Author’s response to reviews

Title: Characterizing the Disability Experience among Adults Living with HIV: A Structural Equation Model Using the HIV Disability Questionnaire (HDQ) within the HIV, Health and Rehabilitation Survey

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Author’s response to reviews:

December 2, 2018
Dear Dr. Cassady-Cain and Dr. Devoto,

Thank you for your correspondence regarding our manuscript entitled: Characterizing the Disability Experience among Adults Living with HIV: A Structural Equation Model Using the HIV Disability Questionnaire (HDQ) within the HIV, Health and Rehabilitation Survey, for BMC Infectious Diseases.

We appreciate the reviewers taking the time to review of the manuscript. We uploaded a revised version of the manuscript with revisions highlighted in yellow. Our point-by-point response to the reviewers’ comments is below. Please do not hesitate to contact me if you require any further information.

Thank you again for considering our manuscript for publication in BMC Infectious Diseases. We look forward to hearing from you.

Sincerely,

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Reviewer 1 Comments

1. William L. Holzemer: Excellent manuscript, contributing new knowledge about the role of disability and comorbidity of people living with HIV. The identification of "uncertainty" as a key concept in understanding predictors and outcomes was fascinating and from my experience, suggests it is a very important concept - not only in HIV but other areas such as oncology. I really enjoyed the manuscript.

Thank you.

Reviewer 2 Comments

2. The Disability Experience among Adults Living with HIV is an important topic, and deserves further research. However, significant revisions are needed, addressing some major concerns. In terms of the rationale and justification for the study - not enough case is made in the paper. The Author(s) aim at characterizing the disability experience and examining the relationships between dimensions of disability among adults living with HIV, but this aim is too generic and it has to be better defined and argued. The author(s) could break down into more specific objectives. Please also provide
a closer linkage between the literature review and the specific objectives and between the specific objectives and each of the direct and indirect (mediating) effects in the SEM (Figure 1).

We revised the introduction to strengthen the rationale for the study to better justify the need to examine relationships between dimensions of disability in the context of HIV. (Introduction: Page 7-8). Instead of adding objectives we operationalized ‘dimensions of disability’ in the aim statement to read: “Our aim was to characterize the disability experience and to examine the relationships between dimensions of disability, specifically physical, cognitive, mental and emotional symptoms and impairments, difficulties with day-to-day activities, uncertainty, and challenges to social inclusion among adults living with HIV.” (Page 9). We revised the literature review to highlight the limitations of existing disability frameworks on understanding the influence that dimensions of disability have on one another and that it is important to identify these relationships in order to identify where to target interventions to most effectively reduce disability among adults living with HIV. We highlighted earlier work that examined relationships between disability, but did not include the concept of uncertainty, which is a dimension of disability in the Episodic Disability Framework. We also revisit this in the discussion highlighting how this analysis builds on previous work examining relationships of disability. In the discussion, we also highlight our hypothesized direct relationships from physical, cognitive, and mental-emotional health challenges and uncertainty to predict challenges with social inclusion based on our previous work and supported by the literature.

3. It is written that standardized path coefficients of >0.2-0.5 were considered as a medium (moderate) effect and >0.5 a large (strong) effect. I believe that these criteria are valid for correlation coefficients (see Cohen's guidelines on that) which are different from standardized path coefficients. I went through the book "Principles and Practice of Structural Equation Modeling", but I was not able to find such criteria. Please double check.

We agree that standardized path coefficients are not correlation coefficients, rather linear regression weights used to examine the potential causal links between variables in structural equation modeling. Standardized parameter estimates were interpreted as the number of standard deviation increases above the mean in the outcome variable for every 1 standard deviation above the mean of the predictor variable. We acknowledge that the categories are arbitrary and interpretations of the strength of path coefficients may vary. We based our a priori interpretation of the strength of standardized path coefficients in Kline et al, Principles and Practice of Structural Equation Modeling (3rd Edition) whereby ‘an absolute standardized effect of <0.1 may be considered a smaller effect, values around 0.30 a ‘typical’ or ‘medium’ effect, and values >0.5 a ‘larger effect’. (Appendix 7.A; Page 185). We defined our criteria for path coefficients as either ‘moderate’ or ‘strong’. We revised our methods accordingly (Methods; Page 13).

4. Mean imputation of missing values should not be used. See the work of Graham (2009). It is essential to compare the characteristics of the sample and population from which it is drawn.

We thank the reviewer for this informative reference. We agree that mean imputation of missing values is not an ideal for dealing with missing data as it assumes that data are missing completely at random (MCAR). Out of the 941 cases included in the analysis, 908 (96%) had complete HDQ data. We used mean imputation at the time of HDQ scoring in order to recover the subscale HDQ scores, prior to the SEM analysis to bring the dataset from 908 complete case responses (96%) to 941. It was the subscale scores that were used in the analysis. The severity items we used to compute the subscale scores had few missing responses <5% across all cases, ranging from 1 missing response (0.1%) for HDQ51 (I have trouble climbing stairs) to 33 missing responses (3.5%) for HDQ19 (I have problems with my
hearing). Despite the low rates of missingness among HDQ responses, we acknowledge the limitation of mean imputation in our discussion and reference the Graham (2009) article as preferred approaches to using full implementation maximum likelihood (FIML) methods to ‘preserve the characteristics of the data as much as possible’ in SEM, so that parameter estimates are unbiased, meaning that the estimated mean and variance of the dataset are as close as possible to that of the true population. (Discussion Page 26).

5. Please stress the theoretical implications of the study.

We added a section in the discussion to profile how the findings relate to disability theory, and specifically build on the Episodic Disability Framework which provided dimensions of disability but not the relationships between them. Future work should consider the contextual factors and their influence on each of the disability dimensions. (Discussion, Page 22).