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# Perceived urban neighborhood environment for physical activity of older adults in Seoul, Korea: A multimethod qualitative study

Seunghyun Yoo *, Dong Ha Kim

*Department of Public Health Science, Graduate School of Public Health, Seoul National University, Republic of Korea*

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ABSTRACT

This study assessed the attributes of a perceived urban neighborhood environment for the physical activity (PA) of older adults by applying a qualitative multimethod approach to collect both descriptive and spatial information. Conducted in a northern community of Seoul, Korea, from April 2014 to November 2015, data collection methods included 90 walking tours by researchers, 46 face-to-face, semi-structured interviews combined with qualitative mapping with senior residents aged 65+, 19 guided tours with the interviewees, and 3 focus groups with 12 community service providers. Thematic analysis and pattern finding were performed on the data. Walking was the main type of PA of the older adults. Nine attributes of perceived neighborhood environment for PA were identified under three themes: daily living (everyday life activities, mobility, social opportunities, diverse destinations); the multidimensionality of accessibility (physical, economic, psychosocial), and attractiveness and pleasantness (maintenance, aesthetics). The subcategories of the attributes included proximity, access to public transportation, walkability, cost-worthiness, low or no cost, familiarity, sense of welcoming, sociocultural appropriateness, fair access, order and upkeep, safety, openness, cleanliness, and interestingness. Strategies to generate more movement and activities in the everyday routine of the elderly should be a core task for health promotion and neighborhood design. A strategic application of multiple qualitative methods can create an opportunity to build contextual understanding and to generate ideas in interactions with the community.



## 1. Introduction

The contributions of physical activity (PA) to the health of older adults have been widely discussed. A substantial proportion of older adults, however, are reported not to be active at a level sufficient to maintain their health (World Health Organization [WHO], 2007). Therefore, nations and communities are striving to develop strategies and plans to promote PA among older adults, and identifying the environmental determinants of PA is instrumental in the process (Suk, 2004; Fleury and Lee, 2006). Physical environmental determinants identified so far include accessibility to parks and green space (Hoehner et al., 2005; Ribeiro et al., 2015; Van Cauwenberg et al., 2015), the quality of walking paths (Pikora et al., 2006), mixed land use (Berrigan and Troiano, 2002; Nyunt et al., 2015), population density (Johnson-Lawrence et al., 2015; Saelens et al., 2003), and neighborhood aesthetics (Ball et al., 2001; Cleland et al., 2015; Giles-Corti and Donovan, 2002). The social environment is also an influential factor in terms of the perceived PA levels of others in the neighborhood (Booth et al., 2000), perceived social support (Everard et al., 2000; Van Cauwenberg et al., 2014), and neighborhood safety (Ball et al., 2001; Cerin et al., 2013).

Individuals experience and interpret these environmental characteristics subjectively, and such perceived environments influence their behavioral reaction to and utilization of the environment for physical activity (Ma and Dill, 2015). Perceived environment is developed in community contexts and affects the community utilization and preference of the neighborhood environment for PA (Gebel et al., 2011; Wu et al., 2016). There are contextual characteristics specific to the life stage of the elderly and aging (Rantakokko et al., 2016; Zhilian and Yanwei, 2016), and efforts to explore how elderly community residents make sense of PA in their neighborhood require novel attempts in research conceptually and methodologically (Ivory et al., 2015).

* Corresponding author at: 1 Gwanak-ro Gwanak-ku, Seoul National University, Graduate School of Public Health, Building 221, Room 318, Seoul 08826, Republic of Korea.
*E-mail address:* syoo@snu.ac.kr (S. Yoo).

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Meanwhile, few researchers have studied perceived environment and the PA of older adults in an Asian urban context. Therefore, this multimethod qualitative study explored the attributes of perceived environment conducive to what is considered PA by older adults in an urban community in Seoul, Korea.

## 2. Methods

### 2.1. Setting

This study was conducted in a northern district of Seoul with an average level of PA friendliness (Kim et al., 2013). The participant community includes three neighborhoods with a high concentration of older adults and long-time residents (Korean Statistical Information Service, 2010).

### 2.2. Data collection

By strategically integrating text information from descriptive methods (e.g. interviews and discussions), and non-text information from spatial methods (e.g. observations, photography, and mapping), qualitative studies can provide comprehensive, in-depth understanding of the community environment and context related to its development and utilization for PA (Moran et al., 2014). This multimethod qualitative study employed in-depth interviews and focus groups for descriptive methods, and touring and mapping for spatial methods. Data were collected between April 2014 and November 2015.

In-depth interviews were conducted with a total of 46 seniors, with a saturation point of approximately 15 interviews per neighborhood. Through purposive sampling to investigate the attributes of perceived environment conducive to the practice of what older adults consider as PA, physically active seniors were recruited for the interviews. Semi-structured interviewing explored the participants' concept of PA, their perception of the neighborhood environment related to PA, and the community context influencing the perception. A time-chart was used to facilitate the interview about routine daily activities. Three focus groups with 12 community service providers for the elderly discussed the environmental features affecting the PA and quality of life of seniors. A short survey was administered to collect basic sociodemographic information of the participants (Table 1).

For spatial assessment, each interviewee was asked to draw, with some assistance if needed, a community map on blank paper to mark the places, routes, and boundaries of PA, and meaningful destinations in the neighborhood. Among 46 participants who had completed the interview and mapping, 19 interviewees agreed to guide the research team individually in the neighborhood to visit the relevant places and further explain what they had mentioned in the interview and mapping. The research team also conducted a total of 90 tours to: 1) observe the environment and residents' activities in each neighborhood using a walking tour index (Sung et al., 2015) on various days of the week, time points, and routes to triangulate the observation data, and 2) confirm the community maps developed in the study.

All verbal data were audio-recorded, transcribed verbatim, and enhanced by field notes taken during data collection. All maps developed in the data collection were digitized using the AutoCAD. The study protocol was approved by the Institutional Review Board of the authors' institution (IRB No. 1410/001-018 & 1505/001-026).

**Table 1**
Socio-demographic characteristics of study participants.

| Older adults ($n = 46$) | | Service providers ($n = 12$) | |
|---|---|---|---|
| Age, mean (SD) | 75.40 (6.40) | Age, mean (SD) | 49.92 (11.03) |
| Years at current address, mean (SD) | 25.34 (19.80) | Years of experience, mean (SD) | 6.16 (10.58) |
| Gender, % | | Gender, % | |
| Female | 60.87 | Female | 83.64 |
| Male | 39.13 | Male | 16.66 |
| Type of residence, % | | Type of organization, % | |
| Single-family house | 39.13 | Public | 66.67 |
| Multiplex | 23.91 | Non-profit | 25.00 |
| Apartment complex | 36.96 | Private | 8.33 |
| Number of cohabitants, % | | Type of service, % | |
| 0 | 50.00 | Welfare | 83.34 |
| 1 | 32.61 | Residential | 8.33 |
| 2 | 13.04 | Education | 8.33 |
| 3 | 4.35 | | |
| Subjective health status, % | | | |
| Good | 28.26 | | |
| Average | 45.65 | | |
| Bad | 26.09 | | |
| Social security support recipients, % | | | |
| Yes | 47.83 | | |
| No | 52.17 | | |
| Physical activity at recommended level[a], % | | | |
| Yes | 52.17 | | |
| No | 47.83 | | |

[a] Throughout the week, older adults should do at least 150 min of moderate-intensity aerobic physical activity, 75 min of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity (WHO, 2010).

### 2.3. Data analysis

Thematic analysis (Braun and Clarke, 2006) was performed on the interview and focus group data. Two researchers coded the data independently and discussed the coding process and code structure consistently. Initially, separate codebooks were constructed for the in-depth interviews and focus groups. Then, constant comparison reclassified and restructured the codes based on their conceptual relationships. In this process, perceived environmental attributes were identified and organized into three main themes, derived from 130 codes from the in-depth interviews and 54 codes from the focus groups.

With the digital spatial information, neighborhood environmental characteristics associated with the PA of the elderly were identified through pattern-finding in terms of distance, direction, dimension, location, counts, and distribution. Moreover, the spatial data were used to assist the interpretation of the descriptive information on perceived environment.

## 3. Results

Nine attributes of the perceived environment conducive to elderly participation in PA were organized under three themes: daily living, multidimensionality of accessibility, and attractiveness and pleasantness (Table 2 and Fig. 1). These attributes and themes were supported by the interview and focus group results, and further contextualized by spatial information. Illustrative quotes for each attribute are presented in Table 2.

### 3.1. Daily living

The study participants defined PA for seniors as "activity involved in maintaining *everyday life*", and "***mobility*** for outings and routine activities." In this regard, walking was the most salient type of PA perceived and performed, and often referenced as a standard mode of exercise for the elderly. In addition to walking for an exercise, walking involved with running errands, attending social services, and strolling in the neighborhood to interact with neighbors all constituted the daily PA of the elderly. Having various ***social opportunities*** and ***diverse destinations*** in the community, therefore, facilitated the elderly to be active in daily life. Destinations for the elderly to walk to and engage in activities included non-typical PA resources (e.g. amenity services and facilities, rest areas, benches and gazebos, stores and markets, and religious organizations, Fig. 4A-1 and 2) in addition to typical ones (e.g. walking

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