

# Association of Environmental Variables with Physical Activity in Older Adults

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## Abstract

The current study investigated the relationship of physical environmental variables with physical activity among Korean older adults. A total of 401 older adults aged 65 years old or older ( $M_{\text{age}} = 75.17$  years,  $SD = \pm 7.24$ ) were recruited from the Nowon district of northern Seoul. Standardized scales were used to measure physical activity and its related environmental variables. The results indicated that physical activity was significantly correlated with availability of facilities and quality of facilities. Physical environmental variables had a significant direct path to explain physical activity.

**KEYWORDS:** Physical activity; Social ecological model; Older adults

## I. Introduction

It is clearly witnessed that the population aged 65 or older is rapidly growing in the world and people with age are suffering from various health risks and diseases<sup>1</sup>. Physical activity is one of the significant health behaviors to prevent an increase in chronic diseases related to aging<sup>2</sup>. Recent studies indicate that many older adults around the world do not meet the physical activity

recommendation to obtain health benefits<sup>3</sup>. Given that physical activity is important for older adults' health and however, few of them are participating in enough physical activity to maintain health benefits, the promotion of physical activity in this age group is needed.

The social ecological model suggests that physical environmental variables (i.e., availability and accessibility to exercise facilities and perceived qualities and safety of facilities etc.) are significant to explain physical activity<sup>4</sup>. In the last decade, a large number of studies carried out physical activity research which focuses on physical environmental variables<sup>5,6</sup>. However, it should be paid attention that not only the available research has been mostly undertaken in western societies as indicated above, but also such research is very lacking in other cultures, such as Korea, where physical activity and its multiple level of influence among older adults have only recently gained attention. Therefore, the current study is carried out to identify 1) the relationships of physical environmental variables with physical activity

## 2. Method

### 2.1. Participants

A total of 401 older adults aged 65 years old or older ( $M_{\text{age}} = 75.17$  years,  $SD = \pm 7.24$ , range = 65-97 years old) were recruited from the Nowon district of northern Seoul. 401 older adults (male = 125, female = 276) provided their consent forms and completed the survey.

### 2.2. Measures

To measure participant perception of neighborhood environment in relation to physical activity the physical environment scale for physical activity developed by Stahl et al.<sup>7</sup> was translated into Korean and used in the study. The revised scale consists of the two sub-scales (availability of physical activity facilities and quality of physical activity facilities) with five items (three for availability and two for quality). A two-week, test-retest reliability was performed, resulting in a reliability coefficient of .918<sup>8</sup>.

A leisure time exercise questionnaire (LTEQ) developed by Godin and Shephard<sup>9</sup> was revised into Korean and used in the study to assess habitual weekly physical activity behaviors. Participants reported how many times during a typical week they took part in strenuous, moderate, and mild physical activity for more than 15 minutes. Scores were calculated by multiplying

each reported activity session by its metabolic equivalent (MET) value and adding the result [MET score = (strenuous  $\times$  9) + (moderate  $\times$  5) + (mild  $\times$  3)]. The two-week, test-retest Cronbach's  $\alpha$  reliability coefficient for the Korean version of the LTEQ was .86<sup>10</sup>.

### 2.3. Data analysis

Descriptive statistics (i.e., means, standard deviations, and frequencies) were used to summarize participant characteristics. Correlation analysis was conducted to identify the correlations among the study variables. Then, structural equation modeling (SEM) was conducted to test the associations of physical environmental variables with physical activity. All statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) Win 20.0 and Analysis of Moment Structure (AMOS) 20.0.

## 3. Results

### 3.1. Correlation between physical activity and the physical environmental variables

Physical activity was significantly correlated with availability ( $r = .21$ ) and quality ( $r = .15$ ).

### 3.2. Relationships of physical environmental variables with physical activity

The SEM analysis produced significant association of physical activity with physical environmental variables (i.e., availability of facilities and quality of facilities) to physical activity. In physical environmental variables availability ( $\beta = .15$ ) and quality ( $\beta = .13$ ) were significant to explain physical activity.

Table 1 : Correlations Between all of the Study Variables

Variable	Physical activity	Availability	Quality
Physical activity		.21	.15
Availability			.64
Quality			
M	21.62	3.65	3.83
SD	14.91	1.01	.93

$r \geq .11 = P < .05$ ;  $r \geq .13 = P < .01$ .

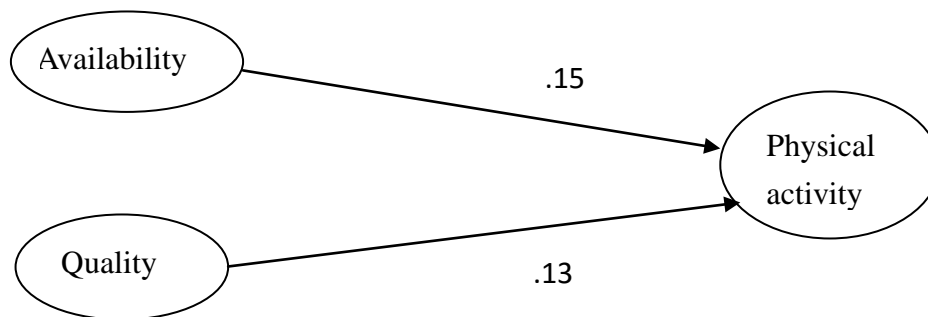


Figure 1 : Relationship of physical environmental variables with physical activity

#### 4. Discussion

The findings indicated that Korean older adults' physical activity was directly associated with physical environmental variables. This finding is supported by previous studies<sup>11</sup>. It is plausible to interpret that physical environment might have a critical role to initiate or sustain active lifestyle in older adults as bodily functional limitations have been generally rapidly increased in this age group. For example, if an older adult has

the well maintained exercise facilities or parks within easy distance, he or she is more likely to engage in physical activity. The strength of the current study is that it carried out physical activity research among less studied Korean older adults with focusing on physical environmental variables because most of studies have been primarily focused on psychological variables in western societies. Therefore, the current study implies to design a

more effective intervention for promoting physical activity among older adults.

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