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Reliability and validity of two HIV/AIDS-specific quality of life instruments adapted for use in HIV-positive Zimbabweans

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Abstract

We sought to assess the reliability and construct validity of the HIV/AIDS-Targeted Quality of Life instrument (HAT-QoL) and the Medical Outcomes Study HIV Health Survey (MOS-HIV) adapted for use in Shona-speaking rural Zimbabwe. HAT-QoL and MOS-HIV were translated and culturally adapted into Shona, and administered to a convenience-sample of 400 patients with HIV-related opportunistic infections. HIV disease severity and bereavement history were assessed. Factor analysis of the HAT-QoL items produced seven factors that were nearly identical to the factor structure reported for an American sample that was the basis for the current HAT-QoL scales. Factor analysis of the MOS-HIV scales resulted in a single factor, not the expected two-factor structure (physical and mental). Convergent and discriminant validity assessments confirmed, in general, that similar Shona HAT-QoL and MOS-HIV dimensions were correlated and dissimilar ones not correlated. Construct validity assessments indicated that, on the whole, most Shona HAT-QoL and MOS-HIV dimensions were capturing anticipated subgroup differences. The exceptions were the Shona MOS-HIV dimensions of general health perceptions, cognitive function, and the quality of life (QoL) item. The reliability and validity of most Shona-adapted HAT-QoL and MOS-HIV dimensions suggest that both instruments are likely useful in measuring the QoL of rural, Shona-speaking populations in Zimbabwe, Mozambique, Zambia, and Botswana.

Keywords

HIV/AIDS; quality of life; translation; Zimbabwe

Nearly two thirds of people living with HIV/AIDS (PLWHA) reside in sub-Saharan Africa where treatment access is limited; however, recent efforts to roll out antiretroviral therapy (ART) programs are now giving more PLWHA access to life-saving medications (UNAIDS, AIDS epidemic update, 2006). In addition to suppressing viral load and decreasing HIV-

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related morbidity and mortality, the goal of ART is to improve quality of life (QOL). The ability to assess HIV-specific QOL in a culturally sensitive manner, though, is limited as few QOL instruments are validated for use in sub-Saharan Africa (Sebit et al., 2000; Wyss et al., 1999).

The Medical Outcomes Study HIV Health Survey (MOS-HIV) – a generic QOL measure adapted for HIV-specific use – has been used with sub-Saharan PLWHA (Wu et al., 1991). A Lugandan adaptation of the MOS-HIV was completed using a rural sample of HIV-positive and negative post-partum women from Uganda; internal consistency reliability coefficients were >0.70 for five of the eight multi-item MOS-HIV dimensions (general health perceptions, physical function, mental health, pain, and health distress) (Mast et al., 2004). Limited construct validity, showing anticipated relationships between QOL dimensions, serostatus, physical symptoms, and HIV viral load, also was seen, suggesting that many dimensions may be useful for this population (Mast et al., 2004).

The HIV/AIDS-Targeted Quality of Life instrument (HAT-QoL) is a disease-specific instrument developed from the self-reported concerns of HIV seropositive individuals (Holmes & Shea, 1997, 1998, 1999). As a result, its content is novel compared to other instruments used in seropositive individuals. HAT-QoL has been adapted into seven African languages, most from southern Africa (Phaladze et al., 2005). While investigators reported that valuable information was gained from five HAT-QoL dimensions (overall function, health worries, disclosure worries, financial worries, and life satisfaction), limited validation data were provided (Phaladze et al., 2005).

Aims of the current study were to assess reliability and validity of Shona-adapted HAT-QoL and MOS-HIV instruments. Shona is spoken by over 10 million people living primarily in Zimbabwe, but also in Mozambique, Zambia, and Botswana. (Shona, 2005; Wikipedia contributors, 2007) We adapted both instruments into Shona given our belief that combined use of a generic instrument and a disease-targeted measure best characterize QOL in un(der) treated HIV/AIDS populations.

Methods

Participants and setting

Following approval from the University of Pennsylvania and Zimbabwean Medical Research Council's human subjects committees, 400 patients were convenience- sampled as they sought treatment at 12 sites in Chipinge, Zimbabwe, for one of the following infections: tuberculosis (TB); persistent sexually transmitted infections (STIs); unusual skin problems (often herpes zoster); and chronic diarrhea (lasting more than a month).

Chipinge is a small rural farming district in southern Zimbabwe along the Mozambican border. Nine of 12 sites were traditional healer facilities and three were biomedical. Participants met inclusion criteria of being an adult, presenting with an HIV-related opportunistic infection, and having received treatment for that illness. Participants read and signed a written (Shona) informed consent form.

Procedures

Interviews were conducted – from October 2000 to January 2002 – after clinical visits. The following were administered: (1) a sociodemographic questionnaire; (2) questions pertaining to the World Health Organization (WHO) clinical guidelines for AIDS; (3) HAT-QoL; and (4) MOS-HIV. Given low literacy rates, all were interviewer-administered.

Instruments

World Health Organization (WHO) clinical case definition—In 1986, WHO recommended a clinical case definition for AIDS in countries where HIV testing is limited (World Health Organisation, 1986). A clinical diagnosis of AIDS is made if an individual presents with two major symptoms (extreme weight loss, chronic diarrhea, and prolonged fever) and one minor symptom (persistent cough, skin rash, herpes zoster, Candida, herpes simplex, and lymph node disease). Though this definition has its limitations (Colebunders et al., 1987; Gilks, 1991; Wabwire-Mangen et al., 1989; Widi-Wirski et al., 1988), it is still used where HIV testing is unavailable (as in this study).

HIV/AIDS-Targeted Quality of Life instrument (HAT-QoL)—The English version of HAT-QoL assesses nine dimensions via 34 items: overall function (6 items, about physical, role, and social function), sexual function (2 items), disclosure worries (5 items), health worries (4 items), financial worries (3 items), HIV mastery (2 items), life satisfaction (4 items), medication worries (5 items), and provider trust (3 items). All items use a “past 4 weeks” timeframe and a Likert response scale from 1 = “all of the time” to 5 = “none of the time” (except when reverse-coded). HAT-QoL dimensions are scored using the sum of item responses, which are transformed to a 0–100 scale; lower scores denote lower QOL. Mean administration time was 10–15 minutes. Two participants had missing data; data for one participant could be imputed using HAT-QoL guidelines (Holmes & Shea, 1998).

Medical Outcomes Study HIV Health Survey (MOSHIV)-35—The English version of MOS-HIV assesses 10 QOL dimensions via 35 items: general health perceptions (5 items), physical function (6 items), role function (2 items), social function (1 item), cognitive function (4 items), pain (2 items), mental health (5 items), energy/fatigue (4 items), health distress (4 items), and (overall) QOL (1 item). A single “health transition” item captures changes in perceived health. Most items use a “past 4 weeks” timeframe; some use “now.” Items use 2 –, 3 –, 5 –, or 6 – point Likert frequency or severity response options; dimensions are scored as described for HAT-QoL. Mean administration time was 10–15 minutes. There were no missing data.

Translation

HAT-QoL and MOS-HIV Shona adaptations, modeled after the International Quality of Life Assessment (IQOLA) Project, were completed by six graduate students from the Department of Linguistics at the University of Zimbabwe, two bilingual health care workers from the Chipinge District Hospital, and original instrument developers (William Holmes; and Christopher Mast for Dr. Albert Wu) (Ware, Keller, Gandek, Brazier, & Sullivan, 1995). Final drafts were piloted with 40 individuals at two AIDS support organizations.

Shona cultural sensibilities required two changes of HAT-QoL. First, because Shona society considers open discussion of sexuality to be inappropriate, HAT-QoL's sexual function dimension was removed. Second, because we could not assume participants' knowledge of their own serostatus given unavailability of HIV testing, explicit mention of HIV or AIDS was removed. Consequently, Shona HAT-QoL's HIV mastery dimension was reconceived as an "illness mastery" dimension. MOS-HIV does not mention HIV or AIDS.

Statistical analysis

Routine dimension-specific psychometric evaluations were completed, including: corrected item-total correlations; internal consistency reliability coefficients (with an alpha of ≥ 0.70 considered acceptable); and ceiling/floor effects (the threshold for which was 20% of participants having the highest/lowest score for a particular dimension) (Cronbach, 1951; Holmes, Bix & Shea, 1996).

Construct validity assessment began with factor analyses to determine whether there was a similar factor structure between adapted instruments and English-language originals. For HAT-QoL, Holmes and Shea conducted principal components analysis (PCA) with Varimax rotation to develop the current eight subscales (Holmes & Shea, 1998). We also completed a Promax rotation for comparison purposes. For the MOS-HIV, Revicki, Sorensen, and Wu conducted a factor analysis of MOS subscales revealing two – mental and physical – factors (Revicki, Sorensen, & Wu, 1998). Parallel analyses specifying oblique rotation were conducted to test presence of a similar two-factor structure.

Multi-trait multi-method procedures were used to assess convergent validity (i.e., strong correlations between similar HAT-QoL and MOS-HIV dimensions (e.g., HAT-QoL health worries and MOS-HIV health distress) and discriminant validity (i.e., weak correlations between dissimilar HAT-QoL and MOS-HIV dimensions, such as the HAT-QoL provider trust and MOS-HIV physical/role/social function). Correlation coefficients computed for all HAT-QoL and MOS-HIV dimension combinations were considered to be *high* if >0.75 , *high-moderate* if $0.51\text{--}0.75$, *low-moderate* if $0.26\text{--}0.50$ ("somewhat"), and *minimal* if ≤ 0.25 (Colton, 1974).

Construct validity was further assessed by comparing dimension scores for subgroups that differed by AIDS categorization, other clinical measures (e.g., STIs, TB), and bereavement history (e.g., loss of a child). Subgroups were compared via two-tailed *t*-tests. We hypothesized that AIDS, having had an STI, having had TB, having been hospitalized, having lost a child, and having lost a partner would be associated – for both instruments – with lower QOL across all dimensions.

Unless otherwise noted, an alpha level of 0.05 was employed. Data were analyzed using SPSS 14.0 for Windows ©SPSS Inc., 1989–2003 (Chicago, IL).

Results

Participants

Participants' characteristics are shown in Table 1. Most were female, married, and unemployed. Most had some formal education, though nearly one-fifth had none. A majority met the WHO AIDS definition: nearly all had lost over 10% of their body weight; a majority had had prolonged fevers; and over half had had chronic diarrhea. Most also had "minor" symptoms.

Score descriptions and reliability for HIV/AIDS-Targeted Quality of Life instrument (HAT-QoL) and Medical Outcomes Study HIV Health Survey (MOS-HIV) dimensions

HAT-QoL score descriptions are reported in Table 2. Mean scores ranged from 31.4 (financial worries) to 74.8 (medication worries), with nearly all dimension scores far lower than those reported from US studies (Holmes & Shea, 1999). There were ceiling effects for medication worries and provider trust. There were no floor effects.

HAT-QoL reliability analyses are reported in Table 3. All Cronbach's alphas were robust except that for illness mastery. Only one item (about disclosure worries) did not reach the recommended item-total correlation coefficient threshold of 0.40.

MOS-HIV score descriptions are reported in Table 4. Mean scores ranged from 29.2 (general health perceptions) to 61.9 (health transition). There was a ceiling effect for role function. There were floor effects for role function, pain, and QOL.

MOS-HIV reliability analyses are reported in Table 5. Cronbach's alphas were robust except those for cognitive function, role function, and pain. Five items (about role function, cognitive function, and mental health) did not reach the recommended item-total correlation coefficient threshold.

Construct validity

Factor analyses—PCA of HAT-QoL resulted in a seven-factor solution explaining 61% of the total variance. The factor structure closely matched that reported by Holmes and Shea in developmental studies, showing factors corresponding to overall function, disclosure worries, health worries, financial worries, life satisfaction, medication worries, and provider trust. One item originally part of the overall function factor ("satisfied with physical activity") loaded with life satisfaction items. The two original HIV mastery items loaded on two different factors, one on the disclosure worries factor and one on the health worries factor. Varimax and Promax rotations did not differ; neither did principal axis extraction differ from the principal components option.

PCA of MOS-HIV sub-scales resulted in one rather than two factors. Thus, we did not analyze physical (PHS) or mental health summary scores (MHS) further.

Multi-trait/multi-method (MTMM) analysis—MTMM results are presented in Table 6. HAT-QoL overall function exhibited moderate to strong correlations with MOS-HIV physical function, role function, social function, energy/fatigue, and health distress. HAT-

QoL health worries was moderately correlated with MOS-HIV health distress, and was minimally correlated with all remaining dimensions. HAT-QoL life satisfaction was somewhat correlated with all dimensions. The correlation pattern for HAT-QoL illness mastery was similar to that for life satisfaction, though moderately correlated with MOS-HIV health distress. HAT-QoL financial worries, however, was not strongly correlated with any MOS-HIV dimensions, somewhat correlated with a few, and minimally correlated with the rest. HAT-QoL medication worries and disclosure worries dimensions exhibited similar correlation patterns.

HAT-QoL provider trust was minimally correlated with all MOS-HIV dimensions. MOS-HIV mental health, cognitive function, and pain exhibited similar correlation patterns with HAT-QoL dimensions (somewhat correlated with approximately two-thirds of dimensions, and minimally correlated with the rest). MOS-HIV health transition and QoL were not strongly correlated with any HAT-QoL dimensions. MOS-HIV general health perception was also minimally correlated with all but one HAT-QoL dimension. For dimensions we believed to be similar to one another, coefficients ranged from 0.30 to 0.59. For dimensions we believed to be dissimilar to one another, coefficients ranged from 0.16 to 0.44. Thus, findings indicate convergent and discriminant validity for all HAT-QoL dimensions and most MOS-HIV dimensions. For dimensions where there were strong correlations across instruments, correlations were not so high as to suggest overlap.

Hypothesis-testing analysis—Mean score differences for HAT-QoL dimensions across subgroups determined by WHO AIDS definition, other clinical measures, and bereavement history are presented in Table 7. Significant differences were consistently found between HIV disease severity, STI, TB, and hospitalization subgroups, and HAT-QoL's overall function, disclosure worries, health worries, and life satisfaction. Significant differences were less consistently found between the noted subgroups and HAT-QoL's financial worries, illness mastery, and medication worries. Significant differences were found between bereavement subgroups and overall function, health worries, and life satisfaction; they were not found for financial worries.

Subgroups' mean score differences for MOS-HIV dimensions are presented in Table 8. Significant differences were consistently found between HIV disease severity, TB, hospitalization, and bereavement subgroups, and MOS-HIV's physical function, role function, social function, pain, energy/fatigue and health distress. Significant differences also were found between HIV disease severity subgroups and MOS-HIV's cognitive function, mental health, and QOL; unexpectedly, no difference was found for general health perceptions. Unexpectedly, significant differences were found between STI subgroups and MOS-HIV's cognitive function, mental health, health transition, health distress, and energy/fatigue. Those who had been hospitalized had significantly higher health transition scores than those who had not.

Significant differences were consistently found between bereavement subgroups and MOS-HIV's role function, social function, and pain. For the mental health dimension, a significant difference was found between loss-of-spouse subgroups (though not between loss-of-child subgroups). Unexpectedly, significant differences were found between bereavement

subgroups and MOS-HIV's physical function, and between loss-of-spouse subgroups and MOS-HIV's general health perceptions and health distress. As expected, no significant differences were found between bereavement subgroups and cognitive function.

Discussion

Our findings indicate that many dimensions of our Shona-adapted HAT-QoL and MOS-HIV have robust psychometric features. The primary strength of the Shona HAT-QoL – like its English counterpart – is its measurement of QOL content derived directly from self-reports of HIV seropositive individuals. The primary strength of the Shona MOS-HIV is twofold: measurements can be compared to equivalent MOS assessments in healthy populations and populations with other diseases throughout the world; and they can be compared to assessments of thousands of Western HIV seropositive individuals (Mast et al., 2004; Wu et al., 1991).

This study revealed the Shona HAT-QoL to have seven dimensions (overall function, disclosure worries, health worries, financial worries, life satisfaction, medication worries, and provider trust) that exhibited strong internal consistency and consistent evidence for construct validity. Only one HAT-QoL item did not reach the item-total correlation coefficient threshold. Only two dimensions – medication worries and provider trust – revealed ceiling effects; none revealed floor effects. Shona HAT-QoL's factor structure was similar to that seen for the developmental sample, with the exception of the "illness mastery" dimension (Holmes & Shea, 1997, 1998, 1999).

We recommend that the HIV mastery dimension be omitted when using HAT-QoL in populations that do not know their serostatus. In populations that know their HIV seropositivity, the original domain should be maintained and tested. Thus, further validation studies are needed for the original HIV mastery dimension.

The HAT-QoL sexual function dimension may not be culturally appropriate in sub-Saharan Africa where conservative sexual norms are a barrier to open discussions about sexuality. We recommend the sexual function dimension be used when the interviewer and respondent are of same sex, a situation we could not assure given our study staff. Thus, further validation studies are needed for this domain.

This study also showed good internal consistency and construct validity for several of the Shona MOS-HIV dimensions (physical function, role function, social function, pain, mental health, energy/fatigue, and health distress) and the health transition item. Five MOS-HIV items did not reach the item-total correlation coefficient threshold. Role function revealed a ceiling effect; and floor effects existed for role function, pain, and QOL. The Shona MOS-HIV factor structure was dissimilar to that found for the developmental sample.

MOS-HIV's general health perception, cognitive function, and QOL dimensions did not exhibit strong reliability or construct validity in hypothesis testing. Thus, further validation studies (perhaps in a more diverse HIV-positive sample) are needed for these dimensions, if not the instrument overall (given factor structure findings). Pending further studies, it may

be that MOS-HIV cannot detect QOL differences in such AIDS-compromised Shona samples (Revicki et al., 1998).

Study limitations include that participants were convenience-sampled and information about those refusing to complete questionnaires was not gathered. This restricted our estimating a participation rate and elucidating potential biases. Also, the sample was a highly symptomatic one, with over three-quarters likely having AIDS, and the asymptomatic subgroup was too small to allow separate reporting of findings. And, too, the sample was rural, so we cannot state that our findings extend to urban populations (though 70% of all Zimbabweans reside in rural areas).

Our hypothesis testing would have benefited from a fuller array of comparisons. For example, limited data curtailed evaluation of the construct validity for HAT-QoL's disclosure worries, financial worries, and provider trust dimensions, as well as MOS-HIV's role function, social function, cognitive function, and health transition dimensions. Future work with both Shona-adapted instruments should capture a broader set of characteristics from participants (i.e., stages of disease, neuropsychological function, stigma) to allow adequate construct validity assessment of all dimensions.

Despite the limitations, this report offers the most comprehensive reliability and construct validity assessments of any QOL instruments adapted for use in sub-Saharan Africa. Our study indicates that the majority of both adapted instruments' dimensions have strong psychometric features that speak to their likely usefulness in measuring QOL of Shona-speaking populations in Zimbabwe, Mozambique, Zambia, and Botswana. This study also points out – as has been done previously (Holmes & Shea, 1999) – the pros and cons of using a disease-targeted QOL instrument, developed from respondents' input, versus a modified generic instrument for disease-specific use. Data presented from this study illustrate the potential benefit of administering both types of instruments to allow a more comprehensive measurement of the QOL of HIV-positive populations and to better characterize the burden of un(der) treated HIV/AIDS (Patrick & Deyo, 1989).

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Table 1

Sociodemographic and WHO clinical case definition characteristics for total sample.

Characteristics	Total (N = 400)
Age (%)	
Teens	8 *
20–29	41
30–39	34
40–49	13
50–59	5
60–69	1
Sex (%)	
Female	58
Male	42
Marital status (%)	
Married	48
Polygamist	5
Co-wife	5
Divorced	5
Separated	9
Single	16
Widowed	13
Abandoned	1
Employment (%)	
Yes	20
No	69
Was employed	8
Self-employed	3
Retired	1
Education (%) [†]	
None	18
1–2	8
3–5	13
6–7	27
O-Level	35
A-Level	1
College	1
Minor WHO symptoms (%)	
Persistent cough	65
Swollen lymph nodes	62
Generalized skin rash	44
Cold sores	40
Candidiasis	29

Characteristics	Total (N = 400)
Herpes zoster (shingles)	16
Major WHO symptoms (%)	
Extreme weight loss	82
Prolonged fever	78
Chronic diarrhea	56
WHO AIDS definition (%)	
Yes	76
No	25
STI (%)	
Ever	57
Never	43
TB (%)	
Ever	36
Never	64
Hospitalization (%)	
Recent	41
Past/never	60
Loss of child (%)	
Yes	40
No	60
Loss of spouse (%)	
Yes	27
No	73

* All percentages computed using denominator made up of all those who provided an answer; rounding may make addition of percentages for some characteristics greater or less than 100%.

[†] O- and A-Levels in Zimbabwe correspond roughly to grades 8–10 and 11–12, respectively, in the USA.

Table 2

Shona HAT-QoL dimension scores and psychometric properties.

	OF*		DW	HW	FW	IM	LS	MW	PT
#Items	6	5	4	3	2	4	5	3	
Mean	46.5	53.4	45.6	31.4	49.1	40.7	74.8	72.4	
Standard deviation	25.8	28.5	28.5	26.1	31.6	25.8	25.2	25.9	
Ceiling effect	2%	5%	5%	3%	13%	4%	24%	25%	
Floor effect	4%	4%	10%	19%	14%	9%	1%	3%	

* Dimensions for the HAT-QoL (Shona) include overall function (OF), disclosure worries (DW), health worries (HW), financial worries (FW), illness mastery (IM), life satisfaction (LS), medication worries (MW), and provider trust (PT).

Table 3

Shona HAT-QoL item-total statistics.

Dimension/Item	Cronbach's alpha	#Items	Corrected item-total correlation	Cronbach's alpha if item deleted
Overall Function (OF)	0.85	6		
Item 1			0.44	0.86
Item 2			0.67	0.82
Item 3			0.66	0.83
Item 4			0.74	0.81
Item 5			0.74	0.81
Item 6			0.60	0.84
Disclosure Worries (DW)	0.79	5		
Item 1			0.30	0.82
Item 2			0.65	0.72
Item 3			0.62	0.73
Item 4			0.69	0.71
Item 5			0.58	0.75
Health Worries (HW)	0.84	4		
Item 1			0.65	0.80
Item 2			0.68	0.79
Item 3			0.67	0.79
Item 4			0.67	0.79
Financial Worries (FW)	0.78	3		
Item 1			0.62	0.72
Item 2			0.63	0.70
Item 3			0.63	0.70
Illness Mastery (IM)	0.63	2		
Item 1			0.46	NA
Item 2			0.46	NA
Life Satisfaction (LS)	0.80	4		
Item 1			0.62	0.74
Item 2			0.62	0.74
Item 3			0.61	0.75
Item 4			0.59	0.76
Medication Worries (MW)	0.81	5		
Item 1			0.52	0.79
Item 2			0.58	0.77
Item 3			0.64	0.75
Item 4			0.63	0.75
Item 5			0.59	0.77
Provider Trust (PT)	0.75	3		
Item 1			0.55	0.72
Item 2			0.64	0.60

Dimension/Item	Cronbach's alpha	#Items	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 3			0.57	0.69

NA=not applicable for subscales with 2 items.

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Table 4

Shona MOS-HIV dimension scores and psychometric properties.

	GH*	PF	RF	SF	CF	P	MH	EF	HD	QL	HT
#Items	5	6	2	1	4	2	5	4	4	1	1
Mean	29.2	59.8	47.3	54.9	50.4	30.2	52.1	46.2	45.2	33.9	61.9
Standard deviation	15.8	25.1	40.3	35.8	23.1	24.2	22.4	24.6	26.8	26.0	29.7
Ceiling effect	0%	9%	30%	16%	1%	0%	1%	3%	2%	1%	11%
Floor effect	2%	1%	35%	17%	2%	21%	1%	2%	6%	28%	13%

* Dimensions for the MOS-HIV include: general health perceptions (GH), physical function (PF), role function (RF), social function (SF), cognitive function (CF), pain (P), mental health (MH), energy/fatigue (EF), health distress (HD), quality of life (QL), and health transition (HT).

Table 5

Shona MOS-HIV item-total statistics.

Dimension/item	Cronbach's Alpha	No. of items	Corrected item-total correlation	Cronbach's Alpha if item deleted
General Health (GH)	0.73	5		
Item 1			0.43	0.71
Item 2			0.46	0.71
Item 3			0.63	0.62
Item 4			0.60	0.64
Item 5			0.42	0.71
Physical Function (PF)	0.80	6		
Item 1			0.60	0.76
Item 2			0.51	0.78
Item 3			0.61	0.75
Item 4			0.58	0.76
Item 5			0.61	0.75
Item 6			0.40	0.80
Role Function (RF)	0.54	2		
Item 1			0.37	NA
Item 2			0.37	NA
Cognitive Function (CF)	0.64	4		
Item 1			0.38	0.60
Item 2			0.36	0.62
Item 3			0.47	0.54
Item 4			0.48	0.53
Pain (P)	0.65	2		
Item 1			0.50	NA
Item 2			0.50	NA
Mental Health (MH)	0.73	5		
Item 1			0.39	0.72
Item 2			0.46	0.69
Item 3			0.56	0.65
Item 4			0.54	0.66
Item 5			0.48	0.68
Energy/Fatigue (EF)	0.77	4		
Item 1			0.55	0.73
Item 2			0.56	0.73
Item 3			0.59	0.71
Item 4			0.60	0.70
Health Distress (HD)	0.78	4		
Item 1			0.62	0.72
Item 2			0.61	0.72
Item 3			0.63	0.71

Dimension/item	Cronbach's Alpha	No. of items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Item 4			0.51	0.78

NA = not applicable for subscales with 2 items.

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Table 6Multi-trait/multi-method analysis using HAT-QoL and MOS-HIV dimension-level correlations.[†]

Variable	OF*	DW	HW	FW	IM	LS	MW	PT
GH	0.23	0.14	0.25	0.22	0.22	0.27	0.16	0.01
P	0.50	0.20	0.41	0.24	0.31	0.39	0.15	-0.02
PF	0.58	0.14	0.46	0.27	0.36	0.45	0.25	0.01
RF	0.54	0.11	0.38	0.23	0.26	0.40	0.11	0.09
SF	0.51	0.19	0.43	0.18	0.25	0.34	0.13	-0.02
MH	0.50	0.25	0.45	0.31	0.38	0.47	0.31	0.01
EF	0.59	0.24	0.45	0.32	0.37	0.48	0.31	0.05
HD	0.61	0.30	0.57	0.44	0.51	0.42	0.25	-0.07
CF	0.43	0.28	0.43	0.38	0.39	0.24	0.26	-0.19
QL	0.40	0.14	0.31	0.16	0.11	0.29	0.11	0.06
HT	0.32	0.20	0.31	0.23	0.28	0.27	0.14	-0.04

* Dimensions for the HAT-QoL (Shona) include overall function (OF), disclosure worries (DW), health worries (HW), financial worries (FW), illness mastery (IM), life satisfaction (LS), medication worries (MW), and provider trust (PT). Dimensions for the MOS-HIV include: general health perceptions (GH), pain (P), physical function (PF), role function (RF), social function (SF), mental health (MH), energy/fatigue (EF), health distress (HD), cognitive function (CF), quality of life (QL), and health transition (HT).

[†]Correlations were considered to be *high* if >0.75, *high-moderate* if 0.51–0.75, *low-moderate* if 0.26–0.50, and *minimal* if =0.25.

Construct validity assessment of Shona HAT-QoL via hypothesis testing using WHO clinical case definition and other variables.

Table 7

Variable	Of*	DW	HW	FW	IM	LS	MW	PT
WHO AIDS definition (Yes vs. No)	-12.2[†]	-6.7	-14.7	-9.2	-11.0	-10.4	-9.4	-[‡]
STI (Ever vs. never)	-5.5	-9.9	-9.9	-8.9	-13.9	-8.6	-9.0	-
TB (Ever vs. never)	-10.7	11.6	-5.6	-	-	-6.9	-	-
Hospitalizations (Recent vs. past/never)	-10.3	11.5	-5.4	-	-	-9.5	-	-8.9
Loss of child (Yes vs. no)	-6.2	-	-5.8	-	-	-8.6	-	-
Loss of spouse (Yes vs. no)	-7.9	-	-8.2	-	-	-7.3	-6.1	-7.3

* Dimensions for the HAT-QoL (Shona) include overall function (OF), disclosure worries (DW), health worries (HW), financial worries (FW), illness mastery (IM), life satisfaction (LS), medication worries (MW), and provider trust (PT).

[†] Subgroup mean score differences are presented. Mean score differences are computed by subtracting the mean score for the second subgroup in each parenthetical clause from the mean score for the first subgroup (e.g., mean score for those that do not have a clinical diagnosis of AIDS from those who did have a clinical diagnosis). A negative sign indicates worse function, more worries, less satisfaction and/or trust in the first subgroup in the parenthetical clause; a positive sign indicates worse function, more worries, less satisfaction and/or trust in the second subgroup. Subgroup mean score differences indicated by bold type are those that are significant at a p -value ≤ 0.05 , and those indicated by normal type approach significance at a p -value ≤ 0.10 but > 0.05 .

[‡] Cells with a “-” indicate that the difference in subgroup mean scores has a p -value > 0.10 .

Table 8

Construct validity assessment of Shona MOS-HIV via hypothesis testing using WHO clinical case definition and other variables.

Variable	GH*	PF	RF	SF	CF	P	MH	EF	HD	QL	HT
WHO AIDS definition (Yes vs. no)	-	-13.2	-16.5	-11.1	-7.1	-10.6	-7.6	-11.9	-14.6	-6.6	-
STIs (Ever vs. never)	-4.2	-4.4	-6.9	-6.5	-6.4	-	-4.8	-5.0	-5.4	-	-10.8
TB (Ever vs. never)	-	-11.5	-17.3	-10.8	-	-7.9	-4.2	-6.1	-8.5	-	5.6
Hospitalizations (Recent vs. past/never)	-2.8	-11.3	-14.1	-8.7	-	-8.0	-	-6.7	-7.7	-	7.4
Loss of child (Yes vs. no)	-	-9.3	-11.6	-8.2	-	-6.7	-	-	-	-	-8.0
Loss of spouse (Yes vs. no)	-3.8	-8.1	-10.3	-8.1	-	-6.1	-6.5	-5.3	-6.8	-	-8.3

* Dimensions for the MOS-HIV include: general health perceptions (GH), physical function (PF), role function (RF), social function (SF), cognitive function (CF), pain (P), mental health (MH), energy/fatigue (EF), health distress (HD), quality of life (QL), and health transition (HT).

[†] Subgroup mean score differences are presented. Computations and meanings are as described in the same footnote to Table 7, above.

[‡] Cells with a “-” indicate that the difference in subgroup mean scores has a *p*-value >0.10.