PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Measuring Disability Experienced by Adults Living with HIV: Assessing Construct Validity of the HIV Disability Questionnaire using Confirmatory Factor Analysis
AUTHORS	O Brien, Kelly; Bayoumi, Ahmed; Solomon, Patricia

VERSION 1 - REVIEW

REVIEWER	Associate Professor Hellen Myezwa University of the Witwatersrand Physiotherapy department Johannesburg South Africa
REVIEW RETURNED	15-Jul-2014

GENERAL COMMENTS	It is advisable to report on the eigen values (principle component analysis) and communalities? One usually checks these things first and if the values are acceptable, only then you are “allowed” to go onto factor analysis. I see the authors used SPSS and MPlus, these software packages do the Eigen values and communalities almost automatically.

REVIEWER	Sumaya Mall Columbia University USA
REVIEW RETURNED	21-Jul-2014

GENERAL COMMENTS	This is a very well written article. I suggest a few conceptual changes before the manuscript can be accepted for publication. Firstly why the choice of measuring instruments? Has the Episodic Disability Framework been used previously in studies of HIV positive populations? I would like to see a stronger description of your goodness of fit test. It feels like the discussion is a repetition of the results. Try to be more analytical. Are your findings reminiscent of previous studies? I also think that the conclusion could be stronger. What are the implications for public health?

VERSION 1 – AUTHOR RESPONSE

Reviewer Name:
Hellen Myezwa (University of the Witwatersrand)

2) It is advisable to report on the eigenvalues (principle component analysis) and communalities? One usually checks these things first and if the values are acceptable, only then you are “allowed” to go onto factor analysis. I see the authors used SPSS and MPlus, these software packages do the Eigen values and communalities almost automatically.

Thank you. We agree that communalities and eigenvalues are important aspects of factor analysis, specifically exploratory factor analysis. Communality and eigenvalue estimates help determine whether a factor exists and which items ‘relate’ to that factor. Communalities (h2) are a feature of items in a data set that represents the amount of variance each individual item has in common with all other items. Eigenvalues are a feature of factors defined as the amount of variance in all items explained by a given factor or component. Factors with larger eigenvalues account for greater variance compared with factors with lower eigenvalues. Communalities can help determine whether a matrix is factorable and eigenvalues are assessed to help determine the number of factors to retain in a solution. These steps are pertinent to exploratory factor analysis which we used in an earlier study to determine the number of domains of disability in the HDQ. (See reference #10 - O’Brien KK, Solomon P, Stratford P, Bayoumi AM. Which dimensions of disability does the HIV Disability Questionnaire (HDQ) measure? A factor analysis. Disability and Rehabilitation. In Press).

In this study, we conducted a confirmatory factor analysis to assess the construct validity of the domains of disability in the HDQ. Unlike exploratory factor analysis that uses communalities to proceed and eigenvalues to determine the number of factors to retain, in confirmatory factor analysis the numbers of factors (or in this case the six domains of the HDQ) are already known. In confirmatory factor analysis, construct validity is evaluated by goodness of fit statistics that determine how well the proposed model (or HDQ items) represent the relationships between the factor (or six domains of disability in the HDQ). We hypothesized that domains in the HDQ represented six dimensions of disability, each represented by specific items in the HDQ: physical symptoms and impairments (represented by 20 items); cognitive symptoms and impairments (3 items); mental and emotional health symptoms and impairments (11 items); uncertainty (14 items); difficulties with day-to-day activities (9 items) and challenges to social inclusion (12 items).

Reviewer Name: Sumaya Mall (Columbia University)

3) This is a very well written article. I suggest a few conceptual changes before the manuscript can be accepted for publication. Firstly why the choice of measuring instruments? Has the Episodic Disability Framework been used previously in studies of HIV positive populations?

Thank you. Given current treatments for HIV and the long-term survival for successfully treated individuals, measuring disability is critical for determining the impact of the disease, its comorbidities and its interventions. While a multitude of health status instruments exist, none captured the breadth and depth of disability experienced by adults living with HIV. Hence, the purpose of the HDQ is to describe the presence, severity and episodic nature of disability experienced by adults living with HIV. Items in the HDQ were derived from the dimensions of disability in the Episodic Disability Framework, a conceptual framework derived from the perspectives of adults living with HIV. The Episodic Disability Framework has been developed and empirically validated with adults living with HIV (O’Brien KK, Hanna S, Gardner S et al. Validation of the Episodic Disability Framework with adults living with HIV. Disability and Rehabilitation. 2014; 36(4):319-329). The Framework also has been used to inform qualitative approaches to exploring experiences of older men who self-identify as having HIV-associated neurocognitive challenges (Hopcroft et al. 2013), and more recently

considered an approach to conceptualize disability among people living with HIV internationally (Hanass-Hancock and Nixon, 2009). This is the first known study to use the Episodic Disability Framework to inform the development and validation of a new measure of disability for adults living with HIV. As recommended, we added a section in the Discussion describing the development of the HDQ from the Episodic Disability Framework, how the Framework has been used more broadly in the context of HIV, and the importance of measuring episodic disability among people living with HIV (Page 19, Line 275-288).

4) I would like to see a stronger description of your goodness of fit test.

We used a combination of approaches to evaluate the overall goodness of fit of the confirmatory factor analysis solution including the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker Lewis Index (TLI). We considered the RMSEA as the primary statistic for overall goodness of model fit because it is recommended for confirmatory factor analysis and is less sensitive to sample size. We added more description of each of the goodness of fit indices in the analysis section (page 8-9; Line 162-170).

5) It feels like the discussion is a repetition of the results. Try to be more analytical. Are your findings reminiscent of previous studies? I also think that the conclusion could be stronger. What are the implications for public health?

Thank you for the suggestion to strengthen the discussion. We expanded on sections in the discussion to describe the implications of the results as they relate to the development and application of the HDQ in research and clinical practice and more broadly to public health policy. For instance, correlation between latent variables, mental and emotional health challenges and challenges to social inclusion, may reflect the influence of mental health on aspects of social inclusion such as employment among people living with HIV. When administering the HDQ, researchers, clinicians and community members should acknowledge the interrelationships between dimensions of disability and the influence dimensions may have on each other when interpreting HDQ domain scores (Page 18-19; Line 262-269). Also, we added a statement about policy implications. Universal measurement of disability with the HDQ may facilitate more broad and ongoing tracking of episodic disability trends and evaluation of interventions to inform resource allocation, as well as income and employment program and policies to ensure optimal care and social inclusion for people living with HIV (Page 21, Line 325- 328). Lastly, we strengthened the overall conclusions stating that the HDQ can be used to describe the multi-dimensional nature of disability experienced by adults with HIV and lay the foundation for more widespread measurement of disability in HIV clinical practice and research (Page 22-23; Line 355-358).