

Field Psychometric Testing of the Instrument for Assessment of Psychological Predictors of Well-Being and Quality of Life in People with HIV or AIDS

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Abstract The Screenphiv, a screening measure for psychological issues related to HIV, was psychometrically tested in a study involving 744 HIV-infected people in Spain. Participants ages 18–82 ($M = 43.04$, 72 % men, 28 % women) completed an assessment protocol that included the Screenphiv and the MOS-HIV. A trained interviewer also collected relevant illness-related clinical data and socio-demographics from the participants. A confirmatory factor analysis was used to evaluate the goodness of fit of the Screenphiv's theoretical model and confirmed six first-order factors and two second-order factors [RMSEA (IC 90 %) = 0.07 (0.07–0.08)]. No

floor or ceiling effects were observed for the scores. Cronbach's alphas were acceptable for all of the factors (from 0.65 to 0.92). Criterion-related validity also achieved; Screenphiv scores were related to socio-demographic and clinical variables and MOS-HIV summary scores. The Screenphiv is a reliable and valid measure, ready to use in research and clinical settings in Spain.

Resumen El Screenphiv, una herramienta de cribado de indicadores psicológicos relacionados al VIH, fue evaluado psicométricamente en un estudio con 744 personas con VIH en España. Los participantes con edades entre 18 y 82 años ($M = 43.04$, 72 % hombres, 28 % mujeres) completaron un protocolo de evaluación que incluía el Screenphiv y el MOS-HIV. Un investigador entrenado también recogió datos clínicos y sociodemográficos. El Análisis Factorial Confirmatorio permitió evaluar la bondad de ajuste de la estructura teórica del Screenphiv y confirmó la presencia de seis factores de primer orden y dos de segundo orden [RMSEA (IC90 %) = 0.07 (0.07–0.08)]. No se observaron efectos suelo o techo en las puntuaciones del cuestionario. El alfa de Cronbach fue aceptable para todos los factores (de 0.65 a 0.92). Evidencias de validez relacionadas a criterio fueron establecidas. Las puntuaciones del Screenphiv se relacionaron con variables sociodemográficas y clínicas y con las puntuaciones sumario del MOS-HIV. El Screenphiv es una medida fiable y con evidencias de validez, que está disponible para usar en investigaciones y entornos clínicos en España.

The study was conducted on behalf of the Spanish Group for the Quality of Life Improvement in HIV or AIDS.

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Palabras clave cuestionario · Screenphiv · predictores psicológicos · calidad de vida · bienestar

Introduction

Previous studies [1–3] have pointed out the limitations of the current approaches to disability and quality of life measurements in the field of human immunodeficiency virus (HIV) infection and acquired immune deficiency syndrome (AIDS). From clinical practice to applied research, we noted that the available disease-specific instruments, which focus mainly on quality of life domains, are becoming obsolete in assessing the needs and challenges that people with HIV (PWH) face daily. The context and perceptions of AIDS have changed as have the management of the disease and its outcomes.

Despite this, an HIV diagnosis may still necessitate adjustment and demand personal and contextual resources to cope with this challenging diagnosis. HIV retains a stigma that can affect health and well-being, even with the availability of effective antiretroviral therapy. Reported evidence has revealed that negative social interactions can predict the mental health state of PWH [4]. On the other hand, a growing body of literature describes a variety of cognitive and behavioral characteristics that can protect against or augment the burden of the illness in this population [5–8].

A diagnosis of HIV is life changing, and thus it is important to explore ways of reducing feelings of depression or distress, social rejection, and isolation, all of which can bring about much damage. It likewise is important to work to enhance perceived control and feelings of well-being among PWH. The literature contains descriptions of many attempts and efforts to fulfill that goal, from individual program intervention directed toward PWH [9], to awareness campaigns against HIV stigma [10] among the general population, to collective support groups [11], as a few examples.

For all those actions, the availability of accurate, up-to-date, and comprehensive assessment tools are mandatory to help practitioners and researchers identify as early as possible signs of risk and protection factors that need to be addressed or be personalized when delivering interventions.

For that reason, we argued that research addressing these concerns is urgently required, and consequently we proposed in past work [2] to develop a specific multidimensional measure of psychological predictors of well-being and quality of life (WB&QOL) that includes relevant indicators from PWH and HIV-related health or allied care professionals.

In that past publication [2], we presented a new measure aiming to be useful for assessment, screening, or evaluation of characteristics that can explain the variability in individual differences of adjustment and health conditions of PWH. Consequently, it may be useful to identify which

characteristics may lead PWH to a vulnerability condition and therefore should be promoted at an individual level in psychoeducational intervention, as well as used to evaluate effects of an intervention that focus on these topics.

According to those early findings [2], the measure features several strengths. The measure was created using a patient-centered approach, combining a literature review, focus groups with PWH, and opinions from HIV experts to develop relevant questions and theoretically supported items. We tested comprehension and feasibility through a cognitive debriefing interviews (i.e., the elements included in the questionnaire were perceived as relevant and as easy to understand and answer), and we pilot tested the items to evaluate empirically the questions in the final version of the questionnaire. This resulted in a novel instrument covering emerging issues within a brief measure comprised of 23 facets of HIV-related psychological aspects, represented by six factors (i.e., emotional distress experience, personal growing attitude and positive coping, cognitive change related to HIV [positive appraisal], active coping focus on collective action and social support, perceived rejection related to HIV and avoidance coping, and personal experience of rejection). These factors are expected to be related to well-being and quality of life, either as a risk factor or a protective factor.

The current report is a continuation of our previous work and part of a larger multicenter research taskforce addressing assessment and intervention of psychological predictors related to WB&QOL in PWH. The aim of this work was to describe the field psychometric testing of the Screenphiv, an instrument for assessing psychological predictors of WB&QOL in PWH or AIDS in a larger and representative sample of Spanish PWH.

In this report, we describe the confirmatory factor analysis (CFA) of the instrument structure and the reliability and validity of the new measure in terms of concurrent and external-related criterion validity. Additional psychometric features, along with norms for the Spanish population, also are presented.

Methods

Early Development of the Instrument for Assessment of Psychological Predictors of Well-Being and Quality of Life in People with HIV or AIDS

The development of the Screenphiv, a measure used to screen for psychological issues related HIV and for assessment of psychological predictors of WB&QOL in PWH or AIDS followed the standards required for a

patient-reported outcomes assessment as advised by several experts [12, 13] and the International Test Commission [14, 15].

Following is a summary of previously published information (see Remor et al. [2] for details) on the development of the questionnaire. Development of the instrument started with a literature review on psychosocial predictors of well-being and quality of life in HIV research. The literature review was followed by a qualitative study with focus groups in order to include the perspective of PWH in the detection of relevant aspects or domains that explain WB&QOL experiences. Thirty-eight men and women with HIV took part in the focus groups. A team of experts then conducted a content analysis of the material collected during the group interviews. We developed potential items assessing predictors based on content analysis results and the literature review.

The procedures for the development of a pool of potential items included defining each construct (facet) to be evaluated and then creating each item. At the end of this step, 96 items remained in the main pool of items and were sent to external experts for rating. Researchers and health care experts in HIV rated the potential pool of items in terms of level of comprehension (wording and clarity), representativeness of the items for the construct being evaluated, relevance for HIV, and suggestions for improvement of items if necessary. These ratings enabled us to decide whether the item had to be retained, reviewed, or rejected, and if it matched the associated facet.

The criteria established for deciding retention, modification, or rejection of items were based on ratings of comprehensiveness, representativeness and relevance, as well as suggestions for modification (rephrase). This process also included opinions on the response scale format chosen for the questionnaire (i.e., Visual Analogue Scale: VAS). Three items were omitted because they did not achieve agreement criteria among experts in terms of clarity, representativeness, and relevance. Another 15 items were reviewed following judges' suggestions. A pool of 93 items remained as potential questions for the instrument.

Further, we conducted 10 additional face-to-face interviews with men and women with HIV to assess the comprehension and feasibility of the reviewed pool of items. Evaluations of feasibility for the VAS response format also were questioned. General feedback from the interviewees revealed that all items addressing relevant issues were easy to understand and answer. We implemented small changes in wording in this step.

Finally, we performed a pilot psychometric testing to assess item quality via empirical criteria and preliminary psychometric properties. Eighty-four men and women with HIV from different regions of Spain answered the pilot testing protocol. Criteria considered for item depuration

were based on item-statistical performance (i.e., presence of missing values, floor and ceiling effects, corrected item-total correlation, changes in alpha, and factorial loads). If one of the rejection criteria was fulfilled, the item was omitted.

After the item-level depuration, 63 items covering 23 facets remained as potential questions. Assessment of instrument structure came next, using an exploratory factorial analysis (EFA) approach. We found a six-factor structure (i.e., emotional distress experience related to HIV, personal growing attitude and positive coping, cognitive change related HIV [positive appraisal], active coping focus on collective action and social support, perceived rejection related to HIV and avoidance coping, and personal experience of rejection). In addition, goodness-of-fit model indexes were achieved for the present structure and number of factors chosen (see detailed statistics in Remor et al. [2]). The factors were labeled as 'risk' or 'protective' factors for WB&QOL experience according the expected effect on outcomes and following the literature evidence (see details in Table 1).

Finally, we named the instrument Screenphiv to represent its function as a screening measure for psychological issues related to HIV. The instrument and instructions for interpretation and calculation of scores are included as a supplementary material, but researchers and health care professionals interested in using the Screenphiv should contact the authors to obtain proper authorization for use (or translation), following the guidelines from the International Test Commission [15].

Participants, Setting, Design, and Procedures

Ethical approval was granted by the Research Ethics Committee of universities and hospitals involved in the study, and all volunteers participating in the study signed a patient informed consent form. Adult men and women with HIV were contacted through hospitals, non-governmental organizations (NGOs), and patient associations.

To be eligible for the study, participants had to be age 18 or older, be capable of understanding and reading Spanish, have been diagnosed with HIV infection at least 6 months before the date of evaluation, and have agreed to participate in the research by signing the informed consent form. Respondents were given no financial incentive for participating at this stage of the study. The data for this work were collected between December 2010 and June 2011.

As part of this psychometric testing study, field study participants ($N = 757$) from different regions of Spain (data collected in 32 centers) completed a self-assessment protocol that included the new measure [2] and the Medical Outcomes Study HIV Health Survey (MOS-HIV) [16] (Spanish version by Badia et al. [17]).

Table 1 Theoretical model and structure of the Screenphiv questionnaire

Facets (number of items)	Factors	Expected effect on well-being and quality of life
HIV stress-related (3) Negative mood HIV-related (3) Emotional loneliness (3) HIV illness representation (3) Internalized stigma (3) Economic worries (3) Satisfaction with sexual activity (3)	F1—Emotional distress experience related to HIV	Risk
Body image–satisfaction (2) Health behavior (3) Problem solving coping (3) Disease knowledge (3) Self-esteem (2) Personal autonomy (2)	F2—Personal growing attitude and positive coping	Protective
Positive reframing (3) Personal meaning (3) Personal values change (3) Optimism (2)	F3—Cognitive change related HIV [positive appraisal]	Protective
Social support (3) HIV activism (3)	F4—Active coping focus on collective action and social support	Protective
Avoidance coping (3) Enacted stigma–perceived group rejection (2)	F5—Perceived rejection related HIV and avoidance coping	Risk
Enacted stigma–personal experience of rejection (2) Body image–disfigurement (3)	F6—Personal experience of rejection	Risk

The MOS-HIV is a multidimensional questionnaire that consists of 35 questions covering 11 domains of health including general health perceptions, pain, physical functioning, role functioning, mental health, energy/fatigue, health distress, overall QOL, and health transition. Mental health summary (MHS) and physical health summary (PHS) scores were calculated from MOS-HIV scales [16, 17]. Trained interviewers also collected relevant illness-related clinical data and socio-demographic data directly from participants.

Prior to the data analysis, the 757 collected assessment protocols entered into the database were checked for inconsistencies in the tabulation or missing values. Thirteen participants were removed from the analysis as they had more than 50 % of values missing in the research protocol. For the protocols presenting fewer than 10 % missing values ($n = 255$), we applied standard imputation method (multiple imputation) for values omitted [18]. For missing values in the MOS-HIV questionnaire, we strictly followed rules established in the MOS-HIV manual. The number of participants included in the final analysis was 744.

In the final sample ($N = 744$), participants' ages varied from 18 to 82 years old ($M = 43.04$; $SD = 9.44$), 72 % were men, and 46.8 % ($n = 347$) lived with a partner. Self-identified sexual orientation was heterosexual for 62.7 %, homosexual for 28.7 %, and bisexual for 3.9 %; 4.6 % did not report an orientation. Participants legally working ($n = 265$) represented 36.2 % of the sample, and those unemployed ($n = 200$) represented 27.3 %. Participants who self-identified as HIV activists ($n = 50$) represented 6.8 % of the sample.

Data were analyzed using PRELIS and LISREL 8.7 statistical programs. To confirm the theoretical structure of the instrument, we applied the CFA method (unweighted least squares). Model fit indexes [19] considered were Chi square (χ^2) and degrees of freedom, incremental fit indexes (CFI, IFI, NFI, GFI, and AGFI) and residual adjustment indexes (RMR and RMSEA). To assess evidences of criterion-related validity, Screenphiv scores were associated with relevant characteristics of the sample and with summary scores of the MOS-HIV questionnaire. We applied Pearson correlation or student's t test statistics, and we identified norms for

the Spanish population by the following percentile cutoffs: 25th, 50th, 75th and 90th.

Results

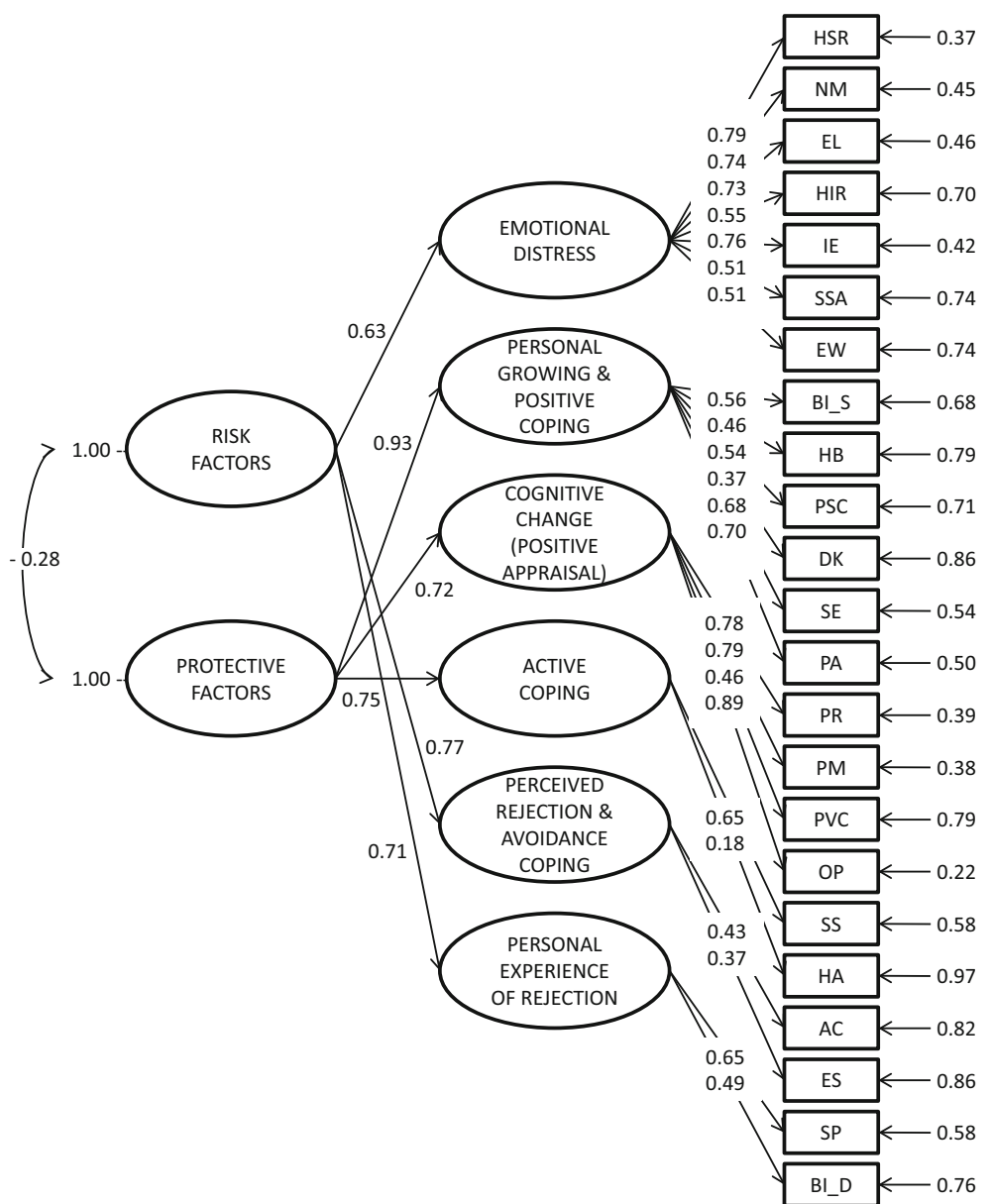
Confirmatory Factor Analysis Approach to Assess Construct Validity

A CFA approach was used to evaluate the goodness of fit of the theoretical model (see model in Table 1) presented in our past work [2]. The model confirmed six first-order factors and two second-order factors (see Fig. 1). One of the two latent dimensions were risk factors for WB&QOL, which

included emotional distress experience related to HIV (Factor 1), perceived rejection related to HIV and avoidant coping (Factor 5), and personal experience of rejection (Factor 6). The second latent second-order dimension was protectors factors for WB&QOL, which included personal growing attitude and positive coping (Factor 2), cognitive change related HIV (positive appraisal) (Factor 3), and active coping focus on collective action and social support (Factor 4).

All model parameters were statistically significant ($p < 0.05$), showing a high saturation of first-order factors in the two second-order latent dimensions. The assessed model (Fig. 1) presented acceptable fit model statistics: $\chi^2 = 1255.97(221, p < 0.001)$; RMSEA (IC 90 %) = 0.079

Fig. 1 CFA of the Screenphiv—screening measure for psychological issues related to HIV: standardized solution. *HSR* HIV stress-related, *NM* negative mood HIV-related, *EL* emotional loneliness, *HIR* HIV illness representation, *IE* internalized stigma, *SSA* satisfaction with sexual activity, *EW* economical worries, *BI_S* body image satisfaction, *HB* health behavior, *PSC* problem solving coping, *DK* disease knowledge, *SE* self-esteem, *PA* personal autonomy, *PR* positive reframing, *PM* personal meaning, *PVC* personal values change, *OP* optimism, *SS* social support, *HA* HIV activism, *AC* avoidance coping, *ES* enacted stigma perceived group rejection, *SP* stigma personal experience of rejection, *BI_D* body image disfigurement



(0.075–0.084); RMR = 0.081; GFI = 0.91; AGFI = 0.92; CFI = 1; NFI = 1.

Reliability

No floor or ceiling effects were observed for the questionnaire scores. Cronbach's alphas were computed and suggested that the internal consistency was acceptable for all the factors and two main domains referred to risk and protective factors (see Table 4). Factors 5 and 6, however, showed an alpha below expectations (<0.70).

Criterion-Related Validity

Characteristics of the Sample Related to Psychological Predictors of WB&QOL

Factor 5 (perceived rejection related to HIV and avoidance coping; $r = -0.09$; $p = 0.017$) and Factor 6 (personal experience of rejection; $r = 0.11$; $p = 0.003$) showed an association with the age of the participants. Older participants tended to report having experienced more rejection and stigmatization (Factor 6) than younger participants; younger participants tended to report more enacted stigma related to HIV and avoidant coping behaviors (Factor 5) than older participants.

Other scores were not related to age. Participants involved with HIV activism showed higher personal growing attitude and positive coping (Factor 2: $t(736) = 2.16$; $p = 0.030$); lower perceived rejection related to HIV and avoidance coping (Factor 5: $t(736) = -2.46$; $p = 0.014$); and higher scores in the summary protective factors domain ($t(736) = 2.15$; $p = 0.032$) than non-activist participants.

Unemployed participants showed higher scores in summary risk factors than other participants ($t(730) = 2.04$; $p = 0.041$). Participants living with a partner showed lower scores on summary risk factors ($t(739) = -4.25$; $p = 0.000$) and higher scores in summary protective factors ($t(739) = 4.59$; $p = 0.000$) than those who were single, divorced, or widowed. Thus, participants living with a partner scored lower in emotional distress related to HIV (Factor 1: $t(739) = -5.06$; $p = 0.000$) and higher in personal growing attitude and positive coping (Factor 2: $t(739) = 3.84$; $p = 0.000$), cognitive change related HIV (Factor 3: $t(739) = 3.42$; $p = 0.001$), and active coping focus on collective action and social support (Factor 4: $t(739) = 4.78$; $p = 0.000$).

Level of CD4 + were positively associated with personal growing attitude and positive coping (Factor 2: $r = 0.11$; $p = 0.008$) and negatively associated with perceived rejection related to HIV and avoidance coping (Factor 5: $r = -0.09$; $p = 0.032$).

Predicting Health-Related Quality of Life from Psychological Risk and Protective Indicators

Screenphiv scores showed associations with MOS-HIV scores in the expected way. Risk factor scores were negatively associated with domains of quality of life as measured by MOS-HIV, while protective factors had a positive association. Degree of associations were higher with the mental health domain than the physical health domain as expected. Results are detailed in Table 2.

In addition, we performed *t*-tests to evaluate the hypothesis that participants with higher scores (percentile >75) on Screenphiv protective factors will present significantly better quality of life as measured by MOS-HIV and that those with higher scores on Screenphiv risk factors will present a significantly worst quality of life as measured by MOS-HIV. As expected participants scoring high on psychological predictors indicating protective factors showed significantly better mental and physical health as measured by MOS-HIV, and those scoring higher on risk factors showed significantly worst mental and physical health (see details in Table 3).

Descriptive Statistics and Percentiles

Sample score means, standard deviations, and percentile cutoffs for all scores in the new measure are presented in Table 4.

Discussion

This report described the psychometric properties of Screenphiv, an instrument for the assessment of psychological predictors of WB&QOL in PWH or AIDS. The results indicated that this new measure can be used with certain psychometric guarantees [13] and may be a useful tool for those pursuing one of the strategies pointed out by UNAIDS [20]: improve well-being, improve quality of life, and provide support for PWH.

The instrument has several strengths due to the careful procedures followed during its early development [2]. Content validity was a priority and was achieved through a literature review as well as interviews with PWH and health care professionals. By comparing the results found with the existing empirical evidence in the literature, we found the categories noted in the earlier analysis of speeches not only replicated the dimensions found in the literature but that also other facets to consider appeared in the WB&QOL of PWH today. The iterative process in the item selection and depuration, along with definitions of the facets and experts' reviews and consultation, comprised the content of the validity process. All these actions ensured

Table 2 Associations between scores on the Screenphiv and scores on the MOS-HIV

Screenphiv factors and domain scores	MOS-HIV scores		
	Physical health summary	Mental health summary	Overall QOL score
F1—Emotional distress experience related to HIV	−0.32**	−0.60**	−0.34**
F2—Personal growing attitude and positive coping	0.25**	0.43**	0.29**
F3—Cognitive change related HIV (positive appraisal)	0.11**	0.28**	0.25**
F4—Active coping focus on collective action and social support	ns	0.08*	0.10**
F5—Perceived rejection related HIV and avoidance coping	−0.08*	−0.23**	−0.14**
F6—Personal experience of rejection	−0.33**	−0.37**	−0.20**
D1—Risk factors for WB&QOL	−0.31**	−0.50**	−0.29**
D2—Protective factors for WB&QOL	0.13**	0.32**	0.26**

* $p < 0.05$; ** $p < 0.01$

Ns not significant

Table 3 Predicting health-related QOL (MOS-HIV scores) from psychological risk and protective factors assessed by Screenphiv

Psychological predictors	MOS-HIV scores					
	Scores on mental health summary		Statistics $t(742)$; p	Scores on physical health summary		Statistics $t(742)$; p
	Screenphiv high	Screenphiv normal		Screenphiv high	Screenphiv normal	
F1—Emotional distress experience related to HIV	42.4	52.5	−15.3; 0.000	45.8	51.4	−6.5; 0.000
F2—Personal growing attitude and positive coping	53.9	48.7	7.3; 0.000	53.5	48.8	5.4; 0.000
F3—Cognitive change related HIV [positive appraisal]	52.0	49.3	3.6; 0.000	51.5	49.5	2.3; 0.019
F4—Active coping focus on collective action and social support	52.4	49.2	4.3; 0.000	50.6	49.8	0.9; ns
F5—Perceived rejection related HIV and avoidance coping	47.5	50.8	−4.4; 0.000	48.9	50.3	−1.6; ns
F6—Personal experience of rejection	46.2	51.3	−6.9; 0.000	46.2	51.3	−5.9; 0.000
D1—Risk factors for WB&QOL	43.1	52.3	−13.6; 0.000	45.9	53.1	−6.2; 0.000
D2—Protective factors for WB&QOL	53.6	48.8	6.8; 0.000	52.1	49.2	3.2; 0.001

Screenphiv high scores percentile ≥ 75 ; screenphiv normal scores percentile < 74

Ns not significant

quality, clarity, relevance, and representativeness of the selected items, ensuring a coherent structure for the instrument. These procedures were consonant with guidelines for PRO development [13].

Data collection within a national task force, with a representative sample, provided evidence of construct validity assessed by a CFA that replicated the theoretical model proposed earlier [2], comprising a multidimensional model of six factors, of which three acted as protective factors and three as risk factors of WB&QOL. The factors that protect WB&QOL were related to personal growing attitude and positive coping, cognitive change related to HIV, and active coping focus on collective action and

social support. The risk factors of WB&QOL were the emotional distress experience related to HIV, perceived rejection related to HIV, and avoidant coping and personal experience of rejection.

Moreover, analysis of the internal structure showed that these six first-order factors can be explained by two second-order latent dimensions that encompass the protective factors of WB&QOL on the one hand and risk factors on the other.

This study also provided evidence of criterion-related validity for the new measure. As expected, participants' characteristics were related to the psychological factors assessed by Screenphiv (e.g., age, HIV activism,

Table 4 Descriptive and reliability of the Screenphiv ($N = 744$)

Factors and domains of the instrument	No. of facets (no. of items)	M	SD	Ceiling effect (%) ^a	Floor effect (%) ^a	Cronbach's α	Percentile (score cut-off)			
							25th	50th	75th	90th
F1—Emotional distress experience related to HIV	7 (21)	43.6	20.9	0	0	0.91	27.4	42.8	58.6	74.1
F2—Personal growing attitude and positive coping	6 (15)	65.3	16.6	0.1	0	0.85	54.1	66.9	77.8	85.0
F3—Cognitive change related HIV [positive appraisal]	4 (11)	64.4	21.8	0.7	0.1	0.90	50.2	66.7	81.9	91.0
F4—Active coping focus on collective action and social support	2 (6)	69.7	19.8	1.9	0	0.75	57.0	72.2	85.1	94.5
F5—Perceived rejection related HIV and avoidance coping	2 (5)	60.7	21.2	0.7	0.1	0.65	44.2	62.1	76.5	88.2
F6—Personal experience of rejection	2 (5)	37.1	22.8	0.1	0.9	0.65	20.0	36.1	53.2	70.7
D1—Summary risk factors for WB&QOL	11 (31)	45.3	18.4	0	0	0.92	31.2	44.7	58.5	71.2
D2—Summary protective factors for WB&QOL	12 (32)	65.8	16.1	0.1	0	0.92	55.8	67.8	77.3	84.6

^a Expected lower than 15 %

employment status, relationship status, immunological condition). Some of these characteristics (e.g., HIV activism, unemployment, relationship status) have been related to quality of life [3, 21]. Moreover, we confirmed the hypothesis that protective factors were positively related and risk factors were negatively related to quality of life, as measured by MOS-HIV. Previous work has described the relevance of both protective [7] and adverse [6, 8] psychological factors to adjustment and control of HIV infection.

In our recently published work [22; see page 6], we provided results for the 23 facets of the Screenphiv in relation to the mental and physical summary scores of the MOS-HIV. Associations of the instrument facets with the summary MOS-HIV scores were shown as expected.

Furthermore, in the present study, when analyzing the correlations of each of the first-order factors with MOS-HIV scores, those with greater associations were emotional distress experience related to HIV and personal experience of rejection, both risk factors for quality of life experience. Past studies [21, 23] have pointed out similar results.

On the other hand, previous studies [7] showed that personal growing attitude and positive coping appeared as protective factors for quality of life perceptions. Our results identified an association of scores of Factor 2 (personal growing attitude and positive coping) and Factor 5 (perceived rejection related to HIV and avoidance coping) with CD4+ level. The literature [7] has identified that positive coping behavior response may help control illness, preventing decline in CD4 + cells. Additionally, perceived

rejection related to HIV, as enacted stigma, has been related to poor health status and quality of life [21].

In addition, participants scoring above the 75th percentile on protective factors and below 75th percentile on risk factors showed better mental and physical health than those who scored in the opposite way. These results may allow for recommended cutoffs as indicators of vulnerability when selecting participants for interventions aiming at adjustment or WB&QOL improvement.

Another aspect of interest is that PWH who live with a partner scored higher in a series of protective factors, specifically those related to personal growing attitude and positive coping. Feelings of companionship, or presence of affective and social support, may help in better managing circumstances related to the HIV-positive condition. These findings were in consonance with a previous work [3] that described that being in a relationship or married were related to subjective well-being. Future work may investigate if the link between having a relationship and well-being might be mediated by the presence of protective personal resources.

Finally, the advantage of having a multidimensional evaluation with six first-order factors and its facets may help researchers and clinicians detect problems or strengths in more specific ways (e.g., identifying specific problematic facets and domains, using percentile cutoffs), thus facilitating the design and delivery of a more personalized intervention aiming at WB&QOL of PWH.

Lastly, the availability of a measure for specific assessment of psychosocial predictors is expected to be of

great help to health care management of HIV infection and to serve as a screening tool for health professionals.

As a limitation of the present study, test–retest reliability was not evaluated. Future work should address stability of the Screenphiv scores across time. Further, to avoid burdening the study participants answering the assessment protocol, we did not include a well-being specific measure. Although the dimension health distress and mental health as represented by the MOS-HIV's MHS score focuses mainly on the experience of psychological wellbeing, we recognize that a further proper evaluation of the well-being needs to be considered in future studies with the Screenphiv.

We also should mention that the results of this study are specific to the Spanish population, and we recommend a validation study be conducted before applying the questionnaire in other populations.

In conclusion, we can affirm that the Screenphiv instrument for the assessment of psychological predictors of WB&QOL has demonstrated acceptable reliability and good evidence of validity enabling us to recommend its use in research and clinical settings in Spain.

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