

# Longitudinal trajectories of IADL changes in community-dwelling older adults

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## Introduction / Rationale

- Maintaining instrumental activities of daily living (IADL) is crucial for older adults' independence.
- Declines in IADL often signal early functional limitations in other areas and increased care needs.
- Understanding longitudinal IADL trajectories and key characteristics can inform interventions that support aging in place.
- We applied latent growth curve modeling (LGM) to examine changes in IADL over time.

## Objectives

- To examine longitudinal IADL trajectories and identify characteristics associated with changes in IADL performance.

## Methods / Approach

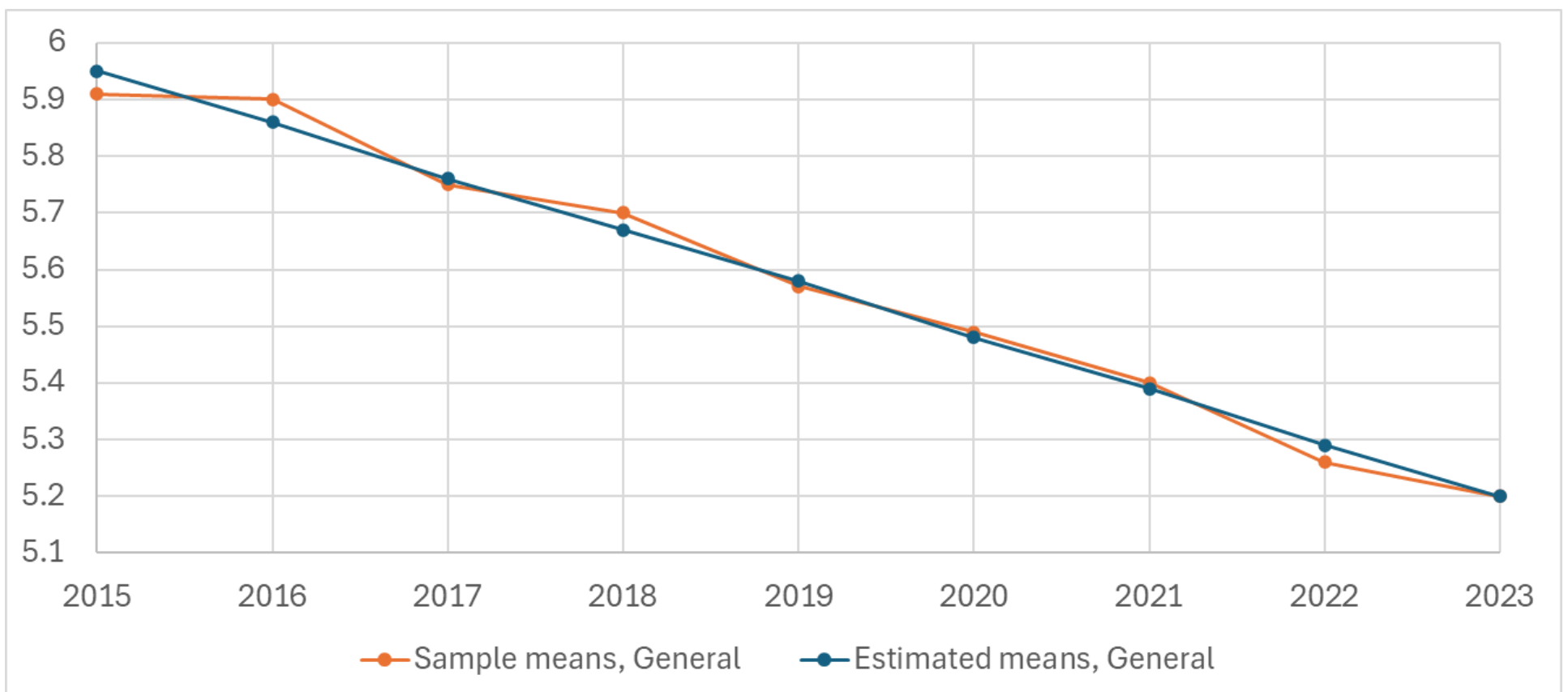
- Data source: National Health and Aging Trends Study (NHATS), 2015–2023
- Sample: n = 2,155 community-dwelling adults ≥65 years
- Outcome: Instrumental Activities of Daily Living (IADL)
- Baseline covariates (time-invariant): age, sex, race, education, income (2015), marital status (2015)
- Time-varying covariates: physical capacity, psychological well-being, BADL
- Statistical methods: Latent Growth Curve Modeling (LGM); compared no-growth, linear, and quadratic models
- Software: Analyses were conducted using SAS software version 9.4 and Mplus version 8.8

**Table 1. Model Fit Indices for Latent Growth Models**

Model	$\chi^2$	p	CFI	TLI	SRMR	RMSEA
No-growth model	4297.353	< .001	.823	.851	.105	.194
Unconditional linear LGM	763.320	< .001	.970	.973	.030	.083
Unconditional linear LGM (free time scores)	546.096	< .001	.979	.977	.032	.077
Unconditional quadratic LGM	230.418	< .001	.992	.992	.016	.045
Conditional quadratic LGM	566.251	< .001	.987	.985	.064	.021

Note. CFI, TLI, SRMR, and RMSEA were used to evaluate model fit. Lower SRMR/RMSEA and higher CFI/TLI indicate better fit.

**Figure 1. IADL Trajectory Over Time: Sample and Model-Estimated Means (2015–2023)**



Note. X-axis = year. Y-axis = mean IADL total score (higher scores indicate better function).



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**Table 2. Descriptive Statistics by Year (2015–2023) (*n* = 2,155)**

Variable	2015	2016	2017	2018	2019	2020	2021	2022	2023
Well-being	17.42 (6.57)	17.69 (6.67)	17.46 (6.66)	17.36 (6.88)	17.38 (7.15)	16.69 (7.97)	16.78 (7.43)	16.90 (8.50)	16.98 (8.48)
Physical capacity	10.23 (6.15)	10.14 (6.30)	9.83 (7.10)	9.59 (7.89)	9.80 (8.44)	9.61 (8.91)	9.45 (10.23)	8.95 (11.09)	7.74 (12.51)
BADL	7.81 (0.35)	7.70 (0.38)	7.71 (0.42)	7.68 (0.51)	7.70 (0.50)	7.61 (0.65)	7.62 (0.81)	7.53 (0.96)	7.41 (1.26)
IADL	5.91 (1.31)	5.90 (1.29)	5.75 (1.43)	5.70 (1.50)	5.57 (1.61)	5.49 (1.75)	5.40 (1.82)	5.26 (1.96)	5.20 (2.01)

**Table 3. Key Predictors of IADL in the Conditional Quadratic LGM (2015–2023)**

Model component	Predictor	Estimate (range)	Significance
Initial status (Intercept)	Male (Sex = 1)	-1.902	$p < .001$
	Education	0.296	$p < .001$
	Income (2015)	0.312	$p < .001$
Time-varying associations (by wave)	Physical capacity	0.168–0.211	$p < .001$ (all waves)
	BADL	0.301–0.505	$p < .001$ (all waves)
	Psychological well-being	0.007–0.046	significant in 2017, 2020–2023

## Results / Practice Implications

- Model selection: Although the unconditional quadratic LGM showed the best fit, we selected the conditional quadratic LGM for explanatory power (CFI = .987, TLI = .985, RMSEA = .021, SRMR = .064).
- Baseline IADL (Intercept): Higher education and income were associated with higher initial IADL ( $p < .001$ ), while male sex (Sex=1) was associated with lower initial IADL ( $p < .001$ ).
- Time-varying covariates: Physical capacity and BADL were consistently associated with IADL across all waves ( $p < .001$ ).
- Well-being: Psychological well-being was significant only at selected waves (2017, 2020–2023).
- Practice implication: Interventions that maintain physical capacity and basic functioning (BADL) may help preserve IADL, with added attention to groups at risk for lower baseline IADL.

## Conclusion

- IADL showed a nonlinear decline from 2015–2023, supporting the use of a quadratic growth framework to capture functional change over time.
- Physical capacity and BADL were consistently associated with IADL across waves, underscoring the interdependence of underlying capacity and basic self-care in maintaining instrumental function.
- Higher education and income predicted higher baseline IADL, suggesting socioeconomic disparities in initial functional status and the need for equity-oriented approaches.

## Significance to the Occupational Therapy profession

- Implications for OT practice: OT interventions should prioritize (1) physical function and activity-based training to support capacity, (2) ADL-focused strategies to maintain foundational self-care skills, and (3) health promotion and psychosocial supports (e.g., coping, engagement, and mental health resources) to sustain community participation and aging in place.
- Overall significance: Findings highlight OT's role in delivering holistic, person-centered interventions that address functional performance and contextual factors to preserve independence in older adults.

