

**The Relationship between Physical
Functioning and Mental Health
among Older Adults with Disabilities in
Korea: Moderating Effects of Age**

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INTRODUCTION

■ *Problem Statement*

- People who are aged 65 and older : 7.2% of the total Korean population in 2000 → 12.2% in 2013 (*Statistics Korea, 2013*).
- People with disability of the overall population: increased almost 2.5 times from 1.5% in 1999 → 4.9% in 2012 (*Employment Development Institute, 2012; 2013*).
- In 2012, those who are age 40 years old or over composed 85.3% of the total legally registered adults with disability, 50 years old or over represent 71.4%, and 60 years old or over represent 49.7% (*Employment Development Institute, 2012*).
- With the increase of aging population that one of the most important challenges of older adults is to become functionally limited and their disability related issue (*Fried & Guralnik, 1997*).
- The presence of functional limitation is associated with not only higher dependence but also higher risk of vulnerable feeling such as depression and anxiety.

- *Research Objectives & Questions*

- Based on the fact that physical functioning in old age is one of most significant factors that affect older adults' mental health.
- Therefore, this study has two goals:
 - ① to describe the functional characteristics of older Korean adults with disabilities and
 - ② to test hypothesized research models regarding the impact of functional limitations on the mental health of older adults with disabilities

Theories

- Research questions on the relationship between functional limitation on mental health of older Koreans with disabilities and the moderating effects of age are based on
- Lazarus and Folkman's (1984) 'Transactional Model of Stress'
- Havighurst's (1961) 'Activity Theory.'

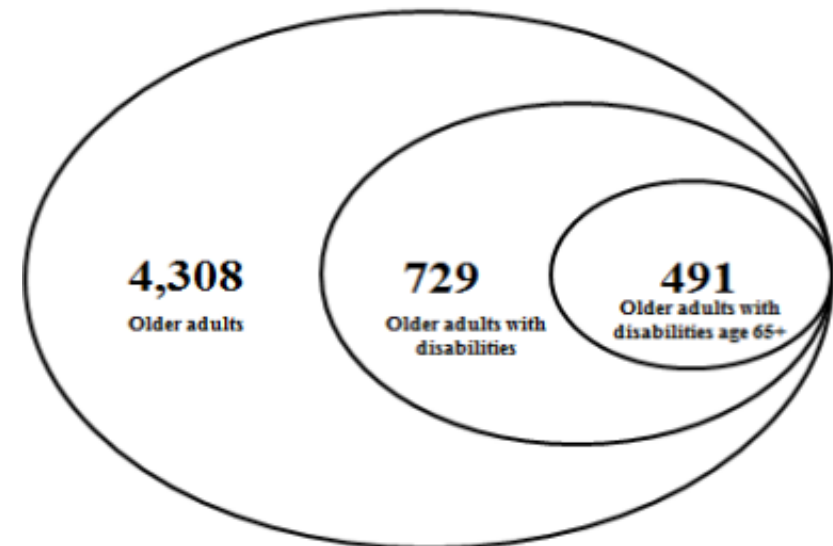
ADL: Activities of daily living

IADL: Instrumental activities of daily living

	Research Question	Research Hypothesis
1	How does functional limitation affect mental health?	Functional limitation may negatively affect one's mental health.
1-1	How are ADLs and IADLs related to depression among older adults with disability?	ADL/IADL limitation may positively affect the levels of depression
1-2	How are ADLs and IADLs related to anxiety among older adults with disability?	ADL/IADL limitation may positively affect the levels of anxiety.
2	Does age moderate the effect of functional limitation on mental health?	There will be age difference in the impact of functional limitation on mental health.
2-1	Is there a difference in the relationship between ADL and depression by various age groups?	There will be age difference. 'Old-old persons' will have the higher level of depression as an impact of ADL limitation compared to the 'young-old persons.'
2-2	Is there a difference in the relationship between IADL and depression by various age groups?	'Old-old persons' will have the higher level of depression as an impact of IADL limitation compared to the 'young-old persons.'
2-3	Is there a difference in the relationship between ADL and anxiety by various age groups?	'Old-old persons' will have the higher level of anxiety as an impact of ADL limitation compared to the 'young-old persons.'
2-4	Is there a difference in the relationship between IADL and anxiety by various age groups?	'Old-old persons' will have the higher level of anxiety as an impact of IADL limitation compared to the 'young-old persons.'

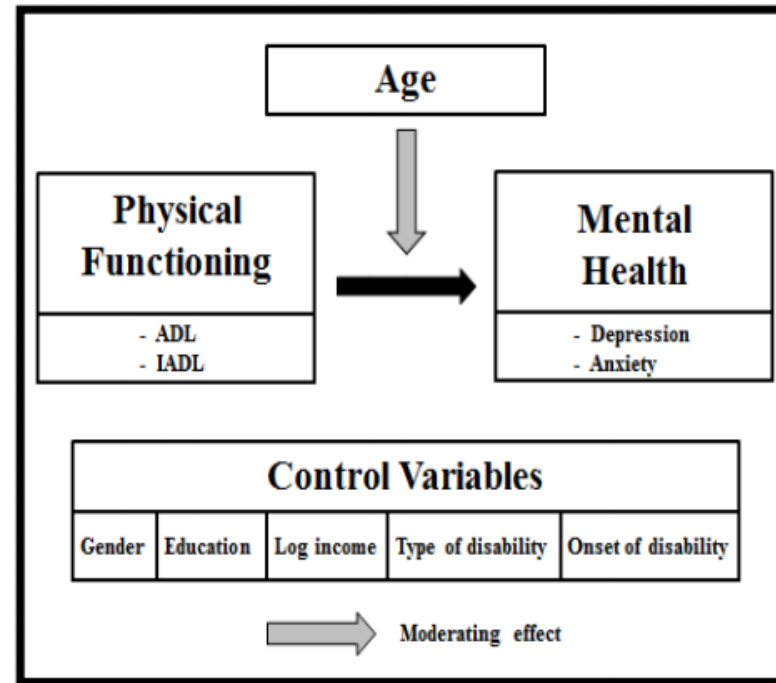
METHODS

- This research used samples collected from the 'National Pension Panel 2009' (NPRI, 2011) for its analysis. The present study analyzed data from the 2009 survey.
- A total of 491 samples were classified as 65 years and over who had disabilities (Figure 1).



• Figure 1. Sample Selection: NPRI 2009 Panel Participants

- To examine the relationship of ADL/IADL and depression/anxiety, controlling for sociodemographic factors, multiple regression models were performed.
- Also, multiple regression analyses were conducted to examine the hypothesis that age has a moderating influence on the association between functional ability and depression/anxiety (Figure 2).



■ Figure 2. Research Model

All variables of the current study

	Label	Type	Measure
IV	Gender	Dummy	1 = female, 0 = male
	Education	Dummy	1= high school & over, 0 = junior & below
	Natural log of income	Continuous	Log of the household gross income of individuals (sum of earned income, financial income, real property, privatetransfer income, publictransfer income, and other incomes)
	Type of disability	Dummy	1 = mental, 0 = physical
	Onset of disability	Dummy	1 = age of 65 and over (late-life disability) 0 = before age of 65 (lifelong disability)
	ADL	Continuous	Mean of the 7 ADL items
	IADL	Continuous	Mean of the 10 IADL items
DV	Sum of 13 depression items	Continuous	Level of depressive/anxiety feeling; 1 = not at all 2 = just a little
	Sum of 10 anxiety items	Continuous	3 = somewhat 4 = quite a lot 5 = very much
CV	Age group	Dummy	1 = age 75 and over (old-old), 0 = age 65-74 (young-old)

Variables	Items	Scale	Variable
Depression	1. Decrease of sexual desire.	5- point scale	Not at all: 1 Just a little: 2 Somewhat: 3 Quite a lot: 4 Very much: 5
	2. I feel low.		
	3. I want to die.		
	4. I cry often.		
	5. I feel trapped or caught.		
	6. I feel that I am a guilty person.		
	7. I feel lonely.		
	8. I feel blue.		
	9. I worry a lot.		
	10. I have lost interest in aspects of life.		
	11. My future seems hopeless.		
	12. Everything feels hard.		
	13. I feel futile.		
Anxiety	1. I feel sensitive.		
	2. I feel trembling or shaking		
	3. I am frightened, or surprised for no reason.		
	4. I feel fearful for no reason.		
	5. Pounding heart.		
	6. I feel nervous.		
	7. I experience overwhelming fear.		
	8. I feel restless.		
	9. Familiar things become unfamiliar.		
	10. I am impatient and restless.		

RESULTS

Socio-demographic Characteristics

Variables		Frequency (N)	Percentage (%)
Gender	Female	251	51.1
	Male	240	48.9
Age (in years)		491	100
		Mean = 73.12	SD = 6.06
Education	Uneducated	134	27.3
	Elementary school	209	42.6
	Junior-high school	62	12.6
	High school	62	12.6
	College (<4 years)	7	1.4
	University (≥ 4years)	14	2.9
	Graduate school	3	.6
Marital Status	Have a spouse	337	68.6
	Divorced	6	1.2
	Bereaved	143	29.1
	Separated	5	1.0
Presence of a spouse	Yes	337	68.6
	No	154	31.4
Employment	Employed	97	19.8
	Unemployed	394	80.2

RESULTS

	Research Question	Research Hypothesis	Results
1	How does functional limitation affect mental health?	Functional limitation may negatively affect one's mental health.	Accepted
1-1	How are ADLs and IADLs related to depression among older adults with disability?	ADL/IADL limitation may positively affect the levels of depression.	Accepted
1-2	How are ADLs and IADLs related to anxiety among older adults with disability?	ADL/IADL limitation may positively affect the levels of anxiety.	Accepted
2	Does age moderate the effect of functional limitation on mental health?	There will be age difference in the impact of ADL on depression.	Accepted
2-1	Is there a difference in the relationship between ADL and depression by various age groups?	There will be age difference. 'Old-old persons' will have the higher level of depression as an impact of ADL limitation compared to the 'young-old persons.'	Accepted in the opposite direction
2-2	Is there a difference in the relationship between IADL and depression by various age groups?	'Old-old persons' will have the higher level of depression as an impact of IADL limitation compared to the 'young-old persons.'	Accepted in the opposite direction
2-3	Is there a difference in the relationship between ADL and anxiety by various age groups?	'Old-old persons' will have the higher level of anxiety as an impact of ADL limitation compared to the 'young-old persons.'	Accepted in the opposite direction
2-4	Is there a difference in the relationship between IADL and anxiety by various age groups?	'Old-old persons' will have the higher level of anxiety as an impact of IADL limitation compared to the 'young-old persons.'	Accepted in the opposite direction

- The findings of this study are presented as the following:
- First, consistent with the previous study, the current study shows that functional limitations (ADLs and IADLs) have a positive association with depression and anxiety symptoms.
- This means that higher levels of limitations in ADLs and IADLs are significantly associated with higher levels of depression and anxiety among older adults with disabilities (Table 1 and Table 2).

Table 1. Effect of Functional Limitation on Depression

	Depression								
	Model I-1			Model I-2			Model I-3		
	<i>B</i>	<i>S. E.</i>	β	<i>B</i>	<i>S. E.</i>	β	<i>B</i>	<i>S. E.</i>	β
Gender	.201	.002	.106 ^{***}	.173	.002	.091 ^{***}	.188	.002	.099 ^{***}
Education	-.234	.003	-.091 ^{***}	-.231	.003	-.090 ^{***}	-.244	.003	-.095 ^{***}
Log income	-.150	.001	-.138 ^{***}	-.186	.001	-.171 ^{***}	-.169	.001	-.156 ^{***}
Type of disability	.468	.009	.061 ^{***}	.439	.009	.058 ^{***}	.464	.009	.061 ^{***}
Onset of disability	.107	.002	.056 ^{***}	.066	.002	.034 ^{***}	.084	.002	.044 ^{***}
ADL	.841	.003	.359 ^{***}				.434	.004	.185 ^{***}
IADL				.593	.002	.369 ^{***}	.369	.003	.230 ^{***}
(Constant)	2.467 ^{***}	.013		2.987 ^{***}	.012		2.630 ^{***}	.013	
N	491								
R-square	.174			.182			.197		
Adjusted R-square	.174			.182			.197		
F	21108.114 ^{***}			22286.949 ^{***}			20993.644 ^{***}		
F (unweighted)	12.835 ^{***}			15.062 ^{***}			13.647 ^{***}		

*p<.05, **p<.01, ***p<.001.

Table 2. Effect of Functional Limitation on Anxiety

	Anxiety								
	Model I -1			Model I -2			Model I -3		
	<i>B</i>	<i>S. E.</i>	β	<i>B</i>	<i>S. E.</i>	β	<i>B</i>	<i>S. E.</i>	β
Gender	.249	.002	.140 ^{***}	.225 ^{***}	.002	.127	.238	.002	.134 ^{***}
Education	-.106 ^{***}	.003	-.044 ^{***}	-.104 ^{***}	.003	-.043	-.116	.003	-.048 ^{***}
Log income	-.109 ^{***}	.001	-.107 ^{***}	-.140 ^{***}	.001	-.138	-.126	.001	-.124 ^{***}
Type of disability	.215 ^{***}	.009	.030 ^{***}	.190 ^{***}	.009	.027	.212	.008	.030 ^{***}
Onset of disability	-.003	.002	-.002	-.039 ^{***}	.002	-.021	-.023	.002	-.013 ^{***}
ADL	.734 ^{***}	.003	.334 ^{***}				.373	.004	.170 ^{***}
IADL				.520 ^{***}	.002	.345	.328	.003	.218 ^{***}
(Constant)	1.709 ^{***}	.012		2.160 ^{***}	.012		1.854 ^{***}	.012	
N	491								
R-square	.144			.152			.164		
Adjusted R-square	.144			.152			.164		
F	16758.761 ^{***}			17856.084 ^{***}			16777.008 ^{***}		
F (unweighted)	10.153 ^{***}			11.956 ^{***}			10.706 ^{***}		

*p<.05, **p<.01, ***p<.001.

RESULTS

- Second, there is a significant moderating effect of age; it is surprising that the 'old-old' persons with high functional limitations are less depressed and less anxious than their younger counterparts. Initially, it was expected that the old-old persons with high functional limitations will be more depressed and more anxious, but there may be a number of explanations for this different outcome (Figure 3 and Figure 4).
- Surprisingly, older age had a buffering effect on the relationship between functional limitations and mental health.

Figure 3. Interaction of ADL/IADL & Age (depression)

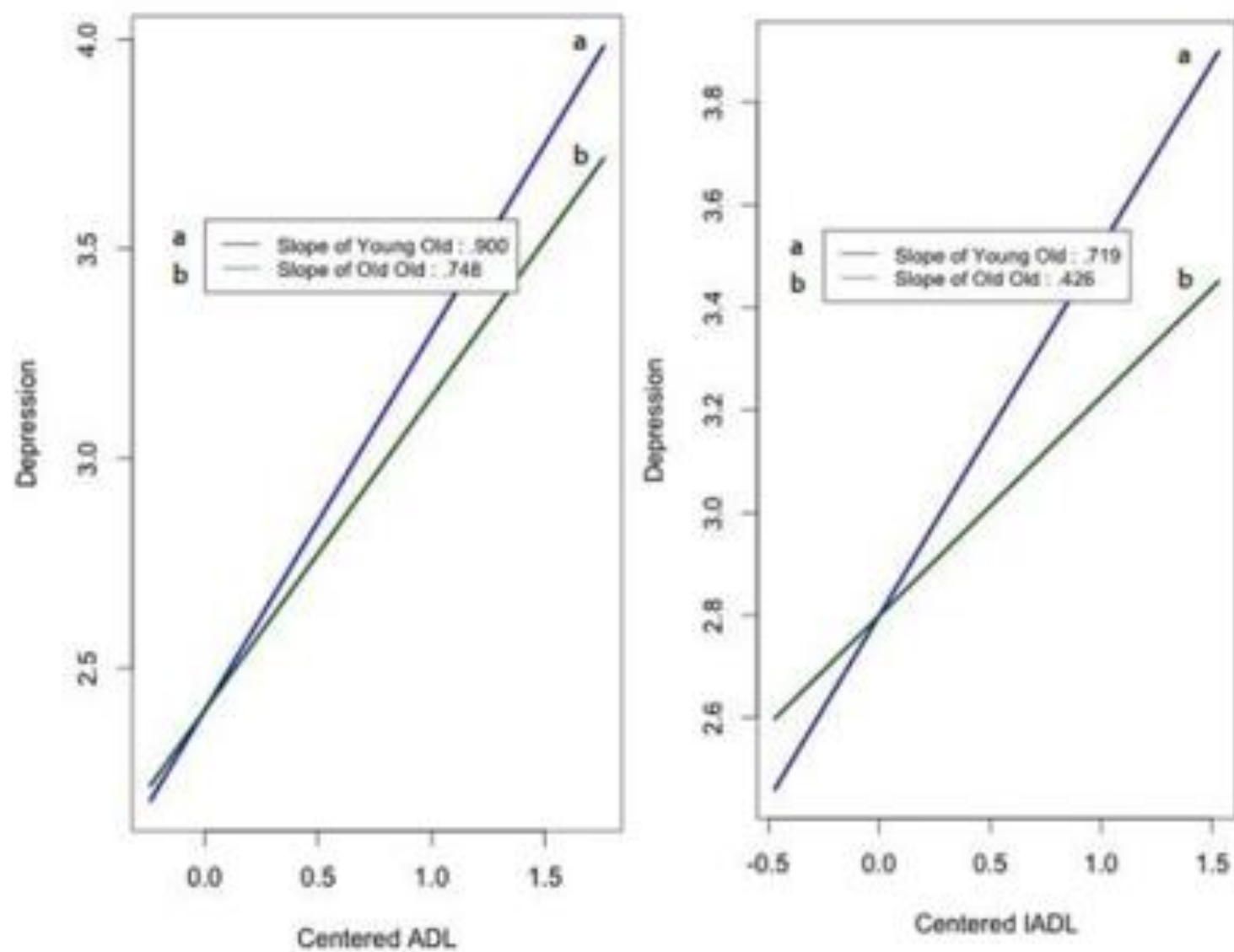
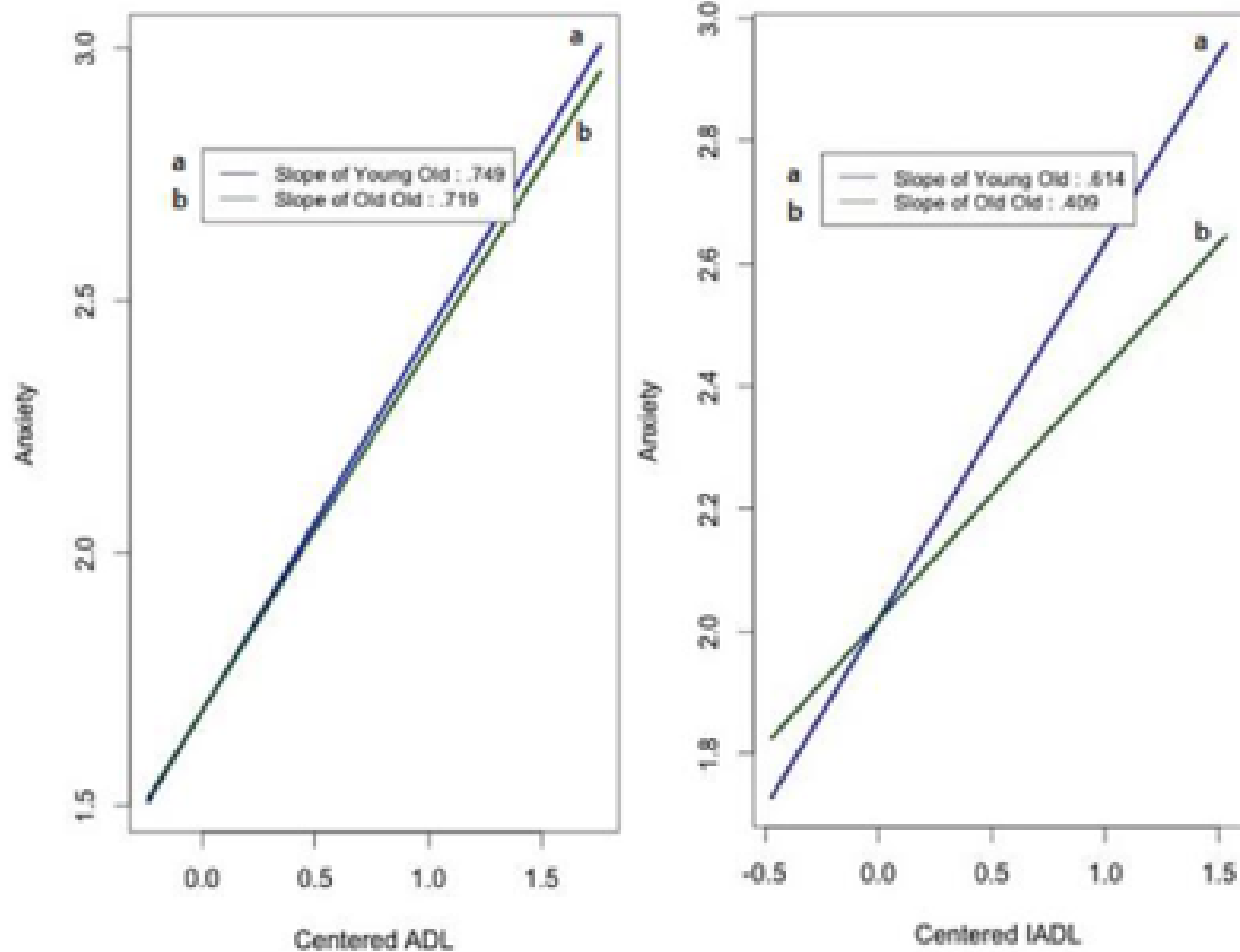


Figure 4. Interaction of ADL/IADL & Age (anxiety)



DISCUSSION

- The findings confirm the importance of early intervention to reduce the anxious feelings among the 'young-old' and functional independence as an important component of mental health later in life. The significant impact of functional health on depression and anxiety differ by age among 'young-old' and 'old-old.'
- Therefore, age-specific implications and services are needed to promote overall health related well-being and quality of independent life of older Korean's disabilities.

DISCUSSION

- The significant moderating effect of age provides insights on developing a health age index (considering both their physical age as well as their chronological age) every decade expecting the cohort effects. Further research to examine the mechanisms and generalization of these findings seems warranted.

CONCLUSION

- The present study suggests the need to concentrate on the interrelationship between physical and mental health to promote older adult's healthy later life.
- Moreover, the significant moderating effect of age provides insights on developing 'a health age index (considering both their physical age as well as their chronological age)' every decade expecting the cohort effects.

- No one is immune from becoming disabled and being old. Active research on older adults with disabilities will provide greater insight by expanding the understanding of late life that everyone will encounter.



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