Factors associated with the reduction in sedentary behaviors of office workers using Ecological Momentary Assessment (EMA) based on the Integrated Behavioral Model in South Korea

Jisoo Chae [1)], Jiye Kim [1)], Hyekyeong Kim [2)]

[1)]Department of Health Convergence, Graduate School of Ewha Womans University, Seoul 03760, Korea

[2)]Department of Health Convergence, Ewha Womans University, Seoul 03760, Korea

Background

- The **prolonged sedentary behavior(SB)** of **office workers** has become serious problems such as obesity and chronic diseases.
- The **integrated behavioral model(IBM)**, which explains the individual's intention and environmental factors related to behavior, is suitable for identifying health behavior for workers in the workplace by applying the main factors affecting individual health behavior.
- **Ecological Momentary Assessment(EMA)** is a practical tool for reducing recall errors and biases and enhancing ecological validity.

Objective

- The purpose of this study is to **identify the individual and workplace environmental factors related to the reduction in SB of office workers based on IBM using EMA**.

Methods

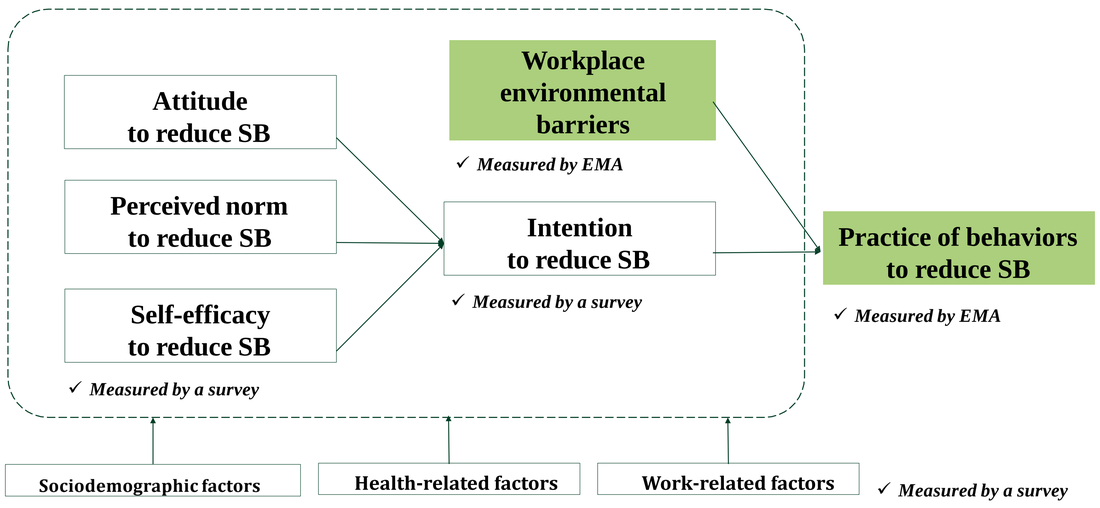
- Data were collected through an online self-report survey and EMA of a total of **96 office workers**.
- Descriptive statistics, Pearson correlation analysis, and multiple regression analysis were performed using SPSS 27.0 for the collected data.
- Latent profile analysis was performed using Mplus.

1. Survey

- Online self-report survey
- Variables : demographic characteristics(sex, age), health-related factors(height, weight, subjective health status, smoking, alcohol), Individual factors for SB reduction behavior(attitude, subjective norms, self-efficacy, and intention), work-related factors(working hours, lunch hours, and out-of-office hours)
- Period : September-November 2020

2. EMA

- EMA was conducted for seven consecutive work days through online links during the evening hours after work, 4-point scale reply for each question (1 point: Strongly disagree ~ 4 points: Strongly agree)
- Variables : Levels of practicing actions to reduce SB (standing up, stretching, working while standing, using stairs, light walking, using public transportation/bicycle/walking for commuting), barriers to reducing SB in the workplace (busyness, supervisors/colleagues, workflow, spatial constraints)
- Period : November 2020



Conclusion

- By identifying that the reduction in SB of office workers is related to **environmental factors** as well as individual, the **rationale for the need for a workplace health promotion program that considers individual workers and workplace environment based on an ecological approach has been expanded**.
- By enhancing the work environment to lower office workers' SB, it will be feasible to contribute to **enhancing employees' health and productivity**.

- Contact E-mail : hkkim@ewha.ac.kr
- This work was supported by the Korea Research Foundation.

Results

General characteristics of participants

- Gender: 58.3% (56 people), Average age: 37.82±8.25 points
- Average working hours per day: 9.15±1.46 hours
- Body mass index (BMI): 23.7±3.46kg/m2
- Average subjective health status [out of 5]: 2.88±0.58 points
- Smokers 21.9% (21 people), high-risk drinkers 18.8% (18 people)

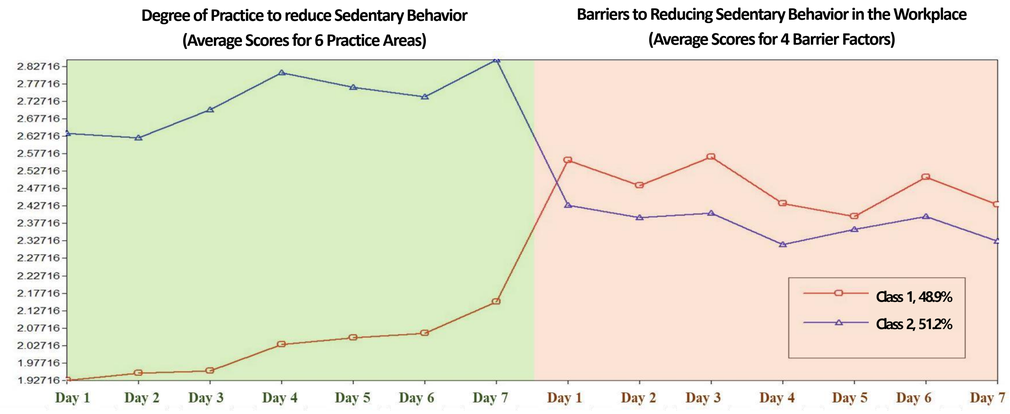
Behavior-related factors for reduction in SB (Bivariate Analysis)

- It has been found that a **higher level of attitude[1, 2], subjective norms[3, 4], and self-efficacy[5]** on reducing SB leads to a **higher intention to improve SB** (p<.01).
- **Actions to reduce SB[7]** were practiced more as the level of **intention to improve SB was higher** (p<.01).

Variables	Pearson correlation coefficients (r)										
	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	.864**	1									
3	.267**	.312**	1								
4	.214*	.280**	.713**	1							
5	.308**	.386**	.468**	.458**	1						
6	**.292****	**.327****	**.389****	**.494****	**.462****	1					
7	.185	.202*	.081	.189	.283**	**.566****	1				
8	.049	-.069	-.080	-.197	-.118	-.229*	-.075	1			
9	.081	-.041	.050	.012	-.072	-.113	-.160	.309**	1		
10	.056	.008	-.102	-.273**	-.078	-.048	-.153	.430**	.173	1	
11	.022	.031	-.078	-.113	.123	-.034	-.094	.250*	.285**	.379**	1

1=Experiential attitude, 2=Instrumental attitude, 3=Injunctive norm, 4=Descriptive norm, 5=Self-efficacy, 6=Intention, 7-10=Stability of workpl ace environmental constraints (7=Busy working schedule, 8=Pressure of bosses or colleagues, 9=Workflow interruption, 10=Not enough spa ce to move around), 11=Practice of behaviors to reduce sedentary behavior. ** p<.01, * p<.05

- **The more workers act to reduce SB**, the **lower the degree of barriers in the workplace** that affect the reduction of SB. *(Class 2)*



Factors of behavior continuity for reduction in SB (Multivariate Analysis)

- The **older** (p<.05),
  the **more inconsistent degree that the workflow is cut off to practice SB** (p<.05),
  the **fewer average working hours** per day (p<.01),
  and the **more smokers** compared to non-smokers (p<.05)
  showed **behavioral practice to reduce non-continuous SB** for 7 days of working.

	Standard deviation of practice of behaviors to reduce SB		
	B	β	p
(Intercept)	0.479		0.020
Sociodemographic factors			
Sex (Ref: Male)	0.009	0.038	0.792
Age	**0.005**	**0.304**	**0.030**
Individual predisposing factors			
Experiential attitude	-0.008	-0.081	0.691
Instrumental attitude	0.014	0.150	0.479
Injunctive norm	-0.019	-0.221	0.152
Descriptive norm	-0.008	-0.095	0.545
Self-efficacy	-0.002	-0.032	0.804
Intention	0.009	0.085	0.501
Stability of workplace environmental constraints*			
Busy working schedule	0.034	0.087	0.461
Pressure of bosses or colleagues	0.062	0.148	0.185
Workflow interruption	**0.102**	**0.257**	**0.031**
Not enough space to move around	0.014	0.036	0.750
Work-related factors			
Working hours	**-0.025**	**-0.292**	**0.007**
lunch time	-0.087	-0.211	0.065
Hours of working out of office	0.010	0.196	0.072
Health-related factors			
BMI	-0.002	-0.062	0.604
Subjective health status	-0.034	-0.160	0.125
Smoking (Ref: Non-smoker)	**-0.067**	**-0.226**	**0.044**
High-risk drinking (Ref: Non-drinker and moderate drinking)	-0.002	-0.006	0.957
R^2	0.361		
F	**2.26 (p<.01)**		

* We calculated standard deviations to identify the stability of workplace environmental constraints