Uganda. *East Afr Med J.* 2009;86(1):16–24.
23. Muhwezi WW, Okello ES, Neema S, Musisi S. Caregivers' experiences with major depression concealed by physical illness in patients recruited from central Ugandan primary health care centers. *Qual Health Res.* 2008;18(8):1096–1114.
24. Hendershot CS, Stoner SA, Pantalone DW, Simoni JM. Alcohol use and antiretroviral adherence: review and meta-analysis. *J Acquir Immune Defic Syndr.* 2009;52(2):180–202.
25. Gonzalez JS, Batchelder AW, Psaros C, Safren SA. Depression and HIV/AIDS treatment nonadherence: a review and meta-analysis. *J Acquir Immune Defic Syndr.* 2011;58(2):181–187.
26. Bolton P, Bass J, Neugebauer R, et al. Group interpersonal psychotherapy for depression in rural Uganda: a randomized controlled trial. *JAMA.* 2003;289(23):3117–3124.
27. Verdelli H, Clougherty K, Bolton P, et al. Adapting group interpersonal psychotherapy for a developing country: experience in rural Uganda. *World Psychiatry.* 2003;2(2):114–120.
28. World Health Organization. A User's Guide to the Self Reporting Questionnaire (SRQ). Geneva: WHO; 1994.
29. Araya R, Wynn R, Lewis G. Comparison of two self administered psychiatric questionnaires (GHQ-12 and SRQ-20) in primary care in Chile. *Soc Psychiatry Psychiatr Epidemiol.* 1992;27(4):168–173.
30. Giang KB, Allebeck P, Kullgren G, Tuan NV. The Vietnamese version of the Self Reporting Questionnaire 20 (SRQ-20) in detecting mental disorders in rural Vietnam: a validation study. *Int J Soc Psychiatry.* 2006;52(2):175–184.
31. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry.* 1998;59 Suppl 20:22–33, quiz 34–57.
32. Flaherty JA, Gaviria FM, Pathak D, et al. Developing instruments for cross-cultural psychiatric research. *J Nerv Ment Dis.* 1988;176:257–263.
33. Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas.* 1960;20:37–46.
34. Fleiss JL. The Design and Analysis of Clinical Experiments. New York: Wiley; 1986.
35. Zwick W, Velicer W. Comparison of five rules for determining the number of components to retain. *Psychol Bull.* 1986;99:432–442.
36. Okello ES, Ekblad S. Lay concepts of depression among the Baganda of Uganda: a pilot study. *Transcult Psychiatry.* 2006;43(2):287–313.
37. Bass JK, Bolton PA, Murray LK. Do not forget culture when studying mental health. *Lancet.* 2007;370(9591):918–919.
38. Canino G, Bravo M. The translation and adaptation of diagnostic instruments for cross-cultural use. In: Shaffer D, Lucas CP, Richters JE, editors. *Diagnostic Assessment in Child and Adolescent Psychopathology.* New York: Guilford Press; 1999.
39. Bass JK, Ryder RW, Lammers MC, Mukaba TN, Bolton PA. Post-partum depression in Kinshasa, Democratic Republic of Congo: validation of a concept using a mixed-methods cross-cultural approach. *Trop Med Int Health.* 2008;13(12):1534–1542.
40. Bolton P, Wilk CM, Ndogoni L. Assessment of depression prevalence in rural Uganda using symptom and function criteria. *Soc Psychiatry Psychiatr Epidemiol.* 2004;39(6):442–447.
41. Betancourt TS, Bass J, Borisova I, et al. Assessing local instrument reliability and validity: a field-based example from northern Uganda. *Soc Psychiatry Psychiatr Epidemiol.* 2009;44(8):685–692.
42. Chen S, Zhao G, Li L, Wang Y, Chiu H, Caine E. Psychometric properties of the Chinese version of the Self-Reporting Questionnaire 20 (SRQ-20) in community settings. *Int J Soc Psychiatry.* 2009;55(6):538–547.
43. Al-Subaie AS, Mohammed K, Al-Malik T. The Arabic self-reporting questionnaire (SRQ) as a psychiatric screening instrument in medical patients. *Ann Saudi Med.* 1998;18(4):308–310.
44. Harpham T, Reichenheim M, Oser R, et al. Measuring mental health in a cost-effective manner. *Health Policy Plan.* 2003;18(3):344–349.
45. Sartorius N, Janca A. Psychiatric assessment instruments developed by the World Health Organization. *Soc Psychiatry Psychiatr Epidemiol.* 1996;31(2):55–69.
46. Nakigudde J, Tugumisirize J, Musisi S. Validation of the SRQ-20 in primary care in Uganda. Proceedings of the First Annual Makerere University Faculty of Medicine Scientific Conference. November 24–25, 2005; Entebbe.
47. Ludermir AB, Lewis G. Investigating the effect of demographic and socioeconomic variables on misclassification by the SRQ-20 compared with a psychiatric interview. *Soc Psychiatry Psychiatr Epidemiol.* 2005;40(1):36–41.
48. Okello ES, Neema S. Explanatory models and help-seeking behavior: pathways to psychiatric care among patients admitted for depression in Mulago hospital, Kampala, Uganda. *Qual Health Res.* 2007;17(1):14–25.
49. Leserman J, Pence BW, Whetten K, et al. Relation of lifetime trauma and depressive symptoms to mortality in HIV. *Am J Psychiatry.* 2007;164(11):1707–1713.
50. Pence BW, Miller WC, Gaynes BN, Eron JJ Jr. Psychiatric illness and virologic response in patients initiating highly active antiretroviral therapy. *J Acquir Immune Defic Syndr.* 2007;44(2):159–166.
51. Pence BW, Miller WC, Whetten K, Eron JJ, Gaynes BN. Prevalence of DSM-IV-defined mood, anxiety, and substance use disorders in an HIV clinic in the southeastern United States. *J Acquir Immune Defic Syndr.* 2006;42(3):298–306.
52. Horberg MA, Silverberg MJ, Hurley LB, et al. Effects of depression and selective serotonin reuptake inhibitor use on adherence to highly active antiretroviral therapy and on clinical outcomes in HIV-infected patients. *J Acquir Immune Defic Syndr.* 2008;47(3):384–390.

## Appendix I

Original Self-Reporting Questionnaire	Back-translated Self-Reporting Questionnaire
1. Do you often have headaches?	1. Do you often have persistent headaches?
2. Is your appetite poor?	2. Is your appetite poor?
3. Do you sleep badly?	3. Do you sleep badly?
4. Are you easily frightened?	4. Are you easily frightened?
5. Do your hands shake?	5. Do your hands shake?
6. Do you feel nervous, tense, or worried?	6. Do you feel nervous, tense, or worried?
7. Is your digestion poor?	7. Do you often experience constipation, heartburn, or bloating of the stomach after having your meals?*
8. Do you have trouble thinking clearly?	8. Do you have difficulties with your thinking, for example, do you think too much?*
9. Do you feel unhappy?	9. Do you feel unhappy?
10. Do you cry more than usual?	10. Do you get a feeling of wanting to cry but you cannot?*
11. Do you find it difficult to enjoy your daily activities?	11. Do you find it difficult to enjoy your daily activities?
12. Do you find it difficult to make decisions?	12. Do you find difficulty in deciding on what activities (household chores) you will perform on a given day?*
13. Is your daily work suffering?	13. Do you have trouble completing your daily tasks?*
14. Are you unable to play a useful role in life?	14. Are you unable to play a useful role in life?
15. Have you lost interest in things?	15. Have you lost interest in things you used to enjoy?
16. Do you feel that you are a worthless person?	16. Do you feel that you are a worthless person?
17. Has the thought of ending your life been on your mind?	17. Has the thought of ending your life been on your mind?
18. Do you feel tired all the time?	18. Do you feel tired all the time?
19. Do you have uncomfortable feelings in your stomach?	19. Do you have uncomfortable feelings in your stomach?
20. Are you easily tired?	20. Are you easily tired?

**Note:** \*SRQ items that were fully revised to capture the idioms of distress in this population.

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