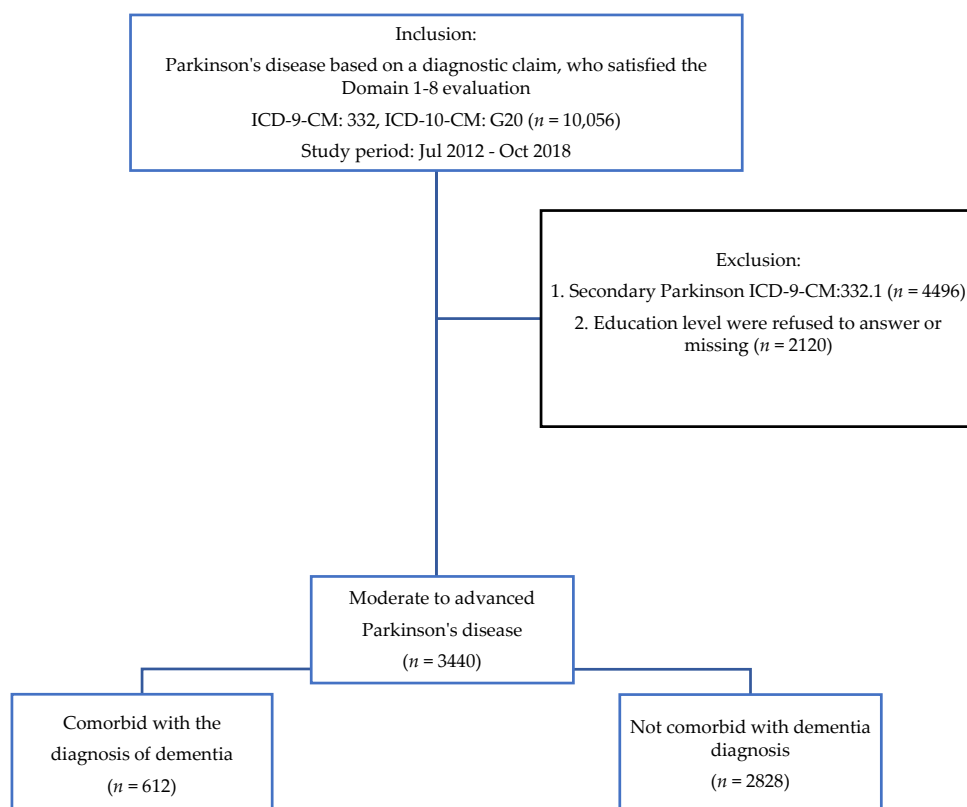


# Supplementary Materials: Hand Fine Motor Skill Disability Correlates with Cognition in Patients with Moderate-to-Advanced Parkinson's Disease



**Figure S1.** Patient selection process

**Table S1.** Items of the eight domains of the Functioning Scale of the Disability Evaluation System-Adult Version.

Domains	Items and labels
Do1 Cognition (6 items) <sub>a</sub>	D1.1 Concentration D1.2 Remembering to do important things D1.3 Problem-solving D1.4 Learning a new task D1.5 Understanding D1.6 Conversation
Do2 Mobility (5 items) <sub>a</sub>	D2.1 Standing for long periods D2.2 Standing up from sitting D2.3 Moving around inside home D2.4 Getting out of home
Do3 Self-care (4 items) <sub>a</sub>	D3.1 Washing whole body D3.2 Getting dressed D3.3 Eating D3.4 Staying by self for a few days

Do4 Getting along (5 items) <sup>a</sup>	D4.1 Dealing with strangers D4.2 Maintaining a friendship D4.3 Getting along with people close to D4.4 Making new friends D4.5 Sexual activities
Do5 Life activities Do5.1 Household activities (4 items) <sup>a</sup>	D5.1 Household responsibilities D5.2 Do important household tasks well D5.3 Do all needed household work D5.4 Household work performed as quickly as needed
Do5.2 Work or school activities (4 items) <sup>a</sup>	D5.5 Day-to-day work/school D5.6 Do important work/school tasks well D5.7 Getting done all needed work D5.8 Work performed as quickly as needed
Do6 Participation (8 items) <sup>a</sup>	D6.1 Joining in community activities D6.2 Because of environmental barriers D6.3 Others affects one's dignity D6.4 Health affects time consumption D6.5 Health affects one's emotion D6.6 Health affects family finances D6.7 Health affects family Not linkable (impact question) D6.8 Doing things for relaxation or pleasure
Do7 Environmental attributes (8 items) <sup>c</sup>	D7.1 Food and drugs for personal consumption D7.2 Products and technology for personal use in daily living D7.3 Products and technology for personal indoor and outdoor mobility and transportation D7.4 Products and technology for communication D7.5 Products and technology for education D7.6 Financial assets D7.7 Climate D7.8 Social security services
Do8 Motor action (7 items) <sup>b</sup>	D8.1 Pick up a pen D8.2 Button up D8.3 Tie something D8.4 Stand up from chair sitting D8.5 Bend down to pick something up D8.6 Walk for 3 m and return D8.7 Sit onto the chair

One extra item is used to ask about having assistive devices or personal assistance in daily life in Domains 1-6 and Domain 8. Two extra items are used to ask about the health impacts on working and salary in each dimension of Domain 6; a, Each item has performance and capability dimensions through interviewing, scoring 0-4 for level of difficulty (rated as follows: 0 = no difficulty; 1 = slight; 2=medium; 3 = high; 4 = extremely high or unable and 9 for not applicable.); b, Each item has a capability dimension through interviewing, scoring 0-4 for degree of personal assistance with usual devices, and each item has a capacity dimension through direct testing without mobility devices, scoring 0-4 (0 = no assistance; 1 =supervision or verbal cue; 2 = a little physical assistance; 3 = lots of physical assistance; 4 = complete physical assistance); c, Through interviewing, dichotomy score: 0 = no environmental barrier or open access; 1 = encounter environmental barrier.

**Table S2.** Multivariate logistic regression models for the association between the different hand fine motor skills and presence of dementia after adjustments for age, sex, and the Hoehn and Yahr stage of Parkinson's disease.

	$\beta$	Odds ratio	95% Confidence index		p value
Pen-holding	0.125	1.133	1.055	1.217	0.001
Buttoning	0.040	1.041	0.974	1.112	0.235
Knotting	0.095	1.099	1.030	1.173	0.004

**Table S3.** Distribution of hand fine motor skill disabilities among patient age groups.**(A) PD patients less than 75 years old.**

	PDD	Non-PDD
Disability	117	884
No Disability	66	565

Sensitivity of detecting dementia by the presence of disability with had fine motor skills = 63.9%; Abbreviation: Parkinson's disease dementia (PDD), non- Parkinson's disease dementia (non-PDD)

**(B) PD patients 75 years old and above.**

	PDD	Non-PDD
Disability	328	1000
No Disability	101	379

Sensitivity of detecting dementia by the presence of disability with had fine motor skills =76.5%; Abbreviation: Parkinson's disease dementia (PDD), non- Parkinson's disease dementia (non-PDD)

**Table S4.** Multivariate logistic regression models for association between hand fine motor skill disabilities and cognitive disability after adjustments for age, sex, and the Hoehn and Yahr stage of Parkinson's disease.

	$\beta$	Odds Ratio	95% Confidence Index		<i>p</i> Value
Intercept	-0.455				<0.001
Gender(ref = Male)					
Female	-0.214	0.807	0.683	0.955	0.012
Age (ref $\leq$ 75)					
75 years & above	0.187	1.206	1.015	1.433	0.034
Hoehn-Yahr Stage (ref = Stage 3)					
Stage 4	0.422	1.524	1.277	1.820	<0.001
Stage 5	1.230	3.420	2.472	4.733	<0.001
Cognition	0.206	1.229	1.187	1.272	<0.001

Cognitive disability was classified on a 10-point scale.