Differences in the Health-Related Quality of Life of Huntington's Disease Patients By Disease Stage in the US and EU5 from the Huntington's Disease Burden of Illness Study (HDBOI)

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Introduction

- Huntington's Disease (HD) is a rare, inherited, and highly complex neuro-degenerative disorder, affecting cognition, movement, and mood.[1]
- In addition to these impairments, those living with HD may experience difficulties with insight[2], and may display a lack of awareness of the severity of their disease.[3]
- HD impacts several aspects of a person's health related quality of life (HRQoL), and there are few studies that assess the impact of HD on HRQoL by disease stage and from a multinational perspective.

OBJECTIVE

This research descriptively explores the differences in EQ-5D-5L utility scores of HD participants by disease stage*.

*as defined by treating physician

Methods

- The **Huntington's Disease Burden of Illness Study (HDBOI)** is a retrospective, cross-sectional dataset that captures sociodemographic and clinical information, medical resource use and HRQoL of a cohort of people with HD.
- Countries included in the study were Germany, France, Italy, Spain, the UK and USA.
- Data was collected between September 2020 and May 2021.
- Data was collected via a **Patient and Public Involvement and Engagement (PPIE-P) questionnaire**; an optional questionnaire completed by HD participants which captured information on HRQoL.
  - Caregivers of HD participants who were unable to complete the PPIE-P due to physical or cognitive impairments, were asked to complete it as proxy-respondents.
- Participants were categorized as early, mid, or advanced stage by the treating physician. Physicians were provided with the Unified Huntington's Disease Rating Scale Total Functional Capacity score[4] and corresponding disease stages to guide their assessment of disease stage.

Outcomes

- The **EQ-5D-5L** is a self-reported health measure comprised of five dimensions: mobility, usual activities, self-care, pain and discomfort, and anxiety and depression.[5]
  - Distribution of responses to each dimension range from 1 "no problems" to 5 "unable to/extreme problems."
- EQ-5D-5L utility scores range from 0 (equivalent to 'dead') to 1 ('perfect health') and were computed using the English value set for all participants for comparability reasons.
- Differences between utility scores were explored by disease stage and the statistical significance of these differences were assessed by analysis of variance (ANOVA) tests.

Results

Sample characteristics

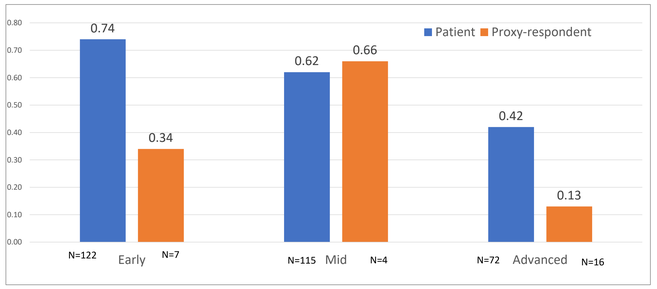
- The analytic sample with information on EQ-5D-5L was comprised of 336 HD participants, of which 38% were early stage (ES), 35% mid stage (MS) and 26% advanced stage (AS).
- Around 8% (N=27) of responses were reported by caregivers who acted as a proxy-respondents.

Table 1. Distribution of responses by respondent type and EQ-5D-5L scores by respondent type and disease stage*

	Full Sample		Early Stage		Mid Stage		Advanced Stage	
	N	Percent	N	Percent	N	Percent	N	Percent
Self-report	309	92	122	95	115	97	72	82
Proxy-respondent	27	8	7	5	4	3	16	18
Total	336	100	129	38	119	35	88	26
EQ-5D-5L Utility Scores	**Full sample**		**Early Stage**		**Mid Stage**		**Advanced Stage**	
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Full sample*	336	0.59 (0.27)	129	0.72 (0.22)	119	0.62 (0.18)	88	0.37 (0.30)
Self-report	309	0.62 (0.24)	122	0.74 (0.19)	115	0.62 (0.18)	72	0.42 (0.27)
Proxy-respondent	27	0.26 (0.35)	7	0.34 (0.31)	4	0.66 (0.26)	16	0.13 (0.31)

*as defined by treating physician

Figure 1. EQ5D-5L utility scores: self-report versus proxy-respondent by disease stage*



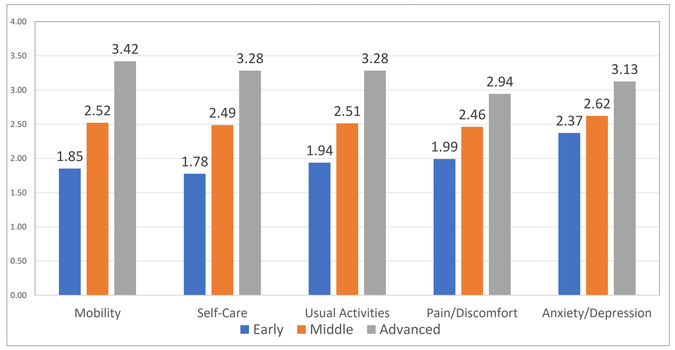
*as defined by treating physician

EQ-5D-5L Utility scores

- EQ-5D-5L utility scores decreased at later stages of disease: mean EQ-5D-5L score for the full sample was 0.72 (SD ±0.22) for ES HD; 0.62 (SD ±0.18) for MS HD, and 0.37 (SD ±0.30) for AS HD.
- This trend was similar for HD self-reported responses, as displayed in **Table 1.**
- However, proxy-responders reported on average worse EQ-5D-5L scores versus HD self-reported scores, and large variations were observed between groups (See **Figure 1**).
  - In the AS group the mean utility score for proxy-respondents was just 0.13 (SD ±0.31) compared to HD self-reported score of 0.42 (SD ±0.27).
- ANOVA tests were conducted for the full sample, self-reported, and proxy-respondents, differences in EQ-5D-5L utility scores between disease stages were all statistically significant: full sample ($p<0.001$), self-reported ($p<0.001$), and proxy-respondent ($p<0.05$).
- Overall differences in EQ-5D-5L between self-reported and proxy-respondents were statistically significant ($p<0.001$).

Results continued

Figure 2. Distribution of responses to each dimension of EQ-5D-5L questionnaire full sample by disease stage*



*as defined by treating physician

EQ-5D-5L Dimensions

- The anxiety and depression dimension was the main driver of poor EQ-5D-5L scores in ES and MS HD respondents (See **Figure 2**).
- In AS mobility, followed by the self-care and usual activities dimensions were the main drivers of lower EQ-5D-5L scores.
- However, anxiety and depression was still weighted heavily in AS, and overall EQ-5D-5L scores are impacted primarily by this dimension.

- The proxy sample was relatively small and results should be interpreted with this in mind and there were less AS HD participants in the sample than expected.
  - As such, HD scores may be higher than expected because of lower numbers in AS.

Conclusion

- Results from the HDBOI study show a substantial humanistic burden on people with HD, and HRQoL deterioration as the disease progresses.
- Mobility and psychological dimensions were impacted and were drivers of poor HRQoL in people with HD.
- Comparing our results with population norms from the UK[6], the 45-54 age group had HRQoL of 0.849. This contrasts with our findings and highlights how on average an HD person's HRQoL is much worse than the general population, even for early stage HD.
- Discrepancies between self-reported and proxy-respondent HRQoL may be related to the well-documented unawareness and under-reporting of symptoms displayed by people with HD.

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