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Exploratory Study on Patient Experience among the Older Adults in South Korea

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M.S., Korea Advanced Institute of Science and Technology, 2018

B.S., Korea Advanced Institute of Science and Technology, 2016

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Abstract

Exploratory Study on Patient Experience among the Older Adults in South Korea

By Sungjae Hong

The attitudes of patients toward healthcare services are now an essential part of discussions of healthcare quality. Patient experience is one of the concepts designed to quantify their attitudes, which focuses on the feedback on actual happening during healthcare services. This study focuses on patient experience among older adults who use health care services more and longer than young adults. Also, the study targets the South Korean population, which has a rapid aging trend and a unique national healthcare system. This study employed the dataset from the Healthcare Service Experience Survey (N=11,098) collected in 2017. There were three categories for patient experience: 1) communication with doctors/nurses, 2) waiting time, and 3) unmet health needs. Demographic characteristics, socioeconomic status, and health status were employed as potential indicators of patient experience. According to the result, older adults were more likely to have unmet health needs than younger adults (10.8% for age ≥ 65 vs. 2.2% for age < 30), while there was a small range of patient experience regarding communication and waiting time between the respondents. However, while socioeconomic status was the main indicator of patient experience regarding communication and waiting time among older adults, there was no significant association between the two among young and middle-aged adults. In contrast, while income level and health status were the main indicators of unmet health needs in all age groups, the power of each indicator differed by the age group. This study asks for policymakers to focus on older adults, especially the older adults with low socioeconomic status and chronic disease when designing healthcare policy for improving patient experience, as older adults are more likely to be underserved during a healthcare experience. Meanwhile, a small range of scales for patient experience regarding communication and waiting time between the respondents implies the need for new measures for patient experience, which can reveal more differences between the respondents.

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Introduction

The attitudes of patients toward healthcare services are now an essential part of discussions of healthcare quality. Researchers interpreted the increasing popularity of the attitudes of patients toward healthcare services for several reasons. First, patients have been changed from passive receivers of healthcare benefits to active consumers looking for sophisticated healthcare services (1–4). Therefore, hospitals wanted to transparently show their performance with respect to the attitudes of their patients toward the hospital services to their potential customers (5). Accordingly, governments and hospitals utilized these measures for quality access and improvement of health system/medical services, though there were some objections to this trend (5–9). The attitudes of patients toward healthcare services were believed to be relevant to healthcare outcomes, including adherence to physician's instructions (3,10). Also, social scientists became more involved in healthcare studies, with a focus on the interpersonal relationships between patients and practitioners (1,11). Increasing supports by the governments in the Western countries on this research topic also contributed to the bloom of this research area (1).

Especially, the attitudes of patients toward healthcare services among older adults needs attention, because there is a global trend of aging, and older adults are most likely to receive the benefits of improvements on patient experience. For example, in 2017, 21.7% of the United States citizens aged 65 or more reported fair or poor health status, while only 5.9% of the citizens aged 18-44 reported the same answer (12). In addition, in 2015, while the inpatient stay rate of the United States citizens aged 65 or more was 26,480 per 100,000 population, the rate was was only 4,024 among the citizens aged 18-44 (13). As both numbers of older people and older patients are increasing, examining the attitudes of older patients toward healthcare services will be inevitable not only for geriatricians but also for policymakers in the public health field.

Among the countries with rapid aging, South Korea has the most dramatic aging trend. In 2018 the ratio of citizens aged 65 or more among the total population had already exceeded 14.0%. Moreover, in 2030 the ratio is expected to be 25.0%, and in 2067 the proportion of older adults is expected to 46.5%, nearly half of the total population (14). The aging population and the concerns of later life h,ave already become social problems in South Korea, and creating more jobs for older adults and caring for dementia patients were election promises of the current president of South Korea, Jae-in Moon (15,16). Similar to the United States, in South Korea, older adults are more likely to use healthcare services than young adults. In 2011, while the average number of outpatient visits among South Korean citizens aged less than 55 was less than 20, this number exceeded 30 among those aged 65 or more (17).

In addition to its rapid aging trend, South Korea has a unique healthcare system, which results in a different context in healthcare service use between South Korea and the United States (18). A significant feature of the Korean national healthcare system is a universal healthcare coverage to citizens. South Korea introduced the National Health Insurance in July of 1977 for those who could not afford the expensive medical cost. For the first time, it covered all employees of enterprises with 500 or more employees, and in 1989 the South Korean government finally expanded the coverage of its National Health Insurance to every citizen (19). There are critical features of the South Korean healthcare system, which shapes healthcare service use of a South Korean: 1) single-payer system, 2) freedom of choice of a medical facility. A single-payer system has an excellent pooling effect, so South Korean citizens pay a small amount of total medical cost, but it also increased the amount of healthcare service usage. For example, in 2019, the average number of annual consultations per person in South Korea was 16.6, which was more than four times that in the United States (20). Together with low out-of-pocket medical pay, freedom of choice of the medical facility has led patients to visit a large hospital rather than a small local clinic. In particular, while the annual number of hospitalized patients in hospitals has

been increased to 23.9% between 2011 and 2014, the number of hospitalized patients in clinics has been decreased to 7.7% between the same era (21). This difference in the context of healthcare service use between South Korea and the United States would result in the different social mechanisms of the attitudes of older patients toward healthcare services. Therefore, we need to examine these attitudes of older patients toward healthcare services in the South Korean context, with a focus on the case of older adults.

There are a number of concepts defined for describing the attitudes of patients toward healthcare services. Patient experience is one of them, which has been recently paid attention by healthcare researchers (22–25). There is no clear consensus on the definition of patient experience, but the definitions of patient experience share some ideas. For example, Dr Foster defines patient experience as the feedback from patients on events that occur during healthcare services (22). Wolf et al. summarized 18 articles of patient experience published within 14 years (2000-2014) and defined patient experience as the perceptions by patients, which have been cumulated from the continuous interactions between the patients and healthcare providers (24). Browne, Roseman, Shaller, and Edman-Levitan defined patient experience as "elicit[ed] reports from patients on what they did or did not experience in their interactions with providers and the health care system" (23). Also, they distinguish patient experience from conventional user-generated reviews by emphasizing the scientific aspects of patient experience scaling. Indeed, healthcare institutions and governments started to develop the scales for patient experience. Jenkinson, Coulter, and Bruster developed the questionnaire, derived from patient-reported healthcare measurements developed by Picker Institute (25). They named this questionnaire Picker Patient Experience 15 (PPE-15) and validated the developed scales with the dataset collected from the Western countries. The United States and the United Kingdom developed the National Health Survey (NHS) of the United Kingdom and Hospital Consumer Assessment of

Healthcare Providers and Systems (HCAHPS) of the United States, based on patient experience based on PPE-15 and the original scales from Picker Institute (26).

Patient experience resembles patient satisfaction, which is the term defined earlier and still conversational regarding its relationship with patient experience. In some articles, these terms are used interchangeably, but healthcare researchers distinguish patient satisfaction and patient experience with several criteria (7,27–29). Table 1 displays the different features which patient satisfaction and patient experience have and the examples of the measures for the two concepts. While patient satisfaction asks for how the perceived healthcare services made the patients feel, patient experience is rather subjective views on objective facts during healthcare services (22,29). LaVela and Gallan made a similar caution on equating these two terms because patient experience measures perceptions on and frequencies of what happened during healthcare service, which does not belong to patient satisfaction (29). Surveys for patient satisfaction and patient experience reflect some of this difference. In the 2007/8 General Practitioner (GP) Access Survey of England, the questions for patient satisfaction are likely to be answered in terms of the level of agreement (30). For example, the questions asked for whether a respondent satisfied with telephone access or opening hours. On the other hand, the questions for patient experience are rather to be answered in terms of the level of the patient's perception of objective facts. For example, the questions asked whether a respondent was able to make an appointment within 48 hours if he or she wanted and whether he or she was able to see specific GP if he or she wanted. Also, while overall patient satisfaction can be measured, there is no term for overall patient experience, but there are just patient experience measures for specific care experiences.

Although patient satisfaction has been more studied than patient experience, this concept has some serious weaknesses. Lebow conducted a literature review of 51 patient satisfaction studies which have published before 1983, and more than half of the studies reported equal to or more than 75% of satisfied patients (31). Williams also criticized patient satisfaction with its high

level of reported values, which often exceeded 90% (32). Reminding of the purpose, the high level of patient satisfaction is not preferable to the researchers. Williams criticized the patient satisfaction concept at a more fundamental level. In detail, he pointed out that the baseline models of the patient satisfaction concept explained a very small ratio of the variance in satisfaction (32). In advance, he argued that the responses regarding patient satisfaction depended on how patients perceive themselves in the healthcare system. Thus, patient experience would be a better choice to examine patient attitude towards the healthcare system and medical services, though there is no clear-cut between patient satisfaction and patient experience.

Healthcare researchers previously studied the social indicators which were correlated with patient satisfaction and patient experience. One of the reported demographic characteristics which correlate with patient satisfaction and patient experience is age. In 1981, Fox and Storms conducted a study on potential social indicators of patient satisfaction by gathering samples from the Baltimore metropolitan area and reported the gradient of the satisfaction with healthcare services by age, which means older people are more likely to report the satisfaction (33). In advance, this positive correlation between age and the satisfaction remained after controlling other factors, including sex, race, socioeconomic status, health status, and factors related to the access on and use of healthcare services. In 2000, Carlson, Bluestein, Fiorentino, and Prestianni investigated the correlation between social indicators and the dissatisfaction with health plan among New Jersey HMO enrollees and reported that the people who were aged 25-54 years are at least 1.36 times more likely to report the dissatisfaction with health plan than the people who were aged 55 or more (34). In 2005, Fan, Burman, McDonell, and Fihn conducted a study on the factors for patient satisfaction, which included demographic factors, socioeconomic status, self-reported health, patient utilization of healthcare services, characteristics of healthcare providers, and continuity of healthcare services (35). Different from the previous studies, this study categorized the measures of patient satisfaction into multiple items: 1) humanistic scale, which

assesses patient satisfaction with healthcare practitioners, and 2) organizational scale, which assesses patient satisfaction with healthcare services and facility. In this study, they reported the positive association between age and patient satisfaction in both scales – if age increases by ten years, the average score of patient satisfaction increases by 8 points out of 100 points, in both scales. The study by Haviland, Morales, Dial, and Pincus in 2005, and the study by Quintana et al. in 2006 also employed demographic factors and socioeconomic status to find the indicators of patient satisfaction (36,37). These studies included more categories for patient satisfaction, including health plan satisfaction, medical care satisfaction, and concern to recommend/switch health plan and patient satisfaction regarding information, personal care, comfort, visiting, intimacy, and cleanliness (36,37). In both studies, older people are more likely to report more patient satisfaction in every category of it. In 2010, Kontopantelis, Roland, and Reeves employed the 2007/8 GP Access Survey in England to reveal indicators of patient satisfaction and patient experience (38). In detail, the study used two questions for patient satisfaction (satisfied with getting through on the phone, and satisfied with hours when GP surgery is opened), and three questions for patient experience (able to get appointment same day or next two days, able to get an appointment more than two full days in advance, and able to get an appointment with particular GP). Similar to the previous studies, this study reported that the respondents who were aged 55 or more were more likely to report positive patient satisfaction and patient experience than the respondents who were aged less than 35.

While most of the previous studies reported a positive association between age and patient satisfaction/experience, there was also a contrasting report on the association between age and patient satisfaction. In 1975, Hulka, Kupper, Daly, Cassel, and Frederic surveyed 3,332 people in Indiana to examine the difference in patient satisfaction by age group, race, gender, and healthcare service usage (39). The study compared the percentages of the people with ‘high satisfaction’ – the respondents who are above the third quartile on the distribution of satisfaction

scores between age groups. Also, this study used three categories for the measures of patient satisfaction: 1) the professional competency of physicians, 2) personal qualities of physicians in their relationships with patients, and 3) accessibility of care, including costs and convenience. Then, they reported that the respondents who were aged 60 or more were less likely to be highly satisfied than younger counterparts for the categories of professional competency and accessibility to care. At the same time, there was still a positive gradient between age and patient satisfaction regarding personal qualities.

There are previous studies that reveal the other demographic indicators of patient satisfaction and patient experience, including sex, marital status, and race/ethnicity (33,34,36–38,40–42). However, other studies contradicted these findings, showing the insignificant or complicated relationship between the two (33,43). Previous studies reported conflicting results on the role of socioeconomic status on patient satisfaction or experience. Some studies reported that higher patient satisfaction or experience was positively associated with higher overall socioeconomic status, including household income, wealth, and educational attainment (36,44,45). However, some other studies, which reported the negative association between them, also existed (34,40,44,46,47). There were also conflicting reports on the association between geographic status and patient satisfaction or experience. For example, people living in rural areas were more likely to report adverse patient satisfaction, but the distance from the clinic did not show a clear relationship with patient satisfaction (35,36). The previous studies reported not only the association between higher patient satisfaction and higher self-reported health but also its high explanatory power of patient satisfaction in the model (34,35). Healthcare-related status, such as health plan type, insurance coverage, health provider type,(36) outpatient setting, ward type, a number of physician visits, and demographic and socioeconomic status of the nurse was also reported of their associations with patient satisfaction (1,34–36,40,46,48). Other factors, such as

English proficiency and cultural competence of practitioners, had correlations with patient satisfaction (48,49).

The research on patient experience has the following limitations. First of all, the previous studies analyzed the role of social indicators on patient satisfaction or experience of the general population, without focusing on any specific cohort. In detail, the previous studies of patient satisfaction and patient experience employed an age as a control variable or a confounder. This trend has remained even from the studies which focused on social indicators of patient satisfaction and patient experience (33–38). However, age is also an important social indicator, which gets along with other important social indicators, such as gender and socioeconomic status.

In addition, the majority of the studies targeted the population from Western countries. In particular, the introduced studies on the relationship between patient experience and the proxy concepts and social indicators usually conducted in the United States or the United Kingdom (33–36,38,48). Therefore, the findings may not be applicable in the case of South Korea, which is the aim of this study. Also, most of the previous studies analyzed patient satisfaction, which has been criticized for its high satisfaction level and low variance between people (31,32). Even a small amount of studies on patient experience used the term positive patient satisfaction as a synonym of patient satisfaction, so they had the same problems of patient satisfaction studies, such as a high level of satisfied people (38). Therefore, there needs a study for the role of social indicators on patient experience, with the focus on a comparison between older adults and their younger counterpart, within a non-Western population.

Recently, several studies on the association between social indicators and patient satisfaction or experience in the South Korean context were published. Un-Na Kim collected patient experience data from two hospitals, analyzed 177 responses. She reported the possible association of patient experience with educational attainment and type of admission for hospitalization. However, there was no association of patient experience with age, sex, and self-

reported health status from the sample (50). Mijong Kim and Soonjoo Park analyzed the 6th Korea National Health, and Nutrition Examination Survey collected in 2015, which contained the first nationwide statistics on patient experience in South Korea. They reported a high level of patient experience on average. In contrast to Un-Na Kim's thesis, they examined the possible association between social indicators and patient experience, including sex, age, living area (urban and rural), marital status, household type (living alone or not), educational attainment, and income (51).

Since 2017, South Korea started to collect patient experience data using the Healthcare Service Experience Survey, which has collected in South Korea, 2017. Different from surveys employed in the previous Korean studies, this survey is designed to measure patient satisfaction and experience exclusively, which will be collected every year. Two published studies employed this survey to analyze patient experience among the South Korean population. Jeong Woo Shin reported a small level of differences of patient experience by demographic status and self-reported health regarding health practitioner services, facility security, and privacy, but reported more significant differences regarding waiting time and a financial burden (52). In advance, Seong Chan Jo and Jae Bin Cha investigated whether the level of patient experience differs by the type of medical institution (e.g., hospital, clinic, oriental hospital/clinic, and dental clinic) and medical department (e.g., internal medicine, general surgery, dentistry, and oriental medicine) that respondents used (53). This study categorized patient experience into three types – communication with doctors, communication with nurses, and the use of medical facilities. For the first time, these researchers analyzed outpatient experience data and reported a partial correlation between the type of medical institution/department and the level of patient experience. In detail, the outpatients who visited a hospital or an oriental hospital/clinic reported a higher level of patient experience than the outpatients who visited a clinic or a dental clinic in most of the scales. Also, the outpatients who visited the department of internal medicine or oriental

medicine reported a higher level of patient experience than the outpatients who visited the department of general surgery or dentistry. They also analyzed hospitalized patients, with two categories for medical institutions (hospital or clinic) and medical departments (internal medicine or general surgery). In contrast to the result from the outpatients, there was no significant correlation between the level of patient experience and the type of medical institution where patients were hospitalized in most of the scales. However, the hospitalized patients who visited the department of internal medicine reported a higher level of patient experience than the hospitalized patients who visited the department of general surgery in some of the scales (53).

The studies from South Korea have limitations as follows. Some of the studies employed a small-size survey that lacks statistical power and generalizability (50). Although other studies employed a large size survey, the scales for patient experience are questionable. Measures from two surveys employed in three Korean studies reported a high average level of patient experience, which was one of the criticisms of patient satisfaction measures (31,32,51–53). Also, there is no Korean study that examined social indicators of adverse patient experience using a large-sized nationwide survey.

To sum up, this study will explore two topics: 1) To examine patient experience level and social indicators of it, and 2) To examine the relevance of patient experience measures used in South Korea. In particular, this study will examine the topics with a focus on the aging population, comparing the results by age groups. The exploration on these topics will enable us to understand how diverse the patient experience among the aging population in South Korea is and to interpret the construction of patient experience with the dynamic interactions of the social contexts we have not been interested in, as the previous scholars have achieved in the social epidemiology field. In addition, the findings would contribute to further discussions and inquiries for the healthcare policies for older adults. We can also expect a suggestion for refining patient experience scales that have been used in South Korea.

Methods

Data come from the 2017 wave of Healthcare Service Experience Survey (HSES) conducted by the Ministry of Health and Welfare in South Korea and KIHASA (54). The HSES is a nationally representative sample of South Korea, which includes demographic factors and socioeconomic characteristics, self-reported health status, patient satisfaction and experience, and attitudes toward the healthcare system (N=11,098).

The survey participants were asked if they had an outpatient or a hospitalization experience in 2017. There were 27 questions for patient experience of the outpatients and 29 questions for patient experience of the patients who were hospitalized, and these questions were categorized into five types: 1) communication with doctors, 2) communication with nurses, 3) the use of medical facilities, 4) safety, and 5) waiting time. However, the actual scales for patient experience regarding 3) the use of medical facilities and 4) safety were more likely to be the scales for patient satisfaction, which asks for more affective judgment of healthcare services by patients (24). For example, one of the scales for patient experience regarding the use of medical facility asks for the comfort level of medical facility which respondents used. Therefore, these two categories were omitted from the scope of the study. In advance, there were three questions on unmet health needs, which were asked of the respondents regardless of whether they had an outpatient or a hospitalization experience in 2017. The three questions asked the respondents whether they had unmet health needs about 1) hospital/clinic visit, 2) treatment and 3) medication. The category of unmet health needs did not use the same scales for patient experience in HSES, but the questions for unmet health needs satisfy the definition of patient experience, which is the feedback from patients on actual happening during healthcare services (22). Therefore, in this study, unmet health needs were included as a category of patient experience for the data analysis.

Consequently, there are four categories for the scales of patient experience: 1) communication with doctors, 2) communication with nurses, 3) waiting time, and 4) unmet health needs due to cost burden. The scales for 1) communication with doctors, 2) communication with nurses, and 3) waiting time were measured with 5-point scales (1: absolutely not – 3: intermediate – 5: absolutely yes; see the questions in Table 9). The scales for 4) unmet health needs due to cost burden were measured with binary scales (yes or no).

Potential indicators of patient experience were demographic characteristics, socioeconomic status, and health status. Demographic characteristics included age, sex, place of living, and living alone. Sex (male or female), place of living (living in a rural or urban area), and living alone (living alone or not) were measured with binary scales, and age was measured with a continuous variable. Socioeconomic status consisted of educational attainment, occupation, and monthly household income. Educational attainment was recorded in a three-level scale (1: elementary school or less, 2: middle school, and 3) high school or higher education), and monthly household income was recorded in a four-level scale (1: less than 1.5 million won, 2: 1.5 million won ~ 3.5 million won, 3: 3.5 million won ~ 5.5 million won, and 4: more than 5.5 million won). The occupation was measured with a categorical variable (paid worker or employee, self-employed or employer, housemaker, student, other types of occupation, and unemployed). Socioeconomic status was recoded into binary variables during the further analysis, for the statistical power of the analysis. In detail, educational attainment was re-coded into a binary variable, which asks whether the survey respondents graduated from a middle school or not. Monthly household income was also recoded into a binary variable, which asks whether the monthly household income in 2017 was less than 1.5 million won or not. The boundary for monthly household income was determined based on the poverty line of South Korea. The occupation was recoded into a binary variable of unemployment, which asks whether the survey respondents were unemployed or not. Health status included types of chronic diseases the survey

respondents had in 2017, which included hypertension, diabetes, hyperlipidemia, arthropathy, tuberculosis, ischemic heart disease, vascular disease, and other types of chronic diseases. The number of chronic diseases for each survey respondent was calculated based on the questions for health status and re-coded into a binary variable (having a chronic disease or not) for further data analysis.

This study conducted two data analysis for the research questions. First, the study examined each patient experience category by age groups. Particularly, the survey has different question groups for outpatient experience and hospitalization experience, so the examination for 1) communication with doctors, 2) communication with nurses, and 3) waiting time was conducted twice for the two types of healthcare service experience. Also, there were multiple questions for patient experience regarding 1) communication with doctors and 2) communication with nurses, so during the first data analysis, this study used the average values of the questions as representative scales for communication with doctor and nurse. Internal consistency of each average value was tested using Cronbach's alpha (α = 0.74 for communication with doctor and 0.75 for communication with nurses during an outpatient visit; α = 0.80 for both communications with doctor and nurse during hospitalization). In the first data analysis, this study divided the survey samples into five age groups (-29, 30-39, 40-49, 50-64, and 65-) and conducted a chi-square test to examine whether each patient experience category statistically differs by the age group.

In the second data analysis, a series of logistic regression models were employed to reveal the association between demographic and socioeconomic characteristics and health experience, with the comparison between age groups. First, the study did not conduct data analysis on patient experience during hospitalization because less than 30% of hospitalized people responded to questions regarding waiting time. For patient experience of outpatients, the study merged the patient experience measures for 1) communication with doctors and 2)

communication with nurses into a single scale using an average value (Cronbach's alpha = 0.82). Also, a new scale was developed for 4) unmet health needs due to cost burden, which recorded whether the survey respondent had either one of the three types of unmet health needs (about clinic visit, treatment, and medication) or not. For the logistic regressions, the representative scales for patient experience of outpatients regarding communication with doctors/nurses and waiting time should be re-coded into binary scales. The median value of the representative scale for communication with doctors/nurses was 4.14, and while it was 3 for the scale for waiting time. Therefore, for the second data analysis, a new binary variable for adverse patient experience of outpatients during communication is developed, which is defined as having an adverse experience if the survey respondents had less than 4.00 points on the representative measure for communication with doctors/nurses. Similarly, there was a new binary variable for adverse patient experience of outpatients regarding waiting time, which is defined as having an adverse experience if the survey respondents gave less than 3 points on the measure for waiting time. For the second data analysis, the study also regrouped the samples with three age groups (-39, 40-64, 65-) to guarantee the statistical power of the data analysis. The analysis was restricted to people who responded to all measures for demographic characteristics, socioeconomic status, and health status, so the number of samples for each age group was slightly reduced (N=3,624 for people aged less than 40, N=5,602 for people aged between 40-64, and N=2,178 for people aged 65 or more). Consequently, 10,864 patients were employed for the second data analysis.

All data analysis was performed using SAS 9.4. This study has received an exemption status from the Emory University Institutional Review Board (IRB) due to its use of secondary data.

Results

In 2017, older adults in South Korea differed from younger adults in terms of healthcare service usage (See Table 2). Of older adults, 92.6% visited clinics for outpatient healthcare services in 2017, which was 1.66 times of that of young adults (55.8%). Also, 10.9% of older adults had a hospitalization experience, which was nearly four times that of younger adults (2.82%). The average number of chronic diseases which a survey participant had in 2017 among older adults was 1.08, while it was nearly none among younger adults.

The distribution of patient experience by age group was different by patient experience measures (See Figure 1, Figure 2, and Table 2). There was a small difference in the average scores of outpatient visits and hospitalization experience between age groups, except the average score regarding waiting time during hospitalization. In detail, the largest difference between the age groups was 0.21 (the average score regarding communication with nurses during outpatient visit experience; 3.97 for people aged <30 or 30~39, and 4.18 for people aged ≥65). We could observe the fluctuation by age group regarding waiting time during hospitalization (See Figure 1 and Table 3), but this possibly came from a low response rate on waiting time among people who reported that they were hospitalized in 2017 (33.5%). In overall, the average scores for outpatient visit and hospitalization experience were very high. Except for the average score for waiting time during hospitalization experience, all average scores for the outpatient visit and hospitalization experience were above 3.43 (of maximum 5.00 points). In advance, the minimum average score regarding communication with doctors/nurses was 3.97. In contrast to outpatient visit and hospitalization experience, there was a gradient of unmet health needs by age group. In detail, of older adults, who are aged 65 or more, 10.8% reported they had unmet health needs in one of three types of healthcare services (clinic visit, diagnosis, and medication), which was 4.7 times of that of the youngest age group (age<29, 2.2%; See Table 3). Also, there were gradients of three basic unmet health needs measures by age group (See Figure 2).

While there was no visible difference regarding average scores of outpatient visit experience by age groups, indicators for outpatient visit experience and the strength of the indicators were different by the age group (See Table 4 and Table 5). In detail, unemployment was the strongest factor among the potential indicators for adverse outpatient visit experience among older adults (OR=1.71 for communication and OR=1.52 for waiting time), and higher income showed its complicating impact on adverse of outpatient visit experience (OR=0.69 for communication and OR=1.14 for waiting time). However, socioeconomic status showed an insignificant impact on patient experience among both young and middle-aged adults. Instead, demographic and health status were partially associated with outpatient visit experience among young and middle-aged adults. For example, young female adults were 0.79 times less likely to have adverse outpatient visit experience regarding communication with doctors/nurses, and middle-aged adults living in a rural area were 1.31 times more likely to have adverse outpatient visit experience regarding waiting time.

In addition to the given findings, significant indicators of outpatient visit experience also vary by types of communication, which construct the average score of outpatient visit experience regarding overall communication (See Table 6). In detail, there are only two of seven scales (Q21: The doctor responded politely; Q23: The doctor consulted the patient with comprehensive wordings) that shared same correlates as for adverse outpatient visit experience (unemployment: OR=1.79 for Q21 and OR=1.80 for Q23; lower household income: OR=1.79 for Q21 and OR=0.66 for Q23). Some scales had indicators for adverse patient experience, which overall outpatient visit experience regarding communication did not have. For example, the scale which measures whether the doctor gave the patient enough opportunities for a question (Q24) had a different demographic indicator for the adverse experience (living in a rural area; OR=0.55). Some scales did not have any significant indicator, such as Q27 (The nurse responded politely).

All age groups shared some indicators for having unmet health needs, while there was a difference in power of the indicators (see Table 7). In all age groups, people with lower household income were more likely to have unmet health needs (OR=2.90 for young adults; OR=2.95 for middle-aged adults; OR=1.74 for older adults). Similarly, people having more chronic diseases were more than two times as likely to have unmet health needs in all age groups (OR=7.98 for young adults; OR=2.89 for middle-aged adults; OR=3.49 for older adults). However, while female young and middle-aged adults were more likely to have unmet health needs than their male counterparts (OR=2.21 for young adults and OR=1.51 for middle-aged adults), there was no significant gender difference regarding having unmet health needs among older adults. On the other hand, while older adults living alone were 1.68 times more likely to have unmet health needs, there was no difference in having unmet health needs between people living alone or not, among young and middle-aged adults. Comparing with outpatient visit experience regarding communication, indicators for overall unmet health needs also had influences on specific unmet health needs (clinic visit, diagnosis, and medication; See Table 8).

Discussion

The data analysis reported on the patient experience of older adults in South Korea, with a focus on the comparison with their younger counterparts. Older adults are more likely to have an outpatient visit and a hospitalization than young and middle-aged adults, however, the average level of outpatient and hospitalization experience did not differ greatly. Further, older adults had more unmet health needs than other age groups, in every specific type of healthcare services (clinic visit, diagnosis, and medication). The results imply that there still are bigger healthcare service demands from older adults, though they already use more healthcare services than younger people.

Although the average scores for outpatient visit experience did not differ between age groups, older adults had different correlates for adverse outpatient visit experience. One of the important correlates was socioeconomic status. In detail, unemployment was associated with adverse outpatient visit experience among older adults. This result corresponds to some of the previous studies on the association between socioeconomic status and patient attitude towards healthcare services (36,44,45). However, educational attainment did not show an association with any outpatient visit experience among older adults. Household income level showed its complicating association with outpatient visit experience. In detail, while older adults with lower household income were less likely to have an adverse outpatient visit experience during communication with doctors and nurses, they were more likely to have adverse experiences regarding waiting time. This result implies different psychosocial mechanisms of outpatient visit experience between patient experience during communication and patient experience regarding waiting time, and there needs to be a follow-up study which reveals potential mediators of the association between household income and outpatient visit experience. In contrast to older adults, demographic and health status were indicators of outpatient visit experience among young and middle-aged adults. However, different from older adults, young and middle-aged adults did not

share the same indicators of outpatient visit experience regarding communication and waiting time. These results, together with the conflicting role of household income on outpatient visit experience among older adults, imply there are more complex psychosocial mechanisms of outpatient visit experience, which differ by age group.

The three age groups shared some indicators for having unmet health needs. In particular, people having lower income or chronic diseases were more likely to have unmet health needs in every age group. However, the strength of each indicator differed by age group. The impact of having lower household income on having unmet health needs was weaker among older adults than among young and middle-aged adults. The importance of chronic diseases in having unmet health needs showed an even more interesting pattern. Among young adults, the correlation was the strongest, but it was much less among middle-aged adults and much more among older adults. In addition, while female young and middle-aged adults were more likely to experience unmet health needs, there was no significant difference in unmet health needs between sex among older adults. On the other hand, older adults living alone were more likely to experience unmet health needs while living alone was not associated with having unmet health needs among their younger counterparts. The given results also imply that each age group possibly have different psychosocial mechanisms of having unmet health needs, which are also different from those of outpatient visit experience.

This study reports some discordance on the previous studies on social indicators of patient satisfaction and experience. While many of the previous studies reported a significant association between demographic status and patient satisfaction and experience, the results in the study show that demographic characteristics did not influence patient experience among older adults (34,35,37,38,40). The discordance between previous studies and this study that targeted older adults implies there need to be more studies of patient experience that focus on minority

classes because analysis of the general population and specific sub-populations can draw different landscapes on psychosocial mechanisms for patient experience.

Current measures for patient experience deserve comment. According to the previous studies which differentiate patient experience and patient satisfaction, patient experiences tend to measure a patient's opinion on actual events during healthcare service experiences (22,29,55). However, there is still a blurry boundary between patient experience and patient satisfaction due to the ambiguous definition of actual events with patient experience measures.. Therefore, for some patient experience measures, the study reported a similar phenomenon to that reported by previous studies that have criticized measures of patient satisfaction. In detail, the previous studies reported some scales for patient satisfaction have overly high average scores, and this study also reported very high average scores on measures for outpatient visit experiences and hospitalization experiences (31,32). We may interpret the result as a high patient experience level by citizens in every age group. However, according to 'more objective' measures -- unmet health needs – a substantial number of people in every age group have unmet health needs, and also there is a disparity of unmet health needs between age groups, with older respondents reporting more unmet health needs, as well as younger and middle-aged women reporting more unmet health needs than men in those age groups. Thus, the given result would better be interpreted as an incompatibility of the current scales for outpatient visit experiences and hospitalization experiences that have been used in this study. In advance, the study reported different indicators of outpatient visit experience between each measure, which constructs overall outpatient visit experience scores regarding communication with doctors and nurses. Recapping the definitions of patient experience and this result, it would be better to avoid collapsing patient experience measures into one single measure.

There are three limitations to the study. First, this study could not include some essential social indicators because the survey used to collect the secondary data used in the study did not

measure some of those factors. For example, marital status has been reported as an important indicator of patient satisfaction, but this study could not employ this status for data analysis (37,41). Considering the changes between models of indicators for each patient experience measure, including marital status in the model would probably change some other correlates of each patient experience measure. Second, the study could not employ logistic regression for examining indicators for hospitalization experience because of a low response rate on waiting time measures during hospitalization experience. Third, this study did not differentiate the types of clinic respondents used, which is reported as a factor to influence on patient experience.(53) In detail, the previous study, which used the same dataset, reported significant differences in patient experience levels between the types of medical institutions (hospital vs. clinic vs. oriental hospital/clinic vs. dental clinic) and the medical departments (internal medicine vs. general surgery vs. oriental medicine vs. dentistry) (53). However, the previous study did not control the social indicators, so if this study could examine the potential influence of the types of medical institutions and the medical departments on patient experience while controlling the social indicators, this study would give more detailed policy implications for improving the patient experience of older adults, with facility-specific suggestions. Unfortunately, to guarantee the statistical power of the second data analysis, the variables for the types of medical institutions and the medical departments were not included in the scope of the study.

There are three strong points of this study. First, the study employed the nationally representative dataset collected from South Korea, which used well-established random sampling. Therefore, the readers can understand overall South Korean contexts of patient experience with this study, with the focus on the comparison between older adults and their younger counterparts. Also, this study employed a dataset collected from South Korea that differs from previous studies of patient experience and patient satisfaction that collected the dataset from the United States or

other Western countries. Most of all, the main focus of this study was patient experience, which has been understudied compared with patient satisfaction, due to its more recent development.

The result of this study asks for policymakers to consider older and younger adults differently when designing healthcare policy for improving patient experience. Also, older adults with lower socioeconomic status and who already have chronic diseases should be in priority of healthcare policy, because they are most likely to have adverse patient experience. We also need further data analysis to reveal unknown indicators that mediate between socioeconomic status and patient experience. For example, before the data analysis, the monthly household income was not expected to have a strong association between adverse patient experience regarding communication or waiting time, because the National Health Insurance system in South Korea is a single-payer model, which enables the citizens to pay a small amount of money for their uses of healthcare services. However, both types of patient experience were associated with monthly household income in opposite directions. In addition to socioeconomic and health status, gender and rurality should be more investigated with their relationship between patient experience and applied to policymaking if there are further findings. For example, the current South Korean health insurance system provides freedom of choice of a medical facility to all citizens, so before the data analysis, rural older adults were expected to have more adverse patient experience than urban older adults because of their preferences on large hospitals and the gap between rural and urban older adults on the access on big hospitals. However, there was no significant association between the place of living and patient experience, and this result might come from the effect of unknown indicators, such as access to transportation to large hospitals.

In advance, there needs to be further development of better measures for patient experience. Scaling opinions on actual events during healthcare services can have the same problems reported in this study, such as high average score and low variability among subgroups. Therefore, the newly developed measures would better be based on count records of actual

events, such as a number of adverse clinic visit experiences among total visits in a recent year, or an average waiting time during a clinic visit.

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Tables

Table 1. The features and the measures of patient satisfaction and patient experience

	Features	Measures
Patient satisfaction	Affective judgment of healthcare services by patients[1] • Different from perceived quality: patient satisfaction asks how the perceived quality of healthcare services made the patients feel Capturing some aspect of happiness[2]	Satisfied with telephone access to doctors (Y/N)[3] Satisfied with healthcare services by doctors in overall (5-point scales: Strongly disagree to strongly agree)[4] Satisfied with health plan/medical care (7-point scales: completely dissatisfied to completely satisfied)[5]
Patient experience	The feedback from patients on actual events occurring during healthcare services[6] "The sum of all interactions, shaped by an organization's culture, that influence patient perceptions across the continuum of care"[7]	Able to make an appointment within 48 hours if patients wanted (Y/N)[3] Unmet healthcare needs due to cost burden (Y/N)[4] Whether doctors talk in front of patients as if the patients were not there (3-point scales: Yes (often), yes (sometimes), and no)[8]

Table 2. Descriptive statistics of survey respondents

	Overall (N=11,098)	Young adults[a] (N=3,720)	Middle-aged adults[b] (N=5,163)	Older adults[c] (N=2,215)
Demographic characteristics				
Female, %	53.0	51.1	53.3	55.3
Age, M (SD)	48.4 (17.9)	27.9 (7.3)	52.4 (6.8)	73.3 (6.5)
Living alone, %				
Geographic characteristics				
Living in rural area, %	27.8	18.8	25.3	48.8
Socioeconomic status				
Educational attainment				
≤ 6th grade, %	11.2	2.0	2.3	47.5
7th ~ 9th grade, %	54.3	45.8	63.0	48.4
≥ 10th grade, %	34.4	52.2	34.6	4.2
Occupation				
Paid-worker, %	38.5	48.0	44.4	8.9
Employer, %	17.1	3.4	24.2	23.5
Homemaker, %	22.4	10.7	26.0	33.7
Student, %	11.2	33.1	0.1	0.0
Others, %	8.5	3.4	3.2	29.5
Unemployed, %	2.1	1.0	1.9	4.1
Nonresponse, %	0.2	0.3	0.1	0.3
Monthly household income				
< 1.5M ₩, %	14.0	2.7	6.7	49.9
1.5M ~ 3.5M ₩, %	33.6	32.7	34.5	33.3
3.5M ~ 5.5M ₩, %	32.3	40.3	35.9	10.3
≥ 5.5M ₩, %	18.2	22.1	21.0	5.1
Nonresponse, %	1.9	2.3	1.9	1.4
Health status				
Number of chronic disease, M (SD)	0.4 (0.7)	0.0 (0.2)	0.3 (0.7)	1.1 (1.0)
Healthcare service usage				
Had outpatient visit experience, %	72.6	55.8	76.2	92.6
Had hospitalization experience, %	5.8	2.8	5.8	10.9

[a] Age<40.
[b] Age=40~64.
[c] Age≥65.

Table 3. Average scores of patient experience measures by age group

	Age				
	~29	30~39	40~49	50~64	65~
Outpatient, M[a]					
Comm. with doctor	3.99	4.00	4.07	4.09	4.13
Comm. with nurse	3.97	3.97	4.05	4.09	4.18
Waiting time	3.43	3.47	3.49	3.48	3.49
Hospitalization, M[a]					
Comm. with doctor	4.17	4.22	4.21	4.16	4.08
Comm. with nurse	4.10	4.20	4.23	4.17	4.08
Waiting time	3.75	2.05	3.11	2.93	3.17
Unmet health needs, %[b]					
Medication	0.6	1.6	1.2	1.5	3.6
Clinic visit	0.4	1.8	2.0	3.2	6.7
Diagnosis	1.7	2.9	2.9	4.3	8.4
Overall	2.2	3.8	3.6	5.6	10.8

[a] Measured with 5-points scale (1 ~ 5).

[b] Percentage of people who had unmet health needs due to cost burden.

Table 4. Regression of adverse outpatient experience regarding communication, by age group

	Overall (N = 7,308)						Young adults (Age < 40; N = 1,902)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	0.92	[0.84,1.02]	0.95	[0.86,1.05]	0.93	[0.84,1.03]	0.84	[0.70,1.02]	0.84	[0.70,1.02]	0.79	[0.65,0.96]
Age[b]	0.83	[0.77,0.89]	0.85	[0.78,0.92]	0.90	[0.82,0.99]	1.00	[0.98,1.01]	0.99	[0.98,1.01]	1.00	[0.98,1.01]
Living alone[c]	0.96	[0.81,1.14]	1.07	[0.89,1.29]	1.12	[0.93,1.35]	1.24	[0.81,1.91]	1.29	[0.82,2.02]	1.23	[0.79,1.94]
Living in rural area[d]	0.93	[0.83,1.04]	0.96	[0.86,1.08]	0.98	[0.88,1.10]	1.26	[1.00,1.60]	1.27	[1.00,1.61]	1.25	[0.99,1.59]
Educated≤ 9 years[e]			0.99	[0.88,1.12]	1.02	[0.91,1.15]			0.91	[0.73,1.15]	0.92	[0.73,1.15]
Unemployed[f]			1.24	[1.04,1.49]	1.25	[1.04,1.50]			1.03	[0.60,1.76]	0.97	[0.56,1.68]
Earned<1.5M₩/mo.[g]			0.74	[0.62,0.87]	0.72	[0.61,0.85]			0.89	[0.51,1.55]	0.94	[0.54,1.64]
Had chronic disease[h]					0.84	[0.74,0.95]					0.87	[0.55,1.37]
	Middle-aged adults (Age = 40~64; N = 3,541)						Older adults (Age ≥ 65; N = 1,865)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.03	[0.89,1.19]	1.01	[0.87,1.17]	1.02	[0.88,1.19]	0.87	[0.70,1.08]	1.03	[0.82,1.29]	1.00	[0.80,1.26]
Age[b]	0.99	[0.98,1.00]	0.98	[0.97,1.00]	0.99	[0.98,1.01]	0.96	[0.94,0.97]	0.95	[0.93,0.97]	0.95	[0.93,0.96]
Living alone[c]	1.10	[0.83,1.46]	1.13	[0.83,1.52]	1.14	[0.85,1.55]	0.91	[0.70,1.19]	1.01	[0.76,1.35]	1.01	[0.83,1.46]
Living in rural area[d]	0.98	[0.83,1.16]	0.97	[0.82,1.15]	1.00	[0.84,1.18]	0.78	[0.63,0.96]	0.89	[0.71,1.10]	0.90	[0.73,1.13]
Educated≤ 9 years[e]			1.07	[0.90,1.27]	1.09	[0.92,1.29]			0.99	[0.58,1.67]	0.93	[0.55,1.58]
Unemployed[f]			0.80	[0.52,1.23]	0.83	[0.53,1.28]			1.74	[1.35,2.24]	1.71	[1.33,2.20]
Earned<1.5M₩/mo.[g]			0.98	[0.72,1.33]	0.90	[0.66,1.23]			0.73	[0.58,0.92]	0.69	[0.55,0.87]
Had chronic disease[h]					0.79	[0.67,0.93]					1.08	[0.85,1.36]

[a] Reference = Male.
[b] For overall population, the study employed age as categorical variable (young, middle-aged, and older adults; reference = young adults). For others, the study employed age as continuous variable (yr.)
[c] Reference = People who live with one or more person(s).
[d] Reference = People who are living in urban area.
[e] Reference = People who educated more than 9 years.
[f] Reference = Employed people (including students).
[g] Reference = People who are in the household with monthly income ≥ 1.5M won per month.
[h] Reference = People who did not have chronic disease within a year.

Table 5. Regression of adverse outpatient experience regarding waiting time, by age group

	Overall (N = 7,308)						Young adults (Age < 40; N = 1,902)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.04	[0.94,1.14]	1.07	[0.98,1.18]	1.07	[0.98,1.18]	1.08	[0.90,1.29]	1.08	[0.90,1.30]	1.08	[0.90,1.29]
Age[b]	0.93	[0.86,0.99]	0.90	[0.83,0.97]	0.91	[0.84,0.99]	1.00	[0.99,1.01]	1.00	[0.98,1.01]	1.00	[0.98,1.01]
Living alone[c]	1.04	[0.89,1.22]	1.00	[0.85,1.19]	1.01	[0.85,1.19]	0.75	[0.49,1.15]	0.76	[0.49,1.18]	0.76	[0.49,1.18]
Living in rural area[d]	0.83	[0.75,0.92]	0.83	[0.75,0.93]	0.84	[0.75,0.93]	1.00	[0.79,1.25]	1.00	[0.79,1.25]	1.00	[0.79,1.26]
Educated≤ 9 years[e]			0.91	[0.82,1.02]	0.91	[0.82,1.02]			0.92	[0.74,1.14]	0.92	[0.74,1.15]
Unemployed[f]			1.34	[1.13,1.58]	1.34	[1.13,1.59]			1.12	[0.66,1.89]	1.12	[0.67,1.90]
Earned<1.5M₩/mo.[g]			1.06	[0.91,1.23]	1.06	[0.91,1.24]			1.00	[0.58,1.71]	1.01	[0.59,1.72]
Had chronic disease[h]					0.97	[0.86,1.08]					0.90	[0.59,1.38]
	Middle-aged adults (Age = 40~64; N = 3,541)						Older adults (Age ≥ 65; N = 1,865)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.07	[0.94,1.22]	1.10	[0.96,1.26]	1.10	[0.96,1.26]	0.95	[0.79,1.15]	1.08	[0.88,1.32]	1.08	[0.88,1.32]
Age[b]	1.00	[0.99,1.01]	1.00	[0.99,1.01]	1.00	[0.99,1.01]	1.00	[0.98,1.01]	0.98	[0.97,1.00]	0.98	[0.97,1.00]
Living alone[c]	1.34	[1.03,1.75]	1.31	[0.99,1.74]	1.31	[0.99,1.74]	1.00	[0.79,1.25]	0.93	[0.73,1.19]	0.93	[0.73,1.19]
Living in rural area[d]	0.73	[0.62,0.85]	0.74	[0.63,0.86]	0.74	[0.63,0.86]	0.90	[0.74,1.08]	0.95	[0.78,1.15]	0.95	[0.78,1.15]
Educated≤ 9 years[e]			0.91	[0.78,1.06]	0.91	[0.78,1.06]			0.92	[0.56,1.50]	0.92	[0.56,1.50]
Unemployed[f]			1.23	[0.84,1.80]	1.23	[0.84,1.80]			1.52	[1.22,1.91]	1.52	[1.22,1.91]
Earned<1.5M₩/mo.[g]			1.02	[0.77,1.36]	1.02	[0.77,1.36]			1.13	[0.92,1.39]	1.14	[0.93,1.40]
Had chronic disease[h]					1.00	[0.86,1.16]					0.98	[0.80,1.21]

[a] Reference = Male.

[b] For overall population, the study employed age as categorical variable (young (0), middle-aged (1), and older adults (2)). For others, the study employed age as continuous variable (yr.)

[c] Reference = People who live with one or more person(s).

[d] Reference = People who are living in urban area.

[e] Reference = People who educated more than 9 years.

[f] Reference = Employed people (including students).

[g] Reference = People who are in the household with monthly income ≥ 1.5M won per month.

[h] Reference = People who did not have chronic disease within a year.

Table 6. Regression of adverse outpatient experience regarding communication, among older adults (Age = 65~; N = 1,865)[a]

	Average[b]		Q21		Q22		Q23	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[c]	1.00	[0.80,1.26]	0.75	[0.52,1.07]	0.95	[0.71,1.27]	1.21	[0.90,1.62]
Age (year)	0.95	[0.93,0.96]	0.90	[0.87,0.93]	0.94	[0.92,0.97]	0.95	[0.93,0.97]
Living alone[d]	1.01	[0.83,1.46]	0.68	[0.43,1.07]	0.88	[0.61,1.28]	1.02	[0.71,1.47]
Living in rural area[e]	0.90	[0.73,1.13]	1.43	[1.02,2.02]	0.83	[0.63,1.10]	1.14	[0.87,1.51]
Educated≤ 9 years[f]	0.93	[0.55,1.58]	0.63	[0.31,1.29]	0.73	[0.40,1.33]	0.90	[0.47,1.72]
Unemployed[g]	1.71	[1.33,2.20]	1.79	[1.22,2.64]	1.34	[0.97,1.85]	1.80	[1.31,2.48]
Earned<1.5M₩/mo.[h]	0.69	[0.55,0.87]	1.79	[1.25,2.58]	0.80	[0.59,1.08]	0.66	[0.49,0.89]
Had chronic disease[i]	1.08	[0.85,1.36]	1.45	[0.98,2.14]	1.17	[0.86,1.58]	0.95	[0.71,1.28]
	Q24		Q25		Q27		Q28	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[c]	0.96	[0.72,1.28]	1.02	[0.76,1.37]	0.98	[0.66,1.44]	1.10	[0.80,1.51]
Age (year)	0.97	[0.95,1.00]	0.93	[0.90,0.95]	0.97	[0.94,1.00]	0.95	[0.93,0.98]
Living alone[d]	1.25	[0.88,1.79]	0.93	[0.65,1.34]	0.77	[0.46,1.28]	0.53	[0.35,0.81]
Living in rural area[e]	0.55	[0.42,0.73]	1.07	[0.81,1.42]	0.91	[0.63,1.33]	1.33	[0.98,1.81]
Educated≤ 9 years[f]	0.72	[0.40,1.30]	0.52	[0.29,0.91]	0.88	[0.37,2.10]	0.85	[0.41,1.77]
Unemployed[g]	1.24	[0.90,1.70]	1.97	[1.44,2.71]	1.33	[0.86,2.04]	2.02	[1.43,2.84]
Earned<1.5M₩/mo.[h]	0.66	[0.49,0.89]	1.07	[0.79,1.44]	1.04	[0.70,1.55]	1.31	[0.95,1.80]
Had chronic disease[i]	0.99	[0.74,1.32]	1.26	[0.92,1.72]	0.73	[0.50,1.07]	1.26	[0.89,1.78]

[a] See Table 9 for the descriptions of Q21 ~ Q27.

[b] Average = (Q21+Q22+Q23+Q24+Q25+Q26+Q27)/7

[c] Reference = Male.

[d] Reference = People who live with one or more person(s).

[e] Reference = People who are living in urban area.

[f] Reference = People who educated more than 9 years.

[g] Reference = Employed people (including students).

[h] Reference = People who are in the household with monthly income ≥ 1.5M won per month.

[i] Reference = People who did not have chronic disease within a year.

Table 7. Regression of having unmet healthcare needs by age group

	Overall (N = 10,825)						Young adults (Age < 40; N = 3,606)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.54	[1.28,1.85]	1.57	[1.29,1.90]	1.57	[1.29,1.90]	2.12	[1.37,3.26]	2.12	[1.38,3.27]	2.21	[1.42,3.43]
Age[b]	1.80	[1.57,2.05]	1.35	[1.16,1.57]	0.95	[0.80,1.12]	1.02	[0.99,1.05]	1.04	[1.01,1.08]	1.03	[1.00,1.06]
Living alone[c]	1.98	[1.57,2.50]	1.36	[1.05,1.76]	1.31	[1.01,1.70]	2.27	[1.15,4.47]	1.65	[0.79,3.45]	1.73	[0.82,3.66]
Living in rural area[d]	0.90	[0.74,1.10]	0.83	[0.67,1.01]	0.80	[0.65,0.98]	1.02	[0.60,1.71]	0.95	[0.56,1.60]	0.93	[0.55,1.59]
Educated≤ 9 years[e]			1.11	[0.88,1.40]	1.00	[0.79,1.27]			1.66	[1.05,2.63]	1.45	[0.91,2.31]
Unemployed[f]			1.40	[1.07,1.83]	1.25	[0.96,1.64]			1.00	[0.30,3.29]	0.85	[0.25,2.90]
Earned<1.5M₩/mo.[g]			2.37	[1.84,3.04]	2.05	[1.60,2.64]			3.35	[1.52,7.39]	2.90	[1.28,6.57]
Had chronic disease[h]					3.31	[2.64,4.15]					7.98	[4.38,14.52]
	Middle-aged adults (Age = 40~64; N = 5,047)						Older adults (Age ≥ 65; N = 2,172)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.50	[1.14,1.97]	1.48	[1.11,1.98]	1.51	[1.13,2.02]	1.30	[0.95,1.79]	1.41	[1.00,1.99]	1.35	[0.96,1.91]
Age[b]	1.02	[1.00,1.04]	1.00	[0.98,1.03]	0.98	[0.96,1.00]	1.00	[0.98,1.03]	0.99	[0.97,1.02]	0.99	[0.96,1.01]
Living alone[c]	1.51	[0.96,2.36]	0.82	[0.50,1.36]	0.81	[0.49,1.34]	2.22	[1.61,3.06]	1.73	[1.23,2.44]	1.68	[1.18,2.38]
Living in rural area[d]	0.90	[0.66,1.23]	0.83	[0.61,1.15]	0.82	[0.60,1.14]	0.83	[0.62,1.12]	0.81	[0.60,1.11]	0.79	[0.58,1.08]
Educated≤ 9 years[e]			1.00	[0.72,1.38]	0.97	[0.70,1.35]			1.16	[0.52,2.59]	1.15	[0.52,2.58]
Unemployed[f]			1.92	[1.11,3.33]	1.61	[0.92,2.81]			1.34	[0.94,1.90]	1.24	[0.87,1.77]
Earned<1.5M₩/mo.[g]			3.39	[2.24,5.13]	2.95	[1.94,4.48]			1.89	[1.34,2.68]	1.74	[1.22,2.47]
Had chronic disease[h]					2.89	[2.15,3.87]					3.49	[2.20,5.52]

[a] Reference = Male.

[b] For overall population, the study employed age as categorical variable (young (0), middle-aged (1), and older adults (2)). For others, the study employed age as continuous variable (yr.)

[c] Reference = People who live with one or more person(s).

[d] Reference = People who are living in urban area.

[e] Reference = People who educated more than 9 years.

[f] Reference = Employed people (including students).

[g] Reference = People who are in the household with monthly income equal to or more than 1.5M won per month.

[h] Reference = People who did not have chronic disease within a year.

Table 8. Regression of having specific unmet healthcare needs by measures, among older adults (Age ≥ 65)

	Overall unmet health needs (N=2,172)						Unmet clinic visit needs (N=2,165)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.30	[0.95,1.79]	1.41	[1.00,1.99]	1.35	[0.96,1.91]	1.22	[0.82,1.82]	1.37	[0.89,2.11]	1.29	[0.83,2.01]
Age[b]	1.00	[0.98,1.03]	0.99	[0.97,1.02]	0.99	[0.96,1.01]	1.00	[0.98,1.03]	0.99	[0.96,1.02]	0.98	[0.95,1.01]
Living alone[c]	2.22	[1.61,3.06]	1.73	[1.23,2.44]	1.68	[1.18,2.38]	2.47	[1.67,3.68]	1.78	[1.16,2.72]	1.71	[1.11,2.63]
Living in rural area[d]	0.83	[0.62,1.12]	0.81	[0.60,1.11]	0.79	[0.58,1.08]	0.89	[0.61,1.29]	0.86	[0.59,1.27]	0.84	[0.57,1.23]
Educated ≤ 9 years[e]			1.16	[0.52,2.59]	1.15	[0.52,2.58]			0.96	[0.38,2.46]	0.96	[0.37,2.47]
Unemployed[f]			1.34	[0.94,1.90]	1.24	[0.87,1.77]			1.46	[0.94,2.25]	1.35	[0.87,2.09]
Earned<1.5M₩/mo.[g]			1.89	[1.34,2.68]	1.74	[1.22,2.47]			2.38	[1.51,3.75]	2.17	[1.37,3.43]
Had chronic disease[h]					3.49	[2.20,5.52]					4.53	[2.34,8.77]
	Unmet medical treatment needs (N=2,169)						Unmet medication needs (N=2,159)					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Female[a]	1.40	[0.98,1.99]	1.51	[1.03,2.22]	1.44	[0.98,2.12]	1.41	[0.83,2.38]	1.41	[0.80,2.48]	1.33	[0.76,2.36]
Age[b]	1.01	[0.98,1.03]	0.99	[0.97,1.02]	0.99	[0.96,1.01]	1.00	[0.96,1.04]	0.99	[0.95,1.03]	0.98	[0.94,1.02]
Living alone[c]	2.24	[1.58,3.18]	1.66	[1.14,2.42]	1.61	[1.10,2.35]	2.57	[1.56,4.26]	1.94	[1.23,3.33]	1.85	[1.07,3.20]
Living in rural area[d]	0.90	[0.65,1.25]	0.86	[0.61,1.21]	0.84	[0.59,1.17]	0.78	[0.48,1.27]	0.73	[0.44,1.20]	0.71	[0.43,1.17]
Educated ≤ 9 years[e]			1.30	[0.51,3.30]	1.29	[0.51,3.30]			1.46	[0.35,6.14]	1.42	[0.34,6.02]
Unemployed[f]			1.34	[0.91,1.97]	1.24	[0.84,1.84]			1.11	[0.62,1.97]	1.02	[0.57,1.81]
Earned<1.5M₩/mo.[g]			2.19	[1.48,3.23]	2.00	[1.35,2.98]			2.16	[1.20,3.88]	1.91	[1.06,3.46]
Had chronic disease[h]					3.80	[2.24,6.47]					6.90	[2.49,19.12]

[a] Reference = Male.

[b] For overall population, the study employed age as categorical variable (young (0), middle-aged (1), and older adults (2)). For others, the study employed age as continuous variable (yr.)

[c] Reference = People who live with one or more person(s).

[d] Reference = People who are living in urban area.

[e] Reference = People who educated more than 9 years.

[f] Reference = Employed people (including students).

[g] Reference = People who are in the household with monthly income ≥ 1.5M won per month.

[h] Reference = People who did not have chronic disease within a year.

Table 9. Questions for patient experience regarding communication[a,b]

Outpatient experience	Q21. Whether doctors responded to patients politely Q22 .Whether doctors consulted patients with enough time Q23. Whether doctors consulted patients with understandable words Q24. Whether doctors gave enough opportunities to patients for question Q25. Whether doctors reflected the opinions from patients Q27. Whether nurses responded to patients politely Q28. Whether nurses consulted patients with understandable words
Hospitalization experience	Q51. Whether doctors responded to patients politely Q52 .Whether doctors consulted patients with enough time Q53. Whether doctors gave enough opportunities to patients for question Q54. Whether doctors reflected the opinions from patients Q56. Whether nurses responded to patients politely Q57. Whether nurses consulted patients with understandable words Q58. Whether nurses responded to patients in emergency contact immediately Q59. Whether nurses well explained what patients should take care after discharge

[a] Translated from the microdata of the 2017 wave of Healthcare Service Experience Survey.
[b] Measured with 5-point scales (1: absolutely not – 3: intermediate – 5: absolutely yes)

Figures

Figure 1. Outpatient and hospitalization experience by age group

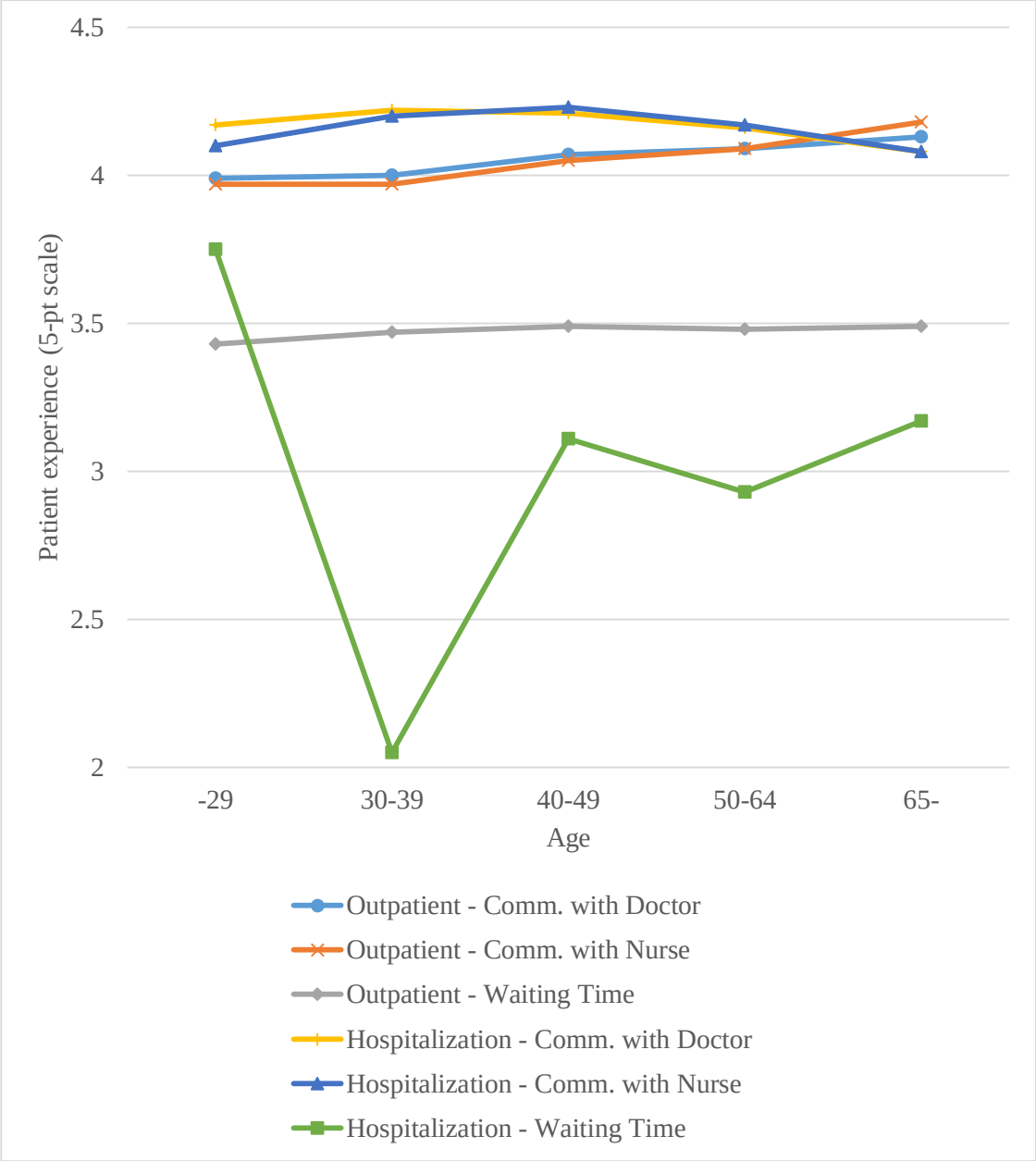

Figure 2. Unmet healthcare needs due to cost burden by age group