

Development of the Scale of Perceived Social Support in HIV (PSS-HIV)

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Abstract Social support (SS) plays a key role for HIV/AIDS prevention and disease management. Numerous general and disease-specific SS instruments have been developed and perception of support has been increasingly considered, though no scales have been specifically developed to measure perceived social support (PSS) in HIV/AIDS. To help fill this gap a 12-item scale was developed. The study comprised 406 (HIV(+)) and HIV(–)) participants from Chile and the UK. A principal component factor analysis yielded three factors explaining 77.0 % of the total variance: *Belonging*, *Esteem* and *Self-development* with Cronbach α of 0.759, 0.882 and 0.927 respectively and 0.893 on the full scale. The PSS-HIV is brief, easy-to-apply, available in English and Spanish and evaluates the perception of supportive social interactions. Further research is needed to corroborate its capacity to detect psycho–socio–immune interactions, its connection with Maslow’s hierarchy of need theory and to evaluate its properties for different health states.

Resumen El apoyo social (AS) juega un rol clave en la prevención y manejo del VIH/SIDA. Numerosos

instrumentos de AS general y para enfermedades específicas han sido desarrollados y han incluido progresivamente el componente perceptivo, sin embargo; ninguna escala ha sido desarrollada específicamente para evaluar el apoyo social percibido (ASP) en VIH/SIDA. La presente escala de 12 ítems, intenta llenar este vacío. Se incluyeron 406 (VIH+ y VIH–) participantes de Chile y el Reino Unido. El análisis factorial de componentes principales arrojó tres factores explicando 77.0 % de la varianza total; *Pertenencia*, *Estima* y *Auto-desarrollo* con Cronbach α de 0.759, 0.882 y 0.927 respectivamente y 0.893 para la escala. Fácil de aplicar, breve y disponible en inglés y castellano; el ASP-VIH evalúa el apoyo percibido en las interacciones sociales. Futuras investigaciones deberán corroborar su capacidad para detectar interacciones psico-socio-inmunológicas, su conexión con la Teoría de Necesidades de Maslow y sus propiedades en otros estados de salud.

Keywords Perceived social support · HIV/AIDS · Scale development · Biopsychosocial · Factor analysis

Palabras clave Percepción del Apoyo social · VIH/SIDA · Escala · Biopsicosocial · Análisis factorial

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Introduction

The UNAIDS Global Report 2013 established that 2.3 million people acquired HIV around the world in 2012; a number that confirms the annual decline in new HIV acquisition. The same report notes that “HIV-related stigma and discrimination persist as major obstacles to an effective HIV response in all parts of the world” [1] resulting in delayed HIV-testing, poor adherence to medical consultation and medication, secrecy related to the

diagnosis, social isolation and harder social inclusion [1–5], becoming one more factor that increases the likelihood of negative affective states [5]. Therefore, it is not surprising to find high rates of stress, anxiety, depression, substance abuse, guilt, shame or suicidal thoughts among people living with HIV/AIDS (PLWHA).

Interpersonal relationships can have both positive and negative influences on health and well-being [6]. A positive perception of the provided support has been widely associated with positive outcomes relating to health and well-being. Therefore, SS has been broadly defined as all the positive interactions a person has with others [7]. Perceived social support (PSS) refers to the level of satisfaction that a person has in relation to his/her need for support, information and reciprocity [8] and it does not necessarily relate to number of interactions or number of supporters, the existence of social network does not guarantee the provision of social support (SS), establishing a difference between PSS and received support, been PSS more consistently related to beneficial health outcomes than has received support [9, 10].

Several studies have demonstrated SS positive effect regarding HIV treatment/consultation adherence, diagnosis disclosure, transmission risk behaviours, social isolation, immune functioning and health in general [11–17].

SS includes three main concepts: supportive networks, supportive behaviours and support as an emotional concept [18]. Emotional support is primarily expected from family or friends, while information might be expected from any personal or institutional network, and the level of support needed is different from person to person. In this way, similar levels of satisfaction from social networks can be interpreted as supportive or unsupportive depending on individual needs. Therefore; the degree of SS needed by each individual will strongly determine the perception of how gratifying his/her social interactions are. In this way, social networks, people's behaviour, and received support are defined in terms of how they are perceived, evaluated and interpreted by each person.

Several instruments have been developed to assess multiple dimensions of SS [19]; related to network theory [20]; received and/or provided support [21]; perceived SS for general population [22] online SS [23]; and health conditions [24]. Many of these are related to the impact of chronic health states [25], e.g. cancer [26, 27] or related to functional components of SS [28].

Despite SS and PSS [29] being widely described as playing a key role in the fight against HIV/AIDS, no instruments have been specifically developed to evaluate HIV/AIDS-related PSS, it usually being evaluated using general SS instruments such as the Interpersonal Support Evaluation List (ISEL) [30] or the Social Support Questionnaire (SSQ) [31], both designed to measure PSS among individuals in the general population, or the Functional

Social Support Questionnaire [32], originally developed to measure SS in patients attending primary care (family medicine) clinic, or the Measure of Social Capital [33], which measures the potential resources a person can access by being a recognised part of a specific network [34]. Several scales have been developed to evaluate HIV/AIDS-related SS. However, most of them have focused on received [35–37] SS rather than perceived SS.

Based on the described studies, PSS is proposed as a significant factor regarding the effects of SS on a person's wellbeing, defined by the individual's needs for support, as well as his/her perceptions and judgements about that support. Therefore, the supportiveness of individual's social network strongly depends on the individual's perceived needs and perceptions of support. Consequently, an instrument designed to evaluate the perception of how supportive social networks are for PLWHA becomes a central element in understanding the key concepts of social networks and SS, both with influence over health behaviours such as HIV sexual risk behaviour [38]; adherence to drug treatment [39, 40] and healthcare [41]; immune and virologic [39, 40] factors; mortality [40]; quality of life [42] and the psycho-social impact of HIV/AIDS [43–45].

To help fill the lack of a PSS scale that especially focus on PLWHA the scale of Perceived Social Support for HIV (PSS-HIV) was developed. The first version was developed in Spanish based on expert criteria and piloted in a sample of PLWHA in Chile. The second (English) version was tested using a British sample. The PSS-HIV is reported here as an easy-to-apply instrument to assess patients' subjective experiences to enhance understanding of how PLWHA perceive their SS and how this perception can directly affect disease clinical evolution, treatment and transmission/acquisition.

This project was approved by the Ethical Committees of the University of Nottingham and the Universidad de Chile, Clinical Hospital. All participants provided written informed consent.

Methods

Scale construction consisted of three stages and comprised 406 participants; 344 HIV(–) volunteers and 62 PLWHA from Chile and the UK. All the analyses were performed using SPSS V.20.

Stages

Stage 1: First (Spanish) Version of the Scale

Based on the authors' experience and literature review 34 items were developed. Seven experts were interviewed to analyse items suitability. Experts included professionals

(PhD, Masters, MD, Psychologists) working with PLWHA and/or researching about social psychology. They were individually interviewed (once) to analyse the proposed items. Several items were modified and 11 items were eliminated based on concordant suggestions. The resulting 23-item scale was piloted with a sample of 26 PLWHA in Chile (Sample 1) and included: (a) nine open questions related to quantitative indicators of social network/support; and (b) 14 items addressing the quality of the support provided. Items were scored on a Likert scale from one to five; from “strongly disagree” to “strongly agree”. For most item, 3 indicates neutral, but a “neutral” answer to items 11, 12, 13, 18, 20, 21 and 23 indicates a lack of SS (see items in Appendix 1). For instance a “neither agree, nor disagree” answer to the item “I feel emotionally sheltered by my family” evidence a lack on the shelter expected from the family. In these cases a neutral answer was assigned two points, the same as “disagree”.

Stage 2: Development of the English Version

The Spanish version was back-translated to develop the English version. An English version was provided by the authors to a professional translator¹ who translated this draft into Spanish. The discrepancies were discussed to find an agreement for semantic equivalence with the translator for the Spanish and English versions. Then, the resulting English version was applied over 31 HIV(–) participants to test language adjustments, before it was piloted on a sample of 210 HIV(–) volunteers in the UK, all UK HIV(–) participants were students recruited at the University of XX. Finally, the back-translated Spanish version was piloted using 103 HIV(–) volunteers in Chile recruited at the Universidad XX Clinical Hospital. Stage 2 comprised 244 HIV(–) participants, they were 18-years or older and those who reported to have a chronic disease, different than HIV/AIDS, were excluded from the evaluation to avoid interference of uncontrolled variables.

Item reduction focused on three criteria: (i) item performance, such as a ceiling effect (more than 95 % of respondent choose the top score [46]); (ii) principal component factor analysis; and (iii) internal consistency considering Cronbach $\alpha > 0.7 =$ acceptable, $>0.8 =$ good and $>0.9 =$ excellent [47].

Stage 3: Validation over PLWHA

The final versions (English and Spanish) of the PSS-HIV were administered to two samples of PLWHA; one in the UK and the other in Chile. PLWHA from the UK

($n = 12$) were recruited at the Derbyshire Positive Support; a peer support group for PLWHA. PLWHA from Chile ($n = 24$) were recruited at the Universidad XX Clinical Hospital. Participants were 18-years or older, diagnosed with HIV or AIDS, and enrolled on highly active antiretroviral therapy (HAART), and without any physical or psychological limitation such as would impact their ability to complete the questionnaires. They answered pen-and-paper self-applied forms of the PSS-HIV and the Hospital Anxiety and Depression Scale, HADS [48].

Convergent and Divergent Validity for All Samples

Anxiety [49, 50], depression [51, 52] and SS [53, 54] have been studied in a wide range of health states including HIV/AIDS and are highly correlated [55–57]. Convergent and divergent validity were evaluated by calculating correlation coefficients between the PSS-HIV final score and HADS subscales.

Factor Analysis

A principal component analysis (PCA) was conducted using the UK and Chilean HIV(–) data. The sampling adequacy was based on Kaiser–Meyer–Olkin criterion, considering $=$ or >0.90 as marvelous, $=$ or >0.80 as meritorious, $=$ or >0.70 as middling, $=$ or >0.60 as mediocre, $=$ or >0.50 as miserable and <0.50 as unacceptable [58]. A Bartlett test of sphericity was applied to test whether correlations differ significantly from zero. The number of relevant factors was determined by application of the Kaiser criterion (or eigenvalue-one criterion); therefore, components that had an eigenvalue greater than 1.0 were retained and interpreted. Since we hypothesised interactions between factors, the resulting factors were obliquely rotated (OBLIMIN procedure). From the resulting factor solution, items with factor loadings less than 0.40 were eliminated based on a widely utilised approach within researchers [59]. Next, item analyses for each factor were carried out. Finally, the internal reliability of the resulting subscales was assessed by Cronbach α .

Results

Stage 1: Data from the First (Spanish) Version

The first version of the scale was piloted using a sample of 26 men living with HIV/AIDS in Chile (age mean 38.3; SD = 7.6), obtaining significant inverse correlation for

¹ Translator: Prof. Ana María Pizarro; School of Modern Languages and Culture, University of Nottingham.

Table 1 Sample characteristics

Variables	HIV(–) total N = 313	
	UK	Chile
Sample		
N	210	103
Age		
Mean	23.4	30.5
SD	4.3	5.02
Gender		
Female (%)	61.7	100
Male (%)	38.3	0

stress² ($r = -0.601$; $p < 0.05$) and for depression³ ($r = -0.542$; $p < 0.05$) and positive correlations for the percentage of T CD4+ lymphocytes⁴ ($r = 0.358$; $p < 0.05$).

Stage 2: English Translation, Spanish Back-Translation and Item Reduction

In Chile 103 HIV(–) participants were evaluated (Spanish PSS version) and 210 participants in the UK (English PSS version). UK participants were slightly younger and Chilean sample was compounded by women, Table 1 summarises demographic data.

Item Modification/Elimination

Most changes implied direct item elimination (item numbering refers to the initial 23-item scale).

Six items were removed from the nine open questions related to quantitative factors of SS: items 1 and 9 addressed similar information to item 2; so only item 2 was kept. Items 3, 4, 6 and 8 showed poor discriminative power (ceiling effect). From the 14 items related to the perceived factors of SS two items were eliminated: number 10 was difficult to understand and 17 (additionally) showed limited discriminative power, with 52 % providing a neutral response (see Appendix 1).

Factor Analysis

The factor analysis was performed based on the remaining 12 items (see Appendix 2). Separate factor analyses were performed for the UK and Chilean HIV(–) samples. In the UK sample the measure of sampling adequacy was 0.868 (Kaiser–Meyer–Olkin) and a Bartlett test of sphericity was

significant ($c^2 = 762.02$, $df = 66$, $p < 0.001$). In the Chilean sample the measure of sampling adequacy was 0.839 (Kaiser–Meyer–Olkin) and a Bartlett test of sphericity was significant ($c^2 = 849.18$, $df = 66$, $p < 0.001$).

Factor Extraction

For both samples a principal axis factoring was carried out. The Kaiser criterion (Eigenvalue ≥ 1.00) was applied to determine the number of relevant factors. The separate analyses both yielded three factors; for the UK sample the three factors explained 57.8 % of the total variance (Factor 1: 38.1 %, Factor 2: 10.8 % and Factor 3: 8.9 %); and for the Chilean sample the three factors explained 77.0 % of the total variance (Factor 1: 46.4 %, Factor 2: 20.4 % and Factor 3: 10.2 %). All items had factor loadings greater than 0.4. There were no item eliminations based on these criteria, see Table 2 for the loadings on each factor.

As shown in Table 2, the resulting factors included nearly the same items; two items are shared by Factors 1 and 2 of both analyses. The factor analysis that explained the higher total variance (77.0 %) was kept.

The resulting factors refers to different needs in terms of SS and were labelled as follows (Table 3): (1) basic needs of support from primary sources of belonging and safety represented by the factor *Belonging*; (2) acceptance, affection and help from others refers to factor *Esteem*; and (3) the factor *Self-development* represents the perception of achieving individual growth and obtaining instrumental support.

Internal Consistency

For the Chilean sample, the overall scale showed good internal consistency (Cronbach $\alpha = 0.89$). Separate item analyses for each resulting sub-scale (factor) were carried out: *Esteem* showed good internal consistency (Cronbach $\alpha = 0.88$), for *Self-development* was excellent (Cronbach $\alpha = 0.93$) and for *Belonging* was acceptable (Cronbach $\alpha = 0.66$). For the UK sample, the overall scale also showed good internal consistency (Cronbach $\alpha = 0.83$). The sub-scales (factors) *Esteem* and *Self-development* showed good internal consistency (Cronbach $\alpha = 0.82$ and 0.80 respectively), but for *Belonging* was low (Cronbach $\alpha = 0.32$).

Inter-Correlations of the Subscales

Sub-scales scores were calculated based on the average of item score. As shown in Table 4, the sub-scales scores showed high correlations with the scale total score ($r > 0.76$; $p < 0.01$) and medium inter-correlation between each other (p between 0.56 and 0.63; $p < 0.01$). The items referring to numbers of people providing SS had lower correlations with the scale and subscales (p between 0.25

² Assessed by the Holmes and Rahe Self-evaluation Scale.

³ Assessed by the Beck Inventory of Depression.

⁴ Assessed by flow cytometry.

Table 2 Factor analysis pattern matrix

Scale		Components						
		Chile			UK			
Factor	Item	1	2	3	1	2	3	
Belonging	10	0.900		0.414	0.655			
	3	0.899			0.784			
Esteem	7		0.918			0.833		
	9		0.897			0.812		
	2	0.402	0.880			0.837		
	1	0.487	0.740			0.651		
Self-development	12			0.866		0.647	−0.500	
	4		0.464	0.810		0.689	−0.568	
	6			0.889		0.477	−0.701	
	8			0.870		0.533	−0.738	
	11			0.864			−0.734	
	5			0.835	0.425		−0.727	

Bold values indicate the items loaded in the factor analysis for each factor for the UK and Chilean population
Only items loading >0.4 are presented

Table 3 PSS-HIV items by factor

Factor	Item
Belonging	
10	If something is for my own good, my family will support me
3	I feel emotionally sheltered by my family
Esteem	
7	If I want to talk to somebody, I can turn to a friend/or my partner and he/she will listen to me
9	If I have problems my friend/partner would help me
2	I feel I can count on my closest friends or partner when I need to be listened to
1	I can freely express my opinion to my partner or group of friends
Self-development	
6	I think that my friends give me possibilities for growth
8	Most of the time, solutions to problems presented by my group of friends are useful
11	Among my friends conflicts are promptly resolved
5	To be part of a group of friends allows me to know myself better
12	My friends have been able to give me affection when I have needed it
4	If I ask for it, my friends can give me good advice for my personal development

and 0.31; $p < 0.01$) Additionally, the scale and sub-scales had medium correlations with anxiety and depression measures (r between -0.35 and -0.55 ; $p < 0.01$).

Variable Distribution

Since the mean and SD of population distribution were unknown for our scale of PSS and to reduce the probability

Table 4 Inter-correlations of the PSS-HIV sub-scales

	Scale	Belonging	Esteem	Self-development
Scale	1	0.762**	0.917**	0.842**
Belonging	0.762**	1	0.563**	0.563**
Esteem	0.917**	0.563**	1	0.632**
Self-development	0.842**	0.563**	0.632**	1
Quantitative	0.309**	0.295**	0.255**	0.270**
Anxiety	−0.480**	−0.522**	−0.396**	−0.374**
Depression	−0.534**	−0.548**	−0.495**	−0.349**

** Correlation is significant at the 0.01 level (2-tailed)

of a type I error by using the Kolmogorov–Smirnov (K–S) test [60], the Lilliefors test, a modification of the K–S test was used instead [61], the null hypothesis for Lilliefors test is that the data is normally distributed. The scores of the total scale (Lilliefors $p < 0.01$) and on the subscales *Esteem*, *Self-development*, and *Belonging* (Lilliefors $p < 0.01$) were not normally distributed. It has been reported that health and SS are closely related [62] and, as mentioned earlier, poor SS has been linked with higher anxiety and depression, both conditions with less than 10 % of incidence in the UK [63] and in Chile [64]. Consequently, it was not surprising that the HIV(−) sample generally rate their social network more positively, resulting in a skewed distribution.

Scoring

The final scale was composed of 12 Likert-type items, all scored 1–5. Possible overall scores range from 12 to 60

Table 5 PSS-HIV items scoring table for final version

Items	Answer	Score
All	Strongly disagree	1
All	Disagree	2
1, 2, 3, 7, 9, 10 and 12	Neither agree nor disagree	2
4, 5, 6, 8 and 11	Neither agree nor disagree	3
All	Agree	4
All	Strongly agree	5
	Maximum score	60
	Minimum score	12

Table 6 Sample characteristics

Variables	PLWHA total <i>N</i> = 36	
	UK	Chile
Sample		
<i>N</i>	12	24
Age		
Mean	40.83	35.87
SD	8.1	8.4
Gender		
Female (%)	41.7	4.2
Male (%)	58.3	95.8

points. Table 5 provides the scoring key for the final version of the PSS-HIV.

Stage 3: Validation over PLWHA

The final versions of the PSS-HIV were administered to a sample of PLWHA in the UK (English version) and in Chile (Spanish version). No differences in age were found between the samples, but the Chilean sample had a higher percentage of men. See demographic data in Table 6. In the UK HIV+ sample adequacy was $KMO = 0.621$ and a Bartlett test of sphericity was significant ($c^2 = 105.24$, $df = 55$, $p < 0.001$). In the Chilean HIV+ sample the KMO was 0.764 and a Bartlett test of sphericity was significant ($c^2 = 272.89$, $df = 66$, $p < 0.001$).

Construct Validity

Construct validity was assessed by calculating correlation coefficients between the PSS-HIV and HADS scores in the samples of 12 PLWHA in the UK and 24 in Chile. The full test and its subscales showed, as expected, negative and significant correlations with anxiety and depression (see all resulting correlations in Table 7).

Table 7 Correlations: PSS and HADS

Sample	HADS	
	Anxiety	Depression
Scale		
UK	-0.875**	-0.917**
Chile	-0.758**	-0.688**
Esteem		
UK	-0.764**	-0.838**
Chile	-0.660**	-0.625**
Self-development		
UK	-0.796**	-0.786**
Chile	-0.672**	-0.621**
Belonging		
UK	-0.695*	-0.757**
Chile	-0.709**	-0.555**

** Significance level <0.01; * significance level <0.05

Table 8 Cronbach α PSS-HIV on PLWHA

	Scale	Esteem	Self-development	Belonging
UK	0.910	0.948	0.843	0.635
Chile	0.937	0.924	0.918	0.833

All sub-scales showed medium or high correlations with anxiety and depression scale. Additionally, significant differences were found in the PSS scores when compared HIV(-) ($M = 50.37$, $SD = 5.67$) and HIV(+) participants ($M = 42.5$, $SD = 10.5$); $t(220) = -4.13$, $p < 0.001$ in the UK. Similarly, significantly higher PSS scores ($t(120) = 1.98$, $p < 0.049$) were found in Chile comparing HIV(-) ($M = 52.17$, $SD = 5.05$) and HIV(+) participants ($M = 49.29$, $SD = 10.23$).

Internal Consistency on HIV(+) Samples

The internal consistency of the PSS-HIV for the UK ($\alpha = 0.910$) and Chilean ($\alpha = 0.937$) PLWHA samples were excellent. Table 8 shows Cronbach α for the scale and sub-scales for both samples.

Discussion

The final scale included 12 items divided into 3 sub-scales. The scale and sub-scales showed reasonable inter-correlations indicating an association between each other but with the capacity to differentiate if necessary. The lower correlation coefficients between items referring to more quantitative indicators of SS and scale and sub-scales score is consistent with the statement that PSS does not

necessarily relates to number of interactions or number of supporters (quantity), but more commonly with the quality of the support provided [65, 66].

Often translated scales (usually from English) have issues regarding psychometric, cultural equivalence and/or language appropriateness; one of the most important features of the PSS-HIV scale is its “bilingual origin”. This is also one of the main differences when compared with existing guidelines on scale development. The authors have between them both native English and native Spanish, and so are able to deal with translation issues.

The results indicate the capacity of the scale and subscales to detect an association between anxiety and depression with similar results to other widely used SS scales such as the Medical Outcome Scales-Social Support Survey (MOS-SSS) [25] and the Multidimensional Scale of Perceived Social Support (MSPSS) [22] in association with depression [67, 68] and the SSQ [31] in association with both anxiety and depression [69]; plus immunological parameters among PLWHA and to establish significant differences between HIV+ and HIV− participants, indicating the PSS-HIV capacity to evaluate related but different constructs and supporting the conclusion of convergent validity [70] and discriminative capacity between different populations; this could also be interpreted as a single underlying factor: PSS.

The resulting factors had 83 % (10 out of 12) similarity between the Chilean and the UK sample. Even though in both samples items number 4 and 12 were loaded for the same two factors, this may still imply some cultural differences; item 4 refers to the availability of advice when asked for it and item 12 to availability of affection when needed, which seems to be more related to *Self-development* for the Chilean participants and to *Esteem* for the British ones. The age difference in the samples (mean UK = 23.4; Chile = 30.5) might explain this result. Further research with a re-test model might give more information to better interpret this result.

Except for the sub-scale *Belonging* in the UK sample (Cronbach $\alpha = 0.32$), the scale and subscales showed good internal consistency for HIV(+) and HIV(−) samples in the UK and Chile. This difference in the internal consistency is consistent with the literature; SS is perceived differently if it comes from friends or from family [55]. For instance, the factor *Self-development* focused on friend support while the factor *Belonging* focused on family support. These may be subcategories of the same construct. On the other hand, this discrepancy may suggest a difference between the samples, possible related to population differences detected by the scale.

Each sub-scale can be interpreted as representing different levels-of-need of SS: (1) the subscale *Belonging* relates to family support, i.e. basic support, safety and

protection from primary groups of membership, (2) the subscale *Esteem* relates to the acceptance, affection and emotional help from others, and (3) the subscale *Self-development* refers to the perception of achieving individual growth based on provided support as a self-actualisation-like factor. This suggests a novel theoretical relationship between PSS and Maslow’s Hierarchy of Needs. Further research should explore this relationship between Maslow and SS.

Further test–re-test models are needed to confirm the loading factors and to establish cut-off values, relating not only with psychological variables such as anxiety and depression, but also to immunological factors such as CD-4 lymphocytes percentage or total count.

The UK sample of PLWHA was small which might affect generalizations over this specific population, but we can assume that the PSS-HIV is a useful scale that provides a disease-specific measure, which gives an advantage over general measures of SS, helping evaluate of the perception of how supportive social networks are for PLWHA. In this way, a lower score on the PSS-HIV scale suggests lower PSS, higher levels of anxiety and depression and lower percentage of CD4+ lymphocytes. The direct correlation between the PSS-HIV and immune markers (CD4+ lymphocytes; $r\ 0.358$; $p < 0.05$) indicates a possible capacity to detect biopsychological interactions with HIV. Further research is needed to corroborate this finding and identify possible therapeutic or prognostic implications of the total score and the different subscales in HIV/AIDS, healthy conditions or under other specific diseases.

Conclusions

Social isolation affects the majority of those living with HIV/AIDS and its impact over mental health, disease management, sexual risk behaviours and the immune functioning have been worldwide documented. Therefore, the scale of PSS-HIV—in English (Appendix 2) and Spanish (Appendix 3)—was specifically developed to assess the perceived component of the support provided by social network and can provide valuable data to establish strategies more related to each person specific level of needs and context and thus, integrate in a practical tactic, a systemic hands-on approach for PLWHA.

The scale is composed of three sub-scales resembling the three top levels Maslow’s Hierarchy of Needs: (a) *Belonging*: the basic needs of support and safety; (b) *Esteem*: the acceptance, affection and help from others; and (c) *Self-development*: the perception of achieving individual growth.

The PSS-HIV was developed for and tested among PLWHA in Chile, re-structured on the base of a non-HIV/

AIDS multicultural sample and then, two similar samples of PLWHA from different cultural background were evaluated obtaining similar results. On this basis this scale can be use either for PLWHA or HIV(–) participants. A validation using a larger sample of PLWHA would corroborate our findings. In the same way future work could also confirm the PSS-HIV utility in other disease-specific statuses.

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Conflict of interest The authors have no conflict of interest to declare.

Appendix 1

First 23-item Version of the Scale of Perceived Social Support in HIV (PSS-HIV).

- a Educational level:
- b Age:
- c Sex (M/F):

SECTION ONE

- 1 During the last three months, how many groups or social networks have you taken part in?
- 2 What areas do your social networks or groups belong to? (select -with "X"- all of them)
- 3 Do you feel that you contribute to your group of friends?
- 4 Do you think your friends consider it important what happens within your group?
- 5 Which group, of which you belong do you feel closer to?
- 6 Do you think that you have friends would do an effort in order to maintain the friendship?
- 7 How often do you usually meet with your closest friends?
- 8 How important is your contribution to your closest friends?
- 9 Approximately; how many close friends do you have in each of the following groups (if any)?
(Put the number in correspondent category)

SECTION TWO

- 10 My closest group of friends has characteristics that provide its own identity.
- 11 I can freely express my opinion with my group of friends or partner.
- 12 I feel I am listened to enough by my closest friends or partner.
- 13 I feel myself sheltered by my family.
- 14 My friends give me good advice for my personal development.
- 15 To be part of a group of friends allows to me know about myself better.
- 16 I think that my friends give me possibilities to grow.
- 17 I feel myself represented by my closest group identity.
- 18 If I want to talk to somebody I can turn to a friend/or my partner and he/she will listen to me
- 19 Most of the time, the solutions of my group, are good.
- 20 If I have problems my friend/partner would help me.
- 21 If it is for my wellbeing, my family will support me
- 22 Among my friends we quickly resolve conflict.
- 23 My friends have been able to give me affection when I needed it.

Appendix 2

Scale of Perceived Social Support in HIV (PSS-HIV)

Cortes A., Hunt N. & McHale S. - 2014

Respondent data: _____ Age: _____
 Evaluation date: _____ Sex (M/F): _____

Please, answer all items using an "X"

N	SCALE	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	I can freely express my opinion to my partner or group of friends.					
2	I feel I can count on my closest friends or partner when I need to be listened to.					
3	I feel emotionally sheltered by my family.					
4	If I ask for it, my friends can give me good advice for my personal development.					
5	To be part of a group of friends allows me to know myself better.					
6	I think that my friends give me possibilities for growth.					
7	If I want to talk to somebody, I can turn to a friend/or my partner and he/she will listen to me.					
8	Most of the time, solutions to problems presented by my group of friends are useful.					
9	If I have problems my friend/partner would help me.					
10	If something is for my own good, my family will support me.					
11	Among my friends conflicts are promptly resolved.					
12	My friends have been able to give me affection when I have needed it.					

Appendix 3

Escala de Percepción del Apoyo Social en VIH (PAS-VIH)

Cortes A., Hunt N. & McHale S. (2014)

Datos del participante: _____ Edad: _____
 Fecha de evaluación: _____ Sexo (M/F): _____

Por favor, responde todos los ítems usando una "X"

N	ESCALA	Muy de acuerdo	De acuerdo	Más o menos	En desacuerdo	Muy en desacuerdo
1	Puedo expresar mi opinión libremente con mi pareja o grupo de amigos.					
2	Siento que puedo contar con mis amigos o pareja cuando necesito que me escuchen.					
3	Me siento emocionalmente apoyado por mi familia.					
4	Si lo pido, mis amigos pueden darme buenos consejos para mi desarrollo personal.					
5	Ser parte de un grupo de amigos me permite conocerme mejor.					
6	Creo que mis amigos me ofrecen posibilidades de crecimiento.					
7	Si quiero hablar con alguien, puedo buscar a un amigo/a o mi pareja y ella/el me escuchará.					
8	Generalmente, las soluciones que me entrega mi grupo de amigos son útiles.					
9	Si tengo problemas, mis amigos o pareja me ayudará/n.					
10	Si algo es por mi propio bien, mi familia me apoyará.					
11	Entre mis amigos, los problemas se resuelven rápidamente.					
12	Mis amigos han sido capaces de darme afecto cuando lo he necesitado.					

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