



Social network types among older Korean adults: Associations with subjective health



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ABSTRACT

With population aging now a global phenomenon, the health of older adults is becoming an increasingly important issue. Because the Korean population is aging at an unprecedented rate, preparing for public health problems associated with old age is particularly salient in this country. As the physical and mental health of older adults is related to their social relationships, investigating the social networks of older adults and their relationship to health status is important for establishing public health policies. The aims of this study were to identify social network types among older adults in South Korea and to examine the relationship of these social network types with self-rated health and depression. Data from the Korean Social Life, Health, and Aging Project were analyzed. Model-based clustering using finite normal mixture modeling was conducted to identify the social network types based on ten criterion variables of social relationships and activities: marital status, number of children, number of close relatives, number of friends, frequency of attendance at religious services, attendance at organized group meetings, in-degree centrality, out-degree centrality, closeness centrality, and betweenness centrality. Multivariate regression analysis was conducted to examine associations between the identified social network types and self-rated health and depression. The model-based clustering analysis revealed that social networks clustered into five types: diverse, family, congregant, congregant-restricted, and restricted. Diverse or family social network types were significantly associated with more favorable subjective mental health, whereas the restricted network type was significantly associated with poorer ratings of mental and physical health. In addition, our analysis identified unique social network types related to religious activities. In summary, we developed a comprehensive social network typology for older Korean adults.

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1. Introduction

According to the United Nations, the number of adults aged 60 years or older has substantially increased in recent years in most countries, and this increase is expected to accelerate over the next decades (United et al., 2015). Population aging has become a

worldwide phenomenon due to decreasing mortality and declining fertility rates (United et al., 2015). South Korea (henceforth simply Korea) is now experiencing population aging at an unprecedented rate and is expected to become a super-aged society, with more than 20% of the population over 65 years of age, in 2026 (E. Lee et al., 2014a). Population aging is a critical issue for policymaking because it increases economic burden as well as medical costs (Muramatsu and Akiyama, 2011). Therefore, preparing for a future super-aged society is a salient issue for public health in Korea.

Aging is associated with poor health and fewer social contacts

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(Baltes and Mayer, 2001), with older adults commonly experiencing loneliness, depression, and social isolation. Previous literature shows that maintaining social integration across the life course has considerable health benefits (Cornwell et al., 2009), with strong associations between social integration and mental health, health-related behaviors, and health outcomes (Kawachi and Berkman, 2001; Litwin, 2011; Martire and Franks, 2014; S. Shiovitz-Ezra and Litwin, 2012; Wan Mohd Azam et al., 2013). Therefore, social gerontologists emphasize the importance of continued social integration and social network connectedness in old age, although the beneficial influence of social integration on health is difficult to measure because these benefits could be attributed to a broad range of factors (Cornwell et al., 2009). Social network analysis is an attempt to clarify the influence of social relationships on health. A social network is a constellation of interpersonal connectedness in varying contexts (Litwin, 2001). Social network analysis is based on the idea that individuals are embedded in webs of social relationships and interactions (Stephens et al., 2011). Previous studies of the association between social relationships and health have examined specific social ties or isolated indices of one's social network, such as its size (Bukov et al., 2002; Stephens et al., 2011; Sugisawa et al., 2002; Yun et al., 2010). However, studies focusing on single aspects of a social network have produced inconsistent results, thus increasing the need for measures that reflect the full complexity of a social network.

Some authors suggest that the sum of each measure of a social network is not equivalent to the whole influence of the social milieu, as social networks are multidimensional and interactive (Bosworth and Schaie, 1997; Fiori et al., 2006; Magai et al., 2003). Therefore, the following studies adopted several clustering methods to detect latent types of similar social networks, which could provide new and important insights on the interpretation of network effects on health (Bosworth and Schaie, 1997; Fiori et al., 2008; Webster et al., 2015; Wenger, 1997). A social network type is a composite characterization of the interpersonal milieu in which an individual is embedded that provides a multidimensional view of that individual's social relationships (Litwin and Shiovitz-Ezra, 2011). The identification of social network types is based on the assumption that social networks are comprised of different groups of people with similar aggregated network characteristics (Webster et al., 2015). Social network types can be useful for assessing the influence of one's social network on health (Bosworth and Schaie, 1997; Magai et al., 2003; Stephens et al., 2011). For instance, a diverse social network with a range of different social ties is associated with better self-rated health among older Korean-American immigrants (Park et al., 2015).

Most social network typology studies have been conducted in western societies, including the United States, Israel, and Europe (Fiori et al., 2006; Le Brocque, 1996; Litwin, 2001, 2007; Litwin and Shiovitz-Ezra, 2011; Melkas and Jylhä, 1996; Wenger, 1997). However, as social networks are shaped by culture, studies of different societies are essential for comparison between and generalization across societies (Fiori et al., 2006). Although studies of Western society have identified four relatively consistent social network types: "diverse," "friend," "family," and "restricted," (Fiori et al., 2006; Litwin, 2001, 2007; Litwin and Shiovitz-Ezra, 2011) studies of social network types in Asian societies are relatively sparse (Cheng et al., 2009; Fiori et al., 2008). In a sample of older Japanese adults, the four common network types ("diverse", "restricted", "friend-focused", and "family-focused"), as well as a unique "married and distal" type, were identified (Fiori et al., 2008). In a sample of older Chinese adults, a "distant family" type was identified in addition to the four common network types described by Western studies (Cheng et al., 2009). However, a previous study investigating the social network typology of older Korean adults identified

only three types of networks: "family", "diverse", and "isolated" (Cheon, 2010).

Compared with Western countries, Korea is a relatively homogenous, non-immigrant society. In 2013, only 2% of Koreans were immigrants (OECD, 2016), most of whom came from other Asian countries (KOSIS). Moreover, the non-immigrant Korean population consists of a single ethnicity, and Korea has only one official language (i.e., Hangeul). Older adults in Korea live in an era of major social and demographic transition. The Korean population grew from 20 million in 1949 to 49 million in 2009. Adults aged 60 years and older were 6% of the Korean population in 1980 but 15% of the population in 2010 (KOSTAT), and the aging index increased from 11.2 in 1980 to 68.4 in 2010 (E. Lee et al., 2014a). Due to rapid industrialization since the 1960s (SaKong and Koh, 2010), the employment share of the manufacturing sector rose from 10% in 1963 to 28% in 1989. Although the service sector also increased its employment share from 26% in 1960 to 67% in 2009, the employment share of primary industry (i.e., agriculture, fishing, and forestry) precipitously declined from 63% to 7% across the same period (SaKong and Koh, 2010). Furthermore, according to a national census, the religious population of Korea increased from 42.6% in 1985 to 53.1% in 2015 (KOSIS), with the two major religions being Buddhism (43%) and Christianity (55%) (Ryu and Sung, 2009).

Population aging is a particular concern in rural areas of Korea due to the outmigration of younger people (Kwon and Jun, 1990; B. Lee and Phillips, 1994). Considering that aging is related to poor health, public health problems due to population aging are more serious in rural areas (Baltes and Mayer, 2001). The Korean Social Life, Health, and Aging Project (KSHAP) is a rural community-based cohort study of individuals aged 60 and older and their spouses who live in a rural township where farming is the main industry. KSHAP selected the entire population aged 60 years or older and their spouses who are living in certain township according to the age standards of an old age pensioner of the National Pensions Act (E. Lee et al., 2014a; Youm et al., 2014). Within this cohort, 58% of the target population are female, and 7% of their children were living in the same township or a neighboring area. Of the 45% of the cohort who are religious, 74% are Christian, and 24% are Buddhist. Although this township has low population density, its residents have relatively dense social networks (Youm et al., 2014). This is in contrast to observations in the U.S. that non-metropolitan areas have both lower population density and residents with lower social activity compared with metropolitan areas (Cornwell EY, 2015). Likewise, respondents of KSHAP have low population density. However, due to local organization and social activity, KSHAP population have relatively denser social networks (Youm et al., 2014). There is one study that investigated the social network typology of the older adults living in a metropolitan region near by Seoul, the capital of Korea. They extracted three social network types based on network composition (i.e., absent, family, nonfamily, or family and nonfamily), size, and contact frequency: "family", "diverse", and "isolated". Respondents Individuals within a diverse social network showed had better health statuses than individuals with an isolated networks type (Cheon, 2010). This study has limitation of comparing with other social network studies because the observed variable is quite different from other social network typology studies. The observed variables included composition (absent, family, nonfamily, family and nonfamily) size, and contact frequency of network (Cheon, 2010).

Considering more active and denser social networks in the township than in metropolitan areas, it would be important to capture detailed network structure among community dwellers of KSHAP. Previous measures of network typology in western societies were usually based on self-reports about social network characteristics, which captures only local structure of respondent-

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