Appendix A. Fear of Falling Avoidance Behavior Questionnaire

Please answer the following questions that are related to your balance. For each statement, please check <u>one box</u> to say how the **fear of falling** has or has not affected you. If you do not currently do the activities in question, try and imagine how your **fear of falling** would affect your participation in these activities. If you normally use a walking aid to do these activities or hold onto someone, rate how your **fear of falling** would affect you as if you were not using these supports. If you have questions about answering any of these statements, please ask the questionnaire administrator.

*Please check **one box** for each question*

Due to my fear of falling, I avoid…	*Completely disagree*	*Disagree*	*Unsure*	*Agree*	*Completely agree*
1. **Walking**	☐	☐	☐	☐	☐
2. **Lifting and carrying objects** *(e.g., cup, child)*	☐	☐	☐	☐	☐
3. **Going up and downstairs**	☐	☐	☐	☐	☐
4. **Walking on different surfaces** *(e.g., grass, uneven ground)*	☐	☐	☐	☐	☐
5. **Walking in crowded places**	☐	☐	☐	☐	☐
6. **Walking in dimly lit, unfamiliar places**	☐	☐	☐	☐	☐
7. **Leaving home**	☐	☐	☐	☐	☐
8. **Getting in and out of a chair**	☐	☐	☐	☐	☐
9. **Showering and/or bathing**	☐	☐	☐	☐	☐
10. **Exercise**	☐	☐	☐	☐	☐
11. **Preparing meals** *(e.g., planning, cooking, serving)*	☐	☐	☐	☐	☐
12. **Doing housework** *(e.g., cleaning, washing clothes)*	☐	☐	☐	☐	☐
13. **Work and/or volunteer work**	☐	☐	☐	☐	☐
14. **Recreational and leisure activities** *(e.g., play, sports, arts and culture, crafts, hobbies, socializing, travelling)*	☐	☐	☐	☐	☐

Please make sure you have checked <u>one box for each question</u>. Thank you!

TOTAL:

Appendix B. Parkinson's disease domain variables.

Scale	Construct	Evidence for reliability	Evidence for validity in PD
PD subtype[23]	A ratio of scores from the MDS-UPDRS is used to define tremor dominant (TD) and postural instability/gait difficulty (PIGD) phenotypes of PD. The mean for all 11 MDS-UPDRS for tremor were divided by the mean for the 5 PIGD items. If the resultant ratio was ≥1.15 then the person was classified as TD and if the ratio was ≤0.90 then the person was classified as PIGD phenotype. A score in between these values was classified as indeterminate.	Reliability has not been determined for this new scale.	TD and PIGD phenotypes have been linked to different clinical features and progressions.[24-26]
MDS-UPDRS[27]	65 item clinical rating scale for PD including interview, clinician rating and self-assessment of PD severity that has 4 parts: I. Non motor experiences of daily living; II. Motor experiences of daily living; III. Motor examination; IV. Motor complications	High internal consistency (Cronbach's α= 0.79 – 0.93 across parts)[27]	Found to be highly correlated with the original UPDRS (r=.96).[27]
Hoehn and Yahr Scale[28]	0 to 5 staging scale that provides a general estimate of disease severity in PD with 0 indicating that the individual is asymptomatic and 5 indicating severely impaired postural stability and functional mobility.	Good reliably for moderate stages (2-4)[28]	Correlations with β-CIT SPECT scanning[29] and fluorodopa PET scanning[30] suggesting convergent validity
PDQ-39[31,32]	Self-report measure of PD related QOL with 39 items in 8 subsections (mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication, bodily discomfort). Each item ranges from 0 (never) to 4 (always). The overall score and subsection scores are calculated by taking the means of each item divided by the total for that section; thus, converting the score into a percentage with higher percentages equating to more disability.	Cronbach's α= 0.72 – 0.95; test-retest reliability .76 – 0.93[33]	Correlations found with BDI>17, MMSE<25, history of falls, postural instability and gait impairments (p<0.001)[34]

Appendix C. Balance and fall domain variables.

Scale	Construct	Evidence for reliability	Evidence for validity
Berg Balance Scale (BBS)[35]	Clinician-rated assessment of balance with 14 different balance tasks. Scores range from 0 to 56 with higher scores suggesting better balance performance.	Excellent test-retest reliability (ICC = 0.94)[36] and interrater reliability (ICC = 0.93 in PD[37]	Area under the ROC curve (0.851) for predicting fall status in those with PD[38]
Activities-Specific Balance Confidence Scale (ABC)[39]	Subjective rating of balance confidence with 16 different ambulatory activities. Items are rated on a rating scale of 0 to 100 with higher scores representing more confidence. The ABC score is the average subjective rating of all 16 items.	Excellent test-retest reliability in PD (ICC = 0.96)[40]	High ABC score is associated with decreased fall risk in PD[41]
Impact of Events Scale (IES)[42,43]	15 item self-report measure to assess distress levels related to a traumatic life event. The total score is the overall stress from the event (fall/falls). There are three subscales: intrusion (e.g., intrusive thoughts, nightmares, intrusive feelings and imagery, dissociative-like re-experiencing), avoidance (e.g., numbing of responsiveness, avoidance of feelings, situations, and ideas), and hyperarousal (e.g., anger, irritability, hypervigilance, difficulty concentrating, heightened startle).	High internal consistency (Cronbach's α = .86 for intrusion, and Cronbach's α = .82 for avoidance)[44]	Can discriminate between stress reactions at different times after an event and highly correlates with post-traumatic stress disorder diagnosis[44]
Consequences of Falling Questionnaire (CoFQ)[45]	Self-report questionnaire about the loss of functional independence (6 items) and damage to identity (6 items) that may occur because of a fall. All items are based on a Likert scale (disagree strongly, disagree, agree, and agree strongly) with responses assigned points of 1 through 4, respectively. Scores range from 12 to 48 with higher scores equating to more catastrophizing thoughts about falls.	Excellent internal reliability (Cronbach's α = .86 − .94) and moderate test-retest reliability (ICC=.61 - .64)[45]	CoFQ is correlated with avoidance of activity and predicted avoidance in activity 6 months later[45]

Appendix D. Physical performance and psychological domain variables.

Scale	Construct	Evidence for reliability	Evidence for validity
30 second Sit-to-Stand Test (30STS)[46,47]	Assessment of one's ability to perform repeated sit to stands from a chair for 30 seconds as a measure of functional lower extremity strength.	Excellent test-retest reliability (ICCs>0.84)[46,48]	Able to discriminate physically active from sedentary older adults[48] and also exercisers and non-exercisers[47]
Timed Up and Go Test (TUGT)[49]	A timed test of functional mobility consisting of time it takes to rise from a chair, walk three meters, turn around, walk back to the chair, and sit down.	Good test-retest reliability in PD (ICCs ≥ 0.80)[36,50] and excellent interrater reliability (r=0.99) in PD[51]	Moderate to good convergent validity evidence in PD (correlated with the BBS (r=-0.78), fast gait speed (r=-0.69), and comfortable gait speed (r=-0.67)[52]
ActivPAL Activity monitor (PAL Technologies Ltd, 50 Richmond St, Glasgow G1 1XP, United Kingdom)	Electronic device measuring five components: hours standing, hours stepping, hours sitting or lying, up/down transitions, and metabolic equivalent of tasks	Inter-device reliability of step number and cadence: ICC (2,1) ≥ 0.99[53]	Absolute percentage of error <1% for outdoor ambulation, <2% for walking speeds of ≤0.67 m/s,[54] sedentary behavior validated against direct observation (R^2=.94)[55]
Zung Anxiety Scale (ZAS)[56]	A self-rating instrument for anxiety disorders with 20 items that are identified by a little, some, a good part, or most of the time. Scores range from 20 to 80 with a higher score suggestive of more anxiety.	Good item-total correlations and a good test–retest reliability in non-PD populations[57]	In non-PD patients it has shown to be sensitive to change in treatment studies of anxiety[57]
Beck Depression Inventory (BDI)[58]	Most widely used instrument for measuring the severity of depression based on symptoms from 21-items rated by the individual on a 0-3 scale. Scores range from 0 to 63 with higher scores indicative of more depression.	Cronbach's α = 0.88 and ICC = 0.89 in patients with PD[59]	85.67% - 88.0% area under the ROC curve for distinguishing depressed from non-depressed in PD[59,60]

Appendix E. Benjamini-Hochberg procedure table. Statistically significant p values are in red.

	p value	rank (j)	(j/m) delta
Socioeconomic Status	0.927	42	0.0500
Falls in the last month	0.793	41	0.0489
Up/down transitions	0.716	40	0.0478
Age	0.618	39	0.0467
MDS-UPDRS IV (Motor complications)	0.609	38	0.0456
Injurious falls in last year	0.592	37	0.0444
Education	0.513	36	0.0433
Hoehn & Yahr Stage	0.44	35	0.0422
Gender	0.353	34	0.0411
Mini-Mental State Exam	0.323	33	0.0400
Falls in the last year	0.28	32	0.0389
PDQ Social support	0.268	31	0.0378
Hours sitting/laying down per day	0.222	30	0.0367
Diagnosis year	0.197	29	0.0356
Hours standing per day	0.147	28	0.0344
Impact of Events Scale - avoidance	0.096	27	0.0322
PDQ Communication	0.091	26	0.0311
Impact of Events Scale – hyperarousal	0.066	25	0.0300
Impact of Events Scale - revised	0.055	24	0.0289
30 Second Sit-To-Stand Test	0.048	23	0.0278
Zung Anxiety Scale	0.025	22	0.0267
Impact of Events Scale - intrusion	0.020	21	0.0244
Hours stepping per day	0.018	20	0.0233
PDQ Emotion	0.015	19	0.0222
Metabolic equivalents per day	0.015	18	0.0211
PDQ Cognition	0.013	17	0.0200
PDQ Stigma	0.012	16	0.0189
Beck Depression Inventory	0.010	15	0.0178
MDS-UPDRS III (Motor)	0.009	14	0.0167
Steps taken in a day	0.009	13	0.0156
Parkinson's disease subtype	0.008	12	0.0144
Timed Up and Go Test	0.004	11	0.0133
MDS-UPDRS I (non-motor experiences of daily living)	0.003	10	0.0122
PDQ Bodily discomfort	0.002	9	0.0111
Berg Balance Scale	0.002	8	0.0100
Movement Disorders Society (MDS)-UPDRS	0.0005	7	0.0078
MDS-UPDRS II (motor experiences of daily living)	0.0005	6	0.0067
Parkinson's Disease Questionnaire (PDQ)-39	0.0005	5	0.0056
PDQ Mobility	0.0005	4	0.0044
Activities-Specific Balance Confidence Scale	0.0005	3	0.0033
Consequences of Falls Questionnaire	0.0005	2	0.0022
PDQ ADLs	0.0005	1	0.0011