

Differences Between Social Classes in Terms of the Subjective Level of Oral Health of the Elderly*

Yun-Jung Jang¹, Min-Young Kim²

¹Dept. of Dental Hygiene, Howon University, Korea (yunjungj@howon.ac.kr), Frist Author

²Dept. of Dental Hygiene, Howon University, Korea (start19@howon.ac.kr), Corresponding Author

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ABSTRACT

The subjective level of oral health may be affected by a number of individual socio-economic factors, and the problem of oral health related inequality due to social polarization has also been highlighted continuously. Hence, this study attempted to examine and understand the differences between the social classes in the terms of the subjective level of oral health of the elderly's oral health related inequality by using the secondary data of the 2020 Community Health Survey. A final analysis was performed for the 72,812 people aged 65 and older who responded to the questionnaire on their subjective perception of oral health. As a result of the study, it turned out that the probability that managers perceived subjective level of oral health as healthy was higher among women, the younger the age, the higher the education level, and for the elderly with spouses, in terms of occupational classification. As a result of the results in the above, the differences in terms of the subjective level of oral health of the elderly were confirmed by the social class, and it may be claimed that a comprehensive project implementation would be needed for the selective management of social determinants of oral health for the extension of healthy life expectancy and improvement of health equity and consideration of oral health across all policies.

1. Introduction

In Korea, life expectancy has continuously increased given the improvement of income level and medical technology, and as of 2019, the average life expectancy is 83.3 years, which is higher than the average life expectancy of 81.0 years among the OECD countries (Ministry of Health and Welfare's press release, 2021). However, the gap between the healthy life expectancy and the life expectancy is 10.9 years, ranking Korea 30th out of 37 countries of the Organization for Economic Cooperation

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and Development (OECD, 2022). There has been no significant change over the past decade, while the life expectancy, an objective health indicator, has reached the level of developed countries and is higher than the OECD average. However, the subjective health status is very low among the OECD countries, which is almost at the lowest level (K-indicator, 2022). Furthermore, the COVID-19 pandemic, which has prolonged for the past two years, is rapidly polarizing society as it is focused on the vulnerable classes due to the inequality in terms of income, education, and employment, etc., as well as the economic shock in Korea (Bank of Korea, 2020). Such social polarization has further intensified as a result of creating a health disparity, yielding inequality in terms of the health level.

To achieve the improvement of the people's healthy life expectancy and health level, the state needs to shift its health care policy from the treatment centered on the medical system towards the comprehensive health management that includes health promotion, prevention, treatment and rehabilitation. Accordingly, in order to promote the health of the people and to prevent diseases according to the National Health Plan, Korea has made efforts by planning and carrying out health policy projects to address social needs and current issues centered on the health prevention and promotion. The implemented health policies have tended to limit health promotion and prevention to a narrow scope of the health care system, and there were attempts to conceptually discuss approaches by life cycle and social determinants of health (Seoul National University Industry-Academic Cooperation Group of the Ministry of Health and Welfare, 2020).

The evaluation of oral conditions for the oral health can help verify the initial symptoms of systemic diseases by identifying objective clinical oral diseases and unhealthy lifestyles (MD Journal Daily, 2022). Since the subjective perception of oral health perceived by individuals would have a practical relationship with the improvement in the quality of life as well as the promotion of oral health, the subjective oral health indicators are important (Jeong, & Lee, 2019). The subjective level of health used as an index to measure the health inequality may be affected by a number of individual socio-economic factors (Jung et al., 2014). It has been reported that the higher the level of household income, education, and occupation, which are the individual socioeconomic levels, the higher the subjective level of health (Kim JH et al., 2010; Seo et al., 2010; Kim MK et al., 2010). Social class is a powerful factor predicting the subjective health status (Chandola et al., 2003), and in the previous studies, occupational groups were classified based on the Korean Standard Occupational Classification as the indicators representing social class and used for analysis (Kim, & Kim, 2007). Occupation is the main factor that can predict subjective oral health status, and it is necessary to classify occupational groups to examine and understand the differences between the social classes of such factors (Kim, 2018).

Meanwhile, the studies on health inequality according to socioeconomic level have been actively conducted, yet the reality is that there is such as little interest in the study of differences between the social classes according to the relatively subjective level of oral health. While the risk to health leading to direct death due to oral diseases is small relative to other diseases, the problem of oral health related inequality due to the social polarization has continuously been highlighted, and it may also be claimed that there is a close relationship with the quality of life for an individual. Hence, in this study, in order to have a deeper relationship between the social policy tasks of the elderly and the phenomenon of oral health related inequality by social class, it is necessary

to understand the specific differences in terms of oral health among the social classes and their causes based on the study on subjective oral health. Hence, effective medical insurance policies for each characteristic of the population with low oral health levels as well as alleviating the differences between socioeconomic classes and improving the oral health level of the people based on the empirical understanding of social class differences affords the expectation that it will be used as the basic data in preparing the policies for oral health improvement such as by providing the oral health promotion projects.

2. Research Method

2.1 Research subjects

The community health survey data, which are the secondary data, were used to examine and understand the differences between the social classes in terms of the subjective level of oral health among the elderly. After receiving the approval and data from the Korea Centers for Disease Control and Prevention, it was approved after being exempted from deliberation by the Institutional Bioethics Committee of OO University (IRB No. 1041585-202204-HR-002-01). As for the subjects of this study, among the 229,269 people who participated in the 2020 Community Health Survey, 72,812 people were finally selected, excluding those who responded 'Refuse to answer' or 'Don't know' for the questionnaire on the subjective perception of oral health among the elderly aged 65 and older.

2.2 Research tools

The general characteristics were classified by gender, age, education level, marital status, and occupation, and as for age, the age group at 5-year intervals used in Korea's statistical data, Korea Statistical Yearbook and Life Table, etc., were categorized into the five groups of 65-69 years old, 70-74 years old, 75-79 years old, 80-84 years old, and 85 years old or older. Educational level was categorized as less than the diploma at elementary school, middle school, high school, and college or university. Occupations were classified into the unemployed, professionals, office workers, service workers, sales workers, agriculture, forestry and fishery workers, craftsmen, equipment, machinery operation and assembly workers, simple laborers, and managers. The dependent variable of this study was the subjective level of oral health. The subjective level of oral health variable measured on a 5-point scale was converted into the dichotomous variables of 'good' (in the case of responding as very good/good/average) and 'bad' (in the case of responding as bad/very bad).

2.3 Statistical analysis

Data analysis was performed by using the STATA12.0 statistical program. The general characteristics of the subjects were analyzed by frequency and percentage. The differences in terms of the subjective level of oral health according to the general characteristics was analyzed by the χ^2 test. The multilevel

logistic regression analysis was used to determine the influential factors of differences between the social classes on the subjective level of oral health.

3. Results

3.1 General characteristics of the elderly

As a result of examining the general characteristics such as gender, age, education level, marital status, and occupational classification, 58.4% of the subjects were females and 41.6% were males, respectively. As for age, 65-69 years old accounted for 28.3%, followed by 70-74 years old at 24.7%, and 75-79 years old at 22.8%, respectively. As for the level of education, 57.7% were elementary school graduates or less, 17.6% were middle school graduates, 16.8% were high school graduates, and 7.9% were college or university graduates or higher. As for the presence or absence of spouse, the presence of a spouse turned out to be high at 64.3%, and as for the occupational classification, the unemployed accounted for the highest proportion at 61.4%, followed by agricultural, forestry and fishery workers at 17.0% and simple labor workers at 12.4%, respectively Table 1.

Table 1. General characteristics

Characteristics division		N	(%)
Sex	Male	30,326	(41.6)
	Female	42,486	(58.4)
Age	65-69	20,575	(28.3)
	70-74	18,018	(24.7)
	75-79	16,608	(22.8)
	80-84	11,419	(15.7)
	≥ 85	6,192	(8.5)
Educational level	Elementary ≤	41,937	(57.7)
	Middle ≤	12,821	(17.6)
	High ≤	12,209	(16.8)
	University ≥	5,748	(7.9)
Marital status	Spouse	46,799	(64.3)
	No spouse	25,985	(35.7)
Occupation	Unemployed	44,651	(61.4)
	Professional	638	(0.9)
	Clerical workers	386	(0.5)
	Service workers	1,938	(2.7)
	Seller	1,368	(1.9)
	Agricultural, forestry and fishery	12,380	(17.0)
	Craftsman	883	(1.2)
	Machine operation and assembly	1,135	(1.5)
	Simple labor	8,992	(12.4)
	Administrator	371	(0.5)

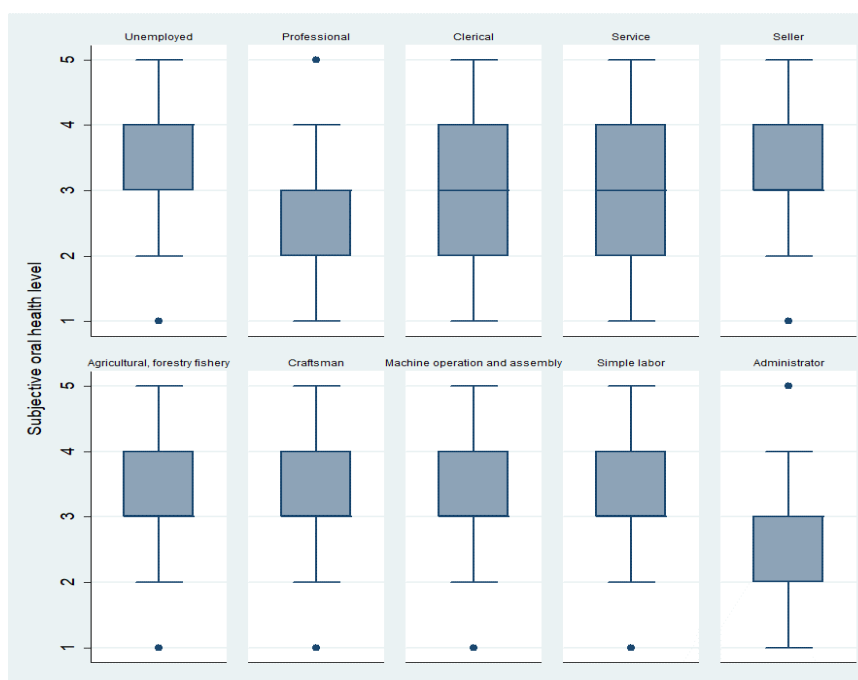
3.2 Differences in terms of the subjective level of oral health of the elderly

As a result of verifying the difference in terms of the subjective level of oral health according to the general characteristics of the elderly, 35.9% for men and 38.1% for women turned out to be ‘bad’ according to gender ($p<0.001$). According to the survey, it turned out that as the age increased, the level of negative evaluation of subjective oral health such as ‘bad’ increased, and as the education level increased, the level of positive evaluation such as ‘normal’ and ‘good’ increased ($p<0.001$). As for the differences in terms of the subjective level of oral health according to the presence or absence of a spouse, it turned out that 36.3% of the elderly with a spouse perceived ‘average’ and 42.0% of the elderly without a spouse perceived ‘bad’ ($p<0.001$). According to the occupational classification, ‘bad’ was the highest for the unemployed, simple laborers, and agricultural, forestry and fishery workers at 38.6%, 37.9%, and 37.0%, each respectively ($p<0.001$), yet experts, office workers, service workers, and sales workers, technicians, equipment, machine operation and assembly workers, and managers turned out to be the highest for ‘average’ Table 2. As in Fig. 1, A box plot was made to verify the distributive differences by charting out the subjective level of oral health measured by the occupational classification on a 5-point scale.

Table 2. Differences in terms of the subjective level of oral health

Characteristics division		Very good	Good	Average	Bad	Not bad	p^*
		N(%)	N(%)	N(%)	N(%)	N(%)	
Sex	Male	741(2.4)	5,401(17.8)	10,327(34.1)	10,886(35.9)	2,968(9.8)	0.000
	Female	690(1.6)	6,856(16.1)	14,219(33.5)	16,179(38.1)	4,541(10.7)	
Age	65-69	568(2.8)	4,225(20.5)	8,340(40.5)	6,126(29.8)	1,314(6.4)	0.000
	70-74	390(2.2)	3,297(18.3)	6,621(36.8)	6,251(34.7)	1,458(8.0)	
	75-79	276(1.7)	2,657(16.0)	5,217(31.4)	6,694(40.3)	1,764(10.6)	
	80-84	151(1.3)	1,491(13.1)	3,013(26.4)	5,045(44.2)	1,718(15.0)	
	≥ 85	46(0.7)	587(9.5)	1,355(21.9)	2,949(47.6)	1,255(20.3)	
Educational level	Elementary ≤	547(1.3)	5,766(13.7)	12,442(29.7)	17,813(42.5)	5,368(12.8)	0.000
	Middle ≤	245(1.9)	2,397(18.7)	4,920(38.4)	4,250(33.2)	1,008(7.8)	
	High ≤	368(3.0)	2,553(20.9)	4,860(39.8)	3,590(29.4)	838(6.9)	
	University ≥	269(4.7)	1,513(26.3)	2,289(39.8)	1,386(24.1)	290(5.1)	
Marital status	Spouse	1,069(2.3)	8,658(18.5)	16,982(36.3)	16,139(34.5)	3,950(8.4)	0.000
	No spouse	362(1.4)	3,592(13.8)	7,551(29.1)	10,918(42.0)	3,559(13.7)	
Occupation	Unemployed	764(1.7)	6,869(15.4)	14,485(32.4)	17,237(38.6)	5,294(11.9)	0.000
	Professional	32(5.0)	207(32.4)	250(39.2)	125(19.6)	24(3.8)	
	Clerical workers	21(5.5)	104(26.9)	156(40.4)	93(24.1)	12(3.1)	
	Service workers	69(3.6)	437(22.6)	810(41.8)	526(27.1)	96(4.9)	
	Seller	39(2.9)	274(20.0)	544(39.8)	415(30.3)	96(7.0)	
	Agricultural, forestry and fishery	263(2.1)	2,329(18.9)	4,145(33.5)	4,590(37.0)	1,053(8.5)	
	Craftsman	32(3.6)	157(17.8)	395(44.8)	241(27.3)	57(6.5)	
	Machine operation and assembly	38(3.4)	234(20.6)	462(40.7)	329(29.0)	72(6.3)	
	Simple labor	149(1.6)	1,529(17.0)	3,122(34.7)	3,404(37.9)	788(8.8)	
	Administrator	23(6.2)	106(28.6)	158(42.6)	74(19.9)	10(2.7)	

* by chi-squared test



* The midline of the box plot signifies the median value, the upper tail signifies the 75 percentile, the lower tail signifies the 25 percentile, and the circle signifies the singular value.

Fig. 1. Occupational classification and the subjective level of oral health.

3.3 Factors influencing the Subjective Oral Health Level of the Elderly

As a result of analyzing the factors affecting the subjective level of oral health of the elderly, it turned out that females perceived their subjective oral health as healthy 0.302 times higher than males ($p < 0.001$). As for age, the probability of recognizing subjective level of oral health as healthy was lower as the age increased relative to the age of 65-69 ($p < 0.001$). As for the education level, the higher the education level relative to the elementary school graduates, the healthier the subjective level of oral health was perceived ($p < 0.001$). Compared to the elderly with a spouse, it was confirmed that the probability of healthy perception of the subjective level of oral health was lower ($p < 0.001$). Compared to the unemployed, simple labor workers were 0.123 times, agriculture, forestry and fishery workers 0.145 times, sales workers 0.221 times, equipment and machinery operation and assembly workers 0.271 times, service workers 0.364 times, technicians 0.375 times ($p < 0.001$), office workers 0.388 times ($p < 0.05$), experts 0.580 times, and managers 0.655 times ($p < 0.001$), and hence, it turned that there is a high probability of perceiving the subjective level of oral health as healthy Table 3.

Table 3. Factors affecting the subjective level of oral health

Characteristics division		Coef.	SE	z	p > z	95% CI	
Sex	Male	1					
	Female	0.302	0.018	16.42	0.000	0.266	0.338
Age	65-69	1					
	70-74	-0.147	0.021	-6.85	0.000	-0.189	-0.105
	75-79	-0.353	0.022	-15.69	0.000	-0.397	-0.308
	80-84	-0.610	0.025	-23.73	0.000	-0.661	-0.560
	≥ 85	-0.903	0.033	-27.19	0.000	-0.969	-0.838
Educational level	Elementary ≤	1					
	Middle ≤	0.434	0.021	19.87	0.000	0.391	0.477
	High ≤	0.642	0.023	27.51	0.000	0.596	0.688
	University ≥	0.992	0.033	29.75	0.000	0.927	1.058
Marital status	Spouse	1					
	No spouse	-0.268	0.018	-14.63	0.000	-0.304	-0.232
Occupation	Unemployed	1					
	Professional	0.580	0.097	5.97	0.000	0.390	0.771
	Clerical workers	0.388	0.117	3.30	0.001	0.157	0.618
	Service workers	0.364	0.051	7.12	0.000	0.264	0.464
	Seller	0.221	0.058	3.80	0.000	0.107	0.336
	Agricultural, forestry and fishery	0.145	0.021	6.68	0.000	0.103	0.188
	Craftsman	0.375	0.073	5.08	0.000	0.230	0.520
	Machine operation and assembly	0.271	0.065	4.18	0.000	0.144	0.399
	Simple labor	0.123	0.024	5.14	0.000	0.076	0.170
	Administrator	0.655	0.126	5.16	0.000	0.406	0.904
Constant		-0.053	0.040	-1.32	0.188	-0.132	0.026

* by multilevel logistic regression

* Coef: coefficient, SE: standard error, CI: confidence interval.

4. Discussion

The WHO and the OECD recommend that the national health policies include the improvement of the general and average health level of the people and the problems of the differences and distributions among the population groups. Hence, the state ought to secure the basic understanding and information on scientific evidence and determinants of the size, characteristics, and trends of inequality in health level, and based on which, a consensus to solve health problems should be formed in society as a whole. The efforts to fairly achieve the health equity, which has emerged as a major agendum to be achieved in the international community in the future, and resolve differences in health by the population group must be continued. To achieve a fair health equity, it is important to measure the subjective level of oral health that allows one to perceive one's own health status and actively reflect the quality of life of individuals to raise the public awareness and begin with specific health problems with the greatest socioeconomic difference by way of setting specific goals and ensuring that the health policies are adopted toward achieving them.

Accordingly, in order to understand the differences between the social classes in terms of the subjective level of oral health of the oral health related inequality of the elderly, this study was conducted by using the 2020 secondary data, the Community Health Survey, to survey the subjective perception of oral health among the elderly aged 65 and older, and the results of the multi-level logistic regression analysis performing on 72,812 people who responded are as follows.

As a result of examining the factors affecting the subjective level of oral health of the elderly, it turned out that the higher the education level, the healthier the subjective level of oral health was perceived among women. The results resembled those of a study (Jung et al., 2019; Kim, 2018; Kim et al., 2013; Kang, & Jung, 2012) which reported on the differences in terms of socio-economic level and the subjective health and the level of oral health. This may be understood since women are relatively more interested in health than men, and hence, they actively practice their oral hygiene care (Hamasha et al., 2018), and the rate of practice of oral examination and use of dental care are also higher (Kim et al., 2015; Ahn et al., 2015; Kim et al., 2014; Kim & Jang, 2021). The differences in terms of the subjective health status according to education level is also consistent with the general socioeconomic level, and the existing studies (Song & Youn, 2019; Li et al., 2018; Hakeberg & Wide Boman, 2017) also report on the fact that education affects the subjective oral health status as an important determinant of personal health, especially in the study of Kim and Kim (Kim & Kim, 2019), which reports on the fact that, in affecting the subjectively perceived bad oral health status of the elderly, the factors were gender, household income and education, while the differences in terms of the subjective oral health status according to income and education level did not decrease for 9 years.

As the age increased relative to the age of 65-69, it turned out that the probability of healthy perception of subjective level of oral health was lower among the elderly without a spouse than the elderly with a spouse. This was similar to the result of low quality of life for oral health behavior and oral health according to age (Kim & Jang, 2021; Song & Youn, 2019; Yang & Suh, 2018; Jo et al., 2019) and marital status (Kim & Jang, 2021; Jo et al., 2019; Park et al., 2008; Ahn & Shin, 2015), and the older people are, they can have a greater influence on the oral health status which is subjectively perceived as bad (Kim & Kim, 2019), and hence, in such a reality where the trend of the times concerns the rapid increase of the elderly population, the gap between the classes may grow further along with social development, and hence, there is a need to increase the relevant interest (Shin, 2018).

Compared to the unemployed, simple labor workers, agricultural, forestry and fishery workers, sales workers, equipment and machinery operation and assembly workers, service workers, craftsmen, office workers, experts, and managers turned out to have a higher probability of recognizing the subjective level of oral health as healthy. This is the result of Kim's study demonstrating the fact that the level of oral health was high when occupations were service and sales workers, craftsmen, and machine operation and assembly workers, and managers, experts, and related workers in Shin et al. In comparison to which, the results of a study demonstrating that skilled workers in agriculture, forestry and fisheries had a higher risk of experiencing problems with oral health and lower rates of oral health behaviors, dental care use, and oral examination practice in those with low-income occupations (Sanders et al., 2005; Shin et al., 2016) showed similar results. Furthermore, the differences

in oral health among the elderly according to income level were still significant even after controlling gender, age, marital status, and health status (Lee, 2020), indicating that the more manual workers, the lower the medical expenses (Lee, 2020). The phenomenon of lower medical expenses for manual workers (Kim et al., 2004) leads to unhealthy lifestyles and behaviors due to material deprivation and social and psychological atrophy, further causing the deterioration of oral health as well as the decline in the quality of life for the oral health. Hence, it is necessary to accurately identify the factors that can affect the oral health level of workers across various occupational groups in order to establish policies regarding oral health that take into account the characteristics of the population group with a low occupational level, and oral policy to improve them, and in developing the oral policies towards that end, it may be claimed that the comprehensive planning according to occupational groups at the national level and oral health management and practical application according to detailed plans are required for the industries belonging to the local community.

While this study was not adequately verified given the limitations of individual characteristic variables that may be used in the community health survey data, it could be confirmed that there were differences between the social classes on the subjective oral health. It was possible to identify the oral health inequality between the social classes by classifying the occupations used as the main indicators for classifying social classes and the subjective level of oral health indicators linked to the oral health promotion as well as the quality of life of the elderly. It is considered that this will be used as the useful data to find alternatives, and hence, to achieve the oral health equity by resolving the gap in oral health between the social classes in the future, it is considered that follow-up studies are needed as it is supplemented by a longitudinal study design survey. Despite the limitations of the study, this study may be used as the useful grounds and the basic data for the regional health policy development and project execution to reduce health disparities if further studies are conducted to identify and articulate the characteristics of each social class demonstrating the vulnerability of the subjective oral health determinants derived from the research results using the local community health survey, which is a legal survey data in Korea.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- Ahn, E. S., Hwang, J. M., & Shin, M. S. (2015). Dental utilization associated factors among elderly. *J Dent Hyg Sci*, 15(1), 60-6.
- Ahn, E. S., & Shin, H. S. (2015). On decomposing the determinants of dental utilization inequalities. *JKOSJ*, 20(2), 140-59.
- Bank of Korea. (2020). Evaluation of Growth Unbalanced after the COVID-19 Crisis: Differentiated shocks between countries and sectors within the country and their impact on the economy

- [Internet]. Bank of Korea; BOK Issue Note. [cited 2020 December 21] Available from: <https://www.bok.or.kr/portal/bbs/P0002353/view.do?nttId=10061835&menuNo=200433>.
- Chandola, T., Bartley, M., Wiggins, R., & Schofield, P. (2003). Social inequalities in health by individual and household measures of social position in a cohort of healthy people. *J Epidemiol Community Health, 57*(1), 56-62.
- Hakeberg, M., & Wide Boman, U. (2017). Self-reported oral and general health in relation to socio-economic position. *BMC Public Health, 18*(1), 63-70.
- Hamasha, A. A., Alshehri, A., Alshubaiki, A., Alssafi, F., Alamam, H., & Alshunaiber, R. (2018). Gender-specific oral health beliefs and behaviors among adult patients attending King Abdulaziz Medical City in Riyadh. *Saudi Dent J, 30*(3), 226-31.
- Jeong, H. J., & Lee, J. H. (2019). The association of subjective oral health awareness with dental caries, dental prostheses, periodontal status of Korean adults. *J Korean Acad Oral Health, 43*(1), 8-13.
- Jo, E. D., Kim, E. S., Hong, H. K., & Han, G. S. (2019). Factors analysis of the oral health-related quality of life in the elderly. *J Korean Soc Dent Hyg, 19*(1), 55-64.
- Jung, M. H., Kim, S. S., Kim, Y. S., & Ahn, E. S. (2014). Relationship of socioeconomic status to self-rated oral health. *J. of dental hygiene science, 14*(2), 207-13.
- Kang, Y., & Jung, K. (2012). The relationship between income inequality and self rated health status-using koeran labor and income panel study data. *Korean Public Admin Rev, 46*, 265-91.
- Kim, C. S., Han, S. Y., Lee, S. E., Kang, J. H., & Kim, C. W. (2015). Dental care utilization for examination and regional deprivation. *J Prev Med Public Health, 48*(4), 195.
- Kim, D. J., Lee, S. Y., Ki, M., Kim, M. H., Kim, S. S., Kim, Y. M., Yoon, T. H., Jang, S. L., Jeong, C. K. H., Choi, H. L., & Lee, J. A. (2013). Developing health inequalities indicators and monitoring the status of health inequalities in Korea. *Korea Institute for Health and Social Affairs Research report, 44*-53.
- Kim, H. R., Kang, Y. H., Youn, K. J., & Kim, C. S. (2004). Socioeconomic health inequalities and counter policies in Korea. Seoul: Research report of the korea institute of health and social affairs. 03, 280-82.
- Kim, H. S., Ahn, E., Kim, M. Y., Kim, S. M., & Shin, H. (2014). Trends of household income and dental care spending. *Journal of Korean Academy of Oral Health, 38*(1), 17-24.
- Kim, J. H. (2018). Socioeconomic status in perceived oral health and contribution of oral health behavioral factors on convergence. *Journal of the Korea Convergence Society, 9*(9), 337-43.
- Kim, J. H., Hong, M. H., & Jeong, M. A. (2010). Subjective oral health awareness level and quality of life study. *J. of the Korea Convergence Society, 1*(1), 57-67.
- Kim, M. K., Chung, W. J., Lim, S. J., Yoon, S. J., Lee, J. K., Kim, E. K., & Ko, L. J. (2010). Socioeconomic inequity in self-rated health status and contribution of health behavioral factors in Korea. *J. of Preventive Medicine and Public Health, 43*(1), 50-61.
- Kim, M. Y., & Jang, Y. J. (2021). Determinants influencing oral examination experience behavior of the elderly. *J Korean Soc Dent Hyg, 21*(5), 585-94.
- Kim, S. Y., & Kim, N. H. (2019). Change over a period of 9 years in self-reported oral health of a middle-aged population using 4-6th KNHANES data. *Journal of Korean Academy of*

- Oral Health*, 43(2), 50-5.
- Kim, Y. M., & Kim, M. H. (2007). Health inequalities in Korea: Current conditions and implications. *J Prev Med Public Health*, 40(6), 431-38.
- K-indicator. (2022). Subjective health status. [Internet]. K-indicator. [cited 2022 July 15] Available from: <https://www.index.go.kr/unify/idx-info.do?idxCd=8082>.
- Lee, W. I. (2020). Oral health disparities in older adults according to household income and residential area. *Humanities and Society* 21, 11(2), 1357-370.
- Li, K. Y., Okunseri, C. E., McGrath, C., & Wong, MCM. (2018). Trends in self-reported oral health of US adults: National Health and Nutrition Examination Survey 1999-2014. *Community Dent Oral Epidemiol*, 46(2), 203-11.
- Ministry of Health and Welfare. (2021). OECD Health Statistics on Health Care in Korea[Internet]. Ministry of Health and Welfare Press Release. [cited 2021 July 20] Available from: https://www.mohw.go.kr/react/al/sal0301vw.jsp?PAR_MENU_ID=04&MENU_ID=0403&CONT_SEQ=366529.
- OECD. (2022). Promoting Healthy Ageing: Most Recent OECD Contributions to the G20 [Internet]. OECD. [cited 2022 July 15] Available from: <https://www.oecd.org/g20/topics/global-health/G20-Promoting-Healthy-Ageing-booklet.pdf>.
- Park, J. H., Jeong, S. H., Lee, G. R., & Song, K. B. (2008). The impact of tooth loss on oral health related quality of life among the elderly in Seongju. Korea. *J Korean Acad Dent Health*, 32(1), 63-74.
- Sanders, A. E., Spencer, A. J., & Stewart, J. F. (2005). Clustering of risk behaviours for oral and general health. *Community Dent Health*, 22(3), 133-40.
- Seo, J. H., Kim, H., & Shin, Y. J. (2010). Analysis for the impact of adulthood and childhood socioeconomic positions and intergenerational social mobility on adulthood health. *J. of Preventive Medicine and Public Health*, 43(2), 138-50.
- Seoul national university industry-academic cooperation group of the ministry of health and welfare. (2020). Strategies for promoting new health policies to improve healthy aging and health equity. Ministry of Health and Welfare Research Report.
- Shin, B. M., Bae, S. M., Yoo, S. H., & Shin, S. J. (2016). Oral health and occupational status among Korean adults. *J Dent Hyg Sci*, 16(3), 225-34.
- Shin, H. S. (2018). Social gradients in oral health status in Korea population. *Arch Oral Biol*, 95, 89-94.
- Silva, D. A., Peres, K. G., Boing, A. F., González-Chica, D. A., & Peres, M. A. (2013). Clustering of risk behaviors for chronic noncommunicable diseases: a population-based study in southern Brazil. *Prev Med*, 56(1), 20-4.
- Song, A. H., & Youn, H. J. (2019). A study on the relationship between socioeconomic level and oral health: analysis of data from the Sixth Korean National Health and Nutritional Examination Survey. *J Korean Soc Dent Hyg*, 19(4), 565-75.
- Yang, H. J., & Suh, W. S. (2018). Differences in oral health behavior and quality of life among the elderly depending on income and education levels. *J Korean Soc Dent Hyg*, 18(2), 217-26.
- 10 secrets about oral and systemic health. [Internet]. MD journal daily. [cited 2022 July 15] Available from: <http://www.mdjournal.kr/news/articleView.html?idxno=29698>.

