

# Reliability and Validity of the HIV Disability Questionnaire (HDQ) with Adults Living with HIV in Canada and Ireland



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## Background

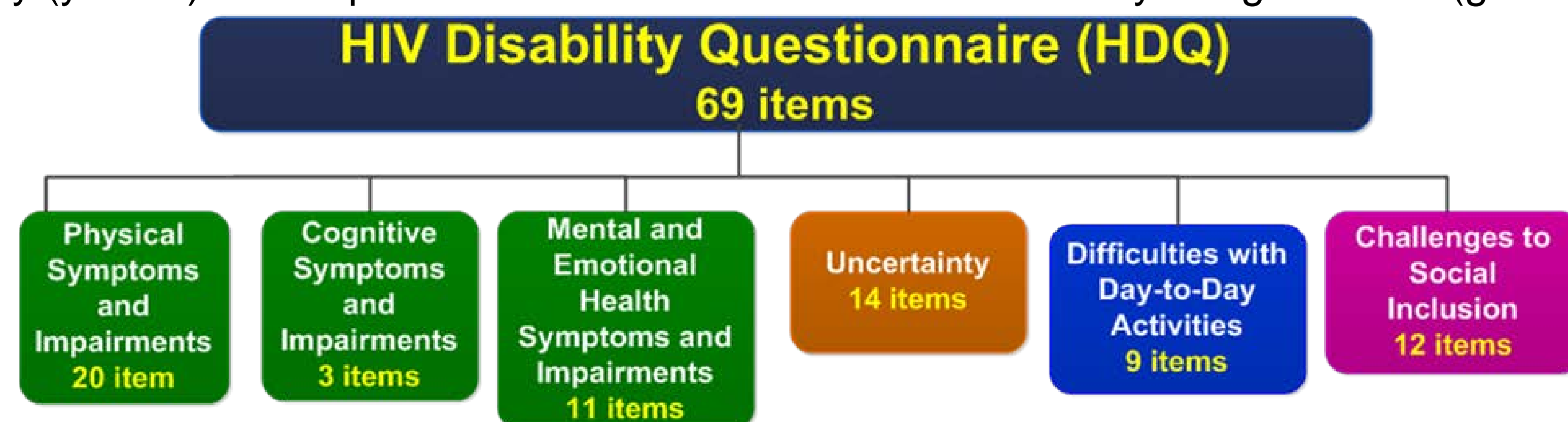
- What is Disability?** Any symptoms and impairments, difficulties with day-to-day activities, challenges to social inclusion and uncertainty experienced by adults living with HIV. These challenges may be episodic in nature, fluctuating on a daily basis (good days and bad days) and over the entire course living with HIV.
- We developed a self-reported HIV Disability Questionnaire (HDQ) in Canada, using the *Episodic Disability Framework*, a conceptual framework that describes disability from the HIV perspective.
- Establishing the measurement properties of the HDQ is important to ensure the questionnaire is consistently measuring what we want it to measure (disability) over time.

## Purpose

To assess internal consistency reliability and construct validity of the HIV Disability Questionnaire (HDQ) with adults living with HIV in Canada and Ireland.

## HIV Disability Questionnaire

**HDQ Structure:** 69 questions that assess presence, severity (5 point ordinal scale), and episodic nature of disability (yes/no) and 1 question that classifies overall health today living with HIV (good day or bad day).



**Administration:** Administered at one point or repeatedly over time. ~11 min to complete.

**Scoring: Disability Presence:** Sum the number of health-challenges present in each of the domains and transform into a score from 0-100. **Disability Severity:** Sum scores for each dimension and transform into a score from 0-100. **Episodic Presence:** Sum the number of health-challenges that changed (got better, got worse or both) within the past week and transform into a score from 0-100.

## Methods

- We recruited adults 18 years of age or older living with HIV from hospital clinics and AIDS service organizations in southern Ontario, Canada and Dublin, Ireland.
- We administered the HDQ with the World Health Organization Disability Assessment Schedule (WHODAS-II), Short Form 36 Questionnaire (SF-36), Medical Outcomes Study Social Support Survey (MOS-SSS), and a demographic questionnaire.

## Analysis

- Internal Consistency Reliability:** We calculated Cronbach's alpha ( $\alpha$ ) and Kuder-Richardson-20 (KR-20) statistics for the disability and episodic scores respectively. We considered  $\alpha$  and KR-20 statistics >0.80 acceptable.
- Construct Validity:** We tested 40 *a priori* hypotheses assessing the correlation between scores of the HDQ and the WHODAS-II, SF-36 and MOS-SSS and two known group hypotheses comparing HDQ presence and severity scores based on age and comorbidity. Irish and Canadian populations were analyzed separately. We considered acceptance of at least 75% of hypotheses as demonstrating support for construct validity.

Characteristics of Participants (n=235)		
	Canada (n=139)	Ireland (n=96)
<b>Gender</b>	Men (82%); Women (17%); Other (1%)	Men (74%); Women (24%); Other (2%)
<b>Median Age (IQR)*</b>	48 years (44, 55 years)	41 years (34, 48 years)
<b>Median Year of Diagnosis* (IQR)</b>	1999 (1990, 2004)	2003 (1998, 2009)
<b>Currently Taking ARVs</b>	91%	88%
<b>Undetectable Viral Load</b>	83%	42%
<b>Currently Working for Pay</b>	21%	54%
<b>Median # of Comorbidities* (IQR)</b>	4 (2, 6)	1 (0, 3)
<b>Living with Four or More Concurrent Health Conditions</b>	58% <i>most common:</i> muscle pain (55%) mental health (47%) addiction (31%) neurocognitive decline (31%)	19% <i>most common:</i> joint pain (23%) Hepatitis C (22%) muscle pain (22%) mental health (19%)

LEGEND: \*Statistical significant median difference (p <0.05) between Canada and Ireland participants; IQR=interquartile range; ARVs=antiretrovirals

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## HIV Disability Questionnaire Scores (n=235)

HDQ Domain	Median HDQ Presence Score (Range 0 to 100) (IQR)		Median HDQ Severity Score (Range 0 to 100) (IQR)		Median Episodic Presence Score (Range 0 to 100) (IQR) [range]	
	Canada n=139	Ireland n=96	Canada n=139	Ireland n=96	Canada n=139	Ireland n=94
<b>Physical</b>	60* (40, 80)	35 (15, 60)	25* (11, 38)	13 (5, 25)	<b>20</b> (5, 55) [0-100]	<b>20</b> (0, 40) [0-95]
<b>Cognitive</b>	<b>100*</b> (33, 100)	33 (0, 100)	25* (17, 4)	8 (0, 25)	0 (0, 67) [0-100]	0 (0, 33) [0-100]
<b>Mental-Emotional</b>	73* (45, 91)	45 (18, 80)	30* (13, 50)	14 (7, 30)	9 (0, 45) [0-100]	9 (0, 36) [0-100]
<b>Uncertainty~</b>	79 (57, 93)	<b>71</b> (50, 93)	<b>39</b> (23, 61)	<b>30</b> (18, 53)	0 (0, 29) [0-100]	0 (0, 36) [0-100]
<b>Day</b>	56* (22, 89)	11 (0, 22)	17* (6, 31)	3 (0, 8)	0 (0, 22) [0-100]	0 (0, 0) [0-89]
<b>Social Inclusion</b>	67* (50, 92)	42 (19, 58)	31* (17, 50)	17 (7, 29)	0 (0, 17) [0-100]	0 (0, 8) [0-92]
<b>HDQ Total</b>	70* (43, 81)	43 (26, 59)	29* (16, 42)	17 (8, 26)	12 (1, 39) [0-100]	12 (3, 28) [0-84]

LEGEND: Higher scores indicate greater disability. \*Statistical significantly higher median difference in HDQ presence and severity scores (p <0.05) for Canada versus Ireland. ~No difference between HDQ domain score. Highest HDQ domain scores bolded.

Good Day / Bad Day Classification: Completed HDQ on 'Good Day' (%)	
Canada (81%)	Ireland (88%)

## Results: Internal Consistency Reliability

HDQ Domain	HDQ Severity Score Cronbach's Alpha (95% CI)		HDQ Episodic Score KR-20 (95% CI)	
	Canada n=139	Ireland n=96	Canada n=139	Ireland n=96
<b>Physical</b>	0.92 (0.90, 0.94)	0.89 (0.86, 0.92)	0.92 (0.91, 0.94)	0.88 (0.84, 0.92)
<b>Cognitive</b>	0.87 (0.82, 0.91)	0.84 (0.77, 0.90)	0.81 (0.74, 0.88)	0.84 (0.76, 0.92)
<b>Mental-Emotional</b>	0.93 (0.91, 0.95)	0.91 (0.88, 0.94)	0.91 (0.89, 0.94)	0.90 (0.86, 0.94)
<b>Uncertainty</b>	0.93 (0.91, 0.94)	0.92 (0.90, 0.94)	0.95 (0.94, 0.97)	0.94 (0.92, 0.97)
<b>Day</b>	0.91 (0.83, 0.93)	0.88 (0.83, 0.94)	0.92 (0.89, 0.95)	0.85 (0.77, 0.93)
<b>Social Inclusion</b>	0.90 (0.88, 0.93)	0.90 (0.85, 0.94)	0.94 (0.92, 0.97)	0.90 (0.85, 0.94)
<b>HDQ Total</b>	0.97 (0.97, 0.98)	0.96 (0.95, 0.98)	0.98 (0.97, 0.98)	0.96 (0.95, 0.98)

**INTERPRETATION:** All statistics >0.80 indicating Internal Consistency Reliability

## Results: Construct Validity

Hypotheses Tested	# of hypotheses tested	# hypotheses confirmed (%)	
		Canada	Ireland
<b>Convergent Construct Validity</b> WHODAS-II scores will moderately ( $\geq 0.50$ ) to strongly correlate ( $\geq 0.70$ ) with HDQ scores	15	13 (87%)	9 (60%)
<b>Convergent Construct Validity</b> SF-36 scores will weakly ( $\geq 0.30$ ) to strongly correlate ( $\geq 0.70$ ) with HDQ scores	18	14 (78%)	13 (72%)
<b>Divergent Construct Validity</b> MOS-SSS scores will weakly ( $\geq 0.30$ ) to moderately correlate ( $\geq 0.50$ ) with HDQ scores	7	5 (71%)	0
<b>Total # Correlation Hypotheses Tested</b>	<b>40</b>	<b>32 (80%)</b>	<b>22 (55%)</b>
<b>Known Groups Validity</b> Older participants with more comorbidity (Canadian) will have higher total HDQ presence and severity scores.	<b>2</b>	<b>2 (100%)</b>	

## Conclusions

- The HDQ demonstrates internal consistency reliability and construct validity when administered to adults living with HIV in southern Ontario and Ireland.
- Differences in construct validity between countries may be due to lower HDQ scores among Irish participants who were younger and reported less comorbidity, cultural differences and difference in HDQ interpretation.
- Further work to explore HDQ applications outside of Canada is needed.

**Conflict of Interest Disclosure:** We have no conflicts of interest