Comparing the social determinants of self-rated health in China and Korea: socio-demographic factors, health risks, and social capital influences

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A Doctoral Dissertation
submitted to the Department of Public Health,
the Graduate School, Yonsei University
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

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February 2015

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February 2015

ACKNOWLEDGEMENTS

The completion of this doctoral dissertation was made possible by the support of the people around me. I would like to express my deepest gratitude to all of them. First of all, I would like to express my deepest and sincerest gratitude to my advisor, Dr Woojin Chung, for his invaluable guidance and scholarly input, and for the constant encouragement he provided throughout my doctoral course. Dr Chung has offered me so much advice, supervising me patiently and always guiding me in the right direction. It has been a great privilege and honor to work and study under his guidance.

I am grateful for the help of all the committee members: Dr Byung Yool Jun, who guided me to consider future steps in this area of research; Dr Heejin Kimm, whose thoughtful consideration and guidance have been invaluable; Dr Tae Hyun Kim, whose comments helped me to greatly improve this manuscript; and Dr In Ok Moon, whose encouragements and help gave me the confidence to overcome every difficulty I encountered.

I would also like to express my appreciation to all of the professors at the Department of Public Health: Dr Heechoul Ohrr, Dr Jaehoon Roh, Dr Myongsei Sohn, Dr Eun-Cheol Park, Dr Chung Mo Nam, Dr Sang Gyu Lee, and Dr Sohee Park. I owe the sincerest and most earnest gratitude to Dr Jiwon Lim, Dr Eun-ok Han, Dr Sun-mi Lee, and Dr Junki Kim for their generous help and encouragement throughout my doctoral course.

I would like to thank my peers, Dr Soyoung Won, Anna Shin, Kyoung Hee Cho, Jae-yeun Kim, Jeong Lim Kim, Jin-Hyeong Kim, Bo young Jung, Sun Jung Kim, Jae-Woo Choi, Jae-Hyun Kim, and Kyu-Tae Han for their thoughtful and stimulating words. I would also like to thank my dear friends, Eun Ji Jung, Chanmi Lee, Mirim Jung, Min Joo Kim, Hye Jung Lee, Seo-young Hur, Jung Eun Kim, Sae Ryung Lim, Bo Kyung Shin, and Mi Young Sohn for being supportive during this challenging time.

I would like to extend my sincerest appreciation to my parents for their love, prayers, and emotional support, regardless of the path I choose. I also express my thanks to my brother for his support and kind prayers. Finally, I thank my God for helping me get through all the difficulties I have faced. You are the one who let me finish my degree. I will keep on trusting You in the future. Thank you, Lord.

Roeul Kim

February 2015

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ABSTRACT

Comparing the social determinants of self-rated health in China and Korea: socio-demographic factors, health risks, and social capital influences

Cross-national comparisons of the social determinants of health in countries with different socioeconomic and cultural backgrounds can help identify opportunities to reduce health inequities. However, very few studies have directly compared the social determinants of health in East Asian countries.

This study set out to compare the social determinants of self-rated health in China and Korea using the 2010 East Asian Social Survey, which consists of nationally representative samples from each country.

A multinomial logistic regression was utilized to identify the significant social determinants of self-rated health in the two nations, based on data from 3,629 and 1,351 participants in China and Korea, respectively.

The results showed that 1) socio-demographic characteristics had substantial effects on the self-rated health of both countries, although the sizes of the effects tended to differ. The age, employment, income, and social class were stronger predictors of health in Chinese respondents, while gender and education had greater effects on health in Korea; the effects of marital status and religion on health were only significant in China; 2) the effects of socioeconomic characteristics on health were much stronger in China than in Korea; 3) the health risk and health care access characteristics were correlated with health in both countries, but tended to differ in strength: chronic diseases,

frequent drinking, and being underweight had a stronger negative effect on the health of Chinese participants, while current smoking habits, being overweight or obese, a lack of physical exercise, and unmet medical needs had a stronger effect on Koreans; and 4) the health effects of social capital characteristics were stronger in Korea than in China.

These findings demonstrate the importance of social health determinants in both countries. They also indicate that, due to systemic and cultural differences, certain social determinants matter more in one country than in the other. Further cross-national studies are required for a better understanding of the social determinants of health in other Asian nations.

Keywords: Social determinants of health, Self-rated health, Cross-national comparison, China, Korea

Ⅰ. Introduction

The social determinants of health are economic and social conditions that influence the health of people and communities. These conditions are shaped by the distribution of money, power, and resources on a global, national, and local level.[1] The social determinants of health are risk factors found in one's living and working conditions (such as the distribution of income, education, the physical environment, and social support), rather than individual factors (such as genes and biology), which influence the risk of disease, or the degree of vulnerability to disease or injury. Generally, the social determinants of health include socioeconomic and demographic factors, health risks and health care assess, and social capital characteristics. These social determinants do not exist in isolation from one another but are combined to determine the health of individuals, communities, and populations.[2,3]

The social determinants of health are mostly responsible for health inequities, i.e., the unfair and avoidable differences in health statuses observed within and between countries.[4] Addressing the social determinants of health is one of the keys to achieving health equity.[3] Specifically, a comparative analysis of the social determinants of health in countries with different economic and cultural backgrounds may provide useful information for addressing health inequities.[5,6]

Existing cross-national comparisons of the social determinants of health have mainly focused on Western countries.[5-9] These studies have shown that the associations between health and different characteristics varied in strength between countries. Using data from two national telephone surveys, von dem Knesebeck et al.[7] found that the associations between socioeconomic characteristics (education, income, occupation,

assets, and homeownership) and health (self-rated health, functional limitation, and depression) were stronger and more consistent in Germany than in the United States. They also reported that the income level was the best predictor of health in Germany. Moreover, using data from the 1994 American and Polish General Social Surveys, Szaflarski and Cubbins[10] showed that the relationship between education, income, and health was stronger in the United States than in Poland.

East Asian countries are often characterized by their unique culture and social norms, including their collectivist tendencies and Confucianist principles, which contrast with Western cultures, in which individuals are regarded as the central social agent. However, cross-national comparative studies of East Asia have been rare, although a few have compared the social determinants of health.[11-14] Using data from a cross-sectional interview-based survey of East Asian countries (Japan, the Republic of Korea, Singapore, five cities in China, and Taiwan) between 2002 and 2004, Yamaoka[12] showed that after adjusting for socioeconomic characteristics, social capital was positively associated with the respondents' self-reported somatic symptoms and overall well-being. However, owing to certain limitations such as the non-nationwide survey conducted in China and the different sampling methods between the countries, Yamaoka's findings are difficult to generalize. Using cross-sectional surveys conducted in 2003, Nomura et al.[13] also investigated the effects of the social determinants of sleeping problems in Korea and Taiwan. They found that, in Korea, sleeping problems were significantly associated with aging, low incomes, and lower levels of social capital; in Taiwan, sleeping problems were significantly associated with being female, aging, and lower levels of social capital. However, they used different sampling methods for the two countries, which may have created biases. Likewise, cross-national comparative studies on health have often suffered from a lack of comparable data.

This study therefore sought to compare the social determinants of health between China and the Republic of Korea (hereafter, Korea) using data explicitly designed to facilitate comparative health research – namely, the 2010 East Asian Social Survey (EASS). No research to date has explicitly compared the social determinants of health between China and Korea. Cross-national comparative research on the different health outcomes between China and Korea is of particular interest. As the most populous country and a growing economic power, China plays a substantial role in global health.[15] China and Korea share many similarities in terms of Confucianist culture and similarities in family structures, life styles, and the geographical locations of the two countries.[16] Moreover, East Asians share similar patterns of perceptions and expressions of, as well as responses to, health.[17] However, the two countries also differ in important ways, particularly in the funding, organization, and delivery of health care, and in their social security systems, income distribution, social inequalities, and religions – which likely has implications pertaining to the health determinants within and between the two countries.[9,14] Specifically, Korea is characterized as having a universal system of health care, while China is not. The two countries have also experienced industrialization at different times, are at different stages of modernization, and are administered by different governmental structures.[14]

The purpose of this study is twofold: (1) to compare self-rated health and its social determinants between two East Asian countries, China and Korea; and (2) to examine the size and patterns associated with the effects of social determinants on health within and between China and Korea.

Ⅱ. Literature review

1. Individual health and self-rated health

Self-rated health was used as dependent variable in this study. Measures of self-rated health have proven to be both reliable and valid health indicators with sufficient variability in a wide range of age groups.[18,19] Especially cross-culturally and cross-nationally, self-rated health is a reliable predictor of subsequent health outcomes, ranging from specific illnesses to functional status to mortality.[20] Chosen as a reference for comparing health levels among nations in health data released by OECD, the self-rated health serves as an important factor in understanding a nation's overall health level.[21]

However, subjective reports of health status may be confounded by other variables, such as neuroticism or psychological distress, and may not correlate with the underlying pathology.[22] Also, there is some uncertainty about what is being measured when using self-rated health as an health outcome.[23]

Nevertheless, self-rated health has been shown to be closely related to the objective health level by many researchers.[18,19,23-25] Self-rated health has reliability and validity for morbidity and mortality.[18,24] In addition, self-report methods that focus on specific, well-operationalized symptoms are reliably associated with physicians' diagnoses.[26] Also, self-rated health has been found to be a good predictor of people's future health care use.[27]

2. The social determinants of health

1) Definition and framework of social determinants of health

Although no single definition of the social determinants of health exists, there are commonalities, and many governmental and non-governmental organizations recognize the existence of social factors impacting the health of individuals. The World Health Organization (WHO) created the Commission on the Social Determinants of Health to address the social determinants of health. The Commission defined the latter as economic and social conditions influencing the health of people and communities.[1] These conditions are shaped by the distribution of money, power, and resources at a global, national, and local level.

The United States Centers for Disease Control defined the social determinants of health as "life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education, and health care, whose distribution across populations effectively determines length and quality of life". These include access to care and resources such as food, insurance coverage, income, housing, and transportation.[28]

The Canadian Public Health Association also defined the social determinants of health as social and economic factors influencing people's health.[29] These are apparent in the living and working conditions experienced by people every day. The social determinants of health influence health in many positive and negative ways. Extreme differences in income and wealth, for example, have negative health consequences for those living in poverty, and these effects are magnified when the latter are congregated in

poor regions. In contrast, those who are well-off and living in well-off regions demonstrate better overall health.[29,30]

Figure 1 was adapted from the World Health Organization and presents a framework for the social determinants of health.[31] It shows the relationships and interactions between the major types of determinants, and the pathways generating health outcomes.

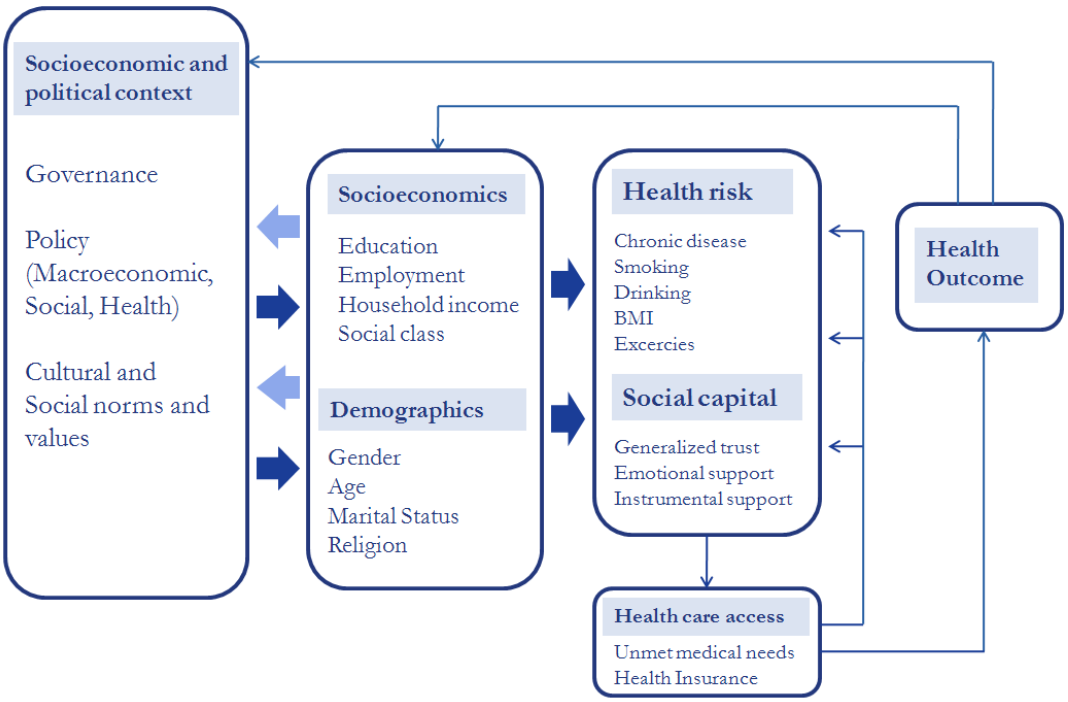

Figure 1. World Health Organization's framework of social determinants of health (2010)

Socioeconomic and political contexts encompass a broad set of structural and cultural aspects in a social system, exerting a powerful formative influence on the patterns of social stratification, and, thereby, on people's health opportunities.[4] Socioeconomic and demographic characteristics are believed to influence health primarily

through their effects on proximate, or micro-level, determinants such as social capital, health risks, and health care access factors. Accordingly, demographic factors such as the gender, age, ethnicity, marital status, and religion interact with socioeconomic factors to influence the level of exposure to social stressors, the health risks, access to medical care and insurance, and, ultimately, health.

Figure 2 was adapted from Healthy People 2020 and presents an organizing framework which reflects the five key areas of the social determinants of health.[32] These five key areas are demographics, socioeconomics, social capital, health risk and health care access, and neighborhoods and the built environment.

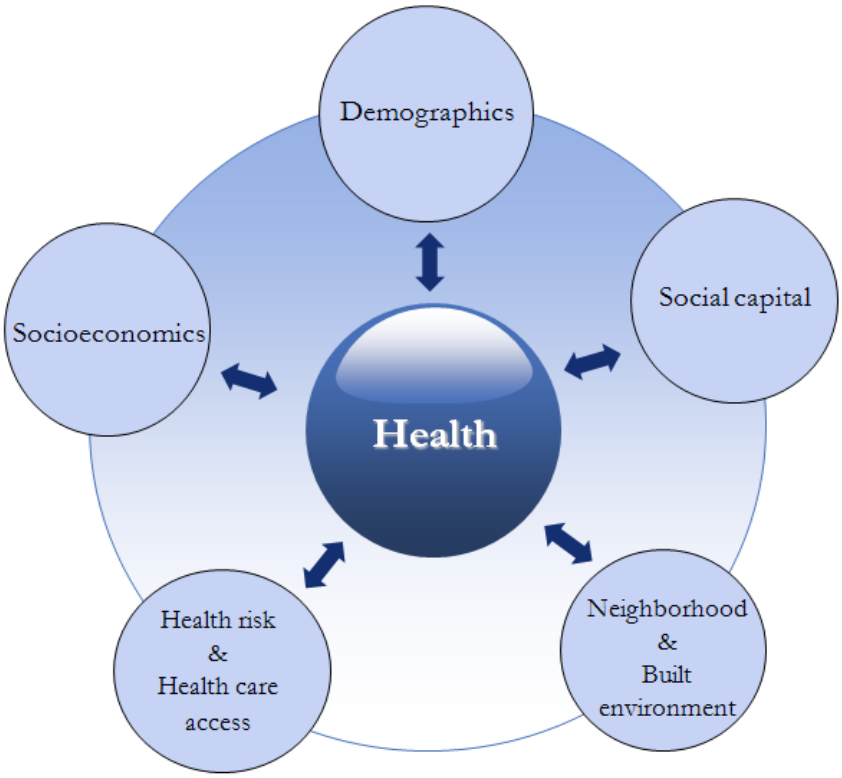

Figure 2. Healthy People 2020's organizing framework of the social determinants of health

Each of these five determinant areas reflects a number of critical components that make up the underlying factors in the arena of the social determinants of health. Neighborhood and the built environment comprises access to healthy foods, the quality of housing, crime and violence, and environmental conditions. This model, similar in composition and orientation to other social determinants of health models,[31,33,34] is not overly complex and lends itself to empirical analysis.

2) Socio-demographics

In terms of gender, existing research has shown that women were more likely to report poor health than men.[35-37] Amongst women, employed women tended to report better self-rated health than housewives, although this can also in some cases be partly attributed to their lower income and education level.[37] On the other hand, contrary to the well-known paradox that men die earlier but women demonstrate poorer health, Reile and Leinsalu reported that men had higher odds of reporting poor health than women. The authors assumed that this was due to the specific adjustments for physical and psychological health complaints made in their study.[38] A gender gap has also been evidenced in terms of life expectancy. In 2009, the life expectancy gender gap stood at 5.5 years on average across OECD countries, with a life expectancy of 76.7 years for men and 82.2 years for women. The reason for this gender gap may stem from the fact that men are more likely to engage in risky behaviors, such as smoking.[39]

In general, people's rating of their own health tends to decline with age.[36,40,41] According to 2011 OECD data, in many countries, there was a particularly marked decline in positive ratings at the age of 45, and a further decline after the age of 65. [40]

Meanwhile, previous studies have demonstrated the protective effect of religion on the health status of individuals in Western countries.[42-44] Nicholson et al.[42] considered whether attending religious services was associated with better self-rated health in a range of European countries. The researchers reported an association between less frequent attendance of religious services and poor health in Europe, although they emphasized the importance of taking individual and contextual factors into account. However, the association between religion and health in Asian countries may be different from that in Western countries. For example, in China, religion is unpopular, going to church is

unusual, and being religious is regarded as deviant.[45] Besides, while religion generally acts as a buffer against suicide in the mainstream religions of the West, in some Asian religions, suicide is morally acceptable under certain circumstances.[45,46]

Education is a key component of one's socioeconomic status that affects people's opportunities to obtain better jobs and achieve higher living standards.[8,11,35,47] Education can also affect people's lifestyle and health behaviors.[38] Poortinga[35] showed that each additional year of full-time education significantly increased the likelihood of reporting good health. Ross and Wu[48] also found a higher level of education to be associated with better self-rated health in all age groups, while gaps in the self-reported health of highly-educated and less-educated people remained constant over the life course.

Retired and inactive people are more likely to report poor health than employed individuals.[36,47,49] Popham et al.[49] noted that the proportion of people in different employment statuses, particularly the proportion inactive due to sickness- or disability-related economic inactivity, could play an important role in the prevalence of poor self-rated health in the UK. Meanwhile, systematic reviews have offered evidence to suggest that poor health can cause job loss and that job loss can cause poor health, the latter possibly being the stronger effect of the two.[49,50]

Previous studies have shown that self-rated health is sensitive to social class differentials.[11,51-53] Gong et al.[53] reported that subjective socioeconomic measures were consistently and strongly associated with self-rated health. In the United States, self-perceived social standing was linked to better self-rated physical and mental health, less physical discomfort, and less psychological stress.

3) Health risk and health care access

Health risks and health care access characteristics are also important in determining the health level. People's health behaviors, including smoking, alcohol consumption, diet, and physical exercise, have an influence on their health. Moreover, as they can be unevenly distributed between different socioeconomic positions, these factors may appear to be important determinants of health inequalities.[31]

Smoking is detrimental to one's health, and even light smoking has adverse health consequences.[54-56] If behaviors do not change, it is predicted that smoking will cause one billion deaths over the course of the 21st century.[57] Smoking is generally more prevalent in lower socioeconomic groups; however, in Southern Europe, the smoking rates are higher in higher income groups, particularly in women. [55]

The contributions of the diet, alcohol consumption, and physical activity levels to health inequalities are less clear, and are not always consistent. However, there is a higher prevalence of obesity and excessive alcohol consumption in lower socioeconomic groups, particularly in richer countries.[58]

Meanwhile, the impacts of various national healthcare systems on the health of countries' populations have been well documented.[59-61] According to the WHO, a nation's healthcare system is an essential factor for determining and improving the health of a country's population.[61] Joumard et al.[62] conducted research on the impact of nations' healthcare systems on their people's health. Estimating the efficiency of the inputs from healthcare spending according to the life expectancy values, the resulting health of the people was found to be better in relation to costs in Australia, Japan, Korea, and Switzerland, while there was large room for improvement without increasing spending in the United States, Denmark, and Greece. Utilizing the 2002-2003 Joint Canada/United

States Survey of Health, Siddiqi et al.[60] conducted a comparative analysis of immigrants and non-immigrants in the United States and Canada, and found that US immigrants had less access to primary care, as the US healthcare system does not operate a national health insurance system covering all citizens.

4) Social capital

The existing research suggests that high levels of social capital, strong social ties, and social support are associated with better health.[63-66] Social support helps to provide people with the emotional and practical resources they need. Belonging to a social network of communication and mutual obligation makes people feel cared for, loved, esteemed, and valued. Supportive relationships may also encourage healthier behavioral patterns.

Using the 2003 European Social Survey, Knesebeck and Geyer[8] explored the association between emotional support, education, and self-rated health in 22 European countries. They found that emotional support was positively associated with self-rated health.

The association between social capital and health has also been observed in many Asian countries, although the strength of the relationship has been shown to vary according to the indicator used and the country under study. A study of 13 provinces in Indonesia showed a positive association between community-level social capital, and physical and mental health.[67] In rural China, Yip et al.[65] found an association between cognitive social capital (i.e., trust) and self-reported general and psychological health. In contrast, few statistical associations or consistent patterns have been reported between structural social capital (organizational membership) and the outcome variables. As organizational membership was originally developed in the Western literature, these types of formal organizations rarely exist in China. The effect of social capital may not apply to all societies uniformly; rather, its effect may vary according to the society and cultures.[64,68]

3. Health care system and health outcomes of China and Korea

1) China

A. Current system

Governance

In China, the organization and management of the health system has primarily been coordinated through the central government's Ministry of Health, although the health policy jurisdiction sometimes overlaps with other central governmental and regional agencies. For example, the Ministry of Finance retains final control over the budgets of the health sector, the Ministry of Labor and Personnel sets occupational health and safety standards, and the Ministry of Environment Protection oversees air and water pollution as well as toxic waste control. The jurisdiction is also apportioned among the departments of public health located within each province, municipality, and autonomous region, and between country-level subdivisions within each of these departments.[69]

Healthcare administration is not only fragmented vertically but also horizontally, a significant reason for the many difficulties afflicting the health sector.[70] The Ministry of Health has had difficulties fulfilling its responsibilities due to inadequate funding and a low priority status within the government, coupled with the widespread perception that it is too close to public hospitals to be able to serve users.[71]

The central government includes bureaucratic divisions for epidemic prevention, medical administration, science and education, maternal and child health, planning and finance, pharmaceutical administration, and traditional medicines. The National Disease

Reporting System collects data on the morbidity and mortality related to communicable diseases and disease outbreaks. Other public health surveillance and monitoring agencies include regional anti-epidemic and hygiene stations, maternal and child health departments, and provincial and local health departments. Data are processed through the Nationwide and Anti-Epidemic Computer Telecommunication Network, but disease reporting from very poor and remote regions of China remains a problem.[69]

Health care financing

As a result of the 1982 decision to introduce market mechanisms into the financing of Chinese health services, the central government's role as the principal source of funding has been drastically reduced such that spending by the central government's spending now accounts for less than one percent of the total health expenditure.[72] In addition, the collapse of the collective agricultural system resulted in the dissolution of the cooperative medical system, which had administered free healthcare. This combination of reduced funding roles among central and cooperative systems has compelled provincial and country governments to provide "basic" workforce salaries for healthcare workers as well as monies for new capital investments.[69] However, these funds only cover 20 to 30 percent of hospital expenditures; patients' contributions on a fee-for-service basis account for the remainder.[72]

Even among the employees of state enterprises, less than half of the workforce is covered by health insurance, and the coverage of dependents is rare. Consequently, the best healthcare facilities tend to be located in the areas where workers are covered by insurance, or where wealthier individuals who can afford the out-of-pocket costs reside.[69]

In 2012, China's total health spending accounted for 5.4% of its gross domestic product (GDP), a rate well below the OECD average of 9.3%. Out of all OECD countries, health spending as a share of the GDP was the highest in the United States, which spent

16.9% of its GDP on health in 2012. Health spending tends to increase with income, and countries with a higher GDP per capita generally also tend to spend more on health. It is therefore not surprising that China ranked below the OECD average in terms of health expenditure per capita, with an average spending of USD 480 in 2012 (calculated based on the purchasing power parity), as compared with the OECD average of USD 3,484.[73]

The public sector is the main source of health funding in nearly all OECD countries. In China, 56% of the health spending in 2012 was funded by public sources, a much lower rate than the 72% average in OECD countries.[73]

Health care resources

With 1.6 physicians per 1000 people in 2012, China had far fewer doctors per capita than the OECD average (3.2 physicians). The number of nurses per capita in China (1.8 nurses per 1000 people) was also much lower than the OECD average (8.8 nurses) in 2012.[73]

The majority of China's hospitals and clinics are state-owned, including those administered by country and provincial governments, municipalities, village resident committees, and the Ministry of Health. The rest, which are mostly clinics rather than hospitals, are owned and operated by collectives, joint ventures, or private entities.[69] Statistics have shown that in 2011, China had a total of 21,979 hospitals, including 14,328 general hospitals (65.2%), 2,831 traditional Chinese medicine hospitals (12.9%), and 4,283 special hospitals (19.5%). The majority of the hospitals were public (13,539; 61.6%), while the total number of private hospitals was 8,440 (38.4%).[74]

Health care use

Despite China's large population and extensive coverage needs, significant improvements have been made in terms of healthcare services. In 2011, there were 6.27 billion clinic visits in China, with an average of 4.6 visits per person per year. The

number of hospitalizations was about 150 million, or 11.3 admissions per 100 persons. The occupancy rates for hospital beds averaged 88.5 percent, and the average length of hospital stays was 10.3 days.[74]

The average number of doctor consultations was five per person in China in 2012, slightly less than the OECD average of six to seven consultations per year. However, there are wide variations among OECD countries depending on the organization of their health system, with the number of doctor consultations ranging from three per year in some countries to thirteen in other countries such as Japan and Korea.[73]

Challenges for the Health Care System

China's health services used to be described as too difficult to access, too expensive, and too variable in quality. Meng et al.[75] reported that the medical insurance coverage had increased from 29.7% in 2003, to 87.9% in 2008, and 95.7% in 2011 as a result of healthcare reforms. However, this increased insurance coverage has not yet been effective in reducing patients' financial risks, as both health expenditure and out-of-pocket payments continue to increase rapidly.

As a nation whose culture and society have long been shaped by farming traditions, China has just reached a significant milestone: with more than 680 million people, its urban population outnumbered its rural population for the first time in January 2012. This urban explosion acts as a double-edged sword with regard to the public health of China. It offers great opportunities for the improvement of health care access and of the basic health infrastructure, but also brings substantial risks, including diet and lifestyle changes, air and water pollution, and occupational and traffic hazards.[76] Gong et al.[77] reviewed the implications of urbanization for the country's health, and called for innovative health research and policies to alleviate the adverse effects of rapid urbanization.

B. Health outcomes

China's economic transition from a centrally-planned to a market-based economy, and its demographic transition from high mortality and high fertility to relatively low mortality and low fertility, occurred quite rapidly. The total fertility rate began to decline rapidly in the 1970s, prior to the establishment of the one-child policy. The total fertility rate in 2012 was below the replacement level (1.66 births per woman).[78]

Due to improved living conditions, public health interventions, and progress in medical care, most countries have enjoyed large increases in life expectancy over the past decades. Since 1960, the life expectancy at birth in China has increased by more than 30 years reaching 75.2 years in 2012, although it remains five years under the OECD average (80.2 years). The infant mortality rate in China has fallen greatly over the past two decades, from 42 deaths per 1000 live births in 1990 to 12 in 2012. Nonetheless, it remains higher than the OECD average of 4 deaths per 1000 births.[73]

In many countries, the proportion of regular smokers among adults has shown a marked decline over the last two decades. The smoking rate in China was 24% in 2010, three percentage points higher than the OECD average of 21%. There is a huge gender gap in the smoking rates between men and women in China: in 2010, 45% of Chinese men reported that they smoked every day, compared to only 2% of Chinese women.[73]

Obesity rates have increased in all OECD countries in recent decades, but with notable differences. The World Health Organization estimated that 4.6% of men and 6.5% of women were obese in China in 2008. This is a much lower rate than in most other OECD countries, although slightly higher than in Japan (3.8% men and 3.4% women in 2012) and Korea (4.4% men and 4.7% women in 2012).

2) Korea

A. Current system

Governance

Social health insurance was first introduced to Korea in 1977 for the benefit of industrial workers in large firms. Following the incremental extension of the covered population based on insurance societies in firms for employees and geographic regions and for the self-employed, Korea achieved universal coverage in 1989.

The Ministry of Health and Welfare (MOHW) is the central governmental office for healthcare that holds primary responsibility for making and regulating healthcare policy in Korea. Additionally, the MOHW has responsibilities for health insurance administration, including the setting of fee schedules and the determination of benefit packages.[69]

A single insurer, the National Health Insurance Service (NHIS), takes responsibility for the operation of the National Health Insurance scheme – namely, the enrollment of insured people and their dependents, the collection of contributions, and the setting of medical fee schedules. Under this system, all hospitals have mandatory contract with the NHIS, which makes partial payments to the hospitals for the patients. Patients receive a standardized medical service for the same price at any hospital.

The Health Insurance Review and Assessment Service (HIRA) reviews the appropriateness of medical fee claims, assesses the service quality of healthcare institutions, and evaluates the medical necessity for healthcare services by providers.[79] Medical care institutions provide healthcare services. They are directed and supervised by

the MOHW. The delivery and provision of health services is heavily reliant on the private sector. Health care delivery is characterized by the dominance of private providers, with approximately 90% of all medical institutions operating as private facilities.[80]

Health care financing

The National Health Security System is administered in two tiers: through the National Health Insurance and the Medical Aid Program. The National Health Insurance is a wage-based contributory insurance program covering 97 percent of the population, whereas Medical Aid is a government-subsidized public assistance program for the poor and the medically indigent.[69]

The financial resources of the National Health Insurance scheme consist of contributions collected from the insured, and of government subsidies. Its first source of funding are the payments (contributions) made by the insured. In 2014, insured employees were required to contribute 5.99% of their salary.[79] The employer and employee each pay 50% of this amount. The contributions of self-employed insured individuals are based on their level of income. To calculate the amount, the insured person's property, income, motor vehicles, age, and gender are taken into consideration. The second source of funding is the government. As of 2013, the National Government was providing 17.3% of the total annual projected revenue, which comprised the contributions paid by the insured to the National Health Insurance Program. The governmental subsidy is comprised of general taxes and surcharges on tobacco.[79,81]

Insured individuals are required to pay a certain portion of their health care costs. As compared with other countries operating a national health insurance scheme, Korea has a relatively high rate of direct payment, due to the limited coverage and a high copayment rate. In 2012, Koreans paid 35.9 percent of their total healthcare expenditures from their own pocket. This is much higher than the OECD average of 19.0 percent.[82] In

addition, private insurance can pay up to 80% to 90% of copayments and can pay for uninsured services. In 2012, 76% of the population had subscribed to a supplemental private insurance.[83]

In 2012, the total health spending in Korea accounted for 7.6% of the gross domestic product (GDP), below the average of 9.3% in all OECD countries. In contrast with many other OECD countries, the health spending as a share of the GDP has continued to increase in recent years, with the country's health spending growing faster than its GDP. The public sector is the main source of health funding in nearly all OECD countries. However, in Korea, the private sector plays a much more important role. Only 55% of the health spending was funded by public sources in 2012, well below the average of 72% in all OECD countries.[82]

Health care resources

As a result of the achievement of universal coverage in 1989 and the deregulation of the rules for establishing new health care facilities in 1990, the number of health care institutions, as well as the number of beds, has dramatically increased over the past two decades. These increases mainly took place in the private sector.[80]

The total number of health care institutions in the country rose from 29,773 in 1995 to 83,811 in 2012.[82] The total number of hospital beds increased rapidly from 134,176 in 1990 to 602,964 in 2012.[84] The number of long-term care hospitals increased from 68 in 2003 to 1,103 in 2012, while the number of beds increased from 8,355 to 160,267 over the same period.[84]

In contrast to the abundant supply of hospital beds, the number of medical personnel is exceptionally low in Korea. In comparison with the OECD average of 3.2, as of 2012, the number of physicians per 1000 people was the lowest, at 2.1.[82] Despite growth in the number of physicians over the last 30 years, physicians are still in short

supply, as the government tightly controls the entry to medical school.[80] With regard to nurses, there are only 4.8 per 1000 people, one of the lowest rates among all OECD countries, for which the average is 9.3.[82]

Necessary medical equipment is rarely unavailable to Koreans. Korea has been importing newly-developed, high-cost medical equipment at a rapid pace, with little governmental regulation. Korea had 23.5 MRI machines and 37.1 computed tomography (CT) scanners per million people in 2012, which was above the OECD average of 14 and 24, respectively.[82] The rapid proliferation of medical technologies has led to soaring healthcare costs and the wasteful duplication of technology; this is one of the major problems of the Korean healthcare system today.

Health care use

Another striking feature of the Korean health care system is the long average length of hospital stay, reflecting the incentives inherent to the fee-for-service payment system. In 2012, the average length of stay in hospitals was 16.1 days, well above the OECD average of 8.4 days.[82]

Similarly, with fewer physicians and nurses in Korea than in other OECD countries, the per capita outpatient visits numbered 8.8 in 1999 and 14.3 in 2012 – significantly higher rates than the OECD average of 6.9.[82] The high outpatient facilities utilization rates reflect people's healthcare-seeking behaviors: people prefer to see a doctor for minor ailments.[85]

Challenges for the Health Care System

Regional inequalities in the access to medical care services in Korea should be addressed. Due to medical profit maximization strategies, most private medical facilities are located in urban areas.[81] In 2012, 94.9% of physicians and 86.6% of hospital beds were in urban areas, while 91.04% of the population lives in urban areas.[84]

Korean society is aging faster than any other. In line with the increased elderly population, there has been an increase in medical expenditure for chronic degenerative diseases, which has become a large social burden.[83] The Korean Government has been endeavoring to reduce the financial burden, particularly on the younger population, through comprehensive health care reform. The Ministry of Health and Welfare is taking various measures for the elderly, such as the expansion of health care facilities and the introduction of the Long-term Care Insurance Program.[81]

B. Health outcomes

The quality of Korean people's lives has regularly been improved by the development of medical technology. In 2012, the life expectancy for the entire Korean population was 81.3 years, one year higher than the OECD average of 80.2. Korea registered gains of more than five years in life expectancy between 2000 and 2012, compared with an average gain of three years across all OECD countries.[82] The infant mortality rate, which is frequently quoted as an index for the health care conditions of a country, was 23 per 1000 live births in 1985, but it dramatically fell to 2.9 in 2012, below the OECD average of 4.[86]

The current panorama of health problems in Korea is similar to that of other developed countries, with infectious diseases no longer representing the most common fatal diseases.[69] In 2013, the ten leading causes of death in Koreans were malignant neoplasms, cerebrovascular diseases, heart diseases, suicides, diabetes mellitus, pneumonia, chronic lower respiratory diseases, liver diseases, transport accidents, and hypertensive diseases. These ten causes of death represented 70.1 percent of all deaths.[86]

Nearly 22% of Korean adults reported daily smoking in 2012, an incidence rate slightly above the OECD average of 20.7%. There remains a huge gender gap in smoking rates: nearly 40% of Korean men – the highest rate across all OECD countries –reported smoking every day in 2012, compared with only 6% of women.[82]

Based on people's actual heights and weights, the obesity rate in Korea is the second-lowest among all OECD countries (behind Japan), with only 4.6% of the adult population defined as obese in 2012, a slight increase from 3.2% in 2001. The country with the highest obesity rate in adults is the United States, with a rate of 35.3%. Based on data measured in 2012, the average of the 16 countries in the OECD was 22.7%.[82]

As stated in the 2014 OECD Health Data, Korea scored among the lowest of all member countries in terms of self-rated health, as only 33.3% of the Korean population evaluated their health positively in the survey. By contrast, 87.5% of Americans considered their health to be "good", the highest rate among all OECD members.[82]

Ⅲ. Methods

1. Data source and study sample

The dataset was obtained from the 2010 East Asian Social Survey (EASS), which is an East Asian version of the US General Social Survey. Each country in the East Asia region, that is, China, Japan, Taiwan, and Korea, implemented a national, cross-sectional survey, which consisted of general social survey types of questionnaires. Samples were selected using a multistage stratified random sampling method.

The East Asian Social Survey (EASS) is a biennial social survey project that purports to produce and disseminate academic survey data sets in East Asia. EASS is based on Chinese General Social Survey (CGSS), Japanese General Social Surveys (JGSS), Korean General Social Survey (KGSS), and Taiwan Social Change Survey (TSCS), and distributed by the East Asian Social Survey Data Archive (EASSDA). Launched in 2003, EASS is one of the few internationally coordinated social survey data collection efforts, and is truly unique in its East Asian focus.

The current EASS participating institutions, which represent four East Asian societies, are all experienced in their large scale, General Social Survey (GSS) type nationally representative sample surveys, and most of them are involved in other international collaborative social survey projects, notably the International Social Survey Program (ISSP). One of the most important methodological features of EASS is that, rather than conducted as an independent survey, its topical modules are integrated into a pre-existing survey framework of each country, just like the way ISSP module surveys are conducted by its member countries. For making integrated and harmonized data,

EASS research teams had repeated conferences, drafting meetings, and pretests in each country. Scholars who participated in the development of the module have continuous conferences and meetings for sharing cross-national analysis results and improving data quality more than once a year in several places of East Asia (Osaka, Seoul, Taipei, Tokyo, and Beijing).

2010 EASS was administered face-to-face in the homes of respondents by trained interviewers during a period from June to December of 2010. Valid response rate 73.0% for China, 63.0% for Korea. The survey methodology was described previously in an online report (http://www.eassda.org/).

Out of 5,327 individuals aged 20 years and over in total, we excluded 347 (6.51%) due to missing values, but we encountered no significant differences between the datasets before and after the exclusion ($P < 0.827$ for gender; $P < 0.867$ for age). Finally, we analyzed data from 4,980 individuals, consisting of 3,629 individuals in China and 1,351 in Korea.

The EASS data archive provides publicly available data from respondents whose identities are undisclosed. Verbal informed consent was obtained from all participants due to the limited time for survey interviews, and waivers of written consent were authorized by an ethics committee. Ethical approval for this study was granted by the institutional review board of the Graduate School of Public Health, Yonsei University, Seoul, Korea.

2. Measures and variables

The dependent variable was obtained from an individual's self-rated health. Each individual was asked 'How would you rate your health?' and was prompted to answer on a 5-point scale: excellent, very good, good, fair, and poor. It was grouped into three categories for purposes of analysis, "poor" (poor or fair), "good" (good), and "excellent" (very good or excellent).

Explanatory variables included demographic, socioeconomic, health risk and health care access, and social capital characteristics. Demographic characteristics include gender, age, marital status, and religion. Individuals were divided into six age groups: 20−29, 30−39, 40−49, 50−59, 60−69, and 70 years and above. For the marital status variable, individuals were divided into three states: married, never-married, and formerly married (widowed, divorced, or separated). We removed unmarried individuals' cohabitating with their partners because this category included only 52 individuals (0.52%). In the EASS, religion was measured by a question that asked about religious affiliation. Eleven categories were distinguished: No religion, Roman Catholic, Protestant, Christian Orthodox, Jewish, Islam, Buddhism, Hinduism, other Christian religions, other Eastern religion, and other religions. In this study, religion was dichotomized as: having or not having a religion. Because, 86.9% of Chinese and 43.3% of Korean respondents reported that they don't have any religion.

The following socioeconomic characteristics were included in the EASS and used in this study: education, employment, household income, and self-assessed social class. Highest education level was used as an indicator of education. Education level was examined in four groups: elementary school/lower (no formal qualification or elementary school), junior high school, senior high school, and college/higher (junior college,

university or graduate school completed). Employment status was dichotomized into ‘employed’ and ‘not employed’ (having no current work income). Household income, which was a continuous variable, was divided by the square root of household size in order to adjust for household size and categorized income quartiles.[87] 12.93 percent of respondents did not report household income. We included the missing variables in household income to prevent any risk of the misclassification of income. Considering self-assessed social class, individuals were asked in the survey, “In our society there are groups which tend to be toward the top and groups which tend to be toward the bottom. Below is a scale that runs from bottom to top. Where would you put yourself on this scale?” Available choices were numerical on a 10-point scale from 1 (lowest) to 10 (highest). We converted the 10-point scale into a 5-point scale and merged the two highest categories because of the smaller number of cases in these groups. As a result, we obtained four categories of a self-assessed social class variable: lowest, low, high, and highest.

Health risk and health care access characteristics include chronic disease, current smoking, drinking frequency, BMI, physical exercise, health insurance, and unmet medical need. Considering chronic disease, individuals were asked in the survey, “Do you have any chronic diseases or longstanding health problems?” Available choices were dichotomized: those who had chronic diseases such as hypertension, diabetes, heart disease, respiratory problem, and others and those who did not. The following variables were also dichotomized: current smoking (‘smoking a few times a year or more’ or not) and physical exercise (‘doing physical exercise for at least 20 minutes a few times a year or more frequently’ or not). Drinking frequency was categorized into two groups: frequent (drinking includes daily or drinking several times a week) and none or infrequent (drinking includes drinking less than several times a month and nondrinking). BMI was

categorized as: underweight (BMI<18.5kg/m^2), normal weight (18.5≤BMI<25kg/m^2), overweight (25≤BMI<30kg/m^2), and obese (BMI>30kg/m^2).

Access to health care was measured by health insurance status and receiving needed care. Health insurance applies to Chinese respondents since Koreans have universal coverage. It was divided into two categories: those who had coverage (public or private) at the time of the interview and those who did not. Unmet medical need was measured by a question "having health care needs in the past 12 months but did not receive it". The answers were grouped into two: yes and no.

Social capital characteristics include generalized trust, emotional support, and instrumental support. Generalized trust was measured by the degree to which respondents agreed with a statement "Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?" Respondents were given four options for the answer: highly trust, trust, do not trust, and do not trust at all. It was dichotomized with the first two alternatives as high trust and the two latter alternatives depicting as low trust. Emotional support was assessed with the question "during the past 12 months, did people listening to personal problems or concerns for you when you needed". The answers were grouped into three: yes, no, and do not have such needs. Instrumental support was assessed with the question "during the past 12 months, did people taking care of household chores (housework, childcare, and nursing care) for you when you needed". The answers were grouped into three: yes, no, and do not have such needs.

3. Statistical analyses

A four-step analysis was performed. First, characteristics of individuals were compared between China and Korea using χ^2 tests. Second, the differences in the proportion of individuals reporting excellent, good, or poor self-rated health were examined for each categorical characteristic for each country, using χ^2 tests. Third, multinomial logistic regression analysis, given the three categories of self-rated health, was used to assess the associations between the social determinants and self-rated health within and between China and Korea. While the ordinal nature of self-rated health would suggest using an ordinal regression, multinomial logistic regression was appropriate given violation to the proportional odds assumptions of ordinal regression. In this study, multinomial logistic regression predicts the risks of reporting either poor health or good health relative to excellent health (reference). Finally, the regression models were run for each country separately to explore possible country differences in the effects of the social determinants on health. Interactions between each predictor and a dummy variable for country were used to formally test for equality of the individual regression coefficients.[9]

Variance inflation factors for the independent variables were also within acceptable limits (VIF<3.4), indicating no serious problems of collinearity. The adjusted odds ratios with 95% confidence intervals (OR, 95% CI) were presented that independent variables are associated with poor health relative to excellent health or good health relative to excellent health. Values of $P<0.1$ were considered to be statistically significant. Likelihood ratio tests (LRTs) were performed to select which model was preferable. Data analyses were performed using SAS, version 9.2 (SAS Institute Inc., Cary, NC, USA).

Ⅳ. Results

1. General description of sample respondents

Table 1 shows how the two countries differ with respect to poor, good, and excellent health, along with socio-demographic characteristics used in this study. The proportion of individuals reporting excellent health was higher for China than Korea (57.45% and 52.04%, respectively).

The distribution of gender was similar between two countries (*P*=0.707). Regarding age, the proportion of individuals aged 70 years and over was higher for China than Korea (9.70% and 8.51%, respectively). The proportion of married individuals was much higher for China than for Korea (65.14% and 62.69%, respectively). For religion, the proportion of individuals who don't have any religion was much higher for China than for Korea (87.68% and 43.01%, respectively).

Regarding education, the proportion of higher than college was higher for Korea than China (47.74% and 15.24%, respectively). On the contrary, the proportion of lower than elementary school was higher for China than Korea (37.23% and 13.03%, respectively). The employment rate was higher for China than for Korea (65.14% and 62.69%, respectively), but the difference of distribution was not statically significant. For self-assessed social class, the proportion of highest categories was higher for Korea than China (12.44% and 5.10%, respectively).

Table 1. Percentage distribution of self-rated health, socio-demographic characteristics in the study within China and Korea.

	China (N=3,629)		Korea (N=1,351)		*P*-value
Variable	n	%	n	%	
Self-rated health					0.001
Poor	674	18.57	301	22.28	
Good	870	23.97	347	25.68	
Excellent	2,085	57.45	702	52.04	
Gender					0.707
Female	1,872	51.58	705	52.18	
Male	1,757	48.42	646	47.82	
Age (years)					<.001
≤29	467	12.87	220	16.28	
30-39	701	19.32	340	25.17	
40-49	900	24.80	324	23.98	
50-59	721	19.87	209	15.47	
60-69	488	13.45	143	10.58	
≥70	352	9.70	115	8.51	
Marital status					<.001
Never married	299	8.24	289	21.39	
Formerly married[a]	369	10.17	154	11.40	
Married	2,961	81.59	908	67.21	
Religion					<.001
Yes	447	12.32	770	56.99	
No	3,182	87.68	581	43.01	
Education					<.001
Elementary school/lower	1,351	37.23	176	13.03	
Junior high school	1,106	30.48	124	9.18	
Senior high school	619	17.06	406	30.05	
College/higher	553	15.24	645	47.74	
Employment					0.109
Not employed[b]	1,265	34.86	504	37.31	
Employed	2,364	65.14	847	62.69	
Household income					0.298
Lowest quartile	793	21.85	292	21.61	
2nd lowest quartile	773	21.30	295	21.84	
2nd highest quartile	801	22.07	304	22.50	
Highest quartile	794	21.88	315	23.32	
Missing	468	12.90	145	10.73	
Self-assessed social class					<.001
Lowest	710	19.56	146	10.81	
Low	2,158	34.67	424	31.38	
High	1,476	40.67	613	45.37	
Highest	185	5.10	168	12.44	

Note: P-values are based on Chi-squared test statistic

[a]'Formerly married' includes widowed, divorced and separated.

[b]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

Table 2 shows how the two countries differ with health risk and health care access and social capital characteristics used in this study. Regarding health risk and health care access characteristics, the countries with the higher proportion of individuals with a particular characteristic were: China for individuals who had chronic disease (34.61%), China for individuals who were current smoker (31.11%), Korea for individuals who reported higher drinking frequency (30.42%), China for individuals reported belonging to the underweight BMI group (10.97%), Korea for individuals who reported doing physical exercise (73.50%), and China for individuals who had unmet medical need (40.37%). Also 11.22% of Chinese respondents reported that they don't have health insurance.

Regarding social capital characteristics, the countries with the higher proportion of individuals with a particular characteristic were: Korea for individuals who reported low generalized trust (56.55%), China for individuals who had emotional support (73.93%), and China for individuals who had instrumental support (69.85%).

Table 2. Percentage distribution of Health risk and health care access, and social capital characteristics in the study within China and Korea.

	China (N=3,629)		Korea (N=1,351)		*P*-value
Variable	n	%	n	%	
Current smoking					0.013
Yes	1,129	31.11	371	27.46	
No	2,500	68.89	980	72.54	
Drinking frequency[a]					<.001
Frequent	629	17.33	411	30.42	
None or infrequent	3,000	82.67	940	69.58	
BMI					<.001
Underweight	398	10.97	91	6.74	
Nomal weight	2,457	67.70	949	70.24	
Overweight	681	18.77	281	20.80	
Obese	93	2.56	30	2.22	
Physical exercise					<.001
Yes	1,695	46.71	993	73.50	
No	1,934	53.29	358	26.50	
Chronic disease					0.002
Yes	1,256	34.61	403	29.83	
No	2,373	65.39	948	70.17	
Unmet medical need					<.001
Yes	1,465	40.37	267	19.76	
No	2,164	59.63	1,084	80.24	
Health insurance					<.001
Yes	3,222	88.78	1,351	100.00	
No	407	11.22	0	0.00	
Generalized trust					<.001
Low	1,171	32.27	764	56.55	
High	2,458	67.73	587	43.45	
Emotional support					<.001
Yes	2,683	73.93	724	53.59	
No	406	11.19	175	12.95	
Do not have such needs	540	14.88	452	33.46	
Instrumental support					<.001
Yes	2,535	69.85	475	35.16	
No	424	11.68	392	29.02	
Do not have such needs	670	18.46	484	35.83	

Note: P-values are based on Chi-squared test statistic

[a]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

2. Comparison between characteristics and self-rated health by country

Table 3 reports rates of self-rated health by socio-demographic characteristics within each country. The effects of socio-demographic characteristics on health are significant in both countries. Gender is associated with self-rated health in both countries. Women are more likely to report poor health compared to men. There is an age gradient in health. The data show that 37.78 and 66.96 percent of persons aged 70 years and over in China and Korea reported poor health, compared to 3.00 and 8.64 percent of their 29 years old and under counterparts. Differences in health by marital status are also revealed in the data, with formerly married persons more likely to report poor health compared to never married and married persons. Religion is associated with self-rated health in both countries. Individuals who have a religion were more likely to report poor health compared to those who don't have any religion.

There is a strong education gradient in health in each country. The data show that 31.38 and 59.66 percent of persons with lower than an elementary school education in China and Korea reported poor health, compared to just 4.16 and 11.01 percent of their higher than college education counterparts. Also, those who are not employed and those with the lowest social class were more likely to report poor health in both countries. Those with the lowest income quartile were more than three times as likely to report poor health compared to those with highest income quartile in both countries.

Table 3. Percentage of poor, good and excellent (Exc) self-rated health by socio-demographic characteristics within China and Korea.

Variable	China (N=3,629)				Korea (N=1,351)				*P*-value
	Poor	Good	Exc	*P*-value	Poor	Good	Exc	*P*-value	
Demographic									
Gender									
Female	21.10	24.79	54.11	<.001	25.82	26.81	47.38	<.001	
Male	15.88	23.11	61.01		18.42	24.46	57.12		
Age (years)									<.001
≤29	3.00	14.56	82.44	<.001	8.64	20.00	71.36	<.001	
30-39	7.42	20.26	72.33		11.47	28.24	60.29		
40-49	16.89	22.67	60.44		16.05	26.85	57.10		
50-59	24.41	28.71	46.88		25.36	34.45	40.19		
60-69	30.12	30.33	39.55		42.66	22.38	34.97		
≥70	37.78	28.69	33.52		66.96	13.91	19.13		
Marital status									
Never married	7.69	17.06	75.25	<.001	11.07	21.80	67.13	<.001	
Formerly married[a]	33.88	27.10	39.02		48.05	20.78	31.17		
Married	17.76	24.28	57.95		21.48	27.75	50.77		
Religion									
Yes	25.06	23.94	51.01	<.001	25.06	24.03	50.91	0.014	
No	17.66	23.98	58.36		18.59	27.88	53.53		
Socioeconomic									
Education									<.001
Elementary school/lower	31.38	23.91	44.71	<.001	59.66	21.02	19.32	<.001	
Junior high school	13.56	25.23	61.21		30.65	33.87	35.48		
Senior high school	12.44	23.10	64.46		21.43	28.82	49.75		
College/higher	4.16	22.60	73.24		11.01	23.41	65.58		
Employment									
Not employed[b]	26.25	29.17	44.58	<.001	32.54	25.79	41.67	<.001	
Employed	14.47	21.19	64.34		16.17	25.62	58.21		
Household income									0.005
Lowest quartile	33.04	23.46	43.51	<.001	43.84	26.71	29.45	<.001	
2nd lowest quartile	20.57	22.90	56.53		17.63	27.80	54.58		
2nd highest quartile	14.11	21.72	64.17		14.47	28.62	56.91		
Highest quartile	9.57	24.81	65.62		13.65	20.00	66.35		
Missing	13.68	29.06	57.26		23.45	25.52	51.03		
Self-assessed social class									
Lowest	31.69	27.61	40.70	<.001	39.04	29.45	31.51	<.001	
Low	18.12	25.04	56.84		21.93	29.72	48.35		
High	13.01	22.02	64.97		18.92	23.49	57.59		
Highest	15.68	18.38	65.95		20.83	20.24	58.93		

Note: P-values are based on Chi-squared test statistic.

[a]'Formerly married' includes widowed, divorced and separated.

[b]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

Table 4 reports rates of self-rated health by health risk, health care access, and social capital characteristics within each country. The data reveal significant effects of health risk, health care access, and social capital characteristics on health in both countries except health insurance.

Regarding the health risk and health care access characteristics, those who reported having chronic disease, physical inactivity, and insufficient medical care had much higher rates of poor health compared to their counterparts. Considering BMI, those who reported underweight in China and obese in Korea showed the highest proportion in reporting poor health. Meanwhile, those who reported current smoking and frequently drinking had lower rates of poor health compared to their counterparts.

The effects of social capital characteristics on health are significant in both countries. Those who reported low generalized trust, no emotional support had higher rates of poor health compared to their counterparts. Those who don't need instrumental support were more likely to report excellent health compared to their counterparts in both countries.

Table 4. Percentage of poor, good and excellent (Exc) self-rated health by risk/health care, social capital characteristics within China and Korea.

	China (N=3,629)				Korea (N=1,351)				*P*-value
Variable	Poor	Good	Exc	*P*-value	Poor	Good	Exc	*P*-value	
Risk/Health Care									
Current smoking									
Yes	14.88	23.21	61.91	<.001	17.25	29.65	53.10	0.011	
No	20.24	24.32	55.44		24.18	24.18	51.63		
Drinking frequency[c]									
Frequent	11.92	24.64	63.43	<.001	15.09	25.06	59.85	<.001	
None or infrequent	19.97	23.83	56.20		25.43	25.96	48.62		
BMI									<.001
Underweight	29.90	22.36	47.74	<.001	19.78	34.07	46.15	<.001	
Nomal weight	17.34	23.97	58.69		19.28	24.66	56.06		
Overweight	16.45	23.64	59.91		31.32	25.27	43.42		
Obese	18.28	33.33	48.39		40.00	36.67	23.33		
Physical exercise									<.001
Yes	11.62	24.25	64.13	<.001	17.22	24.07	58.71	<.001	
No	24.66	23.73	51.60		36.31	30.17	33.52		
Chronic disease									
Yes	44.43	32.25	23.33	<.001	53.60	24.32	22.08	<.001	
No	4.89	19.60	75.52		8.97	26.27	64.77		
Unmet medical need									<.001
Yes	23.07	25.53	51.40	<.001	38.95	29.59	31.46	<.001	
No	15.53	22.92	61.55		18.17	24.72	57.10		
Health insurance									
Yes	19.06	24.05	56.89	0.071					
No	14.74	23.34	61.92						
Social Capital									
Generalized trust									0.039
Low	19.39	26.05	54.57	0.045	25.00	27.23	47.77	0.001	
High	18.19	22.99	58.83		18.74	23.68	57.58		
Emotional support									0.027
Yes	18.49	23.44	58.07	<.001	25.14	25.83	49.03	<.001	
No	25.86	23.15	50.99		28.57	30.86	40.57		
Do not have such needs	13.52	27.22	59.26		15.27	23.45	61.28		
Instrumental support									0.091
Yes	19.25	23.08	57.67	<.001	26.11	25.26	48.63	<.001	
No	22.88	24.53	52.59		25.26	28.32	46.43		
Do not have such needs	13.28	27.01	59.70		16.12	23.97	59.92		

Note: P-values are based on Chi-squared test statistic.

[a][u]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

3. Multinomial logistic model analysis

Table 5 shows the odds ratios from the multinomial logistic regression predicting poor over excellent health within China and Korea respectively. Table 6 shows the odds ratio of reporting good over excellent health. Confidence intervals of each table were described in Appendix tables. Significant differences between two countries in the regression coefficients are shown the columns labeled "C-K" in each table. To detect the change in the significance of independent variables, four models were constructed by adding certain covariates to a previous model, in which Model 1 contains only demographic characteristics, Model 2 was adjusted for socioeconomic characteristics, Mode1 3 for demographic and health risk and health care access characteristics, and Model 4 for demographic, health risk and health care access, and social capital characteristics.

Using Likelihood Ratio Tests (LRTs) and Akaike Information Criterion (AIC), it can be assumed that most appropriate model is Model 4 for Korea and Model 3 for China. Because, non-significance likelihood ratio test indicates no differences between the full (Model 4) and reduced model (Model 3) (See Table 5-3).

The data show that the odds ratio of reporting poor health is lower for male especially in Korea. For Korean male, odds ratio for poor health was 0.54 (95% CI: 0.40–0.74); for good health, 0.72 (95% CI: 0.55–0.94) compared to Korean women. For China, the corresponding odds ratio for poor health was 0.62 (95% CI: 0.51–0.75); for good health, 0.78 (95% CI: 0.66–0.91) (Model 1, Table 5-1 and 6-1).

The data shows that odds ratio of reporting poor health is higher for older people, especially in China. The odds ratio of reporting poor over excellent health for those ages

over 70 and under 29 is 37.70 (95% CI: 19.03–74.69) in China and 32.89 (95% CI: 13.70–78.97) in Korea (Model 1 in Table 5-1).

Meanwhile, the association between marital status and health is only significant in China. For Chinese married persons, odds ratio for poor health was 0.55 (95% CI: 0.32–0.95) compare to never married counterparts. The comparable odds ratio for Korean was 0.71 (95% CI: 0.39–1.28) (Model 1, Table 5-1).

The association between religion and health was significant only in China. For Chinese who don't have a religion, odds ratio for poor health was 1.45 (95% CI: 1.11–1.90) compared to their counterparts. The comparable odds ratio for Korean was 1.02 (95% CI: 0.74–1.39) (Model 1, Table 5-1).

Education was strongly associated with health in both countries especially with respect to poor health. Higher level of education significantly decreased the likelihood of reporting poor health (Model 1-4, Table 5-1). Also, there was a steeper education gradient in Korea. The odds ratio of poor health was 0.27 (95% CI: 0.13–0.57) for Korean with higher than college education and 0.48 (95%CI: 0.25–0.94) for those with senior high school education compared to their counterparts with lower than elementary school education (Model 3, Table 5-1). In China, the corresponding odds ratio was 0.48 (95% CI: 0.28–0.83) and 0.71 (95% CI: 0.50–1.02), respectively.

Employed persons are much less likely to report poor health compared to their not employed counterparts in both countries. Also, employment is more strongly associated with health in China. For Chinese employed persons, odds ratio for poor health was 0.57 (95% CI: 0.44–0.74); for good health, 0.66 (95% CI: 0.54–0.81). For Korea, the corresponding odds ratio for poor health was 0.64 (95% CI: 0.43–0.95); for good health, 0.73 (95% CI: 0.53–1.01) (Model 3, Table 5-1 and 6-1).

There is steeper income gradient in China especially with to poor health. For Chinese with highest income quartile, odds ratio for poor health was 0.43 (95% CI: 0.30–0.60) compared to their counterparts with lowest income quartile. The comparable odds ratio for Korean was 0.56 (95% CI: 0.33–0.96) (Model 2, Table 5-1). Meanwhile, after adjusting health risk and health care access characteristics, the association between income and health became not significant in Korea (Model 3, Table 5-1).

In all Models, the effect of self-assessed social class on health is stronger in China, where the odds ratio of poor health was 0.40 (95% CI: 0.24–0.66) for highest social class and 0.35 (95%CI: 0.27–0.46) for high social class compared to their counterparts with lowest social class. In Korea, the corresponding odds ratio was 0.831 (95% CI: 0.44–1.58) and 0.63 (95% CI: 0.38–1.07), respectively (Model 2, Table 5-1). After controlling other characteristics, the pattern in the significance of social class and health persisted very similarly in China. Difference across countries in the association between social class and health is thus significant, as shown in the column labelled "C-K" in Tables 5-1.

There is greater disadvantage associated with having chronic disease in China, where people with chronic disease were 19.70 (95% CI: 15.22–25.51) and 4.35 (95% CI: 3.57–5.31) times as likely to rate their health as either poor or good, respectively, relative to excellent compared to people without chronic disease. For Korea, the corresponding odds ratio for poor health was 10.06 (95% CI: 6.83–14.81); for good health, 2.36 (95% CI: 1.66–3.37) (Model 3 in Table 5-2 and 6-2).

The association between current smoking and health was only significant in Korea. For Korean who currently smoke, odds ratio for poor health was 1.60 (95% CI: 0.99–2.59); for good health, 1.75 (95% CI: 1.20–2.54). For China, the corresponding

odds ratio for poor health was 0.95 (95% CI: 0.70–1.30); for good health, 1.02 (95% CI: 0.80–1.30) (Model 3 in Table 5-2 and 6-2).

On the other hand, the association between drinking frequency and health was only significant in China. For frequent drinkers, odds ratio for poor health was 0.62 (95% CI: 0.44–0.88) compared to none or infrequent drinkers in China (Model 3 in Table 5-2).

Regarding BMI, Chinese who belong to underweight were 1.68 times (95% CI: 1.19–2.37) and Koreans who belong to obese were 4.59 times (95% CI: 1.41–14.92) as likely to rate their health as poor relative to excellent compared to their counterpart who belong to normal weight (Model 3 in Table 5-2).

The association between physical exercise and health was significant in both countries. But physical exercise effects on health were stronger in Korea. For Korean who exercised, odds ratio for poor health was 0.50 (95% CI: 0.33–0.75); for good health, 0.58 (95% CI: 0.41–0.81). For China, the corresponding odds ratio for poor health was 0.52 (95% CI: 0.41–0.67); for good health, 0.82 (95% CI: 0.68–0.99) (Model 3 in Table 5-2 and 6-2).

Regarding unmet medical need, the association between unmet medical need and health was only significant in Korea. For Koreans with unmet medical need, odds ratio of reporting poor health was 3.49 (95% CI: 2.29–5.32): for good health, 1.96 (95% CI: 1.37–2.82). Meanwhile, for Chinese with health insurance, odds ratio for reporting poor health was 1.41(95% CI: 0.96–2.06) (Model 3 in Table 5-2).

Looking at Model 4 in Table 5-3, for Koreans with high generalized trust, odds ratio of reporting poor health was 0.68 (95% CI: 0.48–0.98) compared to those with low generalized trust. For China, the corresponding odds ratio for poor health was 0.77 (95% CI: 0.61–0.99).

Meanwhile, the association between emotional support and health was significant only in Korea. For Koreans who don't need emotional support, odds ratio for reporting poor health was 0.51 (95% CI: 0.26–1.01) compared to those who have emotional support.

Regarding instrumental support, Koreans who don't have instrumental support were 0.60 times (95% CI: 0.37–0.95) and Chinese who don't need instrumental support were 0.72 times (95% CI: 0.49–1.06) as likely to rate their health as poor relative to excellent compared to their counterpart who have instrumental health (Model 4 in Table 5-3).

Table 5-1. Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Demographic												
Gender												
Female (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Male	0.62***	0.54***		0.67***	0.70*		0.97	0.77		0.96	0.83	
Age (years)												
≤29 (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
30-39	3.74***	1.82†		2.60**	1.82†		1.99†	1.73		1.97†	1.88	
40-49	10.54***	2.80**		6.62***	2.55*		4.17***	1.69		4.23***	2.14†	
50-59	19.95***	6.64***		10.82***	4.31***		4.81***	2.40†		5.04***	2.86*	
60-69	28.30***	12.30***		13.30***	4.84***		4.30***	2.22		4.49***	3.10*	
≥70	37.70***	32.89***		16.54***	9.42***		4.45***	4.20**		4.81***	5.45**	
Marital status												
Never married (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Formerly married[b]	0.76	1.06		0.70	0.79		0.68	0.67		0.69	0.68	
Married	0.55*	0.71		0.62	0.69		0.62	0.77		0.65	0.78	
Religion												
No (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Yes	1.45**	1.02		1.36*	1.05		1.26	1.00		1.26	0.99	
Socioeconomic												
Education												
Elementary school/lower (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Junior high school				0.59***	0.52*		0.64**	0.42*		0.64**	0.42*	
Senior high school				0.55***	0.46**		0.71†	0.48*		0.73†	0.48*	
College/higher				0.33***	0.26***		0.48**	0.27***		0.50*	0.27***	
Employment												
Not employed[c] (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Employed				0.59***	0.65*		0.57***	0.64*		0.58***	0.66*	
Household income												
Lowest quartile (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
2nd lowest quartile				0.68**	0.58*		0.69*	0.70		0.70*	0.71	
2nd highest quartile				0.46***	0.58*		0.47***	0.73		0.47***	0.76	†
Highest quartile				0.43***	0.56*		0.48***	0.78		0.50***	0.81	
Missing				0.47***	0.62†		0.62*	0.73		0.64*	0.76	
Self-assessed social class												
Lowest (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Low				0.50***	0.84	**	0.52***	1.05	**	0.54***	1.11	**
High				0.35***	0.63†	**	0.41***	0.79	**	0.42***	0.82	**
Highest				0.40***	0.83	*	0.46**	1.01	*	0.46**	1.06	*

Table 5-2. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Risk/Health Care												
Current smoking												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							0.95	1.60†	†	0.95	1.57†	†
Drinking frequency[d]												
None or infrequent (ref.)							1.00	1.00		1.00	1.00	
Frequent							0.62**	0.71		0.62**	0.70	
BMI												
Underweight							1.68**	1.27		1.71**	1.25	
Nomal weight (ref.)							1.00	1.00		1.00	1.00	
Overweight							0.83	1.56*	*	0.83	1.48†	*
Obese							0.75	4.59*	**	0.75	4.41*	**
Physical exercise												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							0.52***	0.50***		0.53***	0.51**	
Chronic disease												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							19.70***	10.06***	**	19.63***	9.62***	**
Unmet medical need												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							1.16	3.49***	***	1.13	3.45***	***
Health insurance												
No (ref.)							1.00			1.00		
Yes							1.41†			1.45†		

Table 5-3. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Social Capital												
Generalized trust												
low (ref.)										1.00	1.00	
high										0.77*	0.68*	
Emotional support												
Yes (ref.)										1.00	1.00	
No										1.14	0.85	
Do not have such needs										1.02	0.51†	
Instrumental support												
Yes (ref.)										1.00	1.00	
No										1.07	0.60*	†
Do not have such needs										0.72†	1.04	
N	3,629	1,351		3,629	1,351		3,629	1,351		3,629	1,351	
AIC	6604.965	2554.818		6356.591	2526.069		5615.545	2299.526		5620.090	2299.857	
LR statistics, χ^2 (p)	500.436 (<.001)	250.876 (<.001)		292.374 (0)	72.749 (<.001)		777.046 (0)	258.543 (0)		15.455 (0.116)	19.669 (0.033)	

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001
Confidence intervals were described in Appendix tables.
Model 2: adjusted for socioeconomic characteristics.
Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.
Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.
[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.
[b]'Formerly married' includes widowed, divorced and separated.
[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.
[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Table 6-1. Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Demographic												
Gender												
Female (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Male	0.78**	0.72*		0.81*	0.81		0.85	0.72†		0.85	0.73	
Age (years)												
≤29 (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
30-39	1.70**	1.59†		1.76**	1.73*		1.65*	1.69†		1.64*	1.70†	
40-49	2.31***	1.61†		2.32***	1.75†		1.99***	1.67†		1.99***	1.77†	
50-59	3.80***	3.06***		3.55***	2.75**		2.51***	2.62**		2.53***	2.72**	
60-69	4.75***	2.29*		4.26***	1.50		2.47***	1.41		2.49***	1.48	
≥70	5.12***	2.60*		4.38***	1.37		2.31***	1.17		2.39***	1.17	
Marital status												
Never married (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Formerly married[b]	0.94	1.07		0.97	0.79		0.96	0.70		0.96	0.71	
Married	0.85	1.04		0.93	0.95		0.92	0.95		0.93	0.97	
Religion												
No (ref.)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Yes	1.10	0.81		1.12	0.81		1.11	0.80		1.10	0.80	
Socioeconomic												
Education												
Elementary school/lower (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Junior high school				1.08	0.85		1.08	0.81		1.05	0.78	
Senior high school				0.92	0.67		1.01	0.73		1.00	0.73	
College/higher				1.10	0.54†		1.25	0.60		1.22	0.60	
Employment												
Not employed[c] (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Employed				0.67***	0.77†		0.66***	0.73†		0.67***	0.73†	
Household income												
Lowest quartile (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
2nd lowest quartile				0.87	0.68†		0.88	0.76		0.87	0.77	
2nd highest quartile				0.75*	0.75		0.74*	0.85		0.74*	0.86	
Highest quartile				0.94	0.51**	†	0.97	0.58*		0.95	0.60*	
Missing				1.14	0.73		1.30†	0.79		1.29	0.80	
Self-assessed social class												
Lowest (ref.)				1.00	1.00		1.00	1.00		1.00	1.00	
Low				0.67***	0.82	†	0.69**	0.90	*	0.70**	0.97	*
High				0.51***	0.58*		0.54***	0.69	†	0.55***	0.74	†
Highest				0.39***	0.53*		0.41***	0.59		0.42***	0.64	

Table 6-2. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Risk/Health Care												
Current smoking												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							1.02	1.75**	*	1.02	1.77**	**
Drinking frequency[d]												
None or infrequent (ref.)							1.00	1.00		1.00	1.00	
Frequent							1.01	0.84		1.00	0.84	
BMI												
Underweight							1.11	1.68†	†	1.11	1.68†	†
Nomal weight (ref.)							1.00	1.00		1.00	1.00	
Overweight							0.85	1.26	†	0.85	1.26	†
Obese							1.25	3.51*	†	1.26	3.38*	†
Physical exercise												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							0.82*	0.58**		0.83*	0.57**	
Chronic disease												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							4.35***	2.36***	**	4.34***	2.31***	**
Unmet medical need												
No (ref.)							1.00	1.00		1.00	1.00	
Yes							1.11	1.96***	**	1.10	1.90***	**
Health insurance												
No (ref.)							1.00			1.00		
Yes							1.11			1.12†		

Table 6-3. Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

	Model 1			Model 2			Model 3			Model 4		
Variable	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K	China	Korea	C-K
Social Capital												
Generalized trust												
low (ref.)										1.00	1.00	
high										0.80*	0.80	
Emotional support												
Yes (ref.)										1.00	1.00	
No										0.97	1.25	
Do not have such needs										1.13	0.71	
Instrumental support												
Yes (ref.)										1.00	1.00	
No										1.07	0.89	
Do not have such needs										1.00	1.13	
N	3,629	1,351		3,629	1,351		3,629	1,351		3,629	1,351	

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001
Confidence intervals were described in Appendix tables.
Model fit statistics are equal to table 5.
Model 2: adjusted for socioeconomic characteristics.
Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.
Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.
[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.
[b]'Formerly married' includes widowed, divorced and separated.
[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.
[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Ⅴ. Discussion

1. Main findings

The current study compared the effects of the social determinants of health in China and Korea using data from the 2010 East Asian Social Survey, which allowed for direct cross-national comparison of health in the two countries. Guided by the model presented in Figure 2, the current study revealed that similar social determinants of health were at play in both countries. The size of their impact tended to differ – the age, religion, employment, income, social class, the presence of chronic disease, drinking frequency, as well as being underweight, generally had stronger effects on health in China, while education, current smoking, being overweight or obese, physical exercise, and unmet medical needs tended to have greater effects on health in Korea.

Using a multinomial logistic regression, we found that the results were more pronounced with respect to poor relative to excellent health than they were with good relative to excellent health. That is, the odds ratio reported in Table 5 tended to be of greater statistical significance than the odds ratio in Table 6. This is not surprising, given the violation of the proportional odds assumption noted in the method part of this paper. The preliminary analysis revealed that the effects of the independent variables were generally unequal and non-proportional across the categories of self-rated health.

Regarding the demographic characteristics, the findings revealed that men in Korea were less likely to report poor health than men in China. However, the association between gender and health became insignificant after controlling for the health risk and health care assess characteristics. In both countries, men were also less likely to report

poor health than women. The association between gender and self-rated health has already been noted in previous studies, and it has been observed that males generally tend to report better health.[36,88]

The findings also show that there is a steeper age gradient in China. Older people are more likely to report poor health in China than in Korea. One possible explanation for the different relationship between age and health in the two countries may lie in the more developed welfare policies designed for the elderly in Korea.

Meanwhile, many studies have found an association between marriage and better health.[25,89-91] However, in this study, the association between marital status and health was insignificant in almost every model for both countries. Earlier research on East Asian countries also suggested that marital satisfaction was of greater importance in determining self-rated health than marriage itself.[92] However, owing to the absence of relevant information in the 2010 East Asian Social Survey dataset, marital satisfaction could not be included in this study.

The association between religion and health was only significant in China. In China, people who had a religion were more likely to report poor health than those who did not. It is plausible that Chinese religions such as Buddhism and Taoism, which are at the foundation of the traditional Chinese culture, are different from Western religions in terms of supernatural beliefs, the afterlife, rituals, and organization.[45] For example, Christians more strongly disapprove of behaviors that can potentially damage people's health, such as the excessive consumption of alcohol, smoking, and overindulgence.[43] However, in the case of Chinese religions, there is not a single God to worship and there is a lack of a social support system and coping mechanisms, as the majority of the religious people do not meet regularly. Unlike all the mainstream religions in the West, Chinese religions are often associated with superstition. For these reasons, previous

Chinese studies found that suicide attempters with high religiosity showed a higher degree of suicide intent than those with low religiosity or no religion, unlike in previous Western studies.[93]

The results revealed that education was strongly associated with health in both countries, as suggested in the existing literature.[35,48,94] The education gradient was also found to be steeper in Korea. While education and income are correlated, a higher level of education may confer knowledge and cognitive assets that are health-protective.[95] Therefore, it is possible that providing health information and making healthier choices may produce larger health benefits in Korea.

Moreover, we found that the effects of education on health remained significant in both countries with poor health after adjusting for demographic factors, health risks and health care access, and social capital characteristics. This finding was consistent with earlier research which found that education was the most important non-biological correlate of good health cognitive performance.[96,97]

On the other hand, there was a steeper income gradient in China. We can assume that although the health care system has been reformed, it remains hard for people with a low income to receive the health care they need in China.[98] China has a less equal distribution of income than any European or North American country.[99] The income determines the purchasing power and access to tangible resources at both an individual and community level, which may have implications for the health statuses through factors such as better housing, working conditions, food and health care, and increased social support and community cohesion.[95] Therefore, in China, personal income may help to overcome the lack of insurance or lack of services in the Chinese health care system.

In line with earlier research, employed persons were much less likely to report poor health than the unemployed in both countries.[36,47,49] Employment was more strongly

associated with health in China. With the modernization of the Chinese economy, employment practices are in transition.[100] The Chinese unemployed population no longer receives governmental subsidies or social and health benefits.[56] These changes may lead to a decreased quality of life and poorer health in the Chinese unemployed population.

The data show that the social class is associated with self-rated health in both countries. This finding is consistent with previous studies which found that self-rated health was sensitive to social class differentials.[11,51-53] The effect of the social class on health was much stronger in China in all models. One possible explanation for the different relationship between social status and health in the two countries may be the more equitable distribution of, and access to, social and economic resources in Korea than in China.

Meanwhile, the health risks and health care access characteristics that were correlated with health in both countries tended to differ in strength. The effects of having a chronic disease, of frequent drinking, and of being underweight on poor health were stronger in China than in Korea, while the opposite was true for current smoking, being overweight or obese, physical exercise, and having unmet medical needs.

The data revealed that the drinking frequency was only associated with self-rated health in China. Frequent drinkers in China were less likely to report poor health than non-drinkers or infrequent drinkers. This could be due to the lack of detailed information about the drinking of alcohol (number of units of alcohol consumption) in the data.[88]

Regarding the measure of BMI, the Chinese who fell into the underweight category and the Koreans who fell into the overweight and obese category were more likely to report poor health than their counterparts in the normal weight category. One possible explanation may be that in China, under-nutrition and underweightness are still a problem among the poor, and the prevalence of obesity is relatively lower than in

Western countries.[101] On the other hand, obesity is a serious public health problem in Korean adults.[102]

The findings also show that unmet medical needs are only associated with poor health in Korea. This may be due to the different awareness levels of unmet medical needs in the two countries. Alternatively, it could also be due to a problem related to the health care system of Korea, such as the presence of regional disparities, or the increased elderly population.[81] In a survey conducted on 1,161 outpatients, 25% of the respondents said they had used a traditional Chinese medicinal treatment for chronic conditions, while another 17% said they had had recourse to a traditional Chinese medicinal treatment because Western medicine had failed to cure them.[103]

With regard to social capital characteristics, the effects of generalized trust, emotional support, and instrumental support on poor health were stronger in Korea than in China. The effects of social capital characteristics on health were also found to be relatively weaker than the effects of socioeconomic characteristics in this study. It is plausible that socioeconomic characteristics may be more important determinants of health than social capital characteristics in Asian societies. The effect of social capital may not apply to all societies uniformly; rather, its effect may vary according to society and/or cultures.[64,68]

2. Major contributions

Cross-national comparisons provide a unique opportunity to examine the ways differences in the social contexts of countries shape the social determinants of health. Nonetheless, no study thus far has explicitly assessed and compared the social determinants of health between China and Korea. To the best of our knowledge, the current study was the first to analyze the effects of the social determinants of self-rated health in the two countries.

Data from the 2010 East Asian Social Survey allowed for direct cross-national comparison in a coordinated research setting. Moreover, the survey was conducted on the basis of a vigorously-controlled study protocol, including standard procedures for translating the measures into different languages and for collecting and controlling the data.[104]

Additionally, this study used a comprehensive set of social determinants of health, including socioeconomic and demographic factors, health risks and the health care access, and social capital characteristics. The results produced a more developed comparative study of the social determinants of self-rated health.

3. Limitations

Several limitations to this study need to be considered. First, although self-rated health has been widely accepted as a useful measure in previous studies,[18-20] objective health may be a better measure of health than self-rated health.

Second, it is important to bear in mind that the use of cross-sectional data precludes any definitive causal conclusions regarding the relationships between the social determinants and self-rated health.

Third, some potential characteristics influencing self-rated health, such as one's working conditions, job, and food security situation could not be included as covariates because the dataset did not provide this information.

Fourth, concomitant with the widening socioeconomic gap between the rich and the poor since the economic reforms of the late 1970s, the socioeconomic conditions of the Chinese have changed dramatically. However, due to data limitations, this social change could not be accounted for.

Fifth, the 2010 EASS had relatively low response rates. The response rates were 73.0% in China and 63.0% in Korea, which may have led to non-response bias in both cases. Nonetheless, the dataset was shown to be statistically similar to the corresponding national census data for each country.[104]

Sixth, health ratings may be influenced by cultural factors. For example, as stated in the 2014 OECD Health Data, Korea scored among the lowest of the member countries, as only 33.3% of the Korean population gave a good evaluation of their health in the self-rated health survey. In contrast, 87.5% of Americans considered their health to be "good", the highest rate among OECD members.[82] As has been noted elsewhere, when evaluating their health, respondents tend to draw upon a range of different health aspects, including

both physical and psychological well-being, and health behaviors.[105] However, previous research has shown that East Asians share similar patterns of perception and expression of, and response to, health.[17]

Seventh, there were limitations regarding the use of several indicators in this study. Because of the data information, physical exercise was measured with only one question. Moreover, the International Association for the Study of Obesity (IASO), the International Obesity Task Force (IOTF), and the WHO have proposed BMI cut-off points of 23.0 to 24.9 kg/m^2 for being overweight and ≥25.0 kg/m^2 for obesity in adult Asians.[106] However, the 2010 EASS did not provide BMI cut-off points for Asian populations. This study therefore used the current BMI cut-off points recommended by the WHO.[107] In 2002, the WHO Expert Consultation concluded that there was no universal cut-off point for overweight or obese people across all Asian populations. The recommendations from the Consultation were to follow the current WHO cut-off points for overweightness (≥25 kg/m^2) and obesity (≥30 kg/m^2) used for international classification.[107]

Eighth, as in most cross-sectional studies, the information about the social capital and health was self-reported, and was therefore subject to similar reporting biases as both could be expressions of people's general well-being.[108] The cross-national design also allowed for recall biases, i.e., those with poor self-rated health may have had a tendency to report a lower social capital as a consequence of their health status.[109]

Finally, for social support, this study used a simple measure based on a single question assessing the availability of a confident with whom one could discuss intimate and personal matters. However, as Thoits[110] stated in 1995, this indicator of perceived emotional support has been found to be "…the simplest and most powerful measure of social support…"

Ⅵ. Conclusion

The present study found effects from the social determinants of self-rated health in both countries. It also found that the sizes of the effects tended to differ between China and Korea.

The health effects of the age, religion, employment, income, social class, chronic disease, drinking frequency, and being underweight were stronger in China than in Korea. Conversely, the reverse was true for the following factors: education, current smoking, being overweight or obese, physical exercise, and unmet medical needs. In particular, the effects of socioeconomic characteristics on health were much stronger in China than in Korea. On the other hand, the effects of social capital characteristics on poor health were stronger in Korea than in China. These inter-country differences may reflect systemic differences between China and Korea in terms of social and economic inequities, and of barriers to health care.

This study may help inform researchers and other interested parties of the directions of future cross-national studies on the social determinants of health in other Asian nations. Further cross-national studies are required for a better understanding of the social determinants of health in Asia.

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Appendix. Detailed results of multinomial regression analysis

Appendix Table 1-1. Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

Variable	Model 1					Model 2				
	China		Korea		C-K	China		Korea		C-K
Demographic										
Gender										
Female (ref.)	1.00		1.00			1.00		1.00		
Male	0.62***	(0.51-0.75)	0.54***	(0.40-0.74)		0.67***	(0.55-0.82)	0.70*	(0.50-0.98)	
Age (years)										
≤29 (ref.)	1.00		1.00			1.00		1.00		
30-39	3.74***	(1.90-7.33)	1.82†	(0.91-3.63)		2.60**	(1.33-5.06)	1.82†	(0.90-3.69)	
40-49	10.54***	(5.51-20.19)	2.80**	(1.32-5.95)		6.62***	(3.50-12.50)	2.55*	(1.18-5.50)	
50-59	19.95***	(10.40-8.28)	6.64***	(3.04-14.51)		10.82***	(5.70-20.52)	4.31***	(1.88-9.89)	
60-69	28.30***	(14.60-54.86)	12.30***	(5.49-27.57)		13.30***	(6.89-25.68)	4.84***	(2.01-11.65)	
≥70	37.70***	(19.03-74.69)	32.89***	(13.70-78.97)		16.54***	(8.29-32.99)	9.42***	(3.59-24.73)	
Marital status										
Never married (ref.)	1.00		1.00			1.00		1.00		
Formerly married[b]	0.76	(0.41-1.40)	1.06	(0.51-2.22)		0.70	(0.37-1.33)	0.79	(0.37-1.70)	
Married	0.55*	(0.32-0.95)	0.71	(0.39-1.28)		0.62	(0.35-1.10)	0.69	(0.37-1.26)	
Religion										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.45**		1.02	(0.74-1.39)		1.36*	(1.03-1.80)	1.05	(0.76-1.44)	

Appendix Table 1-2. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

Variable	Model 1			Model 2				
	China	Korea	C-K	China		Korea		C-K
Socioeconomic								
Education								
Elementary school/lower (ref.)				1.00		1.00		
Junior high school				0.59***	(0.46-0.76)	0.52*	(0.27-0.98)	
Senior high school				0.55***	(0.41-0.75)	0.46**	(0.26-0.81)	
College/higher				0.33***	(0.20-0.53)	0.26***	(0.14-0.48)	
Employment								
Not employed[c] (ref.)				1.00		1.00		
Employed				0.59***	(0.47-0.73)	0.65*	(0.46-0.92)	
Household income								
Lowest quartile (ref.)				1.00		1.00		
2nd lowest quartile				0.68**	(0.52-0.89)	0.58*	(0.36-0.95)	
2nd highest quartile				0.46***	(0.34-0.61)	0.58*	(0.35-0.97)	
Highest quartile				0.43***	(0.30-0.60)	0.56*	(0.33-0.96)	
Missing				0.47***	(0.33-0.67)	0.62†	(0.35-1.09)	
Self-assessed social class								
Lowest (ref.)				1.00		1.00		
Low				0.50***	(0.39-0.65)	0.84	(0.49-1.42)	**
High				0.35***	(0.27-0.46)	0.63†	(0.38-1.07)	**
Highest				0.40***	(0.24-0.66)	0.83	(0.44-1.58)	*
N	3,629	1,351		3,629		1,351		
AIC	6604.965	2554.818		6356.591		2526.069		
LR statistics, χ^2, (df), *p*	500.436, (18), <.001	250.876, (18), <.001		292.374, (22), 0		72.749, (22), <.001		

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001

Model 2: adjusted for socioeconomic characteristics.

Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.

Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.

[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.

[b]'Formerly married' includes widowed, divorced and separated.

[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Appendix Table 1-3. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
Demographic										
Gender										
Female (ref.)	1.00		1.00			1.00		1.00		
Male	0.97	(0.72-1.29)	0.77	(0.48-1.22)		0.96	(0.71-1.28)	0.83	(0.52-1.34)	
Age (years)										
≤29 (ref.)	1.00		1.00			1.00		1.00		
30-39	1.99†	(0.96-4.14)	1.73	(0.81-3.73)		1.97†	(0.94-4.09)	1.88	(0.87-4.06)	
40-49	4.17***	(2.07-8.41)	1.69	(0.73-3.89)		4.23***	(2.09-8.53)	2.14†	(0.92-4.99)	
50-59	4.81***	(2.36-9.78)	2.40†	(0.97-5.98)		5.04***	(2.47-10.29)	2.86*	(1.14-7.19)	
60-69	4.30***	(2.07-8.97)	2.23	(0.83-5.97)		4.49***	(2.15-9.38)	3.10*	(1.13-8.52)	
≥70	4.45***	(2.06-9.62)	4.20**	(1.42-12.46)		4.81***	(2.21-10.43)	5.45**	(1.81-16.41)	
Marital status										
Never married (ref.)	1.00		1.00			1.00		1.00		
Formerly married[b]	0.68	(0.32-1.42)	0.67	(0.28-1.57)		0.69	(0.32-1.45)	0.68	(0.29-1.62)	
Married	0.62	(0.32-1.20)	0.77	(0.40-0.49)		0.65	(0.33-1.26)	0.78	(0.40-1.52)	
Religion										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.26	(0.91-1.75)	1.00	(0.69-1.43)		1.26	(0.91-1.74)	0.99	(0.69-1.43)	

Appendix Table 1-4. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
Socioeconomic										
Education										
Elementary school/lower (ref.)	1.00		1.00			1.00		1.00		
Junior high school	0.64**	(0.48-0.85)	0.43*	(0.20-0.89)		0.64**	(0.48-0.86)	0.42*	(0.20-0.89)	
Senior high school	0.71†	(0.50-1.02)	0.48*	(0.25-0.94)		0.73†	(0.51-1.05)	0.48*	(0.25-0.94)	
College/higher	0.48**	(0.28-0.83)	0.27***	(0.13-0.57)		0.50*	(0.29-0.86)	0.27***	(0.13-0.57)	
Employment										
Not employed[c] (ref.)	1.00		1.00			1.00		1.00		
Employed	0.57***	(0.44-0.74)	0.64*	(0.43-0.95)		0.58***	(0.45-0.75)	0.66*	(0.44-0.98)	
Household income										
Lowest quartile (ref.)	1.00		1.00			1.00		1.00		
2nd lowest quartile	0.69*	(0.50-0.95)	0.70	(0.40-1.23)		0.70*	(0.51-0.96)	0.71	(0.40-1.25)	
2nd highest quartile	0.47***	(0.33-0.66)	0.73	(0.41-1.31)		0.47***	(0.33-0.66)	0.76	(0.42-1.38)	†
Highest quartile	0.48***	(0.32-0.70)	0.78	(0.42-1.45)		0.50***	(0.34-0.74)	0.81	(0.43-1.50)	
Missing	0.62*	(0.41-0.94)	0.73	(0.39-1.39)		0.64*	(0.42-0.96)	0.76	(0.40-1.45)	
Self-assessed social class										
Lowest (ref.)	1.00		1.00			1.00		1.00		
Low	0.52***	(0.39-0.71)	1.05	(0.57-1.93)	**	0.54***	(0.40-0.72)	1.11	(0.61-2.05)	**
High	0.41***	(0.30-0.56)	0.79	(0.44-1.44)	**	0.42***	(0.310.57)	0.82	(0.45-1.49)	**
Highest	0.46**	(0.26-0.80)	1.01	(0.49-2.11)	*	0.46**	(0.26-0.82)	1.06	(0.51-2.22)	*
Risk/Health Care										
Current smoking										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	0.95	(0.70-1.30)	1.60†	(0.99-2.59)	†	0.95	(0.69-1.29)	1.57†	(0.97-2.55)	†
Drinking frequency[d]										
None or infrequent (ref.)	1.00		1.00			1.00		1.00		
Frequent	0.62**	(0.44-0.88)	0.71	(0.46-1.09)		0.62**	(0.43-0.88)	0.70	(0.46-1.08)	

Appendix Table 1-5. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting poor self-rated health within China and Korea (base outcome is excellent self-rated health)[a]

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
BMI										
Underweight	1.68**	(1.19-2.37)	1.27	(0.61-2.65)		1.71**	(1.21-2.42)	1.25	(0.59-2.63)	
Nomal weight (ref.)	1.00		1.00			1.00		1.00		
Overweight	0.83	(0.62-1.12)	1.56*	(1.02-2.38)	*	0.83	(0.62-1.11)	1.48†	(0.96-2.27)	*
Obese	0.75	(0.38-1.50)	4.59*	(1.41-14.92)	**	0.75	(0.38-1.50)	4.41*	(1.36-14.28)	**
Physical exercise										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	0.52***	(0.41-0.67)	0.50***	(0.33-0.75)		0.53***	(0.41-0.67)	0.51**	(0.33-0.76)	
Chronic disease										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	19.70***	(15.22-25.51)	10.06***	(6.83-14.81)	**	19.63***	(15.15-25.44)	9.62***	(6.51-14.23)	**
Unmet medical need										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.16	(0.93-1.46)	3.49***	(2.29-5.32)	***	1.13	(0.90-1.42)	3.45***	(2.25-5.28)	***
Health insurance										
No (ref.)	1.00					1.00				
Yes	1.41†	(0.96-2.06)				1.45†	(0.99-2.12)			
Social Capital										
Generalized trust										
low (ref.)						1.00		1.00		
high						0.77*	(0.61-0.99)	0.68*	(0.48-0.98)	
Emotional support										
Yes (ref.)						1.00		1.00		
No						1.14	(0.79-1.63)	0.85	(0.47-1.52)	
Do not have such needs						1.02	(0.68-1.54)	0.51†	(0.26-1.01)	
Instrumental support										
Yes (ref.)						1.00		1.00		
No						1.07	(0.74-1.53)	0.60*	(0.37-0.95)	†
Do not have such needs						0.72†	(0.49-1.06)	1.04	(0.53-2.04)	
N	3,629		1,351			3,629		1,351		
AIC	5615.545		2299.526			5620.090		2299.857		
LR statistics, χ^2,(df), *p*	777.046, (18), 0		258.543, (16), 0			15.455, (10), 0.116		19.669, (10), 0.033		

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001

Model 2: adjusted for socioeconomic characteristics.

Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.

Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.

[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.

[b]'Formerly married' includes widowed, divorced and separated.

[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Appendix Table 2-1 Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

Variable	Model 1					Model 2				
	China		Korea		C-K	China		Korea		C-K
Demographic										
Gender										
Female (ref.)	1.00		1.00			1.00		1.00		
Male	0.78**	(0.66-0.91)	0.72*	(0.55-0.94)		0.81*	(0.68-0.96)	0.81	(0.61-1.09)	
Age (years)										
≤29 (ref.)	1.00		1.00			1.00		1.00		
30-39	1.70**	(1.18-2.46)	1.59†	(0.96-2.63)		1.76**	(1.21-2.55)	1.73*	(1.03-2.92)	
40-49	2.31***	(1.61-3.31)	1.61†	(0.92-2.83)		2.32***	(1.60-3.36)	1.75†	(0.97-3.15)	
50-59	3.80***	(2.63-5.50)	3.06***	(1.68-5.58)		3.55***	(2.43-5.19)	2.75**	(1.43-5.29)	
60-69	4.75***	(3.22-7.02)	2.29*	(1.16-4.55)		4.26***	(2.83-6.42)	1.50	(0.70-3.21)	
≥70	5.12***	(3.32-7.90)	2.60*	(1.12-6.05)		4.38***	(2.76-6.96)	1.37	(0.54-3.48)	
Marital status										
Never married (ref.)	1.00		1.00			1.00		1.00		
Formerly married[b]	0.94	(0.58-1.53)	1.07	(0.55-2.08)		0.97	(0.59-1.59)	0.79	(0.40-1.57)	
Married	0.85	(0.57-1.26)	1.04	(0.65-1.64)		0.93	(0.62-1.40)	0.95	(0.59-1.52)	
Religion										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.10	(0.86-1.42)	0.81	(0.62-1.06)		1.12	(0.87-1.45)	0.81	(0.62-1.07)	

Appendix Table 2-2. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

Variable	Model 1			Model 2				
	China	Korea	C-K	China		Korea		C-K
Socioeconomic								
Education								
Elementary school/lower (ref.)				1.00		1.00		
Junior high school				1.08	(0.87-1.34)	0.85	(0.43-1.66)	
Senior high school				0.92	(0.71-1.20)	0.67	(0.36-1.24)	
College/higher				1.10	(0.82-1.48)	0.54†	(0.28-1.02)	
Employment								
Not employed[c] (ref.)				1.00		1.00		
Employed				0.67***	(0.56-0.81)	0.77†	(0.56-1.05)	
Household income								
Lowest quartile (ref.)				1.00		1.00		
2nd lowest quartile				0.87	(0.67-1.13)	0.68†	(0.44-1.07)	
2nd highest quartile				0.75*	(0.57-0.97)	0.75	(0.48-1.18)	
Highest quartile				0.94	(0.71-1.25)	0.51**	(0.31-0.82)	†
Missing				1.14	(0.85-1.53)	0.73	(0.43-1.24)	
Self-assessed social class								
Lowest (ref.)				1.00		1.00		
Low				0.67***	(0.53-0.85)	0.82	(0.50-1.34)	†
High				0.51***	(0.40-0.65)	0.58*	(0.36-0.95)	
Highest				0.39***	(0.25-0.61)	0.53*	(0.29-0.97)	
N	3,629	1,351		3,629		1,351		

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001

Model 2: adjusted for socioeconomic characteristics.

Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.

Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.

[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.

[b]'Formerly married' includes widowed, divorced and separated.

[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Appendix Table 2-3. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
Demographic										
Gender										
Female (ref.)	1.00		1.00			1.00		1.00		
Male	0.85	(0.68-1.07)	0.72†	(0.49-1.05)		0.85	(0.67-1.07)	0.73	(0.50-1.07)	
Age (years)										
≤29 (ref.)	1.00		1.00			1.00		1.00		
30-39	1.65*	(1.12-2.42)	1.69†	(0.99-2.89)		1.64*	(1.11-2.41)	1.70†	(0.99-2.91)	
40-49	1.99***	(1.35-2.92)	1.67†	(0.91-3.07)		1.99***	(1.35-2.92)	1.77†	(0.96-3.28)	
50-59	2.51***	(1.69-3.75)	2.62**	(1.33-5.19)		2.53***	(1.69-3.78)	2.72**	(1.37-5.43)	
60-69	2.47***	(1.60-3.82)	1.41	(0.64-3.14)		2.49***	(1.60-3.86)	1.48	(0.65-3.34)	
≥70	2.31***	(1.41-3.79)	1.17	(0.44-3.10)		2.39***	(1.45-3.92)	1.17	(0.44-3.13)	
Marital status										
Never married (ref.)	1.00		1.00			1.00		1.00		
Formerly married[b]	0.96	(0.57-1.61)	0.70	(0.35-1.43)		0.96	(0.57-1.61)	0.71	(0.35-1.44)	
Married	0.92	(0.60-1.40)	0.95	(0.58-1.56)		0.93	(0.61-1.42)	0.97	(0.59-1.59)	
Religion										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.11	(0.85-1.45)	0.80	(0.60-1.06)		1.10	(0.84-1.44)	0.80	(0.60-1.06)	

Appendix Table 2-4. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
Socioeconomic										
Education										
Elementary school/lower (ref.)	1.00		1.00			1.00		1.00		
Junior high school	1.08	(0.86-1.35)	0.81	(0.41-1.63)		1.05	(0.84-1.33)	0.78	(0.39-1.57)	
Senior high school	1.01	(0.77-1.34)	0.72	(0.38-1.38)		1.00	(0.76-1.32)	0.73	(0.38-1.38)	
College/higher	1.25	(0.91-1.72)	0.60	(0.31-1.17)		1.22	(0.88-1.68)	0.60	(0.31-1.18)	
Employment										
Not employed[c] (ref.)	1.00		1.00			1.00		1.00		
Employed	0.66***	(0.54-0.81)	0.73†	(0.53-1.01)		0.67***	(0.55-0.82)	0.73†	(0.53-1.01)	
Household income										
Lowest quartile (ref.)	1.00		1.00			1.00		1.00		
2nd lowest quartile	0.88	(0.67-1.16)	0.76	(0.48-1.21)		0.87	(0.66-1.15)	0.77	(0.48-1.22)	
2nd highest quartile	0.74*	(0.56-0.98)	0.85	(0.53-1.35)		0.74*	(0.56-0.97)	0.86	(0.54-1.37)	
Highest quartile	0.97	(0.72-1.30)	0.58*	(0.35-0.96)		0.95	(0.71-1.28)	0.60	(0.36-0.99)	
Missing	1.30†	(0.96-1.77)	0.79	(0.46-1.36)		1.29	(0.95-1.76	0.80	(0.46-1.38)	
Self-assessed social class										
Lowest (ref.)	1.00		1.00			1.00		1.00		
Low	0.69**	(0.54-0.88)	0.90	(0.54-1.51)	*	0.70**	(0.55-0.90	0.97	(0.58-1.63)	*
High	0.54***	(0.42-0.69)	0.69	(0.41-1.14)	†	0.55***	(0.43-0.70	0.74	(0.44-1.23)	†
Highest	0.41***	(0.26-0.65)	0.59	(0.32-1.11)		0.42***	(0.27-0.67	0.64	(0.34-1.21)	
Risk/Health Care										
Current smoking										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.02	(0.80-1.30)	1.75**	(1.20-2.54)	*	1.02	(0.80-1.29)	1.77**	(1.22-2.58)	**
Drinking frequency[d]										
None or infrequent (ref.)	1.00		1.00			1.00		1.00		
Frequent	1.01	(0.78-1.30)	0.84	(0.61-1.16)		1.00	(0.78-1.29)	0.84	(0.60-1.16)	

Appendix Table 2-5. (Continued) Adjusted odds ratios of socio-demographic, risk/health care, social capital characteristics with reporting good self-rated health within China and Korea (base outcome is excellent self-rated health)[a].

Variable	Model 3					Model 4				
	China		Korea		C-K	China		Korea		C-K
BMI										
Underweight	1.11	(0.82-1.49)	1.68†	(0.97-2.89)	†	1.11	(0.83-1.50)	1.68†	(0.97-2.91)	†
Nomal weight (ref.)	1.00		1.00			1.00		1.00		
Overweight	0.85	(0.68-1.06)	1.26	(0.88-1.81)	†	0.85	(0.67-1.06)	1.26	(0.88-1.82)	†
Obese	1.25	(0.75-2.11)	3.51*	(1.25-9.87)	†	1.26	(0.75-2.12)	3.38*	(1.20-9.51)	†
Physical exercise										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	0.82*	(0.68-0.99)	0.58**	(0.41-0.81)		0.83*	(0.68-1.00)	0.57**	(0.41-0.80)	
Chronic disease										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	4.35***	(3.57-5.31)	2.36***	(1.66-3.37)	**	4.34***	(3.56-5.30)	2.31***	(1.62-3.31)	**
Unmet medical need										
No (ref.)	1.00		1.00			1.00		1.00		
Yes	1.11	(0.93-1.32)	1.96***	(1.37-2.82)	**	1.10	(0.92-1.31)	1.90***	(1.32-2.74)	**
Health insurance										
No (ref.)	1.00					1.00				
Yes	1.11	(0.84-1.46)				1.12†	(0.85-1.48)			
Social Capital										
Generalized trust										
low (ref.)						1.00		1.00		
high						0.80*	(0.66-0.96)	0.80	(0.61-1.07)	
Emotional support										
Yes (ref.)						1.00		1.00		
No						0.97	(0.72-1.32)	1.25	(0.78-2.01)	
Do not have such needs						1.13	(0.84-1.53)	0.71	(0.41-1.21)	
Instrumental support										
Yes (ref.)						1.00		1.00		
No						1.07	(0.80-1.43)	0.89	(0.61-1.30)	
Do not have such needs						1.00	(0.75-1.32)	1.13	(0.65-1.96)	
N	3,629		1,351			3,629		1,351		

Note: †p < 0.10; *p < 0.05; **p < 0.01; ***p < 0.001

Model fit statistics are equal to appendix table 1.

Model 2: adjusted for socioeconomic characteristics.

Model 3: adjusted for socioeconomic and health-related risks/health care system characteristics.

Model 4: adjusted for socioeconomic, health-related risks/health care system, and social capital characteristics.

[a]Columns labelled C-K show statistically significant differences between China and Korea for each category of the variable.

[c]'Not employed' includes the unemployed, the retired, the permanently disabled out of labour force, students and housewives.

[d]'Frequent' drinking includes daily or drinking several times a week. 'None or infrequent' drinking includes drinking less than several times a month and nondrinking.

Korean Abstract

한국과 중국간 건강수준의 사회적 결정요인 국가 비교 연구: 인구사회, 건강위험과 사회적 자본 특성을 중심으로

서로 다른 사회경제적, 문화적 배경을 가진 국가간 건강의 사회적 결정요인을 비교하는 국가비교연구는 건강불평등을 줄이는데 기여할 수 있다. 그럼에도 불구하고 동아시아에서 건강의 사회적 결정요인을 직접 비교한 연구가 거의 없었다.

따라서 본 연구는 중국과 한국의 주관적 건강수준에 영향을 미치는 사회적 결정요인을 파악하고, 국가별로 사회적 결정요인이 어떻게 다른지 비교하고자 한다.

각 국가의 대표성이 있는 자료로 구성되어 있으며 국가비교에 적합한 2010 East Asian Social Survey 를 사용하였고, 3,629 명의 중국인과 1,351 명의 한국인을 대상으로 하였다. 양국에서 주관적 건강수준과 유의한 관련성이 있는 사회적 결정요인을 확인하기 위하여 다항로지스틱 회귀분석(multinomial logistic regression)을 사용하였다.

인구학적 특성에서, 성별은 한국에서, 연령은 중국에서 주관적 불건강과 더 강한 관련성이 있었다. 결혼상태, 종교는 중국에서만 주관적 불건강과 관련성이 있었다. 사회경제적 특성에서, 고용상태, 소득, 사회계층은

중국에서 주관적 불건강과 더 강한 관련성이 있었다. 반면 교육은 한국에서 주관적 불건강과 더 강한 관련성이 있었으며, 건강관련 변수와 사회적 자본 변수를 통제하고도 관련성이 유의하였다. 건강위험, 의료접근성 특성에서, 음주빈도, 만성질환은 중국에서, 흡연, 운동, 미충족의료는 한국에서 주관적 불건강과 더 강한 관련성이 있었다. 체질량지수는 중국에서는 저체중이, 한국에서는 과체중과 비만이 주관적 불건강과 관련성이 있었다. 사회적 자본 특성은 다른 사회적 결정요인에 비하여 주관적 건강수준과 관련성이 약하였고, 한국에서 일반적 믿음, 정서적 지지, 도구적 지지가 주관적 불건강과 관련성이 있었다.

주관적 건강수준은 중국과 한국에서 유사한 사회적 결정요인에 의해 영향을 받지만, 국가별로 관련성이 있는 변수가 다르게 나타났으며 관련성의 정도도 달랐다. 이러한 차이는 양국의 사회경제적 불평등의 정도가 다르고, 문화적, 의료체계의 특성이 서로 다르기 때문에 나타난 것으로 추정된다. 본 연구는 중국과 한국을 대상으로 건강의 사회적 결정요인을 직접 비교한 첫 국가비교 연구로서, 향후 아시아에서 건강의 사회적 결정요인에 대한 보다 심도 있는 국가 비교 연구가 필요하다.

핵심어: 건강의 사회적 결정요인, 주관적 건강수준, 국가비교연구, 중국, 한국