The University of Iowa

College of Nursing

Development of Psychometric tests of Cardiac Health Behavior Scale for Adults with Cardiovascular risks

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Introduction

- **According to the World Health Organization (2012), cardiovascular diseases (CVDs), including heart attack and stroke, are the leading cause of death in the world**

- **Many health institutes recommend that people with cardiovascular (CV) risks need to prevent progression of the disease and improve their health status by performing proper health behaviors**

Purpose

- **The purpose of this project was to develop a cardiac health behavior scale (CHB22) to measure perceived health behaviors of adults with CV risks and validate the psychometric properties of this scale.**

Method

- **Design**
  - A methodological study for the instrument development
- **Sample & Data Collection**
  - A convenience sampling method
  - Survey with 298 adults with CV risks in South Korea
- **Instrument Development**
  - The Cardiac Health Behavior Scale (CHB)
  - Extract health behaviors dimensions related to cardiovascular risk factors

Method (cont.)

- **The Cardiac Health Behavior Scale (CHB)**
  - **Resources:**
    - **Cardiac rehabilitation program by AHA (1994)**
    - **The Health-promoting lifestyle profile (excluding the dimensions of perception and relationship (Walker, 1987))**
    - **Literature review**
  - **Five extracted dimensions**
    - **Health Responsibility (HR), Exercise (EX), Diet Habits (DH), Stress Management (SM), Smoking Cessation (SC)**

Method (cont.)

- **The CHB**
  - **Questionnaires**
    - **Select 25 items out of 30 item pools based on content validity index from 5 nurses and researchers**
    - **Focus on cardiac risks related behaviors**
  - **Uses a 4-point response format**
  - **Higher scores for better performance of behaviors**
- **Self-Efficacy for cardiac health behavior (the subscale of the motivation scale: Song & Lee, 2001)**
  - **Used to verify concurrent validity of the CHB**
  - **Consists of 6-item VAS scale in five dimensions matched up with the CHB22**

Method (cont.)

- **Data Analysis**
  - **Descriptive statistics, correlation and exploratory factor analysis (EFA) were performed using SPSSWIN 20.0**
  - **Reliability was assessed by Cronbach's alpha using SPSSWIN 20.0**
  - **Confirmatory factor analysis (CFA) was used to establish construct validity using AMOS 20.0, and maximum likelihood (ML) was applied**

Results
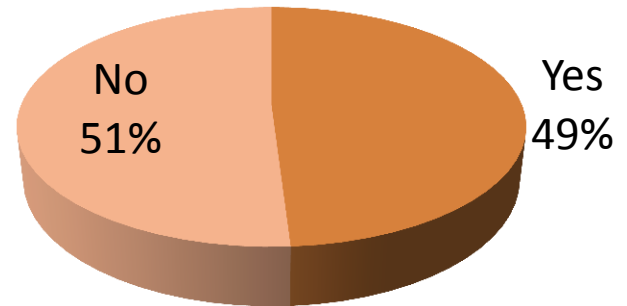
- **Demographic characteristics (N=298)**
  - **Mean age: 67.85**

Gender

Hospitalization (1 year)

Male
34%

Female
66%

No
51%

Yes
49%
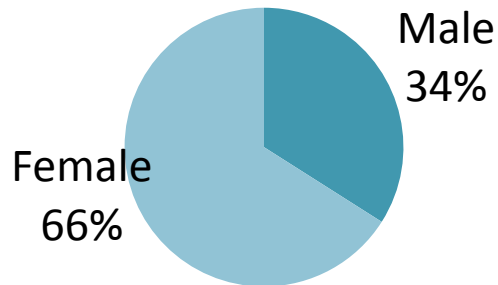
  - **Chronic disease:**
    - **with arthritis 40%**
    - **with hypertension/diabetes 73.5%**

Results

- **Item analysis**
  - **Revised 25 items**
  - **2 items of 25 were eliminated - Violation of theoretical assumptions**
  - **Total 23 items were remained**
- **Factor analysis (EFA)**
  - **1 item was eliminated – Violation of internal consistency**
  - **Finally total 22 items were verified**

Results - EFA

No	Item	1	2	3	4	5	6	Reliability
1	Watch abnormal symptoms of my body.	.730						
2	Discuss my health with health professionals.	.717						
3	Watch TV programs or read the magazine for health.	.610						.73
4	Take physical checkup regularly.	.715						
5	Know my blood pressure and heart rates	.441						
6	Walking rather than driving a car to short distance.		.619					
7	Take a walk in short distance.		.778					
8	Do vigorous exercise for 20-30 min 3/week.		.765					.76
9	Do stretching exercise to relax the muscle.		.656					
10	Take a meal three times a day.			.819				
11	Have a breakfast.			.784				
12	Eat slowly and avoid overeat.			.577				
13	Prefer to cook my own meal rather than eating out.						.790	.71
14	Prefer natural ingredient for cooking rather than ready-made meals.						.854	
15	Eat the five nutrients in food.			.561				

Results – EFA (cont.)

16	Think happy things to avoid worries before going to bed.	.547						
17	Identify what is giving me stress.	.490						.56
18	Express my feeling and thoughts to others.	.657						
19	Use several ways to release stress and tension.	.741						
20	Recognize the harm of smoking.		.589					
21	Avoid smoking area.		.824					.70
22	Try smoking cessation.		.870					
Eigenvalue		4.87	2.21	1.66	1.54	1.26	1.16	
Variance		22.2	10.1	7.58	7.02	5.77	5.29	
Cumulative variance		22.2	32.3	39.8	46.8	52.5	**57.8**	**.84**

Results

● **Model Fit Indices**

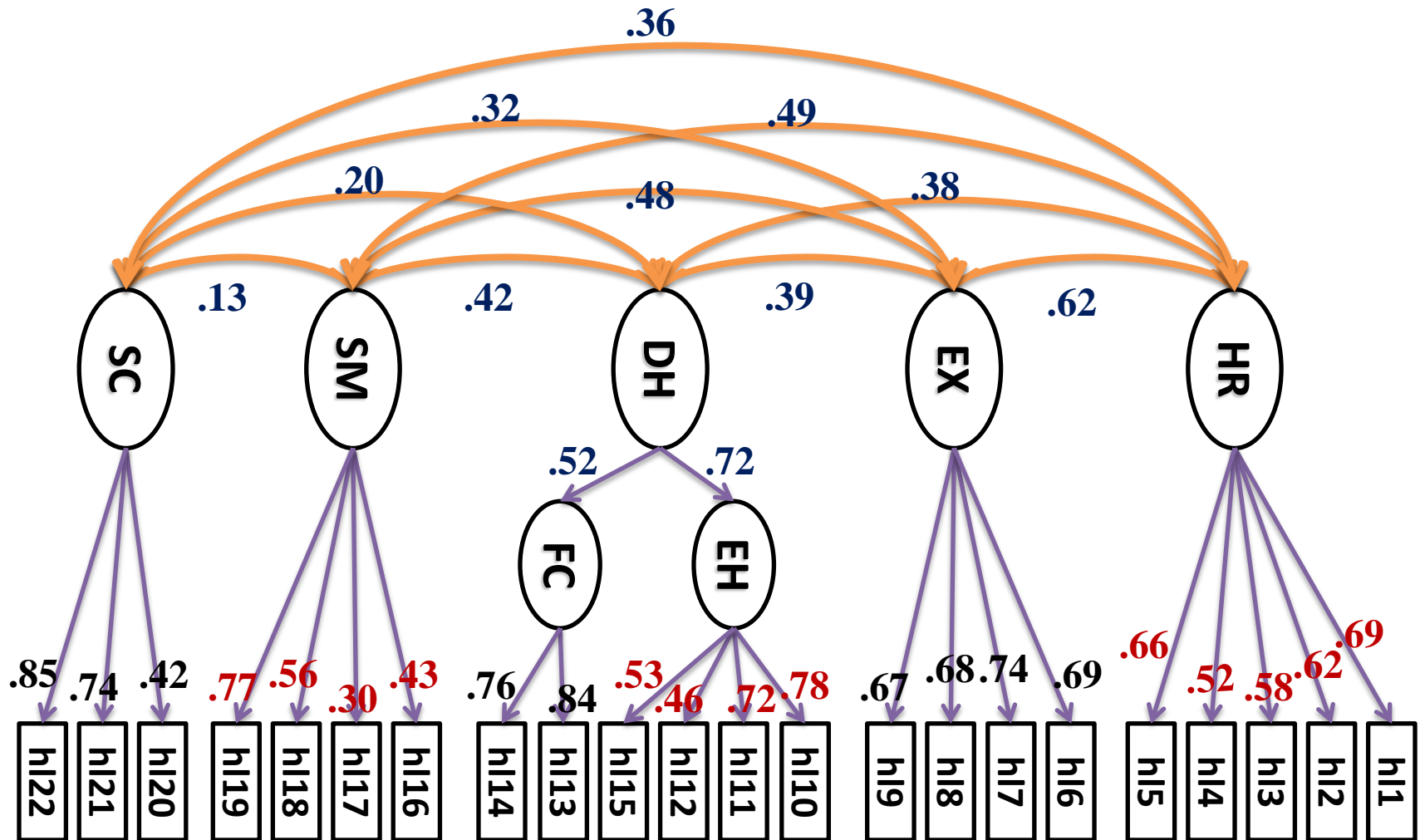| Goodness	X²	df	X²/df	p	SRMR	CFI	RMSEA
Criteria			<3	>0.05	≤0.08	≥0.90	≤0.05
Proposed model	361.95	195	1.86	<.001	.06	.90	.05 (.45~.62)

df: degree of freedom

SRMR: standard root mean square residual

CFI: comparative fit index

RMSEA: root-mean-square error of approximation

Results - CFA

Results

- **Correlation between CHB22 and Self-Efficacy**

Factors	HR	EX	DH		SM	SC
			EH	FC		
Coefficients	.45	.50	.05	.13	.42	.45
P value	<.001	<.001	.40	.02	<.001	<.001

Conclusion

- **The CHB22 has acceptable construct validity and reliability, suggesting its utility in assessing cardiac health behaviors of Korean population with coronary heart disease or cardiovascular risks.**

- **Future work will generalize usefulness of the CHB22 to assess health behaviors of various population with cardiovascular risks.**

References

- **Cardiac rehabilitation programs. A statement for healthcare professionals from the American Heart Association. (1994).** *Circulation, 90*(3), 1602-1610.

- **Song, R. & Lee, H. (2001). Managing health habits for myocardial infarction (MI) patients.** *International Journal of Nursing Studies*. 38, 375-380

- **Walker, S.N., Sechrist, K.R., and Pender, N.J. (1987). The health promoting lifestyle profile: development and psychometric characteristics.** *Nursing Research*. 36, 76-81.

- **World Health Organization. (2012). Cardiovascular disease (CVDs). Retrieved January 28, 2013 from http://www.who.int/mediacentre/factsheets/fs317/en/index.html**

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