

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Sociodemographic and health behavioural factors associated with access to and utilization of eye care in Korea: Korea Health and Nutrition Examination Survey 2008-2012
AUTHORS	Rim, Tyler Hyung Taek; Choi, Moonjung; Yoon, Jin-Sook; Kim, Sung Soo

VERSION 1 - REVIEW

REVIEWER	Sang Min Park Seoul National University College of Medicine, South Korea
REVIEW RETURNED	05-Mar-2015

GENERAL COMMENTS	<p>This paper is based on a large nationally representative health examination survey in Korea, and results are interesting. The authors showed sociodemographic disparities in eye care utilization.</p> <p>1) There was a mismatch of title in this manuscript. Which was the main question of this paper? 'Sociodemographic and health behavioural factors associated with access to and utilization of eye care in Korea' or 'Barrier in eye care utilization and trend after economic crisis in 2008 in Korea'?</p> <p>2) As the exposure variable of this study were sociodemographic and health behavioural factors, more detailed description related with these variables will be needed in METHOD section. And where were the results about health behavioural factors related with eye care utilization?</p> <p>3) Authors defined the outcome measure as the last visit to the eye clinic being <1 year ago. Is there any reference for the definition of the outcome measures (eye care)? (Especially, for not elderly population or people without diabetes?)</p> <p>4) If regular eye care utilization is needed for high risk groups such as elders or those with diabetes, it will be more interesting to add the results of vulnerable groups</p> <p>5) The authors focused the impact of economic crisis on eye care disparity, more specific description is needed in introduction and method section.</p> <p>6) And authors used Korea health and nutrition examination survey 2008-2012. Is this data enough to answer the research question about the moderation effects of economic crisis in 2008 on eye care utilization or its disparity?</p>
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	7) English editing will be needed.
REVIEWER	Der-Chong Tsai National Yang-Ming University Hospital, Taiwan.
REVIEW RETURNED	13-Mar-2015

GENERAL COMMENTS	<p>Sociodemographic inequity in eye care utilization is an important public health issue. Rim et al analyzed the data from the nationally representative survey (KNHNES) to address these issue in South Korea. Authors reported interesting findings that middle-aged men were especially vulnerable to utilize eye care service and economic crisis had impact on the screening rate.</p> <p>Specific comments:</p> <ol style="list-style-type: none"> 1. Recent study suggests that health status should be taken into account when analyzing socioeconomic inequity in healthcare utilization (Agerholm et al, 2013). I think this finding still holds true in eye care utilization analysis. For example, diabetic or glaucoma patients should have more regular eye examinations than those without these systemic or ocular morbidities. Therefore, adjustment for major chronic comorbidities of participants, even self-reported ones, would be helpful. 2. In Abstract, I don't think this conclusion statement is appropriate. This conclusion cannot be supported by the current findings of this study. 3. English editing is suggested.
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VERSION 1 – AUTHOR RESPONSE

Reviewer Name Sang Min Park

Institution and Country Seoul National University College of Medicine, South Korea

Please state any competing interests or state 'None declared': None declared

This paper is based on a large nationally representative health examination survey in Korea, and results are interesting. The authors showed sociodemographic disparities in eye care utilization.

1) There was a mismatch of title in this manuscript.

Which was the main question of this paper?

'Sociodemographic and health behavioural factors associated with access to and utilization of eye care in Korea' or 'Barrier in eye care utilization and trend after economic crisis in 2008 in Korea'?

The main goal of this manuscript was to use the national survey data to explore the sociodemographic and health behavioural factors associated with eye care utilisation. While analysing the trend throughout time, we found an interesting fact that eye care utilisation decreased since 2007, when the world economy face a global financial crisis, and that the effect was most dramatic on the middle-aged men. We agree with the reviewer's comment that the main outcome of this study was to identify factors related to eye care utilisation, and therefore we changed the title to "Sociodemographic and health behavioural factors associated with access and utilisation of eye care in Korea: Korea Health and Nutrition Examination Survey 2008-2012".

2) As the exposure variable of this study were sociodemographic and health behavioural factors, more detailed description related with these variables will be needed in METHOD section.

And where were the results about health behavioural factors related with eye care utilization?

We have added a more detailed description on the independent variables in the method section. We additionally analysed the relationship between comorbidities including diabetes mellitus and hypertension and eye care utilisation, and health behavioural factors including smoking and abnormal alcohol use. The revised method section is written in red text.

Methods - Independent variables

The sociodemographic factors which were evaluated included age, sex, household income, education, having a spouse, and residential area. The comorbidities including diabetes mellitus and hypertension and health behavioural factors including lifetime smoking and abnormal alcohol use were also analysed based on the self-report by trained interviewer. Age was divided into decades (30~39, 40~49, 50~59, 60~69, 70~). The income per adult equivalent was calculated by dividing the household income by the square root of number of people in the household. Education was grouped by the level of attainment (elementary school, middle school, high school, university or higher) and the residential area was categorized to either urban area or non-urban area (town or country). Abnormal alcohol use was defined as a score of 12 or more on the Alcohol Use Disorder Identification Test (AUDIT). Lifetime smokers included respondents who reported that they were current smokers and have smoked at least 100 cigarettes in their lifetime.

3) Authors defined the outcome measure as the last visit to the eye clinic being <1 year ago. Is there any reference for the definition of the outcome measures (eye care)? (Especially, for not elderly population or people without diabetes?)

Many of the previous reports on eye care utilisation in various countries have analysed the results based on the ophthalmologic examination within the past year (e.g. Muller A, Keeffe JE, Taylor HR. Changes in eye care utilization following an eye health promotion campaign. *Clin Experiment Ophthalmol* 2007;35:305-9., R Zhang X, Saaddine JB, Lee PP, et al. Eye care in the United States: do we deliver to high-risk people who can benefit most from it? *Arch Ophthalmol* 2007;125:411-8, Orr P, Barron Y, Schein OD, et al. Eye care utilization by older Americans: the SEE Project. *Salisbury Eye Evaluation. Ophthalmology* 1999;106:904-9., Jin YP, Trope GE. Eye care utilization in Canada: disparity in the publicly funded health care system. *Can J Ophthalmol* 2011;46:133-8). Also, the American Academy of Ophthalmology recommends a yearly examination for the elderly (>65years) and high risk group including those with diabetes, and the American Association of Pediatric Ophthalmology and Strabismus recommends that screening should be repeated every 1-2 years after age 5. The guidelines by the Korean Ophthalmological Society recommends regular screening for adults over 40 years of age, and there is a high incidence ocular conditions in Koreans, especially myopia in young adults. Therefore, we considered it appropriate to set the outcome measure as the last screening being <1 year ago. We added further explanations in the methods section and the modifications are in red text.

Methods - Outcome variable

The Vision Screening Committee of AAPOS (American Association for Pediatric Ophthalmology and Strabismus) recommends that screening should be repeated every 1-2 years after age 5. The prevalence of myopia in young adults in their third and fourth decade of life is as high as 80% in Korea. 12 The most recent eye examination guideline¹³ published in 2011 by the Korean Ophthalmological Society recommends regular screening for adults over 40 years of age, and it seems appropriate to set the ocular examination frequency to 1 or 2 years. Since the questionnaire in the KNHANES asked whether the participant received eye examination within the past 3 years or within 1 year, we defined the outcome measure as the last screening being <1 year ago. Many of the previous studies conducted in the U.S. used the same variable. 14

4) If regular eye care utilization is needed for high risk groups such as elders or those with diabetes, it will be more interesting to add the results of vulnerable groups

Thank you for your comment. We added comorbidities including diabetes and hypertension, and health behavioural factors including smoking and abnormal alcohol use as independent variables. The results are added in Table 1 and Table 2. Those with comorbidities were more likely to receive regular eye examinations than those without medical conditions. The other results of multivariate analysis after adjusting for the additional variables were consistent with previous results. We revised the results and the discussion section to incorporate the additional results.

Results

The univariable and multivariable odds ratio (OR) revealing relationships between the use of eye care and various individual and sociodemographic indicators is presented in Table 2. Multivariable analysis was performed on outcome variables of participants who did or did not receive an eye examination within 1 year. Age had positive correlation with eye care utilisation, and women were seen more than men. Household income (highest quintile), and education level (university or higher) were associated with increased eye care utilisation (Table 2). The subjects living in urban areas were more likely to utilise eye care than those living in rural area. Participants with hypertension or diabetes mellitus were more likely to visit ophthalmologists than those without the comorbidities. The abnormal alcohol use and smoking did not have a significant association with eye care utilisation.

Discussion

People with comorbidities including hypertension and diabetes are more likely to utilise medical care for the management of their conditions, and therefore are more likely to be encouraged to receive regular eye examinations. Diabetics, especially, are frequently referred by internists to visit ophthalmologists for screening of diabetic retinopathy.

Abstract

Results: Of the 25,752 respondents, 8,237 (32.0%) visited an eye clinic in the past year, 11,028 (42.8%) were seen more than 1 year ago, while 6,487 (25.2%) had never seen an ophthalmologist. Eye clinic utilisation was statistically associated with older age, female sex, higher household income, higher education levels, living in an urban area, and having comorbidities including diabetes and hypertension. Middle aged men between 30 and 49 years of age were found less likely to receive eye care compared to the rest of the population, and the proportion that do plummeted after the financial crisis of 2007.

5) The authors focused the impact of economic crisis on eye care disparity, more specific description is needed in introduction and method section.

Thank you for your comment. We added more specific descriptions in the introduction and methods section as follows.

Introduction

The global economic crisis around 2007 had a significant impact on the Korean economy. Although the influence of the economic crisis on health is currently unknown, it is likely that the economic recession has affected the health system. Involuntary job loss may increase the risk of somatic illness and psychiatric disorders, however other researches have emphasized the positive effects of a contracting economy on the reduction in risky behaviour, such as driving and alcohol use. This study aims to analyse realised access to eye care in Korea at a national level, explore the individual and contextual characteristics that may contribute to disparities and barriers to care, and assess the effect of economic crisis on eye care utilisation.

Methods - Economic crisis

In April 2007, New Century Financial Corp., a leading subprime mortgage leader, filed for bankruptcy, leading to the onset of a severe global recession.²⁵ The impact of the US subprime mortgage crisis on the world was immediately reflected upon the Korean economy, and the KOSPI (Korea Stock Exchange Index) declined more rapidly than the Dow Jones Industrial Average index of the U.S. Therefore, we considered that the economic recession in Korea began in 2007 and continued through 2008.

6) And authors used Korea health and nutrition examination survey 2008~2012. Is this data enough to answer the research question about the moderation effects of economic crisis in 2008 on eye care utilization or its disparity?

Although a self-reported data, the Korea National Health and Nutrition Survey is a nationwide cross-sectional epidemiologic survey that is generally considered valid and reliable, and its population-based surveys are effective ways to systemically monitor and evaluate access to eye care. Also, it includes a representative sample of non-institutionalized civilian population nationwide based on the Census, increasing its generalisability. However, we agree with the reviewer's comment that there are limitations on completely explaining a complex social phenomenon, being a cross sectional survey which cannot define causal relationship and vulnerable to recall bias. We have explained the limitations further in the discussion section and "strengths and limitations of this study" section.

Discussion

This study has several limitations. KNHANES is an annually conducted cross sectional study, and therefore although the association between variables can be concluded, the causal relationships cannot be defined. The decreasing trend after the global economic crisis in 2007 can be estimated by evaluating a 5-year trend of each variable, but again the exact correlation cannot be determined. However, the decrease in eye care utilisation in middle-aged men, who are the lead contributors to the national economy, after the financial crisis, was unequivocal. Further observation and evaluation on the change in health behaviour after economic recession over longer period of time is needed to provide more solid evidence. Also, the analyses were based on self-reported data, which is subject to recall bias. It is likely to be inaccurate especially when reporting for income in times of economic fluctuations, and the retrospective questions regarding eye clinic visits may be imprecise especially in the elderly. However, the decreasing trend in the high income group after the financial crisis seemed to be distinct from the other groups, and the elderly were more likely to receive eye care than the young population, and therefore the recall bias of the self-reported data is likely to have little effect on the results. Lastly, the health behaviour of Koreans may be different from those in other countries, since the Korean health system provides universal insurance coverage and affordable medical costs.

Strengths and limitations of this study

λ The analyses are based on self-reported data, which are subject to recall bias. Although, the study analysed the trend throughout time by using a 5 year data of a national cross sectional survey which was conducted annually, it might be insufficient to completely explain a complex social phenomenon.

7) English editing will be needed.

We have thoroughly revised our manuscript and edited the grammatical errors. We consulted the school's English editing service for revision.

Reviewer Name Der-Chong Tsai
Institution and Country National Yang-Ming University Hospital, Taiwan.
Please state any competing interests or state 'None declared': Non declared.

Sociodemographic inequity in eye care utilization is an important public health issue. Rim et al analyzed the data from the nationally representative survey (KNHNES) to address these issue in South Korea. Authors reported interesting findings that middle-aged men were especially vulnerable to utilize eye care service and economic crisis had impact on the screening rate.

Specific comments:

1. Recent study suggests that health status should be taken into account when analyzing socioeconomic inequity in healthcare utilization (Agerholm et al, 2013). I think this finding still holds true in eye care utilization analysis. For example, diabetic or glaucoma patients should have more regular eye examinations than those without these systemic or ocular morbidities. Therefore, adjustment for major chronic comorbidities of participants, even self-reported ones, would be helpful.

Thank you for your constructive comment. As you suggested, we added comorbidities including diabetes and hypertension, and health behavioural factors including smoking and abnormal alcohol use as independent variables. The results are added in Table 1 and Table 2. Those with comorbidities were more likely to receive regular eye examinations than those without medical conditions. The other results of multivariate analysis after adjusting for the additional variables were consistent with previous results. We revised the results section to incorporate the additional results.

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2. In Abstract, I don't think this conclusion statement is appropriate. This conclusion cannot be supported by the current findings of this study.

Thank you for your comment. We have changed the conclusion based on the findings of this study.

Conclusions: There is a substantial sociodemographic disparity in eye care utilisation in Korea, and men with low financial income and education level are especially at risk. Use of eye care among middle-aged men has decreased since the global financial crisis that began in 2007, and therefore health care policies and public interventions should be targeted on the vulnerable group to promote access to medical care.

3. English editing is suggested.

We have thoroughly revised our manuscript and edited the grammatical errors. We also consulted the school's English editing service for revision.

VERSION 2 – REVIEW

REVIEWER	Sang Min Park Seoul national university college of medicine, Korea
REVIEW RETURNED	04-May-2015

GENERAL COMMENTS	Authors responded adequately according to reviewer's comments.
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REVIEWER	Der-Chong Tsai National Yang-Ming University Hospital, Taiwan
REVIEW RETURNED	09-May-2015

GENERAL COMMENTS	The amendment responds to the questions adequately.
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