

# 노인들의 응급의료이용 결정요인과 형평성

이석민\*·박주문

## The determinants of Emergency Care Utilization and Equity of Access to Care in Elderly Koreans

L Lee, Sukmin\*, Park, Ju Moon\*\*

**Abstract:** 본 연구의 목적은 노인들의 응급의료이용에 영향을 주는 요인들을 알아보고 의료접근의 형평성을 조사하는 데 있다. 2014년 한국의료패널조사 자료를 사용하여 기술분석과 로지스틱회귀분석이 행하여졌으며 인터뷰에 참여했던 1,313명의 노인들이 표본으로 선정되었다. 연령, 성별, 교육수준 등의 인구변수들이 응급의료이용의 중요한 결정요인이었다. 의료요구는 노인 계층 간 응급의료이용의 차이를 충분히 설명하지 못한 결과 나타났으나 건강상태는 응급의료서비스를 사용하는 노인들의 중요한 결정요인이었다. 의료비지출은 응급의료서비스이용의 계층 간 차이를 개선하지 못했으나 응급의료이용의 중요한 예측요인으로 남았다. 한국에서 의료개혁은 의료요구를 가진 노인들이 효과적인 진료혜택을 받을 수 있도록 전국민 응급의료 보장을 확대하는 방향으로 계속 이루어져야 한다. 앞으로 연구도 75세 이상의 고령노인과 여성 및 교육수준이 낮은 노인, 그리고 높은 의료비 지출을 하는 노인과 같은 인구계층들에게 혹시 있지 모르는 의료접근의 장애들을 허무는 방향으로 이루어질 필요가 있다.

This study examines the determinants of emergency care utilization and equity of access to care in elderly Koreans. Based on the data from the 2014 Korea Health Panel Survey, descriptive and logistic regression analysis was performed. The sample for this study was 1,313 individuals who participated in interviews.

Predisposing factors such as age, sex, and education were significant determinants of emergency care utilization. Differences in need do not fully account for the original differences observed between subgroups of older Koreans. Health status was important determinant of older Koreans using emergency care services. Spending medical expense did not ameliorate the subgroup differences in the use of emergency care services. Nonetheless, spending medical expense remains a particularly important predictor of emergency care utilization.

Health care reforms in Korea should continue to concentrate on insuring effective universal emergency care, implying that all older Koreans with need receive effective coverage. Future study is also needed to understand the access barriers that may exist for the selected demographic subgroups, i.e., those over 75, women, less educated persons, and those with higher medical expense.

**키워드:** 응급의료서비스, 보건의료제도, 의료의 형평성, 한국노인

**Key Words:** Emergency care services, Health care system, Equity in utilization, older Koreans.

### 1. Introduction

The overall frequency of chronic diseases is increasing due to the widespread changes in population structure and the overall change in lifestyle. According to the Annals of the Health Insurance Statistics Bulletin (2015), the number of

patients treated with chronic diseases, including hypertension was 14,391 thousand persons, up 2.9 percent from the previous year and medical expenses amounted to about 21,299.4 billion won, up 8.0 percent. In Particular, the number of people treated with high blood pressure is about 5,706,000, and

\* Professor, Department of Physical Therapy, Sahmyook University, E-mail : Leesm@syu.ac.kr

\*\* Professor, Department of Urban Policy and Administration, Incheon National University, E-mail: jumoonpark@inu.ac.kr

occupy a high proportion and the number of diabetic patients stood at about 2,521,000, up 4.6 percent from a year earlier. The reason why we need to be more alarming is the risk of complications caused by complications such as the above illnesses. There are several types of illnesses that contribute to diabetes, and hypertension, but in general, it can lead to brain and cardiovascular disease (Kim, 2000).

According to the death statistics (2015), the mortality rate for heart disease is the second highest rate of 55.6 per 100,000 persons, and the death rate of the blood vessel disease is placed in third place with 48.0 per 100,000 persons. This figure indicates the rate of mortality from cerebral and cardiovascular diseases. Sudden deterioration occurs when this condition worsens. In this case, the importance of rapid emergency medical care is crucial to determining the magnitude of the subsequent damage.

In addition, Korea is suffering from various disasters today. Worries about natural disasters such as typhoon and earthquakes are also growing. One cannot ignore that the response to emergency patients in this situation is an important factor in determining the quality of life in a society.

There is some research on the satisfaction and factors affecting the health care services. Research on 5,432 elderly patients over the age of 65 who visited a local ambulance center at a university hospital in Gyeonggi-do showed that the subjects of the study were relatively more serious (Lee & Shin, 2008). A study of 5,759 people over the age of 65 who visited the local emergency medical center in Yangcheon-gu, Seoul found that older adults accounted for 10.7% of all patients, more than half of them were women, and 119 utilization and hospitalization were higher as they got older (Lee & Jee, 2009). A study of 10,264 patients over the age of 65 visited one of the emergency medical centers in Gyeongsangbuk-do found that the causes of their visits was 78.4% disease and 96.4% of the others were accidental (Nam, 2016). Kim & Yum (2016) evaluated whether the satisfaction of nursing services, conversion costs, and perceived risks affect the intention of using emergency medical services again. Lee et al. (2011) analyzed the correlation with the satisfaction of the emergency medical service, using service user's characteristics, service delivery, and service provider characteristics as an independent variable.

However, there is little the equity of access in the use of emergency care services in Korea. Thus, this

study examines the determinants of emergency care utilization and equity of access to care in elderly Koreans. The findings are based on the data from the 2014 Korea Health Panel Survey (KHPS). The Aday-Andersen behavioral model is used to guide empirical and normative assessment of equity under Korean universal health insurance system (Lee et al., 2011; Aday & Andersen, 1975). Two principal questions with respect to equity of access in the use of emergency care services are addressed: (a) which subgroups of the Korean elderly are most likely to have utilized emergency care services, and (b) to what extent are the subgroup differences in utilization related to need? This study hypothesizes that the Korean health care system will be equitable.

## 2. Methods

### 2.1 Conceptual Model

The Aday and Andersen model (Aday & Andersen, 1975; Aday & Andersen, 1981; Park, 1994) is used to guide the analyses. In this framework, a series of predisposing, enabling, and need factors are hypothesized to be predictive of utilization of services. The predisposing component includes those variables that describe the "propensity" of individuals to use services. The enabling component describes the "means" individuals have available to them for the use of services. The need component refers to the illness level, which is the most immediate cause of emergency care utilization (Aday & Andersen, 1981).

Equity of access to emergency care is measured based on the relative importance of need compared to the other determinants of emergency care utilization. Access is equitable to the extent that predisposing, need-related demographic factors such as age and sex, as well as illness, account for emergency care utilization. Inequity is, however, suggested if services appear to be distributed on the enabling variables, rather than need.

The analyses will focus on subgroup differences in whether an individual used emergency care services, and a systematic series of multivariate (logistic regression) analyses examining the extent to which these differences are explained by equitable (need-related) or inequitable (non-need-related) factor.

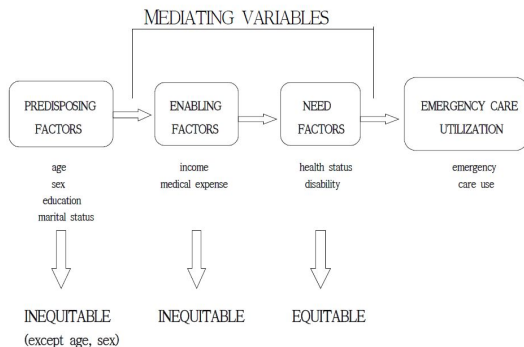


Figure 1 Conceptual framework for this study

## 2.2 Study Sample

The present study focuses on cross-sectional analyses, using the KHPS, which was released to the public in 2014. Baseline data were collected between May 12 to December 10, 2011. Through a face-to-face interview survey, the KHPS provides information on demographic characteristics, service utilization behavior, medical expenditure and health behaviors of the targeted households and their members. With respect to emergency care use a total of 1,313 individuals were surveyed. The sampling frame for the KHPS Household Component was drawn from respondents to the National Population and Housing Census. KHPS sampling weights incorporated adjustment for the complex sample design and reflected survey nonresponse and population totals from the current population survey; weights were applied in all statistical analyses to obtain nationally representative estimates. The KHPS Review Board granted an exemption for this research.

## 2.3 Measures

The predisposing and enabling measures included age, gender, education, marital status, medical expense, and income. The need and health-related measures included health status, and disability. The dependent variables are dichotomies reflecting whether or not an older person used the emergency room (yes or no).

There are no or minimal missing information on all predisposing, enabling, and need variables corresponding to the Aday and Andersen model. Many individuals have not evaluated their health status ( $n=82$  or 6.2% of the sample). For the logistic regression analyses, the independent variables were

re-coded to indicate dichotomies. The first category for a variable was coded 1 and the reference category for it (after “vs.”) was coded zero.

The several measures of health status were all reported in an interview format, and range from the highly subjective (e.g. self-evaluation) to the more objective (e.g. conditions checked by a nursing assistant) (Park, 1995). In this study, four measures of health status and need were respectively represented as a dichotomy, i.e. a self-evaluation of health as (1) ‘fair/good/very good’ (1) versus ‘poor/very poor’ (0), and (2) having a disability as ‘yes’ (1) versus ‘no’ (0). In addition to the health status of the elderly, the utilization of emergency care services is closely related to demographic factors – in particular age and sex. As proxies for need, age and sex were respectively represented as a dichotomy, i.e. ‘75 and older’ (1) versus ‘65–74’ (0) and ‘male’ (1) versus ‘female’ (0) in this analysis. Marital status was used in this analysis and was represented by the binary variable ‘married’ (1) versus ‘unmarried or separated or divorced or widowed’ (0). A categorical factor indicating the level of education attained was used as a supplementary measure of socio-economic status. In this study, education was represented by the binary factor ‘high schooling or less’ (1) versus ‘college schooling or more’ (0).

Enabling factors included medical expense, and income. The medical expense was represented by the dichotomous factor (1) ‘0–504,000 won’ versus ‘>504,000 won’ (0). The relationship between income and care is more complicated, for which further examination is necessary (Cohen, et al., 2000) While total household income likely overstates the economic resources actually available to an individual, personal income likely understates the resources accessible to someone who is married. Thus the combination of spouses’ resources was deemed appropriate (Mutchler & Burr, 1991). In this study, income was represented by the binary factor (1) ‘0–70million won’ versus ‘>70million won’ (0). Income refers to totals for individuals, if not married, or the couple, if married with spouse present in the same household.

## 2.4 Data Analysis

Descriptive statistics such as mean, standard deviation (SD), frequency and percentage were used to analyze the individual characteristics of the sample. A series of bivariate analyses and associated chi-squares was performed examining the relationship

between each of the predisposing, enabling and need variables and emergency care utilization. Logistic regression analysis was then used to examine the importance of factors found to be significant in the bivariate analyses in predicting whether or not an individual used the emergency room.

A systematic series of multivariate (logistic regression) analyses were conducted to address the relative importance of the respective predisposing, enabling and need factors as predictors of utilization. The predisposing variables were entered in stage 1 to examine demographic subgroup differences. The need variables were entered in stage 2 to examine the extent to which the subgroup differences in stage 2 were reduced when variations in the need for care were controlled. At the final stage, the enabling factors were entered to examine whether the remaining subgroup differences were due primarily to the availability of personal or medical care resources (stage 3).

A logistic regression is useful for estimating models reflecting the relationship between the dependent variable and the independent variables, when the dependent variable is binary or dichotomous. Also, the application of a logistic regression to this analysis is appropriate because of the small number of cases that did not utilize emergency care services which resulted in the skewness of the principal dependent variable.

The statistical significance of the odds ratios (the ratio of the likelihood that one age group, e.g., 65-74 years, has access compared to another age group, e.g., 75 + years) is examined to evaluate the impact of the predisposing, enabling, and need factors at each stage. Change in the magnitude or significance of the odds ratios in the successive stage is used to identify those factors which help to account for the subgroup differences in the probability of using emergency care services. An equitable distribution of services would be reflected in demographic subgroup (except for age and sex) differences (stage 1) being largely explained by differences in need (stage 2). Empirically, this effect would be documented by the odds ratio becoming nonsignificant or remaining significant ( $p \leq 0.05$ ) but increasing ( $>$ ) or decreasing ( $<$ ) substantially (10+%) in stage 2. An inequitable distribution of services would be reflected in the extent to which resource factors (such as income, and medical expense) have strong independent or explanatory effects in accounting for variables in use (stage 3). Empirically, significant odds ratios for these

factors in the stage 3 analyses would document their independent effects in predicting emergency care utilization. Substantial changes in the odds ratios for other variables (increasing or decreasing 10+% or becoming nonsignificant) from stage 2 to stage 3 of the analyses, would attest to the explanatory effects of the enabling variables, that is, they help to account for (or explain) differences between demographic subgroups. In either case, the findings point to variations in use due to the availability of these resources.

The  $-2 \times$  (log likelihood) test, based on the chi-square distribution, was used to test the maximum likelihood fit of the model, that is, the extent to which the probabilities of occurrences predicted by the model were an accurate representation of the actual occurrences (such as, whether or not the emergency room was used).

### 3. Result

#### 3.1 Sample characteristics

The predisposing, enabling, and need characteristics along with emergency care utilization are presented in Table 1. Survey respondents had a higher percentage with primary/middle schooling, a higher percentage of those who were not married, and a higher percentage of those who were 75 or older and male (Table 1). The average age of the respondents was 73.9( $\pm 6.7$ ) years old. 50.2% of the respondents were male. 56.2% of the respondents were single. 8.9% of the respondents had no schooling; 36.5% had primary/middle schooling; 38.1% had high schooling; 29.6% had college or higher. 17.8% of the respondents had a yearly family income of <20 million won; 26.1% had 20-40 million won; 37.4% had 40-70 million won; 18.7% had 70 million won or more. The yearly family income of the respondents ranged from 1,644 million won to 7,677 million won. The medical expense of the respondents ranged from 333,943 to 653,587 won and the yearly average medical expense respondents or their family members spent was 493,765 won (US \$ 450). 11.7% of the respondents evaluated their health as poor or very poor; 88.3% evaluated their health as one of fair, good, and very good. 93.5% of the respondents had no disability; 6.5% had a disability.

#### 3.2 Bivariate analysis

Those who were most likely to have used

emergency care services included those who were 75 or older, women, those who were not married, those who

**Table 1. Descriptive Characteristics of the Sample (N=1,313)**

Variables	N (%)	Mean(±SD)
<b>Predisposing:</b>		
Age (years)		73.9(±6.7)
75 +	1208(92.0)	
65-74	105(8.0)	
Sex		
Male	659(50.2)	
Female	654(49.8)	
Education		
No schooling	117(8.9)	
Primary/Middle schooling	479(36.5)	
High schooling	328(25.0)	
College schooling+	389(29.6)	
Marital status		
Married	511(38.9)	
Divorced/separated/widowed	46(3.6)	
Not married	714(56.2)	
<b>Enabling:</b>		
Income(million won)		46.0(±30.1)
0-20	234(17.8)	
20-40	343(26.1)	
40-70	491(37.4)	
70+	245(18.7)	493,765
Medical expense(won)		(±159,822)
0-504,000	118(8.99)	
504,000+	1,195(91.01)	
<b>Need:</b>		
Health status		
Fair+	1,087(88.3)	
Poor	144(11.7)	
Disability		85(6.5)
Yes	1,228(93.5)	
No		

were primary/middle schooling, those who rated their health as fair or good or very good, those who had no disability, those who spent the medical expense of 504,000 won or higher, and those who had a yearly family income of 40-70 million won (Table 2).

**Table 2. Percentage of those who used emergency services by each variable.**

Study Variables	Emergency care utilization	
	Percentage	$\chi^2$
<b>Predisposing:</b>		
Age (years)		22.33 <sup>a</sup>
75 +	643(48.9)	
65 - 74	81(6.2)	
Sex		5.11 <sup>b</sup>
Male	26.1	
Female	29.0	
Education		43.42 <sup>a</sup>
No schooling	5.8	
Primary/Middle schooling	23.3	
High schooling	13.2	
College schooling+	12.8	
Marital status		12.94 <sup>b</sup>
Married	22.2	
Divorced/separated/widowed	2.9	
Not married	29.9	
<b>Need:</b>		
Self-perceived health status		9.82 <sup>a</sup>
Fair+	47.3	
Poor	7.9	
Disability		4.24 <sup>b</sup>
Yes	4.3	
No	50.9	
<b>Enabling:</b>		
Income (won)		6.44 <sup>c</sup>
0-20 million	11.0	
20-40million	14.5	
40-70million	19.9	
70million or	9.6	
Medical expense (won)		73.09 <sup>a</sup>
0-504,000	1.6	
504,000 +	53.5	

a: p<.01 b: p<.05 c: p<0.1

Note: The number of cases on which the estimates are based is 1,313, except for the following variable (for which the number of cases is noted in parentheses): self-perceived health status (1,231).

In the initial stage of the analyses, the variables such as age, sex, education, marital status, income, medical expense, self-perceived health status, and disability remained significant predictors of emergency care utilization. All tests were conducted at the 10% level of significance.

### 3.3 Multivariate analysis

The odds ratios for emergency care utilization, simultaneously adjusted for multiple independent variables, are presented in Table 3. After adjusting for an array of predisposing factors (stage 1), older adults who were most likely to have used emergency care services included those aged 65 to 74, those who have college schooling or more, and men. Among all the predisposing variables, three variables, i.e., age, sex, and education (except for marital status) were significantly associated with whether or not emergency

care was utilized.

These relationships were re-examined, adjusting for need (stage 2). The elderly with fair or good or excellent health status were more likely to have used emergency care services than those with poor or very poor health status.

Health status had little impact on the subgroup differences in emergency care utilization (see Table 3). The demographic subgroup differences (those 65-74 versus adults over 75+, men versus women, and those who had high schooling or less versus college schooling or more) differences were not fully narrowed in stage 2. The findings suggest that health status remain important predictor of the use of emergency services among older Koreans.

The impact of the enabling factors was examined in stage 3. The enabling factors were income, and medical expense. Those who spent the medical expense of 504,000won were 5 times more likely to have used emergency care services than those who spent the medical expense of >504,000 won. Adjusting for spending medical expense plan had little impact on the odds ratios of emergency care utilization for the predisposing and need factors. The remaining subgroup differences remained about the same once the resource variables were taken into account.

In sum, spending medical expense did not ameliorate the remaining subgroup differences in the use of emergency care services among older Koreans, observed in stage 3. Nonetheless, spending medical expense remain significant

independent determinants of emergency care utilization.

**Table 3 – Multivariate logistic regression analysis of predictors of emergency care utilization for Korean Elders, weighted (2011)**

Determinants	Emergency care utilization					
	Stage I		Stage I		Stage III	
	Odds ratio (95%CI)	p	Odds ratio (95%CI)	p	Odds ratio (95%CI)	p
<b>Predisposing:</b>			0.401	<0.01	0.435	<0.01
Age (years)	0.355	<0.01	(0.243-0.661)		(0.262-0.722)	
75 +	(0.218-0.579)					
65 - 74			1.385	< 0.01	1.267	<0.05
Sex	1.351	<0.01	(1.098-1.748)		(0.999-1.607)	
Male	(1.060-1.689)					
Female			0.5553	<0.01	0.617	<0.01
Education	0.525	<0.01	(0.427-0.717)		(0.472-0.807)	

High schooling or less					
College schooling+	(0.409-0.674)				
Marital status	0.999	0.995	1.055	0.673	1.065 0.626
Married	(0.785-1.272)		(0.823-1.353)		(0.826-1.374)
Others					
<b>Need:</b>					
Health status			1.434	0.06	1.305 0.179
Fair+			(0.976-2.106)		(0.885-1.926)
Poor					
Disability			0.640	0.22	0.621 0.205
Yes			(0.311-1.318)		(0.297-1.299)
No					
<b>Enabling:</b>					
Income					0.89 0.474
0-70million					(0.646-1.225)
70million+					
Medical expenditure					5.393 <0.01
0-504,000won					(3.212-9.053)
504,000+					
	48.1		57.57		109.55
<b>Model</b>	4		6		8
<b>chi-square</b>	<0.0001		<0.0001		<0.0001
<b>Degree of freedom</b>					
<b>Significance</b>					

The chi-square based test for assessing how well the models fit the data was significant, i.e. p< 0.0001 (Table 3)

### 4. Discussion

The results of this study do not support the hypothesis that the Korean health care system is equitable. In the multivariate analysis, this study reveals that older Koreans'health status is determinant of whether or not they have used emergency care services. Differences in need do not fully account for the original differences observed between subgroups of older Koreans. The remaining subgroup differences remained about the same once the resource variables are taken into account. Nonetheless, medical expense remains important independent predictor of access. Predisposing factors such as age, sex, and education

were also determinants of Korean elders using emergency care services.

The Korean health care system does not yield an equitable distribution of services for older Koreans, who were reported in the existing emergency care literature as a group with higher needs, but limited access to care (Aday & Andersen, 1980; Park, 1995). Possible explanations for inequalities are the fact that certain subgroups, i.e., those who spent the medical expense of 504,000 won were 5 times more likely to have used emergency care services than those who spent the medical expense of >504,000 won, even after the other factors were taken into account, but there may have been other explanations that were not evident. This finding may imply that lower income groups were over-utilizing the services. Similar concerns about higher service utilization have been born out in the medical aid program, which subsidizes health insurance co-payments for the low-income population in Korea (Mutchler & Burr, 2000). Moreover, such higher use of service by the subsidized is possible as the Korean health care system has no gate-keeping or care management system. The government recently introduced a care management program to monitor and guide medical aid beneficiaries with a high utilization of health care (Kim, et al., 2013), but its effectiveness is still under evaluation.

Variations in the patterns of use of emergency services for certain subgroups of older Koreans i.e., those over 75, women, less educated persons, and/or those who spent higher medical expense point to the fact that non-financial policy options or modifications of the existing financing system may be required to enhance access for these groups.

This study contributes to the existing literature on emergency care equity: as far as I know, this study is the first study to examine the extent to which equity in the use of emergency care services has been achieved in Korea, using national survey data. Methodologically, I used large-scale survey data collected by Korea Institute for Health and Social Affairs and National Health Insurance Corporation in 2014. I also examined various predisposing, enabling, and need variables associated with health services utilization based on a literature review, and also evaluated the equity of Korean health care system based on the relative important of need compared to other factors of health services utilization. All the data were self-reported. Proxy responses were accepted for family members who were not at home,

and were required for all children and for family members who were physically or mentally incapable of responding to themselves. Although a considerable effort was made to ensure accurate reporting, the information from both proxy respondents and self-responding might be inaccurate because the respondent was unaware of relevant information, had forgotten it, did not wish to reveal it to an interviewer, or because the respondent did not understand the intended meaning of a question. There are also several limitations. The analysis model, as used in this study, was limited to the data collected by the Korea Health Panel Study in 2014. There is difficulty that arises as the result of using the model with the secondary data, e.g., as for the study design, none of the established association can be inferred as a cause-effect relation. Also, the data did not include place of residence that might reveal plausible geographical differences in equity. In previous studies by Park (2015), place of residence was found to influence health care utilization. There could also be unobserved factors associated with health care utilization in this study due to the limitation of the data. These variables should be included in future study.

## 5. Conclusion

This study provides an important contribution to the knowledge base of Korean elders. Korean health care system does not yield an equitable distribution of emergency care services for older Koreans. Health care reforms in Korea should continue to concentrate on insuring effective universal emergency care, implying that all older Koreans with need receive effective coverage. Further research is needed to understand the access barriers that may exist for selected demographic subgroups, i.e., those over 75, women, less educated persons, and those with higher medical expense.

## REFERENCES

- Aday LA, Andersen R.(1981). Equity of access to medical care: a conceptual and empirical overview, *Med Care*, 19(Suppl 12), 4-27.
- Aday LA, Andersen R, Fleming GV.(1980). *Health care in the U.S.: equitable for whom?* Beverly Hills, CA: Sage Publications.

- Aday LA, Andersen R.(1975). *Development of indices of access to medical care*, Ann Arbor, MI: Health Administration Press.
- Cohen MA, Weinrobe M, Miller J.(2000). *Multivariate Analysis of patterns of informal and formal caregiving among privately insured and nonprivately insured disabled elders living in the community*, Agency for Health Care Policy and Research.
- Kim HJ, Yum OH.(2016). Effects of nursing satisfaction, conversion costs and perceived risks on the intent to reuse of the patients who visited the emergency medical centers, *Journal of Nursing Administration*, 17(4), 432-442.
- Korean National Health Insurance Corporation (2015). *2015 Health Insurance Statistics Report*, Seoul.
- Kim H, Kwon S, Yoon NH, Hyun KR.(2013). Utilization of long-term care services under the public long-term care insurance program in Korea: implications of a subsidy policy, *Health Policy*, 111, 166-174.
- Kim YO.(2000). Prevention of brain and cardiovascular diseases, *Social Education Studies*, 5(1), 1-22.
- Lee JC, Kim GH, Kim HN, Park YH.(2011). Emergency care user's satisfaction and factors, *Korean Journal of Emergency Medical Association*, 22(4), 299-308.
- Lee EK, Jee EJ.(2009). Rate of return to hospital and related characteristics for senior citizens at local emergency medical center, *Journal of Aged Nursing*, 11(1), 71-80.
- Lee BO, Shin OJ.(2008). The severity of the elderly patients in Emergency care Center, *Journal of Aged Nursing*, 10(2), 164-172.
- Mutchler J, Burr JA.(1991). Racial differences in health and health care service utilization in after life: the effect of socio-economic status. *J Health Soc Behav.*, 32, 342-356.22.
- Nam CS.(2016). *An analysis on the characteristics of visiting hospital for the elderly in elderly in Gyeongbuk Regional Emergency Medical Center and its use*, Thesis, University of Daegu Oriental Medicine.
- National Statistical Office.(2016). *Press Release on Causes of Death Statistics 2015*, Daejeon: National Statistical Office.
- Park JM.(2015). Equity of access under Korean universal health insurance. *Asia-Pacific Journal of Public Health*, 2015, Vol. 27(2) NP914-NP924.
- Park JM.(2013). Equity of access to long-term care among the Korean elderly. *Health*, 5, 1641-1647. doi: 10.4236/health.2013.510221.
- Park JM.(2005). The determinants of long-term care utilization and equity of access to care among older adults in Dong-Ku of Incheon metropolitan city, South Korea. *Asia-Pacific Journal of Public Health*, 17, 104-109.
- Park JM.(1995). *Equity of access under Korean national health insurance: Implications for health care reform*, Paper presented at the annual meeting of the Korean Health Administration Association, Seoul.
- Park JM.(1994). *The determinants of physician and pharmacist utilization and equity of access under Korean universal health insurance*, PhD. Thesis, Houston, Texas: University of Texas.
- Shin SM, Kim MJ, Kim ES, Lee HW, Park CG, Kim HK.(2010). Medical aid service overuse assessed by case managers in Korea, *J Adv Nurs.*, 6(10), 2257-2265. doi: 10.1111/j.1365-2648.2010.05364.x. Accessed 25 June 2015.

논문투고일 2019년 5월 30일  
 논문심사일 2019년 6월 10일  
 논문게제일 2019년 6월 30일