**Supplemental Digital Content**

**Table S1**. Structure of the Measurement Model: ICF Rubrics, Factors, Domains, and Details of the Measures. Rubric colors correspond to Figure 1.

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| **PERSONAL FACTORS**: Age, Education  |
| **IMPAIRMENTS** | **ACTIVITY LIMITATIONS** | **PARTICIPATION RESTRICTIONS** |
| **HIV-related** | **Stigma** | **Brain Health** |
| Signs and symptomsa | Beliefs Domain: WHOQOL-HIV BREFb | Depressionc,d (HADS, RAND-36 MHI) | Physical function (RAND-36 PFI)f | Social role(RAND-36 SF)i |
| Duration of HIV infection | Anxietyc,d (HADS, RAND-36 MHI) | Cognitive difficulties (PDQ)g | Life-Space Mobilityj  |
| Cognitive performance (B-CAM)e | Meaningful activities (CHAMPS)h |
| **ENVIRONMENTAL FACTORS**: WHOQOL-HIV Domain V (Environment)k and item forsocial supportl |

a. Revised Sign and Symptom Check-List for HIV (SSC-HIVrev)28 including presence and intensity: weakness, loose stools, diarrhea, dizziness, headaches, weight gain in the stomach area, hump on the back of neck, skinny arms and legs, prominent leg veins, numbness/tingling of feet/toes weakness, gastrointestinal symptoms, headaches, numbness, change in body shape.

b. Beliefs domain of the WHOQOL-HIV BREF questionnaire34: To what extent are you bothered by people blaming you for your HIV status? [5-point scale: “not at all” to “an extreme amount”].

c. Hospital Anxiety and Depression Scale32, Anxiety sub-scale (7 items): tense/wound up, frightened/nervous, worrying thoughts, restless, panic, relaxed; Depression sub-scale (7 items): enjoy things (2 items), slowed down, lost interest in appearance, laugh, look forward, cheerful; 4-point frequency scale.

d. RAND-3631 Mental Health includes anxiety (A) and depression (D) items: During the past 4 weeks: Have you been a very nervous person (A); Have you felt so down in the dumps that nothing could cheer you up (D); Have you felt calm and peaceful (A); Have you felt down (D); Have you been a happy person (D)?

e. Brief Cognitive Assessment Measure (B-CAM) a computerized battery of cognitive tests tapping simple reaction time, verbal memory, working memory, choice reaction time, attention and interference control30.

f. RAND-3631 Physical Functioning: Does your health now limit you in vigorous activities, moderate activities, lifting or carrying groceries, climbing stairs, Bending, kneeling or stooping, Walking (100 metres, half a kilometre, more than one kilometre), bathing or dressing yourself; 3 point limitation scale

g. Perceived Deficits Questionnaire (PDQ)33: 20 self-report items on memory and concentration; 4-point frequency scale.

h. Current engagement in meaningful activity: hours per week spent in recreation, leisure, household management, sports with content derived from Community Healthy Activities Model Program for Seniors (CHAMPS) measure26.

i. RAND-3631 Social Function (Social Role): During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or groups?

j. Life-Space Mobility (LSM)27: spatial measure of the area through which a person travels over a specified time period ranging from displacement extending from within one’s own home to displacement beyond one’s town or geographic region.

k. WHOQOL-HIV BREF questionnaire14 Domain V (Environment): How safe do you feel in your daily life? How healthy is your physical environment? Do you have you enough money to meet your needs? How available to you is the information that you need in your day-to-day life? To what extent do you have the opportunity for leisure activities? How satisfied are you with the conditions of your living place? How satisfied are you with your access to health services? How satisfied are you with your transport?

l. Social support: WHOQOL-HIV BREF questionnaire14, How satisfied are you with the support you get from your friends?

**Supplementary Table 2. Direct effects of model variables**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Personal** | **Environment** | **Biology** |  **Stigma** | **Impairments** | **Activities** | **Participation**  | **Direct effect** | **SE** | **STDYX** |
| Age |   | HIV-symptoms |   |   |   |   | 0.023a | 0.012 | 0.077 |
| Age |   | Duration of HIV  |   |   |   |   | 0.293 | 0.04 | 0.3 |
| Age |   |   | Stigma |   |   |   | -0.014 | 0.005 | -0.104 |
| Age |   |   |   | Anxiety |   |   | 0.284 | 0.081 | 0.131 |
| Age |   |   |   | Depression |   |   | 0.128 | 0.065 | 0.068 |
| Age |   |   |   | B-CAM |   |   | -0.18 | 0.024 | -0.328 |
| Age |   |   |   |   | Physical  |   | -0.386 | 0.093 | -0.156 |
| Age |   |   |   |   | Cognitive |   | 0.147 | 0.071 | 0.07 |
| Age |   |   |   |   |   | Social role | 0.393 | 0.107 | 0.122 |
| Education |   | HIV symptoms |   |   |   |   | -0.188a | 0.098 | -0.078 |
| Education |   |   |   | Depression |   |   | -1.222 | 0.413 | -0.081 |
| Education |   |   |   | B-CAM |   |   | 0.662 | 0.166 | 0.15 |
| Education |   |   |   |   | Physical |   | 1.736 | 0.765 | 0.088 |
|   |  Social support |   |  Stigma |   |   |   | -0.151 | 0.061 | -0.133 |
|   |  Social support |   |   | Anxiety |   |   | 2.069 | 0.78 | 0.113 |
|   |  Social support |   |   | Depression |   |   | 3.176 | 0.675 | 0.201 |
|   |  Social support |   |   |   | Physical |   | -3.185 | 0.895 | -0.153 |
|   |  QoE | HIV symptoms |   |   |   |   | -0.042 | 0.006 | -0.284 |
|   |  QoE |   |  Stigma |   |   |   | -0.01 | 0.004 | -0.144 |
|   |  QoE |   |   | Anxiety |   |   | 0.439 | 0.048 | 0.412 |
|   |  QoE |   |   | Depression |   |   | 0.442 | 0.041 | 0.479 |
|   |  QoE |   |   | Cognitive performance |   |   | 0.065 | 0.011 | 0.243 |
|   |  QoE |   |   |   | Physical |   | 0.287 | 0.065 | 0.237 |
|   |  QoE |   |   |   | Meaningful |   | 0.163 | 0.076 | 0.085 |
|   |  QoE |   |   |   |   | LSM | 0.012 | 0.003 | 0.17 |
|   |   | HIV symptoms |  Stigma |   |   |   | 0.063 | 0.019 | 0.14 |
|   |   | HIV symptoms |   | Depression |   |   | -1.487 | 0.228 | -0.237 |
|   |   | HIV symptoms |   | Anxiety |   |   | -1.753 | 0.286 | -0.242 |
|   |   | HIV symptoms |   |   | Physical |   | -1.803 | 0.352 | -0.219 |
|   |   | HIV symptoms |   |   | Cognitive |   | -0.843 | 0.242 | -0.121 |
|   |   | Duration of HIV |  Stigma |   |   |   | -0.012 | 0.006 | -0.089 |
|   |   | Duration of HIV |   | B-CAM |   |   | -0.046 a | 0.024 | -0.082 |
|   |   | Duration of HIV |   |   | Physical |   | -0.217 | 0.097 | -0.086 |
|   |   |   |  Stigma | Anxiety |   |   | -2.821 | 0.636 | -0.176 |
|   |   |   |  Stigma | Depression |   |   | -0.992 a | 0.540 | -0.071 |
|   |   |   |  Stigma | B-CAM |   |   | -0.396 | 0.164 | -0.098 |
|   |   |   |   | Anxiety | Physical |   | -0.229b | 0.139 | -0.202 |
|   |   |   |   | Anxiety | Cognitive |   | 0.529 | 0.045 | 0.549 |
|   |   |   |   | B-CAM | Meaningful |   | 1.219 | 0.346 | 0.17 |
|   |   |   |   | B-CAM | Cognitive |   | 0.987 | 0.151 | 0.259 |
|   |   |   |   | Depression | Physical |   | 0.567 | 0.183 | 0.432 |
|   |   |   |   | Depression |   | Social role | 0.963 | 0.082 | 0.563 |
|   |   |   |   |   | Cognitive | Social role | 0.234 | 0.061 | 0.152 |
|   |   |   |   |   | Cognitive | LSM | 0.007 | 0.003 | 0.109 |
|   |   |   |   |   | Physical | Social role | 0.175 | 0.044 | 0.134 |
|   |   |   |   |   | Physical | LSM | 0.005 | 0.002 | 0.094 |

The variables, both observed and latent, are structured under the ICF framework. Columns on the right provide the estimate of direct effect with its standard error, along with a standardized effect (standardized beta) for comparisons. a0.05 < *p* < 0.10; all other associations are *p* < 0.05 unless otherwise indicated. b*p* > 0.10, but needed for overall model fit.