Impacting Factors of Oral Health Status on EQ-5D among the Elderly; The 6th Korea National Health and Nutrition Examination Survey

Hye Sook Choi¹ and Moon Hee Kwon²*

¹Department of Dental Hygiene, Kyungdong University, Gangwon-Do, Korea; chs@kduniv.ac.kr
²Department of Nursing, Kyungdong University, Gangwon-Do, Korea; kmh@kduniv.ac.kr

Abstract

Objectives: The oral health status has reported to be as an important factor of EQ-5D. This study was to find out the effect of oral health status on EQ-5D in the Korean elderly. Methods/Statistical Analysis: A cross-sectional view study was conducted on a general population basis. 1097 subjects were participated and checked on socioeconomic history, smoking, drinking, regular dental visit and EuroQol-5D. The oral health status as periodontal disease treatment, chewing and speaking was measured. The data was analyzed using multi-level logistic regression for the impacting factors of oral health on EQ-5D with complex sampling methods by SPSS (ver.21.0). Findings: These results reported that chewing difficulty was the strongest impacting factor on EQ-5D. The other factors on EQ-5D were being younger, male, near rich and more walking activity. The elderly who had chewing difficulty was more likely to have low EQ-5D and had an independent effect statistically. This study was valuable in the view of rapidly increasing older people subjects in Korea. These results are valuable for the elderly who are rapidly increasing in Korea. According to existing reports, teeth missing number was closely connected with health outcomes and these are in consensus with this study results. Application/Improvements: Oral health management such as chewing difficulty and speaking may be very important strategy to improve the Quality of Life especially in the elderly population.

Keywords: Chewing, EQ-5D, Impacting Factor, Oral Health Status, Speaking, The Elderly

1. Introduction

Oral health is an indispensable factor to general quality of life among the elderly. Poor oral health status can be source of diminished quality of life and caused of pain and suffering as well as may cause sleep disturbance, depression and psycho-social outcomes. In addition to that, older people are facing with a risk of chronic conditions, like developing hypertension, diabetes. According to previous studies, older people who have bad oral health have a lower life satisfaction as well as poor psychological health. Study results indicate lower oral health status such as tooth loss, periodontal disease is associated with being impact negatively on quality of life and also being a significant impact about quality of life of diabetic subjects.

In Palma and colleagues analyzed about the association between health-related quality of life and periodontal diseases in Brazilian and the relevant individual factors among the adults by using Unified Health System. They found that bad periodontal problems are connected with quality of life, presumed according to the self-reported of health. They identified that the odds on taking dental examination services were lower in those with lower wealth and income status. Our study was performed to find out the impacting factors of oral health status about quality of life in the Korean elderly, applying multilevel analysis to know the effect of oral health status variables, in addition to analyzing the impacting factors with individual characteristics and oral health status variables.

*Author for correspondence
2. Materials and Methods

2.1 The Data Source

We used the available data excluding the missing values from the 6th KNHANES (Korea National Health and Nutrition Examination Survey). The KNHANES data have been started in the public health level on health and health related behaviors, as well as food and nutrition data as a nationally representative data since 1998. Also this survey was a cross-sectional one with stratified random sampling. So we analyzed the data with complex sampling method. Because complex sampling data was designed according to the KNHANES, if they will be used by applying a weight to analyze the parameters it has the advantage that can be generalized. Raw data were used to the procedure of provided guidance published on the web-site.

2.2 Selection Process of the Subject

Considering the questionnaire of oral health status and EQ-5D, the study subjects were 65 and older aged, with one of the major problems of the elderly. Also, the missing values for each variable were excluded.

2.3 Outcome Measures and Statistical Analysis

Considering Baseline characteristics of the groups were investigated by chi-square test and used data from 1097 subjects aged 65 and older (demographic characteristics, weighted frequencies and percentages). Multilevel logistic regression was applied to find out the impacting factors of oral health status on EQ-5D of the elderly in the community by using SPSS (ver. 21.0). A probability (P) value of less than 0.05 as significant level was used.

3. Study Results

It Table 1 shows individual and oral health characteristics of the sample. The mean of EQ-5D of the elderly was 8.29±0.7. The elderly, over one-half were female (57.0 percent). The mean (standard deviation) age was 72.70 (±2.3) years. More than half of the participants had under elementary school (66.2 percent). About 24.9 percent was reported below the poverty guideline. One in three elderly reported having periodontal care, but less than 65 percent indicated they had no walking state. Multilevel analysis results Table 2 indicated that chewing difficulty was the most impacting factor on EQ-5D of the elderly and being older and female and no walking, and lower income were associated with lower odds of EQ-5D. Among oral health status variables, chewing difficulty had significant independent effect on EQ-5D of the elderly after adjustment for the individual factors.

| Table 1. Characteristics of the study sample (N=1097) |
|---------|-------|-----|
| Age     | N     | %   |
| 65-69   | 377   | 34.3|
| 70-79   | 578   | 52.3|
| over 80 | 142   | 13.4|
| Sex     |       |     |
| male    | 473   | 43.0|
| female  | 624   | 57.0|
| Education |     |     |
| elementary | 714 | 66.2|
| middle   | 146   | 13.5|
| high     | 165   | 14.1|
| university | 72  | 6.2 |
| Chewing |       |     |
| no       | 577   | 51.6|
| yes      | 520   | 48.4|
| periodontal disease treatment |     |     |
| no       | 353   | 65.8|
| yes      | 184   | 34.2|
| Income   |       |     |
| poor     | 277   | 24.9|
| near poor| 277   | 24.5|
| near rich| 267   | 23.7|
| rich     | 276   | 26.8|
| Working |       |     |
| no       | 709   | 64.8|
| yes      | 388   | 35.2|
| Marital status |    |     |
| married  | 1092  | 99.6|
| single   | 5     | 0.4 |
| Drinking |       |     |
| no       | 733   | 66.0|
| yes      | 364   | 34.0|
| Smoking  |       |     |
| no       | 975   | 89.4|
| yes      | 122   | 10.6|
| Chewing |       |     |
| No       | 721   | 67.2|
| Yes      | 376   | 32.8|
| Speaking |       |     |
| No       | 514   | 48.2|
| Yes      | 583   | 51.8|
| Total    | 1097  | 100.0|

*: n = 537
4. Discussion

As we know of it, this is the first study that researchers confirmed the impacting factors of both individual characteristics and oral health status level on EQ-5D among the elderly in Korea by multi-level logistic regression analysis. The results show that the chewing difficulty was the most impacting factor about the quality of life of the Korean elderly and being older, female, no walking and lower income were associated with lower quality of life and these results are consistent with those of late studies. Previous reported that teeth missing number means health outcome collected across lifespan among older adults.

In conclusion, oral health was strongly related with quality of life in Korean elderly. Chewing difficulty had significant and independent effect on EQ-5D and being older, female, less walking and lower income were major impacting individual factors on lower EQ-5D. And this result was concordant with the late Spain study that...
Impaired oral health was associated with mastication having negative effects on the quality of life of the old.\textsuperscript{[4,5]}

The chewing difficulty among the oral health status variables can be considered as the predictor of EQ-5D among the Korean elderly. Therefore, to keep and improve the quality of life of the Korean elderly, we should consider intervening strategies on health and nursing policy tailored at individual characteristics and oral health status level in advance.

5. References

1. Snyder A. Oral health and the triple aim: evidence and strategies to improve care and reduce costs. National Academy for State Health Policy. 2015 Apr. p. 1–14
2. Sim SJ. Association between oral health status and perceived general health (EuroQol-5D). Journal of Dental Hygiene Science. 2014 Aug; 14(3):364–70.
3. Bennadi D, Reddy CVK. Oral health related quality of life. Journal of International Society of Preventive and Community Density. 2013 Jan–Jun; 3(1):1–6.
4. Montero J, Albaladejo A, Zalba JI. Influence of the usual motivation for dental attendance on dental status and oral health-related quality of life. Medicina Oral, Patologia Oral Y Cirugia Bucal. 2014 May; 19(3):e225–31.
5. Newton JT, Asimakopoulou K. Managing oral hygiene as a risk factor for periodontal disease: A systematic review of psychological approaches to behaviour change for improved plaque control in periodontal management. Journal of Clinical Periodontology. 2015 Mar; 42(S16):S36–46.
6. Halawany HS, Abraham NB, Jacob V, Al Amri MD, Patil S. Is psychological stress a possible risk factor for periodontal disease. A systematic review. Journal of Psychiatry. 2015; 18(1):1–7.
7. Palma PV, Caetano PL, Leite ICG. Impact of periodontal diseases on health-related quality of life of users of the Brazilian unified health system. International Journal of Dentistry; 2013 Nov. p. 1–6.
8. Batista MJ, Lawrence HP, De Sousa MDLR. Impact of tooth loss related to number and position on oral health quality of life among adults. Health and Quality of Life Outcomes. 2014 Nov; 12(1):1–10.
9. Rao A, Shenoy R, Rao A. Impact of periodontal health on the quality of life among diabetics. International Journal of Advanced Research. 2014 Jun; 2(6):608–13.
10. Meusel RDZD, Ramacciato CJ, Motta R, Brito BR, Flório MF. Impact of the severity of chronic periodontal disease on quality of life. Journal of Oral Science. 2015 Jun; 57(2):87–94.
11. Gabardo MCL, Moysés SJ, Moysés ST, Olandoski M, Olinto MTA, Pattussi MP. Multilevel analysis of self-perception in oral health and associated factors in Southern Brazilian adults: A cross-sectional study. Cadernos de Saúde Pública. 2015 Jan; 31(1):49–59.
12. Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, Li CH. Trends in oral health status: United States, 1988–1994 and 1999–2004. Vital and health statistics. Series 11. Data from the National Health survey. 2007; 248:1–92.
13. Luo J, Wu B, Zhao Q, Guo Q, Meng H, Yu L, Ding D. Association between tooth loss and cognitive function among 3063 Chinese older adults: A community-based study. PloS one. 2015 Mar; 10(3).
14. Gil-Montoya JA, de Mello ALF, Barrios R, Gonzalez-Moles MA, Bravo M. Oral health in the elderly patient and its impact on general well-being: a nonsystematic review. Clinical Interventions in Aging. 2015 Feb; 10:461–7.
15. Martín JM, Pérez MB, López-Valverde A, Llodra-Calvo JC. Clinical and sociodemographic predictors of oral pain and eating problems among adult and senior Spaniards in the national survey performed in 2010. Oral Medicine and Pathology. 2015 Jul; 20(4):e393–401.