



# SE-19 Ageing

## Key predictive factors on the self-rated health among older couples

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2026.02.10

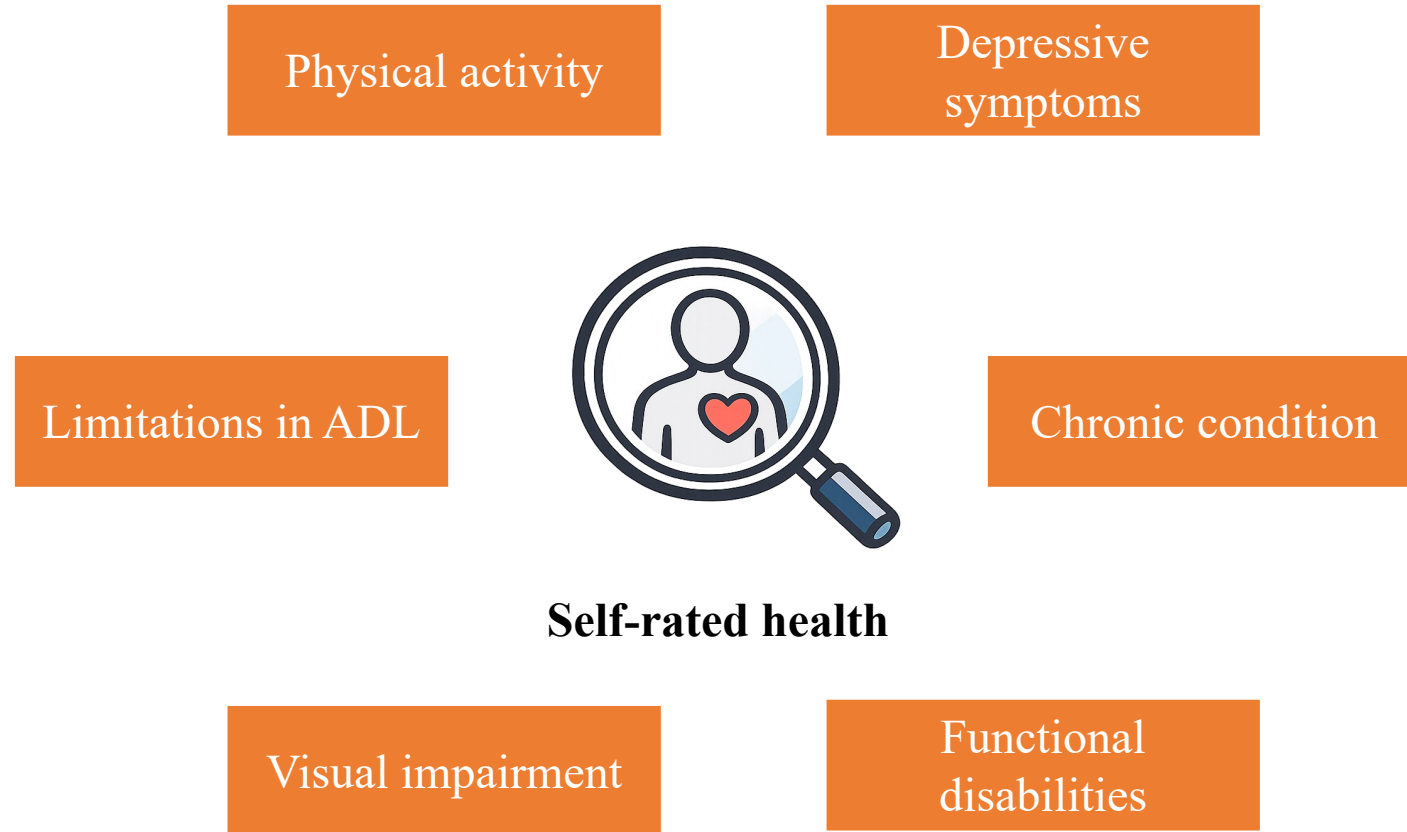
# INTRODUCTION



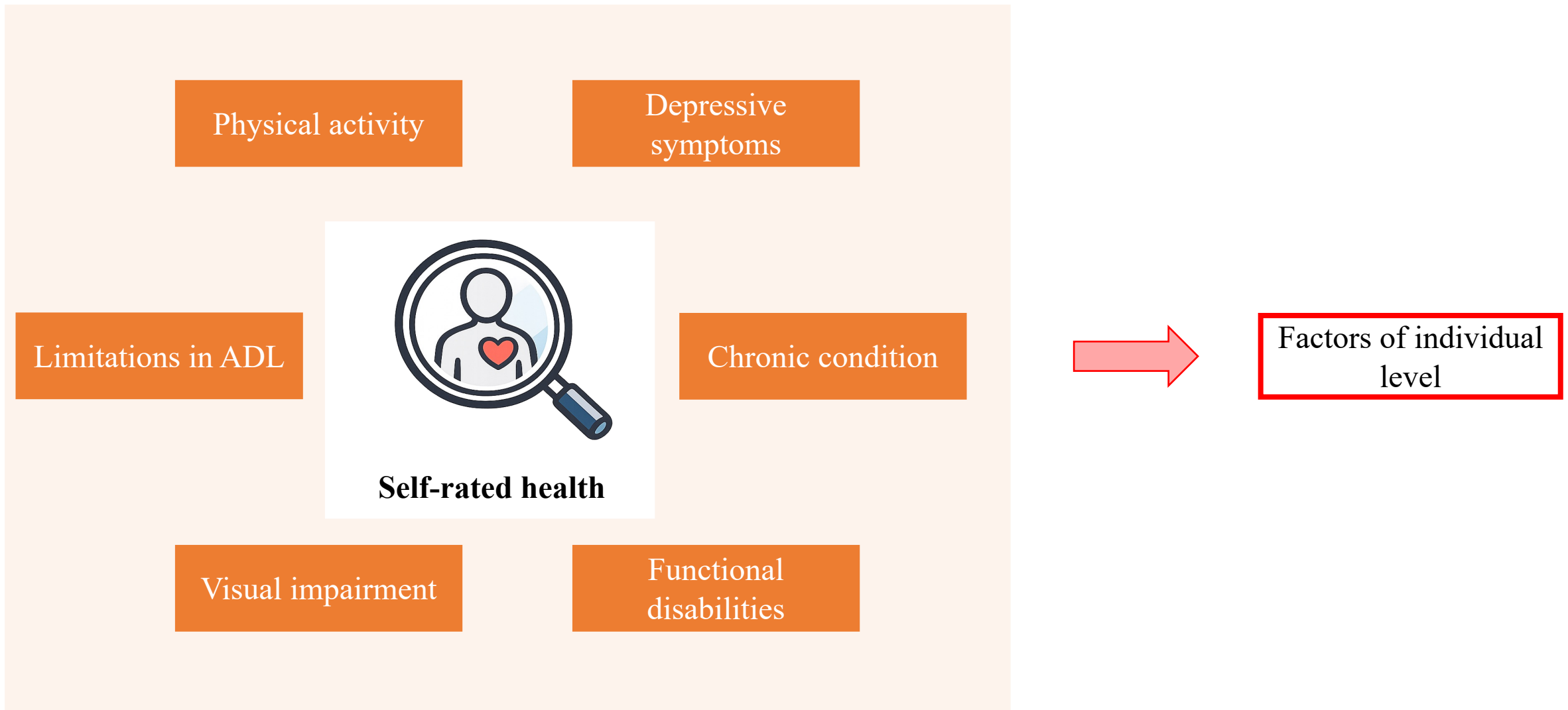
**Self-rated health**

- A key indicator of successful and active aging
- It predicts physical function, mental health, and mortality
- Proven as a valid indicator for short-, mid-, and long-term mortality risk
- Korea's rapidly aging population highlights the need to identify factors threatening self-rated health

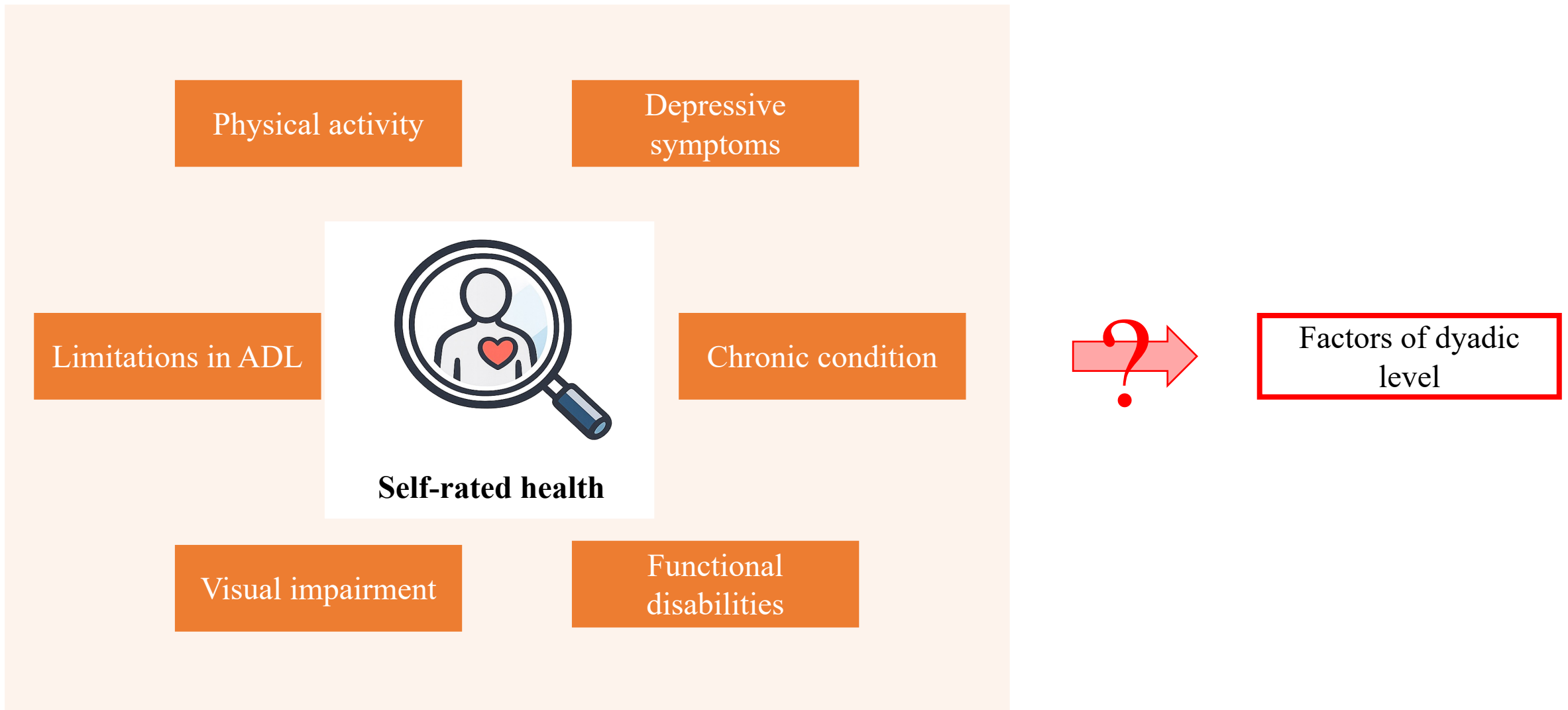
# INTRODUCTION



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# INTRODUCTION

## ❖ Study Aim

- ✓ To develop prediction models of self-rated health among community-dwelling older couples
- ✓ To incorporate both individual and spousal characteristics
- ✓ To identify key factors associated with subjective health
- ✓ To provide evidence for interdependent, couple-centered health management strategies

# METHODS

- ❖ Design: Cross-sectional study
- ❖ Data: 2023 Korean Elderly Survey
- ❖ Study participants
  - ✓ Removed the individuals who interviews were completed by proxy respondents ( $n = 127$ ), 2) those not living solely with an older spouse (specifically, households in which an older adult couple co-resided with their adult children or other family members;  $n = 4,808$ ), 3) and cases in which both members of the couple were not interviewed ( $n = 677$ ).
  - ✓ Among the data of 10,078 older adults, the final sample was 4,466 older adults (2,233 dyadic data)

# METHODS

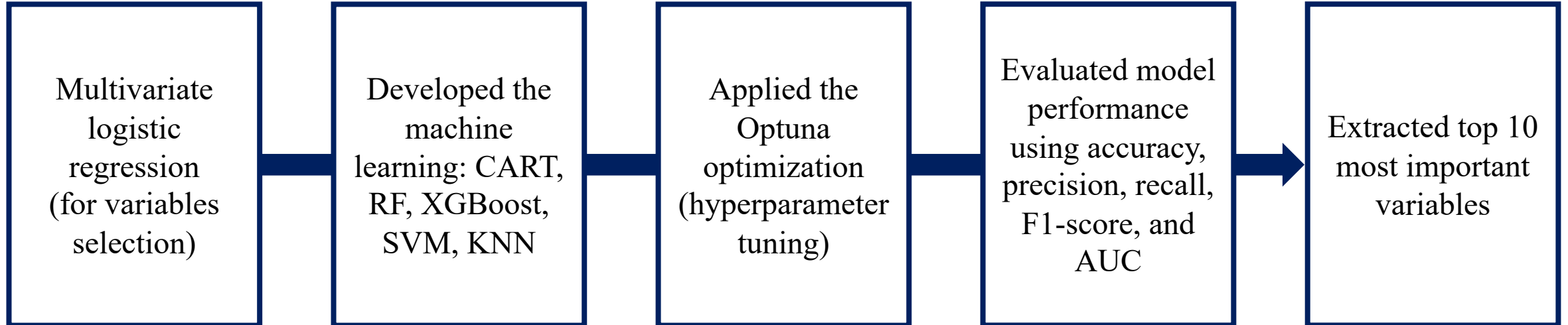
## ❖ Study variables

Outcome	self-rated health	<ul style="list-style-type: none"><li>• Question: How do you perceive your overall health status?</li><li>• Scoring<ul style="list-style-type: none"><li>• Five-point Likert scale (1 = very healthy, 2 = somewhat healthy, 3 = fair, 4 = somewhat unhealthy, 5 = not healthy at all)</li></ul></li><li>• Converted into a binary variable<ul style="list-style-type: none"><li>• 0 = very healthy + somewhat healthy + fair</li><li>• 1 = somewhat unhealthy + not healthy at all).</li></ul></li></ul>
Predictor variables	Own variables ..... Partner's variables	<ul style="list-style-type: none"><li>• Age, years of educational attainment, number of physician-diagnosed chronic conditions, employment status, depressive symptoms, need for assistance with BADL and IADL, participation in social activities, history of falls, presence of government-registered disabilities in Korea, engagement in regular exercise, cognitive function, and regular contact with friends, family members, and children</li></ul>

# METHODS

## ❖ Statistical analysis

- ✓ To predict the self-rated health using the factors of one's own and partner's, and identify key variables that are associated with the predictive model
  - ✓ Used the machine learning technique
- ✓ Analyses were conducted separately to predict males' and females' self-rated health



# RESULTS

## ❖ Demographic characteristics of participants according to self-rated health status

Variables	Good self-rated health (n = 3597, 80.54%)	Poor self-rated health (n = 869, 19.46%)	p-value
Sex			0.3075
Male	1,785 (49.62%)	448 (51.55%)	
Female	1,812 (50.38%)	421 (48.45%)	
Age	72.28±5.68	76.67±6.16	<.0001
Years of education	9.49±3.65	7.23±3.99	<.0001
Economic status			<.0001
Currently employed	1,589 (44.18%)	238 (27.39%)	
Other (previously employed and Never employed)	2,008 (55.82%)	631 (72.61%)	
Number of chronic diseases	1.80±1.35	3.40±1.62	<.0001
History of fall (yes)	118 (3.28%)	88 (10.13%)	<.0001
Having disabilities (yes)	62 (1.72%)	94 (10.82%)	<.0001
Regularly exercise (yes)	2,120 (58.94%)	387 (44.53%)	<.0001
Cognitive function	25.61±4.25	23.06±4.72	<.0001
Regular contact with their children	2,219 (61.69%)	491 (56.50%)	0.0050
Regular contact with their family	402 (11.18%)	72 (8.29%)	0.0130
Regular contact with their friends	2,154 (59.88%)	399 (45.91%)	<.0001
Depressive symptom	2.05±2.35	5.29±3.51	<.0001
Assistance with BADL	7.04±0.38	7.54±1.65	<.0001
Assistance with IADL	10.23±1.01	11.91±3.89	<.0001
Social activity	0.45±0.72	0.53±0.67	0.0032

# RESULTS

## ❖ Individual- and Dyadic-Level Factors Associated With Self-Rated Health Among Older Couples

Variable	Odd ratio	p-value	95% CI
Target variable: <b>Females'</b> self-rated health			
Own's factor			
<b>Age</b>	<b>1.074</b>	<b>0.000</b>	<b>1.045 to 1.104</b>
Years of education	0.927	0.008	0.876 to 0.980
<b>Number of chronic diseases</b>	<b>1.446</b>	<b>0.000</b>	<b>1.303 to 1.602</b>
Regularly exercise	0.697	0.013	0.525 to 0.926
History of fall	1.750	0.032	1.051 to 2.912
Having disabilities	4.320	0.000	1.988 to 9.393
<b>Depressive symptom</b>	<b>1.345</b>	<b>0.000</b>	<b>1.269 to 1.425</b>
<b>Assistance with IADL</b>	<b>1.330</b>	<b>0.000</b>	<b>1.208 to 1.465</b>
Partner's factor			
<b>Self-rated health</b>	<b>8.319</b>	<b>0.000</b>	<b>5.906 to 11.717</b>
Years of education	1.066	0.018	1.011 to 1.125
Number of chronic diseases	0.872	0.019	0.777 to 0.977
Depressive symptom	0.890	0.000	0.839 to 0.946
Assistance with IADL	0.894	0.001	0.838 to 0.953

# RESULTS

## ❖ Individual- and Dyadic-Level Factors Associated With Self-Rated Health Among Older Couples

Variable	Odd ratio	p-value	95% CI
Target variable: <b>Males' self-rated health</b>			
Own's factor			
Age	1.050	0.000	1.024 to 1.077
Years of education	0.939	0.001	0.904 to 0.976
Economic status	0.728	0.035	0.541 to 0.978
Number of chronic diseases	1.542	0.000	1.390 to 1.713
Having disabilities	3.224	0.000	1.896 to 5.479
Depressive symptom	1.316	0.000	1.247 to 1.387
Assistance with IADL	1.184	0.000	1.101 to 1.274
Partner's factor			
Self-rated health	8.016	0.000	5.732 to 11.212
Number of chronic diseases	0.824	0.000	0.745 to 0.912
Depressive symptom	0.926	0.010	0.873 to 0.981
Assistance with IADL	0.913	0.017	0.847 to 0.984
Regular contact with their children	0.709	0.019	0.532 to 0.945
Regular contact with their family	1.353	0.044	1.007 to 1.817

# RESULTS

## ❖ Predictive Performance of Machine Learning Models for Self-Rated Health by Sex

	Accuracy	Recall	Precision	F1-score	AUC
Target variable: Females' self-rated health					
CART	0.787	0.770	0.460	0.576	0.804
<b>RF</b>	<b>0.848</b>	<b>0.667</b>	<b>0.583</b>	<b>0.622</b>	<b>0.872</b>
XGBoost	0.781	0.770	0.451	0.569	0.861
SVM	0.845	0.683	0.573	0.623	0.870
KNN	0.764	0.746	0.427	0.543	0.818
Target variable: Males' self-rated health					
CART	0.7896	0.7910	0.4840	0.6006	0.8494
RF	0.7836	0.8284	0.4764	0.6049	0.8909
<b>XGBoost</b>	<b>0.8403</b>	<b>0.7388</b>	<b>0.5789</b>	<b>0.6492</b>	<b>0.8964</b>
SVM	0.8284	0.7687	0.5508	0.6417	0.8957
KNN	0.7985	0.6716	0.4972	0.5714	0.8297

# RESULTS

## ❖ Key Predictors of Self-Rated Health Identified by Machine Learning Models

No.	Target variable: Females' self-rated health
1	Depressive symptom of owns'
2	Age of owns'
3	Number of chronic diseases of owns'
4	Age of partners'
5	Self-rated health of partners'
6	Depressive symptom of partners'
7	Assistance with IADL of owns'
8	Years of education of owns'
9	Number of chronic diseases of partners'
10	Years of education of partners'

# RESULTS

## ❖ Key Predictors of Self-Rated Health Identified by Machine Learning Models

No.	Target variable: Males' self-rated health
1	Self-rated health of partners'
2	Depressive symptom of owns'
3	Assistance with IADL of owns'
4	Having disabilities of owns'
5	Number of chronic diseases of owns'
6	Age of owns'
7	Age of partners'
8	Depressive symptom of partners'
9	Years of education of partners'
10	Economic status of owns'

# DISCUSSION

## ❖ Opposite Directions of Own vs. Spousal Factors

- ✓ Identical variables showed opposite directions depending on whether they were measured as own factors or spousal factors
- ✓ Own factors
  - ✓ Chronic diseases, depressive symptoms, and IADL dependence
  - ✓ Increased likelihood of poor self-rated health
- ✓ Spousal factors
  - ✓ The same health conditions often showed attenuated or opposite associations
- ✓ This pattern suggests that self-rated health reflects relative evaluation within intimate relationships, rather than absolute health status alone

# DISCUSSION

## ❖ Why Self-Rated Health Remains a Valid Indicator

- ✓ Despite opposite directions in some spousal variables, self-rated health showed consistent positive concordance
- ✓ Spousal self-rated health demonstrated a strong positive association with one's own self-rated health in both females and males
- ✓ This finding supports the construct validity of self-rated health
- ✓ Self-rated health captures
  - ✓ Shared emotional environment
  - ✓ Mutual health awareness
  - ✓ Lived health experience within couples



# Thank you

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**2026.02.10**

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# DISCUSSION

- ❖ Complementary Value of Statistical and Machine Learning Approaches
  - ✓ Logistic regression identified direction and significance of associations
  - ✓ Machine learning captured relative importance and complex interactions
  - ✓ Consistent findings across methods
    - ✓ Spousal self-rated health ranked as a key predictor
    - ✓ Individual mental and functional health remained central
  - ✓ Combined approaches enhanced robustness, interpretability, and clinical relevance of findings

# CONCLUSION

1

- Self-rated health reflects multidimensional health conditions in later life

2

- Spousal characteristics play a critical role in shaping self-rated health

3

- Strong concordance in self-rated health within couples supports its validity

4

- Findings highlight the need for couple-centered and sex-specific health assessment strategies