

Prevalence of Pre-frailty and Frailty among Middle-aged and Older Adults of India

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Background

- Frailty is a state of decreased physiological reserve and increased vulnerability to stressors, distinct from aging, disability, and comorbidity.
- The most common definitions are the frailty phenotype and the frailty Index, but simpler tools like the FRAIL scale are being advocated for clinical settings.
- Various studies show that about 3.9% to 51.4% of community-dwelling adults aged 60 and older are physically frail in low and middle income countries as defined by Fried phenotype criteria.
- Frailty increases the risk of adverse health outcomes, higher healthcare costs, and greater use of medical resources.
- There is no standard treatment for frailty, but multi-domain interventions, particularly those including exercise (especially resistance training), show promise.
- Early identification of frailty syndrome is essential for averting consequences that could burden healthcare and social care systems.
- This study aims to explore age-specific factors that influence the elements of the Fried frailty phenotype among adults across different age groups (45-59, 60-74, and 75+).

Methods

- The study utilized data from the Longitudinal Aging Study in India (LASI) Wave-1 (2017–18), which is a nationally representative dataset.
- LASI collected data from 73,396 individuals aged 45 and over, as well as their spouses, across India's states and union territories.
- The study focused on a total sample size of 57,252 older adults aged 45 and above, comprising 26,602 males and 30,650 females. The sample was derived after excluding missing cases for physical frailty.
- Frailty was assessed using the modified Fried frailty phenotype scale, which includes five physiological deficits: ***exhaustion, weak grip strength, slow walking time, unintentional weight loss, and low physical activity.***
- Potential and health-related predictors at individual level- ***ADL, IADL, Self rated health, BMI, Co-morbidity, Cognitive impairment and depression.***

Figure 1: Prevalence of frailty phenotype by age-group in India 2017-18

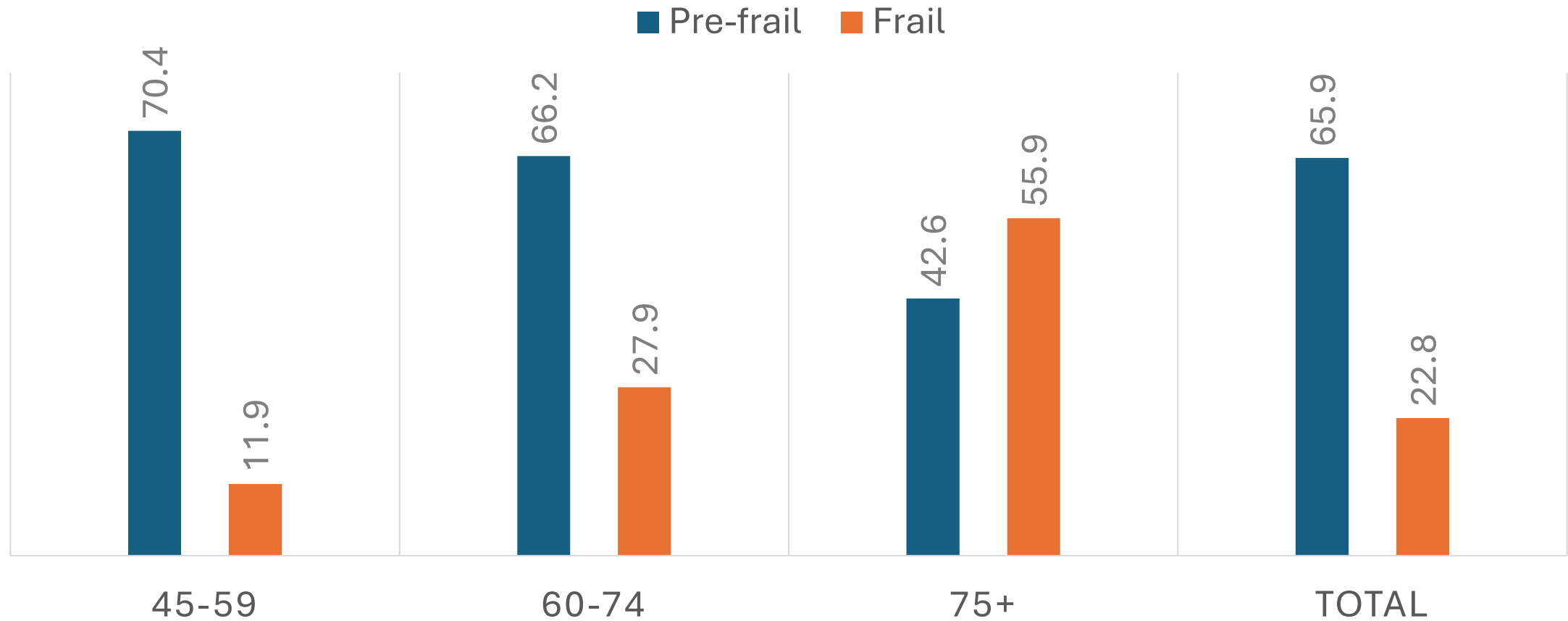


Table 1: Frailty components and combinations in pre-frail and frail individuals of different ages (percentage)

Frailty components	Age-Group							
	Pre-frail				Frail			
	45-59	60-74	75+	Total	45-59	60-74	75+	Total
Weakness (W)	42.0	64.1	79.6	53.2	91.0	95.0	97.7	94.7
Exhaustion (E)	34.8	24.7	13.1	29.3	86.1	75.5	64.1	75.7
Slowness (S)	2.4	4.4	7.3	3.5	22.7	43.7	67.6	44.2
Weight Loss (WL)	3.2	2.1	1.6	2.6	17.3	15.2	9.2	14.2
Low Physical Activity (LPA)	62.1	65.2	73.8	64.1	94.8	93.5	97.1	94.8
(LPA) +(W)	18.1	35.7	54.4	27.5	86.0	88.5	94.9	89.4
(E)+(LPA)	13.9	9.5	6.5	9.1	81.0	69.1	61.2	66.4
(E)+(LPA)+(W)	—	—	—	—	72.1	64.3	59.0	65.0

Figure 2: Age-specific diagnostic accuracy of Fried frailty phenotype components in India 2017-18

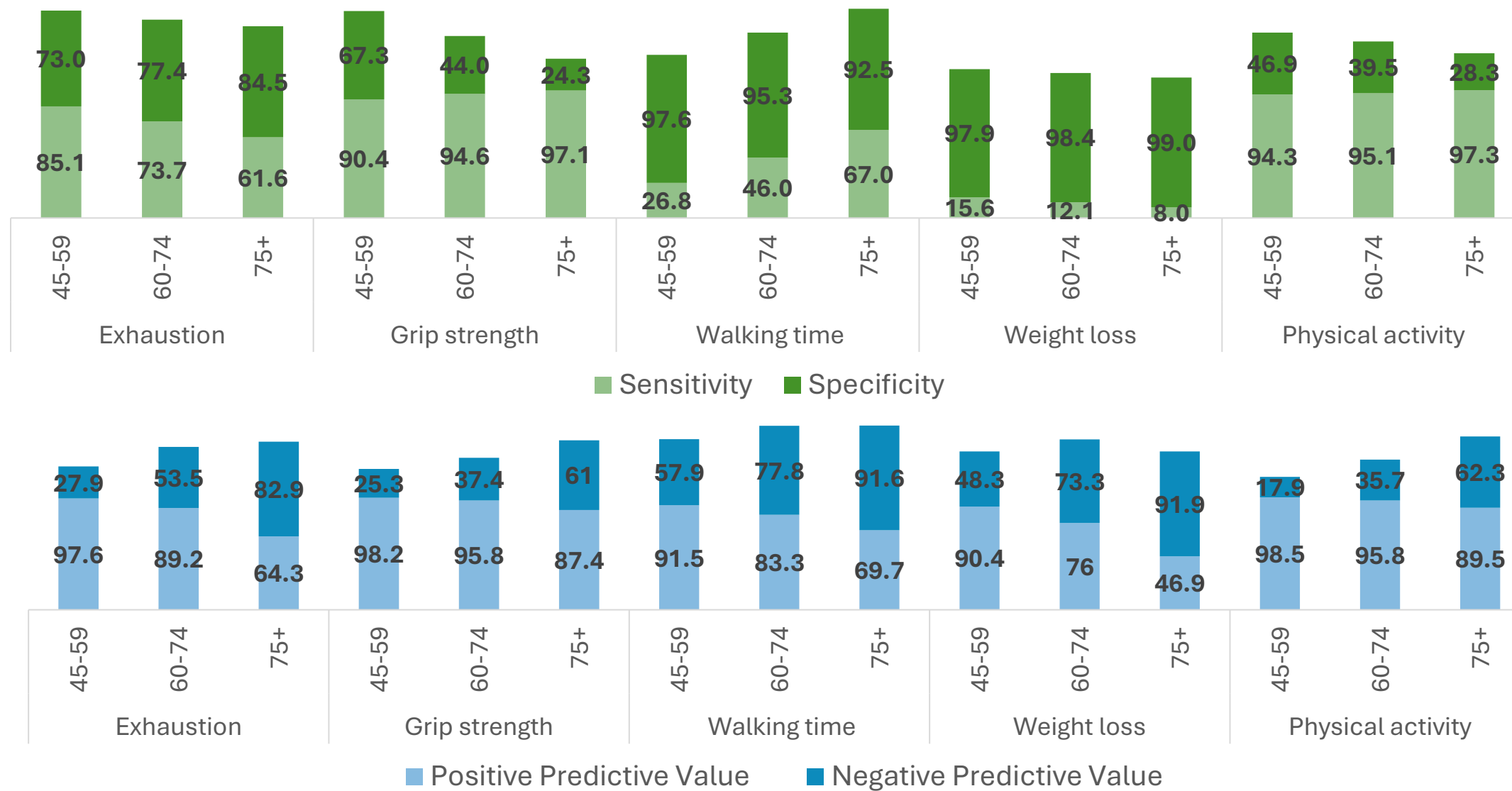


Table 2: The Structure Matrix (Discriminant Analysis)

Predictors	Function 1		Function 2	
	45-59	60+	45-59	60+
Depression	0.775	0.629	0.741	0.583
ADL	0.440	0.581	0.371	0.447
IADL	0.463	0.682	0.431	0.636
Cognition	-0.340	-0.495	-0.388	-0.591
Morbidity	0.448	0.286	0.520	0.435

Function 1: Pre-frail to frail ; Function 2: Robust to frail

Key Findings

Prevalence of Frailty: The prevalence of frailty increases with age. In the 75+ age group, frailty is observed to be more than five times higher compared to the 45-59 age group. Approximately 80% of adults aged 45-59 are either pre-frail or frail, while this percentage rises to over 95% in the 60-74 and 75+ age groups.

Key Frailty Components: Low physical activity and weakness (weak grip strength) are the most prevalent components of frailty. Low physical activity is more common in younger age groups (45-59 and 60-74), while weakness is more prevalent in the 75+ age group.

Significant Predictors: Depression and Instrumental Activities of Daily Living (IADL) are strong predictors of frailty in the 45-59 age group. In the 60+ age group, IADL, cognition, depression, and morbidity are stronger predictors.

Diagnostic Accuracy: Low physical activity and weakness show high sensitivity (over 90%) for identifying frailty across all age groups. Weight loss consistently exhibits high specificity (over 97%), indicating its effectiveness in correctly identifying individuals without frailty.

Combination of Frailty Components: The combination of "low physical activity and weakness" is the most significant pairwise combination, with its prevalence increasing with age among frail individuals. This combination is observed in 86%, 88.5%, and 94.9% of frail individuals across the 45-59, 60-74, and 75+ age groups, respectively.

Conclusions

- Regular assessment of physical activity status and handgrip strength in middle-aged and older adults is recommended as an easy, quick, and feasible screening instrument for physical frailty in the community-dwelling population.
- Age-stratified analysis is useful for evaluating frailty status and helps in the development of public health measures at the early stages.
- The findings have practical implications for improving the quality of life of the studied population in India and reducing their future healthcare expenses.