

INTRODUCTION

Adult polyglucosan body disease (APBD)

- Ultra-rare neurogenetic disorder on the glycogen storage disease type IV spectrum
- Hallmark feature: polyglucosan bodies in the nervous system, due to deficiency in glycogen branching enzyme (GBE)
- Symptoms typically appear in adulthood and commonly include neurogenic bladder (loss of control of bladder), gait difficulties, sensory loss, and cognitive impairment

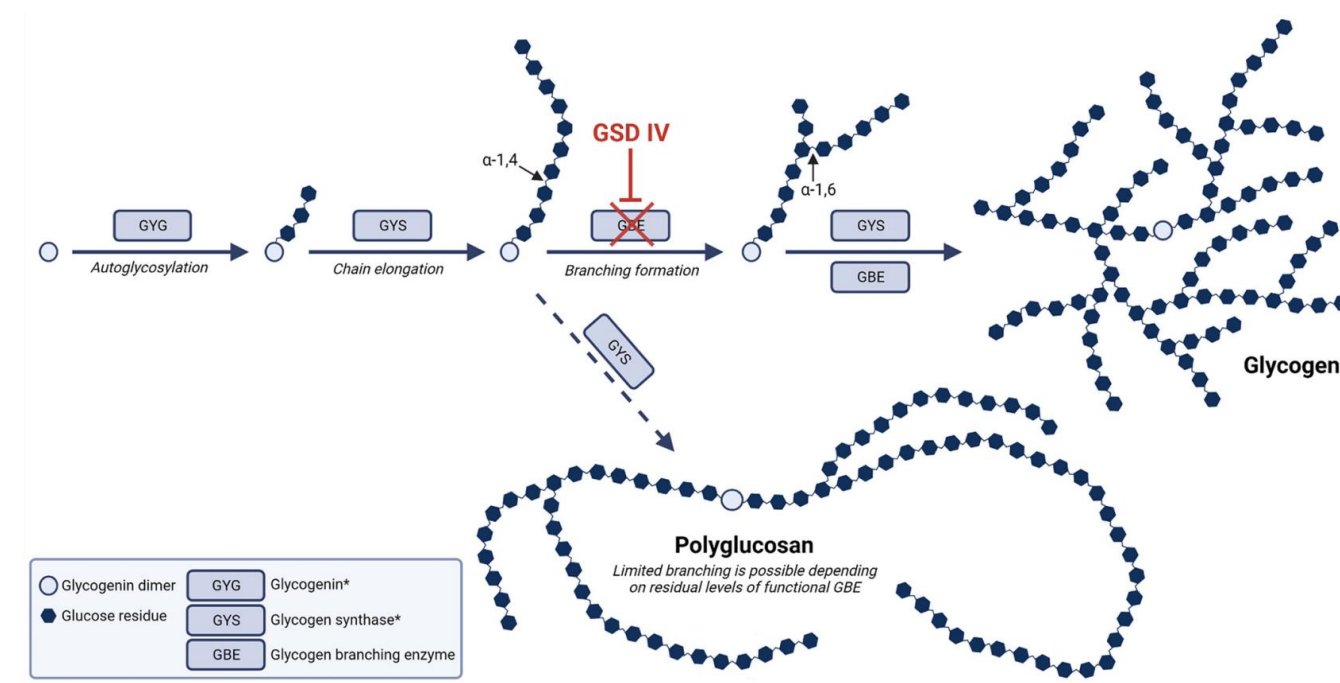


Figure 1. Polyglucosan body formation compared to normal glycogen formation.¹

Patient-reported outcomes (PROs) are an unmet need for the APBD community

- No disease-specific quality of life measure currently available for APBD
- 36-Item Short Form Health Survey (SF-36), SF-12, and function-specific PROMIS have been used for Glycogen Storage Diseases I – III^{2,3}

OBJECTIVE

To design a PRO specific to APBD that serves as a sensitive tool for measuring health-related quality of life (HR-QOL) by assessing the symptoms and activities of daily living (ADLs) that are most relevant to patients with APBD. We aim for this PRO to be useful in examining patient outcomes in clinical trials of investigational therapies, in clinical care, and for further natural history research.

METHODS

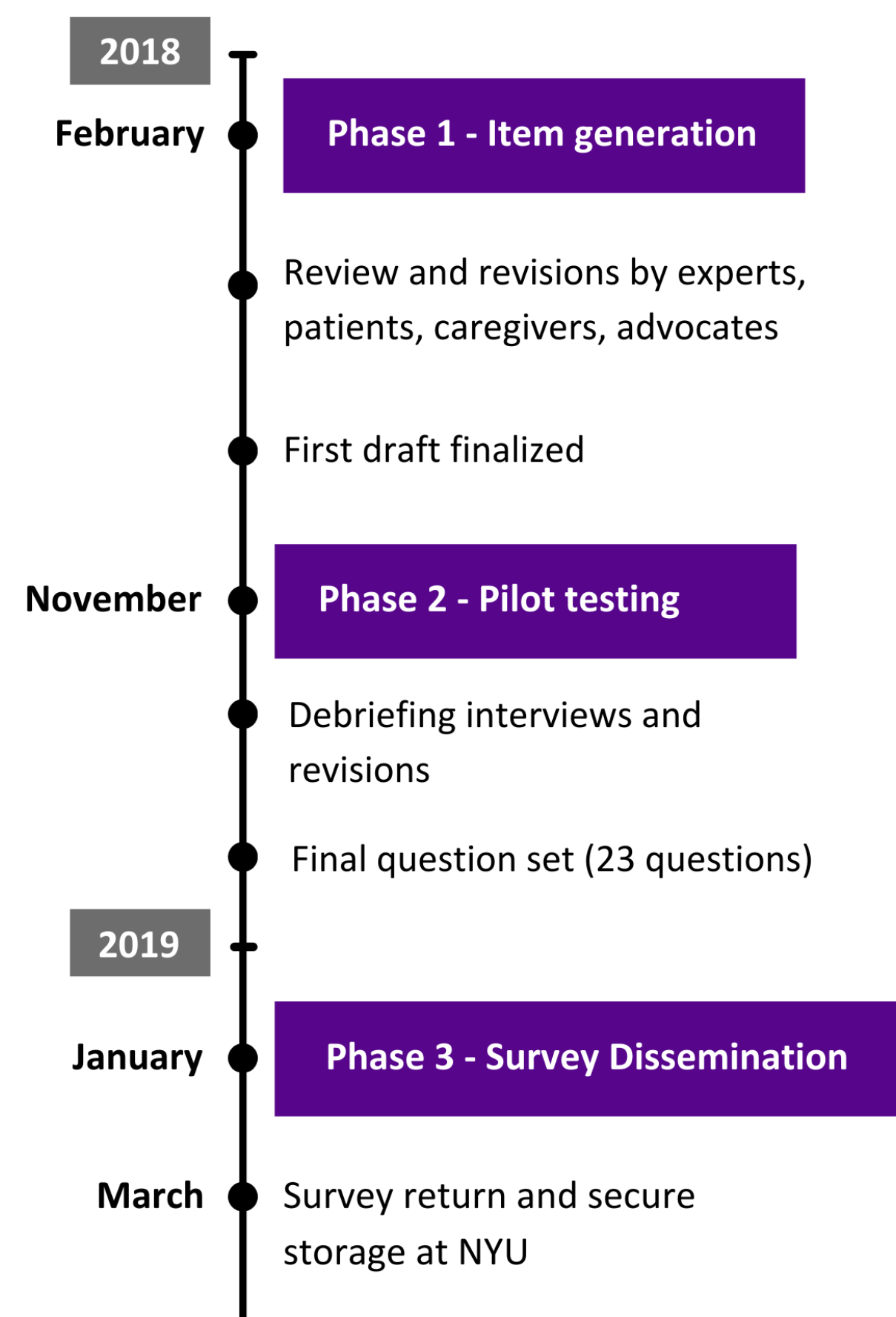


Figure 2. Timeline of Survey Development and Administration.

RESULTS

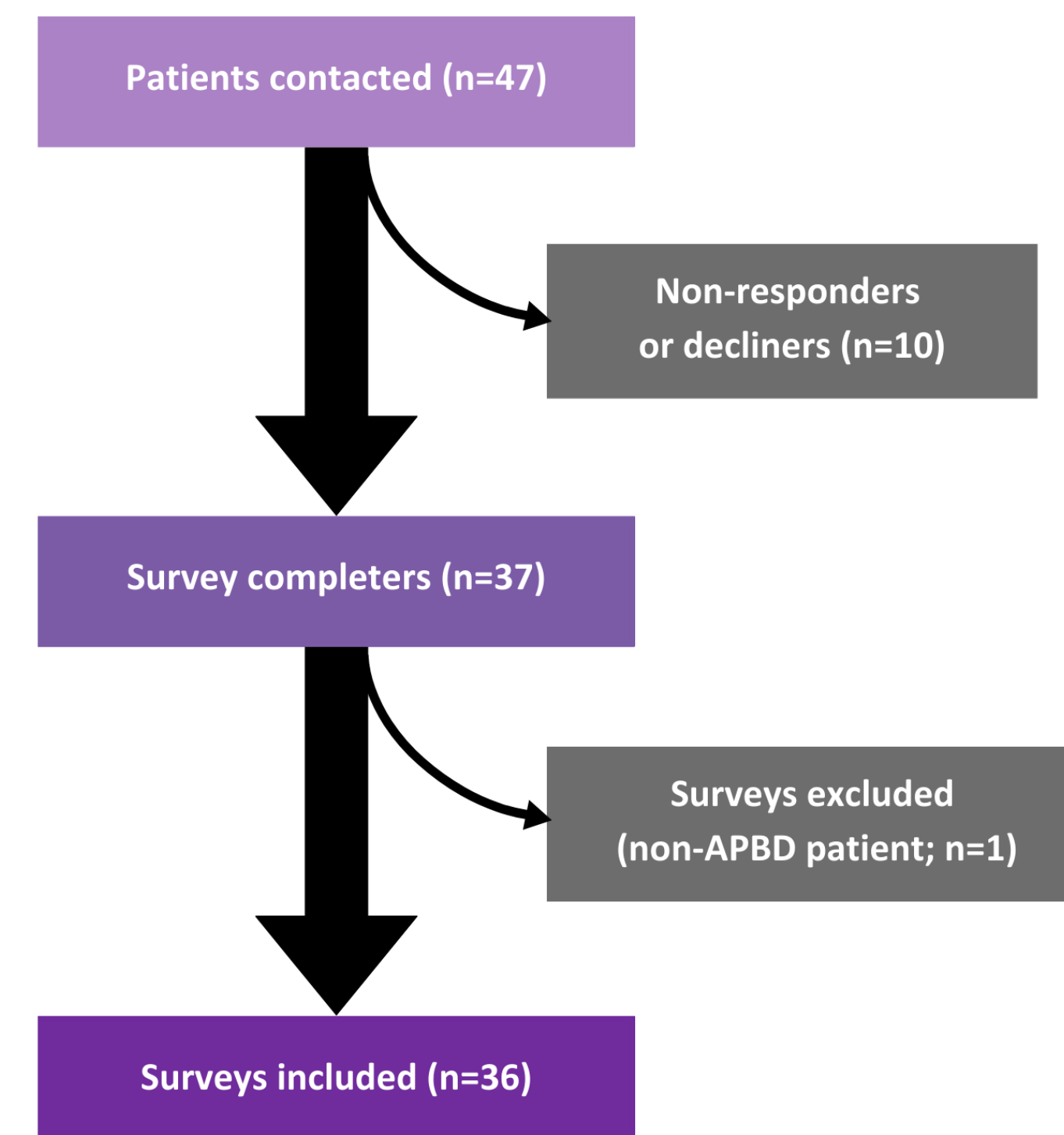


Figure 3. Study Flowchart. 47 individuals were contacted, and 37 individuals completed the survey.

| | n (%) | | n (%) |
|---------------------------------|---------|---|---------|
| Age (n=35) | | Age at Symptom Onset (n=35) | |
| ≥60 years of age | 29 (83) | 30 – 39 years old | 7 (20) |
| <60 years of age | 6 (17) | 40 – 59 years old | 25 (72) |
| | | 60 – 79 years old | 3 (9) |
| Sex (n=36) | | Initial Symptoms by Type (n=36) | |
| Male sex | 20 (56) | Sensory | 24 (69) |
| Female sex | 16 (44) | Motor | 32 (91) |
| | | Neuropsychiatric | 17 (49) |
| Race (n=36) | | Years to Diagnosis (n=35) | |
| White (non-Hispanic) | 35 (97) | ≤ 1 year | 2 (6) |
| Other | 1 (3) | >1 and <10 years | 21 (63) |
| | | ≥10 years | 11 (31) |
| Ethnicity (n=36) | | Urinary Retention Treatment Use (n=36) | |
| Ashkenazi Jewish | 28 (78) | Yes | 21 (58) |
| Other | 8 (22) | No | 15 (42) |
| Employment Status (n=36) | | Assistive Device Use (n=36) | |
| Unemployed | 28 (78) | Yes | 32 (89) |
| Employed | 8 (22) | No | 4 (11) |
| Diet (n=36) | | Survey Completion (n=36) | |
| Special Diet | 13 (36) | Self | 27 (75) |
| Standard Diet | 23 (64) | Caregiver | 9 (25) |

Table 1. Respondent Demographics. The majority of participants were ≥60 years of age (83%), white (97%), Ashkenazi Jewish (78%), and unemployed (78%).

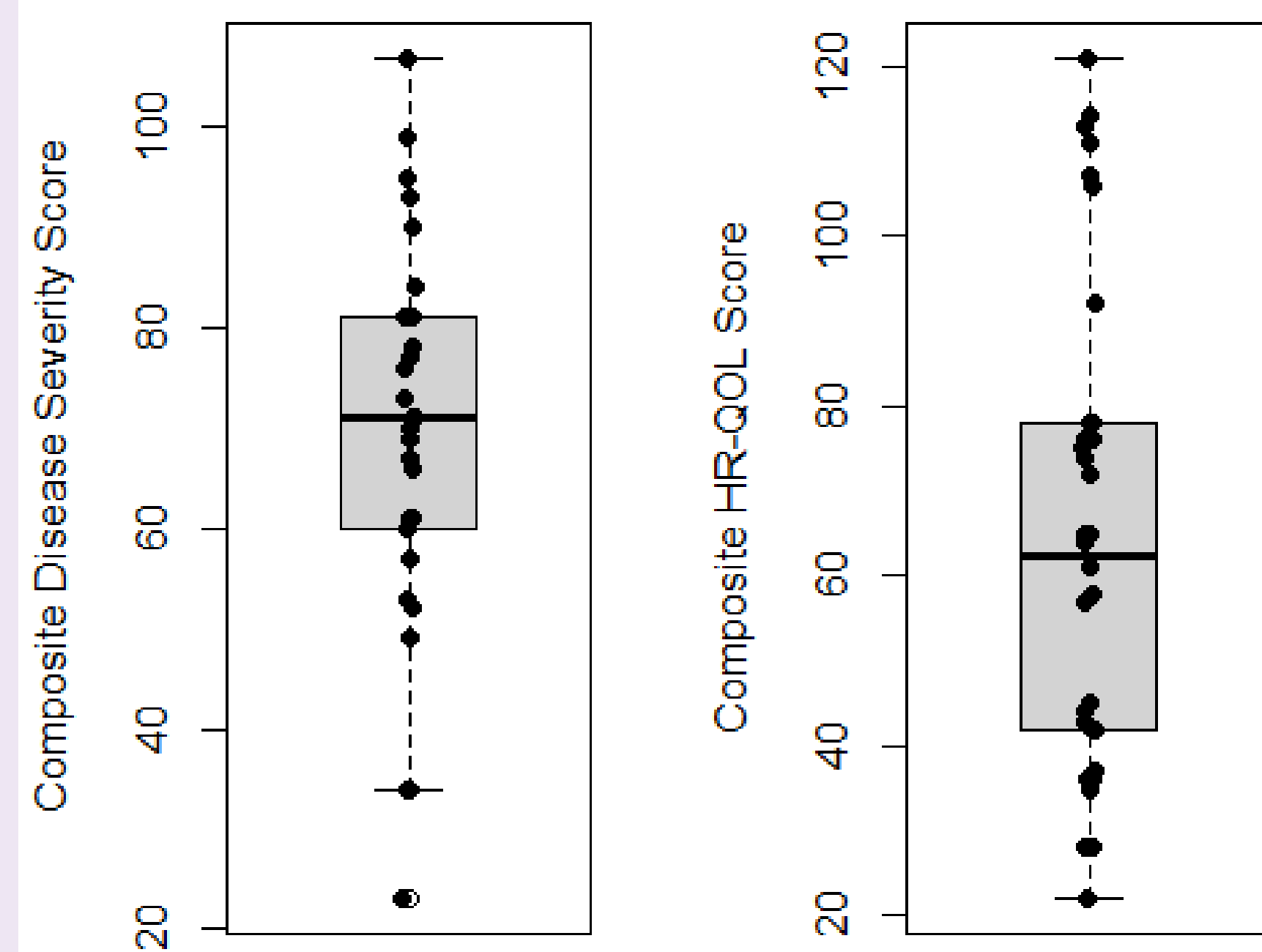


Figure 4. Distributions of Composite Disease Severity (n=29) and HR-QOL Scores (n=34). Among disease severity and HR-QOL assessments without missing data (29 and 34 assessments, respectively), the average composite disease severity score was 69 (out of 138) (SD=20; median=71; range: 23-107) and the average composite HR-QOL score was 64 (out of 132) (SD=28; median=62.5; range: 22-121), where scores of 138 and 132 would reflect maximum disease severity and poorest HR-QOL, respectively.

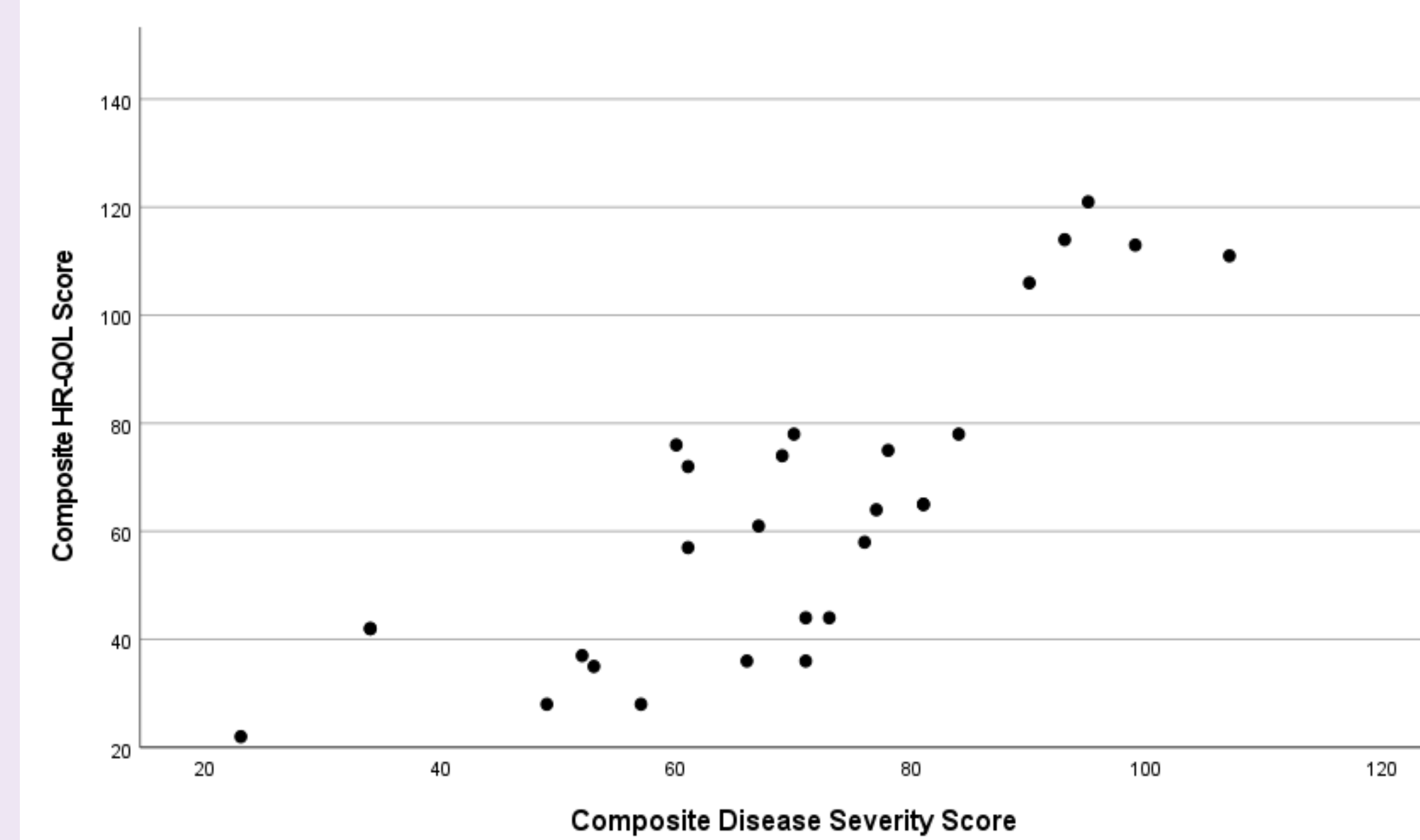


Figure 5. Correlation Between Composite Disease Severity and HR-QOL Scores (n=28). The two composite scores are highly correlated (Pearson correlation coefficient = 0.809; 95% CI: 0.625, 0.908), revealing internal consistency between symptom burden/disease severity and HR-QOL.

Symptom severity and ADL difficulty

Three most severe symptoms on average:

1. walking/gait difficulty (4.8/5)
2. leg weakness (4.8/5)
3. incontinence (4.3/5)

Three most difficult ADLs on average:

1. walking on uneven ground (4.5/5)
2. walking up stairs (4.29/5)
3. walking overall (4.2/5)

Relationship to demographic variables (linear regression)

- Unemployment, use of one or more assistive devices, and current age (for some age ranges) significantly predicted HR-QOL
- Unemployment, use of one or more assistive devices, and survey completion by a caregiver proxy significantly predicted disease severity

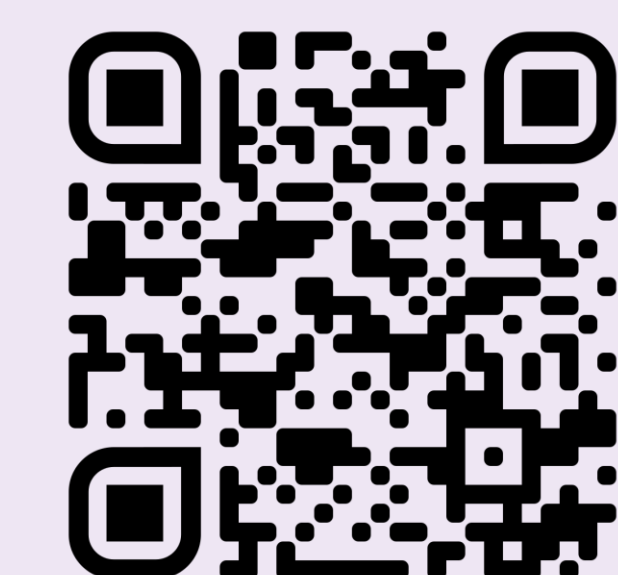
DISCUSSION AND CONCLUSIONS

- Our results for age at symptom onset and initial symptom presentation corroborate data reported in the majority of existing APBD literature.
 - 71% of participants experienced onset between 40-59 years of age with no significant differences between males and females.
 - 90% of participants reported one or more motor symptoms at onset of disease.
 - Most commonly reported symptoms at onset: bladder/urine control difficulties (56%), feet numbness/tingling/burning (56%), walking/gait difficulty (47%), and lower extremity weakness (39%) being the most commonly reported symptoms at disease onset.
- While there is little to no prior work on HR-QOL in APBD in the literature, our study adds key data on patient-reported disease severity and HR-QOL and their relationship to various diagnostic and demographic features.

Key Takeaways

- The development of the APBD-SQ, the first disease-specific PRO for HR-QOL and disease severity in APBD, marks an important stride forward for further research on the disease and potential treatments.
- Obtaining adequate natural history data with appropriate PROs is an essential first step before clinical trials of investigational therapies can take place and are important in defining the minimum clinically important difference (MCID).
- Multiple natural history studies are ongoing within APBD, where the application of the APBD-SQ could be of benefit.

VIEW OUR PRE-PRINT:



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