

Functional Limitations Among Adults with Arthritis: An Analysis of Duration, Severity, and Type of Arthritis

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Background

- Arthritis is a leading cause of functional limitations among adults. (Dunbp, Manheim, Yelin, Song, and Chang 2003)
- Severity of arthritis is negatively associated with functional health and activity. (Zimmer, Hickey, and Searle 2002)
- Most studies focus on severity of arthritis, and rarely focus on how long one has lived with arthritis.
 - Individuals can vary greatly in their adaptation to diseases and this is not always well explained by the severity of the disease. (Curtis, Groarke, Coughlan, and Gsel 2005)

Background

- Duration of disease may affect how one learns to live and function with the disease, therefore increasing one's ability to perform activities. (Barlow, Cullen, and Rowe 1999)
 - As one lives with arthritis, one learns how to adapt to challenges. (Evers, Kraaimaat, Geenen, Jacobs, and Bijlsma 2003)
- Levels of functional ability decrease as one lives with the chronic disease because of fear-avoidance and losses in physical functioning as the illness progresses. (Zimmer, Hickey, and Searle 1997)

Data and Method

- Health and Retirement Study
 - Longitudinal Panel Study of non-institutionalized U.S. population over the age of 50.
 - 1998, 2000, 2002 and 2004 waves
 - Total Sample Size = 30,195
 - Sub-sample Size = 11,316
- Weights are used to correct for the complex sampling design.
- Multiple Linear Regression

Dependent Variable

- Functional limitations:

- walking several blocks, walking one block, sitting for about two hours, getting up from a chair after sitting for long periods, climbing several flights of stairs without resting, climbing one flight of stairs without resting, lifting or carrying weights over ten lbs, stooping kneeling, or crouching, reaching arms above shoulder level, pushing or pulling large objects, and picking up a dime from the table.
- From the 2004 wave
- Additive index: 0 to 11

Independent Variables

- Duration (1998, 2000, 2002, 2004)
 - Range: 1 to 4
 - 1 = arthritis in only most recent wave (shortest reported duration)
 - 4 = arthritis in all waves (longest reported duration).
- Severity:
 - seen by a doctor specifically for his/her arthritis
 - has stiffness, pain, swelling of joints due to arthritis
 - takes any medications or treatments for arthritis
 - had surgery or joint replacement because of arthritis
 - Range: 0 to 4 (4 = most severe)
- Self-rated change in severity
 - Arthritis has gotten worse
 - Arthritis has stayed the same (reference group)
 - Arthritis has gotten better

Independent Variables Continued

- **Type of arthritis:**
 - Osteoarthritis (reference group)
 - Rheumatoid arthritis
 - Gout or Lupus
 - Arthritis due to an injury
- **Control Variables:** **gender**, **age**, **race/ethnicity** (Non-Hispanic Whites vs. others), **marital status** (married vs. not married), **education** (number of year), **household income** (logged), **net wealth** (logged), **insured** (yes/no), **self-rated health** (poor to excellent), **chronic conditions** (number of), **seeing impairment** (blind to excellent), **hearing impairment** (poor to excellent), **physical activity** (yes/no), **body mass index** (underweight, normal weight (ref), overweight, and obese), **smoking status** (never smoked (ref), former smoker, currently smoking).

Table 1. Descriptive Statistics

	Percent	Mean	Std. Error
Dependent Variables			
Functional Limitations		3.82	0.054
Independent Variables			
Duration of Arthritis		3.44	0.014
Self-rated Change in Severity			
Worse	11.1		
Same	57.8		
Better	31.2		
Severity of Arthritis		1.72	0.010
Type of Arthritis			
Osteoarthritis	60.1		
Rheumatoid	24.9		
Gout/Lupus	2.8		
Arthritis due to an Injury	12.3		

Table 1. Descriptive Statistics Continued

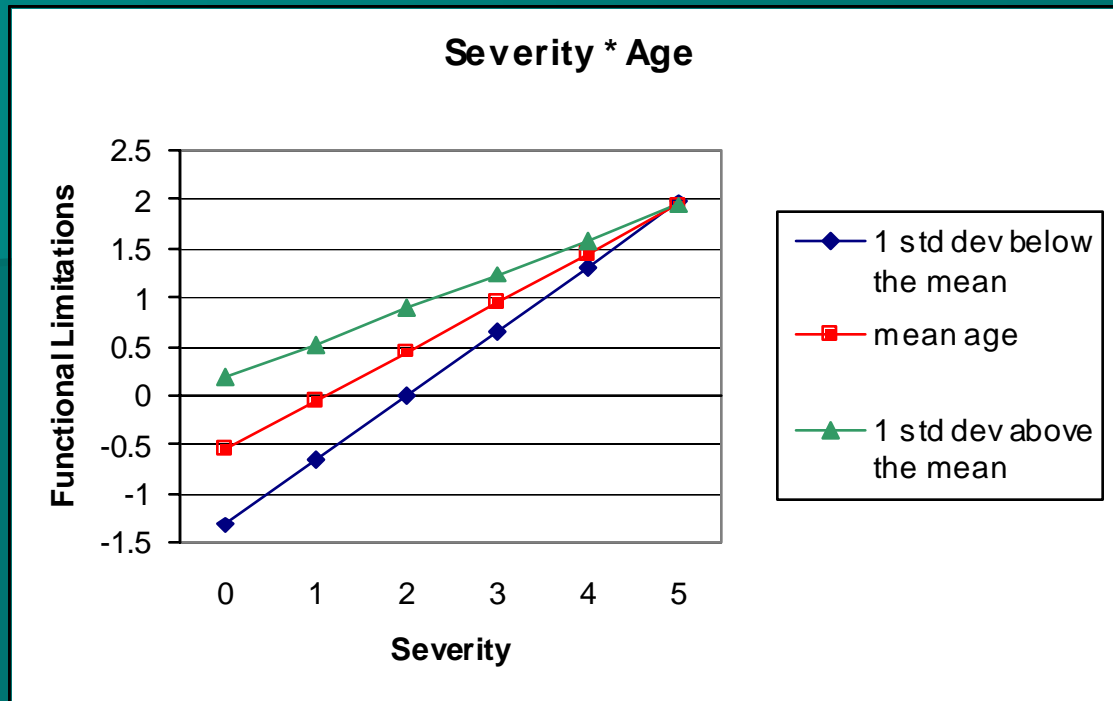
	Percent	Mean	Std. Error
Age (uncentered)		67.78	0.199
Gender (Female)	60.5		
Race/Ethnicity (Non-Hispanic Whites)	81.9		
Marital Status (Married)	62.3		
Education		12.25	0.081
Household Income (logged)		10.30	0.029
Net Wealth (logged)		11.02	0.068
Insurance		0.96	0.004
Self-rated Health		3.05	0.018
Chronic Conditions		1.48	0.017

Table 1. Descriptive Statistics Continued

	Percent	Mean	Std. Error
Seeing Impairment		4.16	0.015
Hearing Impairment		3.33	0.014
Participation in Physical Activity	39.7		
BMI			
Underweight	1.7		
Normal weight	27.6		
Overweight	37.6		
Obese	33.1		
Smoking Status			
Current Smoker	14.1		
Former Smoker	45.1		
Never Smoked	40.9		

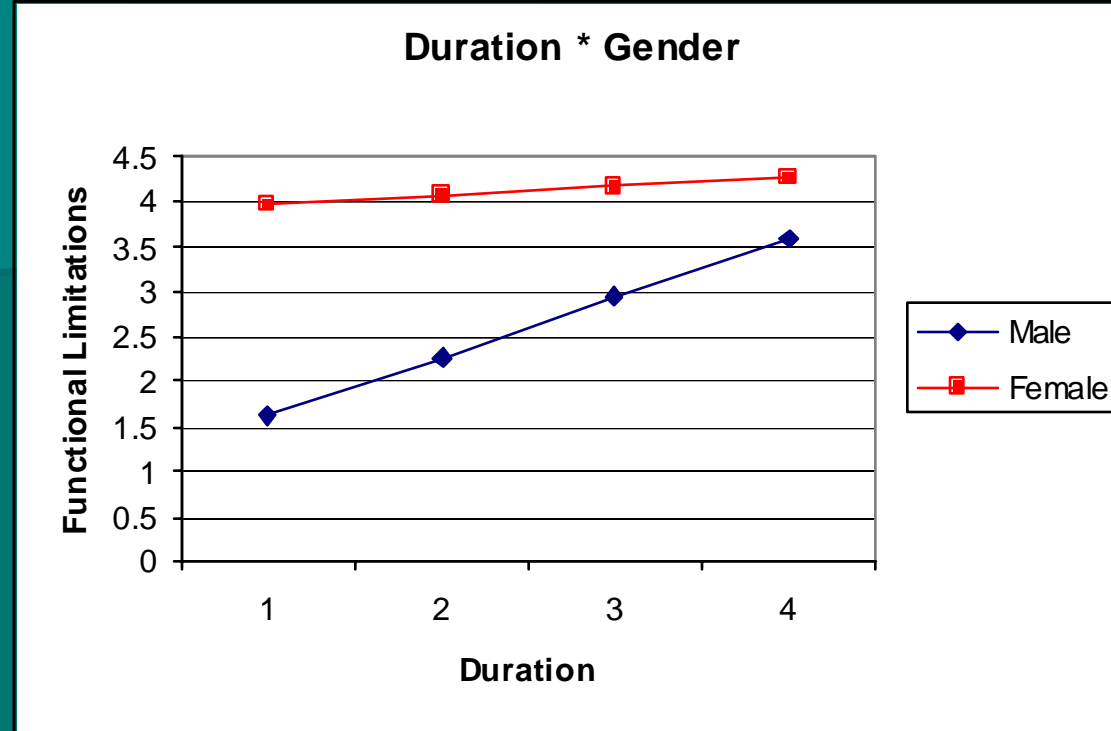
Table 2. Coefficients from Linear Regression on Functional Limitations

	Model 1	Model 2
Duration of Arthritis	0.319*	0.664***
Self-rated Change in Severity		
Same (reference)	---	---
Worse	0.466***	0.468***
Better	-0.171	-0.168
Severity of Arthritis	0.473***	0.503***
Type of Arthritis		
Osteoarthritis (reference)	---	---
Rheumatoid	-0.084	-0.072
Gout/Lupus	-0.727***	-0.701**
Arthritis due to an Injury	-0.061	-0.049
Severity * Age		-0.013***
Duration * Gender		-0.567*
R-Square	42.84	43.10
Notes: *p<.05, **p<.01, ***p<.001		



- The effect of severity on functional limitations is dependent on age:

Younger adults have fewer limitations at lower levels of severity, but their slope is more positive. At higher levels of severity, adults at all ages have similar levels of functional limitations.



- The effect of duration on functional limitations is dependent on gender:
Females have higher levels of functional limitations at all lengths of duration. However, the gap in functional limitations closes as duration increases.

Table 3. Coefficients for Linear Regression on Functional Limitations by Gender

	Females	Males
Duration of Arthritis	0.056	0.657***
Self-rated Change in Severity		
Same (reference)		
Worse	0.468***	0.490**
Better	-0.033	-0.428**
Severity of Arthritis	0.446***	0.495***
Type of Arthritis		
Osteoarthritis (reference)		
Rheumatoid	-0.092	-0.040
Gout/Lupus	-1.401***	-0.325
Arthritis due to an Injury	-0.265	0.172

- For males only, duration and self-perceived improvement in arthritis are important predictors of functional limitations.
- For females only, those with Gout/Lupus are significantly different from those with OA

Conclusion

- Main Findings:
 - Duration AND Severity predict functional limitations
 - As severity increases, functional limitations increase.
 - The effect of severity depends on age
 - As duration increases, functional limitations increase.
 - The effect of duration depends on gender: more important for males than females.
 - Perceiving arthritis as worse predicts an increase in functional limitations.
 - Females with Gout/Lupus have fewer functional limitations compared to females with OA.