AIDS and Behavior (2020) 24:629–636
https://doi.org/10.1007/s10461-019-02524-6

ORIGINAL PAPER

The Utility of the Hopkins Symptom Checklist as a Trans-Diagnostic Screening Instrument for Common Mental Disorders Among Persons Seeking HIV Testing

Jason Bantjes[1] · **Ashraf Kagee**[1] · **Wylene Saal**[1]

Published online: 30 April 2019

Abstract
There is a need for effective psychiatric screening of HIV test seekers, given the high rates of psychopathology in this population. We used receiver operating characteristic curve analysis to establish the utility of the short version of the Hopkins Symptom Checklist (HSCL-25) to correctly identify common mental disorders (CMDs) among persons seeking HIV testing. The HSCL-25 is moderately accurate in identifying CMDs (sensitivity = 69%, specificity = 71%). The HSCL-25 performed better than the Beck Depression Inventory at detecting depressive disorders, and was comparable to the Beck Anxiety Inventory and Posttraumatic Stress Scale-Self-report at detecting cases of generalised anxiety disorder and posttraumatic stress disorder, respectively. However, the instrument generates a high number of false positives and is poor at detecting cases of alcohol use disorder, which limits its utility as a trans-diagnostic screening tool in HIV testing sites.

Keywords Common mental disorders · Screening · HIV-testing · Hopkins symptom checklist · South Africa

Abbreviations

AUDIT	Alcohol use identification test
ARV	Anti-retroviral
AUD	Alcohol use disorders
BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
CMDs	CMDs
DSM	Diagnostic and statistical manual for mental illness
GAD	Generalised anxiety disorder
HIV	Human immunodeficiency virus
HSCL	Hopkins symptom checklist
HSCL-25	Hopkins symptom checklist-short version
MDD	Major depressive disorder
NPV	Negative predictive value
PTSD	Posttraumatic stress disorder
PDD	Persistent depressive disorder
PPV	Positive predictive value
PTSS	Posttraumatic Stress Scale–Self-report
ROC	Receiver operating characteristic
SCID	Structured clinical interview
SAMISS	Substance abuse and mental illness symptom screener

Introduction

There is increasing awareness of the importance of integrated mental health care services and the need for effective psychiatric screening procedures within HIV testing and treatment centres [1–4]. Rates of psychological distress and psychopathology are marked among persons living with HIV [5–9] and among those seeking HIV testing [10, 11]. Mental health problems have an enduring deleterious impact on physical health, quality of life, and social and occupational functioning. Mental health problems are also associated with an increased risk of HIV infection and with poor adherence to anti-retroviral therapy (ART) [12]. Consequently, there have been calls to establish suitable screening procedures at HIV testing and treatment sites in order to identify individuals who are likely to meet diagnostic criteria for a CMD and who require referrals for clinical assessment by a mental health professional [10]. It may, however, not be practical

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s10461-019-02524-6) contains supplementary material, which is available to authorized users.

✉ Jason Bantjes
jbantjes@sun.ac.za

[1] Department of Psychology, Stellenbosch University, Private Bag X1, Matieland 7602, South Africa

or even desirable to screen all HIV test seekers for mental health problems in low resource settings; the lack of reliable screening instruments for use in these settings and the paucity of suitable mental health referral agencies makes it potentially unworkable to establish efficient screening and referral systems in HIV testing centres, especially if the screening instruments are not sensitive and specific [13]. Research has already established the utility of a range of disorder-specific screening tools for identifying major depressive disorder (MDD), generalised anxiety disorder (GAD), posttraumatic stress disorder (PTSD), and alcohol use disorders (AUD), among persons seeking HIV testing [14–16]. It is, however, potentially cumbersome and time-consuming to use multiple disorder-specific screening instruments to identify patients who need further psychiatric assessment, especially in busy resource-constrained HIV testing sites in low- and middle-income countries, like South Africa. It is within this context that we wished to establish whether the short version of the Hopkins Symptom Checklist (HSCL-25) could be used in HIV testing sites to identify people likely to have CMDs and who require further psychiatric assessment.

Screening for Common Mental Disorders

There are several advantages to utilising well-validated screening instruments for CMDs in primary health care settings, including the fact that such practices may help to create an integrated person-centred health care system and may assist in closing the mental health treatment gap [17–19]. Research suggests that health professionals working in primary health care settings have difficulty diagnosing mental disorders as a result of inadequate knowledge of diagnostic criteria, uncertainty about what to ask in order to elicit psychiatric symptoms, and time constraints [20]. Screening can overcome some of these barriers by enabling health workers who do not have specialist mental health training, to efficiently and accurately identify patients who would benefit from further psychiatric assessment.

The use of mental health screening instruments in primary health care settings is not without challenges and potential shortcomings [21]. First, it can be difficult to identify a screening instrument that has good sensitivity (i.e. a high probability of correctly identifying individuals with a mental disorder) and good specificity (i.e. a high probability of correctly identifying individuals who do not have a mental disorder) [22]. In a perfect screening instrument both sensitivity and specificity would equal 1 and the optimal cut off point would maximise both values [23]. In practice, however, there is often a trade-off between specificity and sensitivity with clinicians typically favouring sensitivity when screening for highly infectious illnesses or conditions which are life-threatening and/or have serious complications, while specificity is favoured when it is difficult or costly to make referrals and clinicians want to avoid generating high numbers of false positives [24]. Second, the use of mental health screening instruments for the indiscriminant screening of all patients may not be appropriate in low-resource settings where inadequate and inaccessible psychiatric services hamper the referral of individuals who screen positive. The use of screening tools which lack specificity can generate an inordinate number of false positive referrals and hence place an unnecessary burden on already scarce psychiatric services [13]. Third, self-report screening tools have been critiqued for being less reliable and valid than more structured clinician administered mental health screening instruments [22]. However, the use of clinician administered instruments is dependent on the ready availability of suitably trained clinicians, which may be limited in low-resource primary health care settings. Finally, it can be challenging to determine the optimal length of a screening instrument; overly inclusive screening instruments can be long and cumbersome to administer, while ultra-short instruments may have limited utility to accurately and consistently identify patients in need of further assessment [25]. For all of these reasons, there should be judicious use of mental health screening instruments within HIV testing sites.

In spite of the potential limitations of screening instruments, some advances have been made towards establishing the utility of disorder-specific screening instruments for CMDs in primary health care settings generally [25–29], and in specific health care settings, such as HIV treatment centres [30–32]. Trans-diagnostic screening instruments, such as the K10 and Substance Abuse and Mental Illness Symptom Screener (SAMISS), have also been validated for use in detecting CMDs among HIV-infected individuals in South Africa [33, 34]. Comparatively less attention has been paid to validating screening instruments for use among persons seeking HIV testing. Notable exceptions are the recently published studies reporting on the utility of the Posttraumatic Stress Scale-Self-report (PTSS), the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI), and the Alcohol Use Identification Test (AUDIT) to identify persons seeking HIV testing who likely meet diagnostic criteria for PTSD, MDD, GAD and AUD respectively. Research suggests that the Posttraumatic Stress Scale-Self-report can identify PTSD among HIV test seekers with a sensitivity of 0.76 and a specificity of 0.78 (positive predictive value (PPV) = 0.24, negative predictive value (NPV) = 0.97) [15]. The BDI-I predicts MDD among HIV test seekers with 0.67 sensitivity and 0.67 specificity (PPV = 0.25, NPV = 0.92) [14], while the BAI identifies cases of GAD with a sensitivity and specificity of 0.82 and 0.80, respectively (PPV = 0.13, NPV = 0.99) [16]. Similarly the AUDIT identifies cases of AUD among persons seeking HIV testing with a 0.81 sensitivity and 0.81 specificity (PPV = 0.51, NPV = 0.95) [16]. While there is some evidence to support

the use of these disorder-specific screening instruments in HIV testing sites, it may not be practical or efficient to ask HIV test seekers to complete a lengthy battery of tests consisting of multiple screening instruments. It may also not be feasible for clinic staff to have to score and interpret multiple disorder-specific screening instruments, each of which has different optimal cut-off points and scoring algorithms. These concerns prompt questions about the potential utility of brief trans-diagnostic screening instruments, such as the Hopkins Symptom Checklist (HSCL), to identify HIV test seekers who require further psychiatric assessment in resource constrained settings, like South Africa.

Hopkins Symptom Checklist

The Hopkins Symptom Checklist (HSCL) is a selfreport symptom inventory, which asks about a range of complaints typically associated with CMDs. The items are representative of the symptom dimensions commonly observed among outpatients in primary health care settings (namely somatization, obsessive-compulsiveness, interpersonal sensitivity, anxiety and depression). These dimensions have been consistently identified in repeated factor analyses (i.e. a statistical method used to identify the smallest number of underlying variables) in a wide range of populations [35]. The HSCL is available in two formats; a longer version consisting of 90 items (HSCL-90) and a short version consisting of 25 items (HSCL-25).

The HSCL-25 consists of 25 items, each of which is scored on a scale of 0 (Not at all) to 4 (Extremely), thus yielding a potential total score between 0 and 100. It consists of two parts; part I has ten items assessing typical anxiety symptoms, and part II consists of 15 items assessing symptoms of depression. It is thus possible to calculate a HSCL-25 total score (the sum of all 25 items), an anxiety subscale score (sum of the items in part I), and a depression subscale score (sum of the items in part II).

Studies in several populations have consistently shown that the total score on the HSCL is highly correlated with severe emotional distress of unspecified diagnosis, and the depression score is correlated with major depression as defined by the Diagnostic and Statistical Manual (DSM) of the American Psychiatric Association [36]. The HSCL-25 has been used in population-level ecological studies of mental disorders [37], and in a range of diverse settings to identify individuals who require psychiatric care, including asylum seekers [38], traumatized refugees [39], former political detainees in South Africa [40], patients seeking medical care in primary health care settings [41], as well as among populations affected by war [42] and other post-conflict populations in low- and middle-income countries [43]. It has also been adapted and translated for use in culturally and linguistically diverse regions of the world, including Asia [44, 45], the Middle East [41], Africa [46], and the former Yugoslavia [47]. The instrument is also available in a number of European, African and Asian languages [35, 38, 41, 42, 48–55]. The HSCL-25 has also been utilised in studies of psychological distress and psychopathology among pregnant women with HIV in Tanzania [56] and persons living with HIV in South Africa [48, 57]. Furthermore, it has been used in multinational studies to assess the prevalence of psychiatric symptoms among persons living with HIV [58]. The HSCL has not, however, been extensively validated as a screening instrument for CMDs among persons seeking HIV testing.

The aim of this study was to establish the utility of the short version of the Hopkins Symptom Checklist (HSCL-25) to correctly identify CMDs among persons seeking HIV testing. We chose to use the HSCL-25 rather than the K-10 or SAMISS, given research showing that the K-10 only demonstrated "agreeable sensitivity and specificity" (p. 1163) [33] and that the SAMISS demonstrated "moderate specificity" (p. 1136) [34] in detecting CMDs among HIV-infected individuals in South Africa. We were also interested in establishing the utility of the HSCL-25 for use in HIV-testing sites given that this instrument was develop specifically for use in primary health care settings, it is available in a large number of languages, is relatively quick to administer (typically taking < 10 min to complete), and has previously been shown to have good utility as a trans-diagnostic mental health screening tool.

Methods

Sampling

Data for this cross-sectionals study were collected from a convenience sample of 500 individuals seeking HIV testing in a peri-urban area of the Western Cape Province of South Africa, as part of a larger study to investigate CMDs and psychological adjustment among individuals seeking HIV testing [59].

Persons seeking HIV testing were invited to enrol in the study prior to receiving their HIV-test. To be eligible for the study participants had to be 18 years or older, have capacity to give informed consent and be able to understand English or Afrikaans. Participants were excluded if they were under 18, lacked capacity or were not conversant in English or Afrikaans.

Data Collection

The following data were collected on Lenovo tablets in a confidential setting by trained data collectors under the close supervision of two registered psychologists:

(1) *Demographic variables* Participants were asked their age and home language. They were also asked how they self-identified in terms of gender and race.
(2) *CMDs* Participants were assessed to establish if they met diagnostic criteria for MDD, persistent depressive disorder (PDD), GAD, PTSD and AUD, using the research version of the Structured Clinical Interview (SCID) adapted to be compliant with the 5th edition of the DSM [59, 60].
(3) *Hopkins Symptom Checklist* Participants were asked to complete the HSCL-25.

All interviews were audio recorded and quality checks were conducted to ensure adherence to the study protocol and the accuracy of the data collected.

Data Analysis

Data were cleaned, checked and imported into SPSS for analysis. Descriptive statistics were used to determine the sample characteristics, prevalence estimates for CMDs, and the range and mean scores on the HSCL-25. Receiver operating characteristic (ROC) curve analysis was employed to determine the optimal cut-off point, specificity, sensitivity, PPV and NPV for the HSCL-25's ability to identify individuals with a CMD. We also used ROC curve analysis to establish the utility of the HSCL-25 total scores, depression subscale scores, and anxiety subscale scores to detect MDD, PDD, GAD, and PTSD, using the SCID as the gold standard for determining psychiatric caseness. We sought to optimise sensitivity and specificity, by selecting the cut-off scores which corresponded to the smallest absolute difference between sensitivity and specificity [23].

Ethics

Ethical approval for this study was obtained from the Health Sciences Research Ethics committee at Stellenbosch University. Permission to conduct the study was also obtained from the Western Cape Department of Health. Written informed consent was obtained from all participants prior to data collection, and data were securely stored in a manner that protected the identity of participants. Participants who were identified as being in psychological distress were referred to appropriate community based psychological services.

Results

Sample Characteristics

Just over half of the sample (N = 500) self-identified as female (51.6%). The mean age of the participants was 36 years (range 18–71, SD = 12.2). In terms of race, 72.6% identified as coloured (an official term used in South Africa for population classification), 26.2% Black-African, and 0.8% White. The majority of the sample (69.0%) were Afrikaans speaking, while 6.0% were English and 19.6% were isiXhosa speaking. The mean total score on the HSCL-25 was 46 (range = 25–97, SD = 17.1). Scores on the depression subscale ranged from 15 to 60, with a mean of 28.6 (SD = 11.4) and scores on the anxiety subscale ranged from 10 to 39, with a mean of 17.4 (SD = 6.4).

The prevalence estimates with 95% confidence intervals (95% CI) for CMDs in the sample were as follows: MDD 14.4% (11.4–17.8), PDD 7.2% (5.1–9.8), GAD 3.4% (5.1–9.8), PTSD 5.0% (3.2–7.3), and AUD 19.6% (16.2–23.4). A total of 37.0% of the sample met diagnostic criteria for one CMD, 7.6% met criteria for two disorders, and 2.8% met criteria for three disorders.

Receiver Operating Characteristic Curve Analysis of the HSCL-25

The ROC curve in Fig. 1 shows the performance of the HSCL-25 in detecting caseness of any CMD. The area under the curve (AUC) of 0.80 (95% CI 0.75–0.83) indicates that the HSCL-25 is moderately accurate in identifying individuals with a CMD. At a total-score cut-off point of 43, the HSCL-25 identified individuals who met diagnostic criteria for a CMD, with a sensitivity of 0.69% (95% CI 0.62–0.76) and specificity of 0.70 (95% CI 0.65–0.75). The PPV was 0.57 (95% CI 0.52–0.62) and the NPV was 0.80 (95% CI 0.76–0.83). These data indicate a 57% probability that

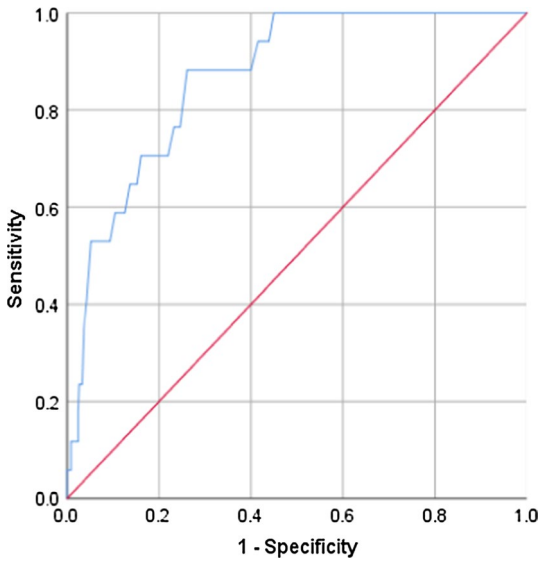

Fig. 1 Receiver operating characteristic curve for the utility of the Hopkins Symptom Checklist-25 to identify individuals with a common mental disorder among people seeking HIV testing (n = 500)

individuals who scored above 43 on the HSCL-25 would likely meet diagnostic criteria for a CMD, and an 80.0% probability that individuals scoring below 43 would not meet the criteria for a disorder. Detailed data for the co-ordinates of the ROC curve, showing how the optimal cut-off point was established, are available as supplementary material on request.

The results of the ROC curve analysis of the utility of the HSCL-25 to identify MDD, PDD, GAD, PTSD and AUD are shown in Table 1. Optimal cut-off points were established using the total HSCL-25 score and the depressive scale sub-score (for depressive disorders) and the anxiety subscale scores (for anxiety disorders and PTSD). Figures showing the ROC curves for each of the analyses presented in Table 1, along with detailed data showing how the optimal cut-off points were determined, are available on request as supplementary material.

Discussion

The finding that 37.0% of HIV test seekers reported at least one CMD is consistent with literature showing that between 20 and 36% of patients in primary health care outpatient settings typically have mental health problems [20, 61–63]. Our data supports calls to establish suitable mental health screening procedures and psychiatric referral pathways within primary health care settings generally [17], and HIV testing centres specifically. In order to establish effective mental health screening practices in HIV testing sites it will be necessary to identify user-friendly, valid screening instruments for this population. Our analysis suggests that the HSCL-25 has limited utility as a valid brief trans-diagnostic screening tool to identify individuals who are likely to have a CMD; it is only moderately accurate and 43% of the cases identified at the optimal cut-off score will be false positives, potentially generating a high number of unnecessary psychiatric referrals. This compares poorly to the SAMISS which identified CMDs among HIV infected individuals in South Africa with a specificity and sensitivity of 0.78 (95% CI 0.73–0.83) and 0.85 (95% CI 0.73–0.93) [34].

The analysis we have presented suggests that the HSCL-25 can be used to screen for depressive illnesses (both MDD and PDD) in populations of persons seeking HIV testing. It is noteworthy that in detecting cases of MDD, the depression subscale of the HSCL-25 (sensitivity = 0.81, specificity = 0.78, PPV = 0.39, NPV = 0.96) performed remarkably better than previous reports on the utility of the BDI-I for

Table 1 The results of the ROC curve analysis of the utility of the eHSCL-25 to predict common mental disorders among persons seeking HIV testing (N = 500)

	Optimal cut-off point	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Major depressive disorder					
Total score	53.50	0.778 (95% CI 0.664–0.867)	0.778 (95% CI 0.736–0.817)	0.371 (95% CI 0.322–0.423)	0.954 (95% CI 0.931–0.970)
Depression sub-scale	33.50	0.806 (95% CI 0.695–0.889)	0.780 (95% CI 0.738–0.819)	0.382 (95% CI 0.333–0.433)	0.960 (95% CI 0.937–0.975)
Persistent depressive disorder					
Total score	56.50	0.778 (95% CI 0.609–0.899)	0.782 (95% CI 0.742–0.819)	0.217 (95% CI 17.82–26.16)	0.978 (95% CI 0.961–0.988)
Depression sub-scale	35.50	0.750 (95% CI 0.578–0.879)	0.767 (95% CI 0.726–0.805)	0.200 (95% CI 0.163–0.243)	0.975 (95% CI 0.957–0.986)
Generalised anxiety disorder					
Total score	56.50	0.765 (95% CI 0.501–0.932)	0.760 (95% CI 0.719–0.797)	0.101 (95% CI 0.761–0.132)	0.989 (95% CI 0.975–0.995)
Anxiety sub-scale	21.50	0.765 (95% CI 0.501–0.932)	0.776 (95% CI 0.736–0.813)	0.107 (95% CI 0.810–0.141)	0.989 (95% CI 0.976-0.996)
Post-traumatic stress disorder					
Total score	59.50	0.800 (95% CI 0.593–0.932)	0.811 (95% CI 0.772–0.845)	0.182 (95% CI 0.145–0.226)	0.987 (95% CI 0.972–0.994)
Anxiety sub-scale	21.50	0.800 (95% CI 0.593–0.932)	0.787 (95% CI 0.748–0.823)	0.165 (95% CI 0.132–0.205)	0.987 (95% CI 0.972–0.994)
Alcohol use disorder					
Total score	43.50	0.612 (95% CI 0.509–0.709)	0.600 (95% CI 0.550–0.648)	0.272 (95% CI 0.234–0.312)	0.864 (95% CI 0.830–0.892)

use in this population (sensitivity = 0.67, specificity = 0.67, PPV = 0.25, NPV = 0.92). The depression subscale of the HSCL-25 is also shorter than the BDI-I. In terms of identifying GAD, the anxiety subscale of the HSCL-25 (sensitivity = 0.77, specificity = 0.78, PPV = 0.11, NPV = 0.99), performed less well than the BAI (sensitivity = 0.82, specificity = 0.80, PPV = 0.13, NPV = 0.99), although still within acceptable limits.

The finding that the HSCL-25 has utility as a screening instrument for PTSD among HIV test seekers, is consistent with a number of other studies that have demonstrated the utility of this instrument in screening for trauma related disorders in diverse populations [38, 42]. In terms of identifying cases of PTSD among HIV test seekers, the anxiety subscale of the HSCL-25 (sensitivity = 0.80, specificity = 0.79, PPV = 0.17, NPV = 0.99) compares favourably with disorder-specific screening instruments, such as the Posttraumatic Stress Scale–Self-report (sensitivity = 0.76, specificity = 0.78, PPV = 0.24, NPV = 0.97).

It is noteworthy that the HSCL-25 demonstrated low levels of sensitivity and specificity in detecting cases of AUD. This is not altogether surprising given that the instrument does not ask directly about substance use. Crucially this finding highlights the fact that if the HSCL-25 is used to screen for CMDs among HIV test seekers, it will be necessary to augment it with substance use specific screening items, especially given the finding in previous studies of prevalence estimates of 19.8% for AUD in this population [10]. To this end, future studies could establish the utility of screening instruments such as the CAGE Screening Test for Alcohol Use Disorders and AUDIT to be used in conjunction with the HSCL-25. Both the CAGE and AUDIT are short instruments which could be included with the HSCL-25 without significantly increasing the time taken to screen patients.

The HSCL-25 makes use of a Likert scale and relies on the use of patient self-report forms. This may make the instrument inaccessible and difficult to understand for illiterate individuals and those with low levels of education. Research suggests that there are also important cultural differences in response patterns to Likert scale questionnaires [64]. It will be important for future research to establish how user-friendly the HSCL-25 is and how patients in different cultural settings experience its use, before the instrument is widely adopted for mental health screening at HIV-testing sites.

Limitations

Data were collected via self-report measures at one non-medical testing site in the Western Cape Province of South Africa. Only individuals conversant in English or Afrikaans were included in the sample. This limits the generalisability of these results to other settings and highlights the need for these findings to be replicated in samples drawn from HIV testing sites in other areas. It is also a limitation that we did not assess symptoms of bipolar spectrum disorder and thus our estimates of MDD may be marginally inflated because they might include some individuals with a bipolar spectrum disorder.

Conclusion

There is an emerging debate about the merits of trans-diagnostic approaches to screening and intervention for CMDs, versus disorder-specific approaches [65–67]. This is an important issue to consider in the context of implementing mental health screening and intervention services in both HIV testing and HIV treatment settings, especially in resource-constrained environments where psychiatric services are scarce and oversubscribed. The prevalence data we collected suggest that there is a need to identify brief trans-diagnostic instruments with high levels of sensitivity and specificity for screening HIV test seekers for CMDs. Our analysis suggests that while the HSCL-25 holds some promise as a valid brief trans-diagnostic screening tool, its low PPV may make it unsuitable for use in low-resource environments, like HIV testing sites in South Africa. More work is required to identify user-friendly trans-diagnostic mental health screening instruments for use in HIV testing sites.

Acknowledgements This research was funded by grants from the South African National Research Foundation (Grant No. 93515, awarded to Ashraf Kagee) and the South African Medical Research Council (Career Development Grant awarded to Jason Bantjes).

References

1. Collins PY, Holman AR, Freeman MC, Patel V. What is the relevance of mental health to HIV/AIDS care and treatment programs in developing countries? A Systematic review. Aids. 2006;20(12):1571–82.
2. Breuer E, Myer L, Struthers H, Joska JA. HIV/AIDS and mental health research in sub-Saharan Africa: a systematic review. Afr J AIDS Res. 2011;10(2):101–22.
3. Lyketsos CG, Hanson A, Fishman M, McHugh PR, Treisman GJ. Screening for psychiatric morbidity in a medical outpatient clinic for HIV infection: the need for a psychiatric presence. Int J Psychiatry Med. 1994;24(2):103–13.
4. Chibanda D, Cowan FM, Healy JL, Abas M, Lund C. Psychological interventions for common mental disorders for people living with hiv in low- and middle-income countries: systematic review. Trop Med Int Heal. 2015;20(7):830–9.
5. Myer L, Smit J, Le Roux L, 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;2(2):147–58.
6. Israelski DM, Prentiss DE, Lubega S, Balmas G, Garcia P, Muhammad M, et al. Psychiatric co-morbidity in vulnerable populations receiving primary care for HIV/AIDS. AIDS Care—Psychol Socio-Medical Asp AIDS/HIV. 2007;19(2):220–5.
7. Klinkenberg WD, Sacks S. Mental disorders and drug abuse in persons living with HIV/AIDS. AIDS Care—Psychol Socio-Medical Asp AIDS/HIV. 2004;16(Suppl 1):S22–42.
8. O'Cleirigh C, Magidson JF, Skeer MR, Mayer KH, Safren SA. Prevalence of psychiatric and substance abuse symptomatology among HIV-infected gay and bisexual men in HIV primary care. Psychosomatics. 2015;56(5):470–8.
9. Brandt R. The mental health of people living with HIV/AIDS in Africa: a systematic review. Afr J AIDS Res. 2009;8(2):123–33.
10. Kagee A, Saal W, De Villiers L, Sefatsa M, Bantjes J. The prevalence of common mental disorders among South Africans seeking HIV testing. AIDS Behav. 2017;21(6):1511–7.
11. Kagee A, Saal W, Bantjes J. Distress, depression and anxiety among persons seeking HIV testing. AIDS Care—Psychol Socio-Medical Asp AIDS/HIV. 2017;29(3):280–4.
12. Springer SA, Dushaj A, Azar MM. The impact of DSM-IV mental disorders on adherence to combination antiretroviral therapy among adult persons living with HIV/AIDS: a systematic review. AIDS Behav. 2012;16(8):2119–43.
13. Kagee A, Tsai AC, Lund C, Tomlinson M. Screening for common mental disorders in low resource settings: reasons for caution and a way forward. Int Health. 2013;5(1):11–4.
14. Saal W, Kagee A, Bantjes J. Utility of the Beck Depression Inventory in measuring major depression among individuals seeking HIV testing in the Western Cape, South Africa. AIDS Care. 2018;30(Sup1):29–36.
15. Kagee A, Bantjes J, Saal W, Sefatsa M. Utility of the Posttraumatic Stress Scale–Self-report version in screening for posttraumatic stress disorder among persons seeking HIV testing. South African J Psychol. 2018;49(1):136–47.
16. Saal W, Kagee A, Bantjes J, (under review). Evaluation of the Beck Anxiety Inventory in predicting generalized anxiety disorder among individuals seeking HIV testing in the Western Cape, South Africa. South African J Psychiatry.
17. Maruish ME, editor. Handbook of psychological assessment in primary care settings. New York: Routledge Taylor & Francis; 2017. p. 783.
18. Diez-Canseco F, Toyama M, Ipince A, Perez-Leon S, Cavero V, Araya R, et al. Integration of a technology-based mental health screening program into routine practices of primary health care services in Peru (The Allillanchu Project): development and implementation. J Med Internet Res. 2018;20(3):e100.
19. World Health Organization. Integrating mental health into primary care: a global perspective. Geneva: World Health Organisation; 2008. p. 1–206.
20. Spitzer RL, Williams JBW, Johnson JG, Kroenke K, Linzer M, Degruy FV, et al. Utility of a new procedure for diagnosing mental disorders in primary care: the PRIME-MD 1000 study. JAMA. 1994;272(22):1749–56.
21. Rahm AK, Boggs JM, Martin C, Price DW, Beck A, Backer TE, et al. Facilitators and barriers to implementing screening, brief intervention, and referral to treatment (SBIRT) in primary care in integrated health care settings. Subst Abus. 2015;36(3):281–8.
22. Freeman C, Tyrer PJ, Tyrer P. Research methods in psychiatry. London: RCPsych Publications; 2006.
23. Habibzadeh F, Habibzadeh P, Yadollahie M. On determining the most appropriate test cut-off value: the case of tests with continuous results. Biochem Medica. 2016;26(3):297–307.
24. Sox HC, Blatt MA, Higgins MC, Marton KI. Selection and interpretation of diagnostic tests. In: Sox HC, Blatt MA, Higgins MC, Marton KI, editors. Medical decision making. Chichester: Wiley; 2013. p. 243–87.
25. Mitchell AJ, Coyne JC. Do ultra-short screening instruments accurately detect depression in primary care? A pooled analysis and meta- analysis of 22 studies. Br J Gen Pract. 2007;57(535):144–51.
26. Patel V, Araya R, Chowdhary N, King M, Kirkwood B, Nayak S, et al. Detecting common mental disorders in primary care in India: a comparison of five screening questionnaires. Psychol Med. 2008;38(2):221–8.
27. Mulrow CD, Williams JW, Gerety MB, Ramirez G, Montiel OM, Kerber C. Case-finding instruments for depression in primary care settings. Ann Intern Med. 1995;122(12):913–21.
28. Hough R, Landsverk J, Stone J, Jacobson GR. Comparison of psychiatric screening questionnaires for primary care patients. MD: Rockville; 1983.
29. Ali GC, Ryan G, De Silva MJ. Validated screening tools for common mental disorders in low and middle income countries: a systematic review. PLoS ONE. 2016;11(6):e0156939.
30. Chishinga N, Kinyanda E, Weiss HA, Patel V, Ayles H, Seedat S. Validation of brief screening tools for depressive and alcohol use disorders among TB and HIV patients in primary care in Zambia. BMC Psychiatry. 2011;11:75.
31. Chibanda D, Verhey R, Gibson LJ, Munetsi E, Machando D, Rusakaniko S, et al. Validation of screening tools for depression and anxiety disorders in a primary care population with high HIV prevalence in Zimbabwe. J Affect Disord. 2016;198:50–5.
32. Natamba BK, Achan J, Arbach A, Oyok TO, Ghosh S, Mehta S, et al. Reliability and validity of the center for epidemiologic studies-depression scale in screening for depression among HIV-infected and -uninfected pregnant women attending antenatal services in northern Uganda: a cross-sectional study. BMC Psychiatry. 2014;14(1):2197.
33. Spies G, Kader K, Kidd M, Smit J, Myer L, Stein DJ, 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):1163–8.
34. Breuer E, Stoloff K, Myer L, Seedat S, Stein DJ, Joska JA. The validity of the substance abuse and mental illness symptom screener (SAMISS) in people living with HIV/AIDS in primary HIV care in Cape Town, South Africa. AIDS Behav. 2014;18(6):1133–41.
35. Derogatis LR, Lipman RS, Rickels K, Uhlenhuth EH, Covi L. The Hopkins symptom checklist (HSCL): a self-report symptom inventory. Behav Sci. 1974;19(1):1–15.
36. American Psychiatric Association Committee on Nomenclature and Statistics. Diagnostic and statistical manual of mental disorders. 4th ed. Washington, DC: American Psychiatric Association; 1994.
37. Knaevelsrud C, Brand J, Lange A, Ruwaard J, Wagner B. Web-based psychotherapy for posttraumatic stress disorder in war-traumatized Arab patients: randomized controlled trial. J Med Internet Res. 2015;17(3):e71.
38. Jakobsen M, Thoresen S, Johansen LEE. The validity of screening for post-traumatic stress disorder and other mental health problems among asylum seekers from different countries. J Refug Stud. 2011;24(1):171–86.
39. Wind TR, van der Aa N, de la Rie S, Knipscheer J. The assessment of psychopathology among traumatized refugees: measurement invariance of the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 across five linguistic groups. Eur J Psychotraumatol. 2017;8(sup2):1321357.
40. Kagee A. Symptoms of distress and posttraumatic stress among South African former political detainees. Ethn Heal. 2005;10(2):169–79.

41. Ventevogel P, De Vries G, Scholte WF, Shinwari NR, Faiz H, Nassery R, et al. Properties of the Hopkins symptom checklist-25 (HSCL-25) and the Self-Reporting Questionnaire (SRQ-20) as screening instruments used in primary care in Afghanistan. Soc Psychiatry Psychiatr Epidemiol. 2007;42(4):328–35.
42. Silove D, Manicavasagar V, Mollica R, Thai M, Khiek D, Lavelle J, et al. Screening for depression and PTSD in a Cambodian population unaffected by war: comparing the Hopkins Symptom Checklist and Harvard Trauma Questionnaire with the structured clinical interview. J Nerv Ment Dis. 2007;195(2):152–7.
43. Hollifield M, Warner TD, Lian N, Krakow B, Jenkins JH, Kesler J, et al. Measuring trauma and health status in refugees: a critical review. J Am Med Assoc. 2002;288(5):611–21.
44. Hinton WL, Du N, Chen YCJ, Tran CG, Newman TB, Lu FG. Screening for major depression in vietnamese refugees—a validation and comparison of two instruments in a health screening population. J Gen Intern Med. 1994;9(4):202–6.
45. Mollica RF, Wyshak G, de Marneffe D, Khuon F, Lavelle J. Indochinese versions of the Hopkins Symptom Checklist-25: a screening instrument for the psychiatric care of refugees. Am J Psychiatry. 1987;144(4):497–500.
46. Vinck P, Pham PN. Association of exposure to violence and potential traumatic events with self-reported physical and mental health status in the Central African Republic. JAMA. 2010;304(5):544–52.
47. Vuković IS, Jovanović N, Kolarić B, Vidović V, Mollica RF. Psychological and somatic health problems in bosnian refugees: a three year follow-up. Psychiatr Danub. 2013;26(3):442–9.
48. Kagee A. Psychological distress among persons living with HIV, hypertension, and diabetes. AIDS Care—Psychol Socio-Medical Asp AIDS/HIV. 2010;22(12):1517–21.
49. Al-Turkait FA, Ohaeri JU, El-Abbasi AHM, Naguy A. Relationship between symptoms of anxiety and depression in a sample of arab college students using the Hopkins Symptom Checklist 25. Psychopathology. 2011;44(4):230–41.
50. Glaesmer H, Braehler E, Grande G, Hinz A, Petermann F, Romppel M. The German Version of the Hopkins Symptoms Checklist-25 (HSCL-25)—Factorial structure, psychometric properties, and population-based norms. Compr Psychiatry. 2014;55(2):396–403.
51. Mouanoutoua VL, Brown LG. Hopkins Symptom Checklist-25, Hmong Version: a screening instrument for psychological distress. J Pers Assess. 1995;64(2):376–83.
52. Kaaya SF, Lee B, Mbwambo JK, Smith-Fawzi MC, Leshabari MT. Detecting depressive disorder with a 19-item local instrument in Tanzania. Int J Soc Psychiatry. 2008;54(1):21–33.
53. Fröjdh K, Håkansson A, Karlsson I. The Hopkins Symptom Checklist-25 is a sensitive case-finder of clinically important depressive states in elderly people in primary care. Int J Geriatr Psychiatry. 2004;19(4):386–90.
54. Kleijn WC, Hovens JE, Rodenburg JJ. Posttraumatic Stress Symptoms in Refugees: assessments with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist–25 in different languages. Psychol Rep. 2001;88(2):527–32.
55. Lhewa D, Banu S, Rosenfeld B, Keller A. Validation of a tibetan translation of the hopkins symptom checklist-25 and the harvard trauma questionnaire. Assessment. 2007;14(3):223–30.
56. Kaaya SF, Fawzi MCS, Mbwambo JK, Lee B, Msamanga GI, Fawzi W. Validity of the Hopkins Symptom Checklist-25 amongst HIV-positive pregnant women in Tanzania. Acta Psychiatr Scand. 2002;106(1):9–19.
57. Kagee A, Martin L. Symptoms of depression and anxiety among a sample of South African patients living with HIV. AIDS Care—Psychol Socio-Medical Asp AIDS/HIV. 2010;22(2):159–65.
58. Orlando M, Burnam MA, Beckman R, Morton SC, London AS, Bing EG, et al. Re-estimating the prevalence of psychiatric disorders in a nationally representative sample of persons receiving care for HIV: results from the HIV cost and services utilization study. Int J Methods Psychiatr Res. 2002;11(2):75–82.
59. Bantjes J, Kagee A. Common mental disorders and psychological adjustment among individuals seeking HIV testing: a study protocol to explore implications for mental health care systems. Int J Ment Health Syst. 2018;12(1):16.
60. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington: American Psychiatric Publishing; 2013.
61. Milanović SM, Erjavec K, Poljičanin T, Vrabec B, Brečić P. Prevalence of depression symptoms and associated socio-demographic factors in primary health care patients. Psychiatr Danub. 2015;27(1):31–7.
62. Cerimele JM, Chwastiak LA, Dodson S, Katon WJ. The prevalence of bipolar disorder in general primary care samples: a systematic review. Gen Hosp Psychiatry. 2014;36(1):19–25.
63. Ormel J, Vonkorff M, Ustun TB, Pini S, Korten A, Oldehinkel T. Common mental disorders and disability across cultures: results From the WHO Collaborative Study on Psychological Problems in General Health Care. JAMA. 1994;272(22):1741–8.
64. Lee JW, Jones PS, Mineyama Y, Zhang XE. Cultural differences in responses to a likert scale. Res Nurs Health. 2002;25(4):295–306.
65. Newby JM, McKinnon A, Kuyken W, Gilbody S, Dalgleish T. Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. Clin Psychol Rev. 2015;40:91–110.
66. Titova N, Deara BF, Staplesa LG, Teridesa MD, Karina E, Sheehana J, et al. Disorder-specific versus transdiagnostic and clinician-guided versus self-guided treatment for major depressive disorder and comorbid anxiety disorders: a randomized controlled trial. J Anxiety Disord. 2015;35:88–102.
67. Caspi A, Moffitt TE. All for one and one for all: mental disorders in one dimension. Am J Psychiatry. 2018;175(9):831–44.