



ANTERIOR, BUT NOT POSTERIOR, TOOTH LOSS IS ASSOCIATED WITH MORE FREQUENT COGNITIVE IMPAIRMENT AND WORSE SELF-REPORTED ORAL HEALTH IN COMMUNITY DWELLING ELDERLY



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1. Introduction

Oral health is risk factor for interference with cognitive function. The number of teeth lost is associated with oral health-related quality of life (OHR-QoL).

2. Objective

This study aimed to examine tooth loss distribution and the impact on OHR-QoL perception in cognitively impaired and cognitively normal groups.

3. Materials and Methods

This cross-sectional study examined community-dwelling elderly aged ≥ 60 years in Indonesia. Cognitive status was assessed by a clinical psychotherapist by using the mini mental state examination (MMSE) with a score range of 0-30. Participants with a total score of < 25 were defined as having cognitive impairment and normal have a total score of ≥ 25 . Dental status was examined by a dentist and involved the number of anterior and posterior teeth lost. An interview was conducted to collect information on socio-demographic characteristics and self-reported perception of oral health and functional status using a part of an oral health-related quality of Life (OHR-QoL) questionnaire. The questionnaire used a 0-4 scale. A Mann-Whitney test for numerical and Chi-Square for categorical data were used to compare the groups. The Spearman correlation test was used to analyse the correlation between number of anterior teeth lost and self-reported oral health with the MMSE score. For all tests, a p-value < 0.05 was considered statistically significant.

4. Results

There were 13 subjects in the cognitive impairment group and 42 subjects in the normal cognitive group. The cognitive impairment group showed a significantly lower education level compared to the normal group, $p < 0.05$. There was a significant difference in anterior tooth loss for the cognitively impaired compare to the normal group, $p < 0.05$. The Spearman correlation test showed anterior tooth loss related to the MMSE score with a weak association ($r = -0.294$; $p < 0.05$) in our study.

Table 1. Characteristics of subjects and tooth loss distribution in the cognitive impairment group compare to the normal group in community-dwelling elderly according to MMSE category

Demographics	N=55	Normal (n=42) MMSE Score ≥ 25	Impairment (n=13) MMSE Score < 25	P value
Age (mean,SD)	68.47 (± 7.35)	68.02 (± 7.20)	69.92 (± 8.04)	
Education (mean,SD)	7.81 (± 3.528)	8.47 (± 3.31)	5.69 (± 3.50)	*p < 0.05
Sex (%)				
Man	(15) 27.3	(10) 23.8	(5) 38.5	
Woman	(40) 72.7	(32) 76.2	(8) 61.5	
Occupation (%)				
Entrepreneur	(4) 7.3	(3) 7.1	(1) 7.7	
Government employee	(2) 3.6	(2) 4.8	-	
Labourer	(4) 7.3	(1) 2.4	(3) 23.1	
Retired	(6) 10.9	(5) 11.9	(1) 7.7	
Housewife	(39) 70.9	(31) 73.8	(8) 61.5	
Systemic disease (yes;%)				
Hypertension	(23) 41.8	(17) 40.5	(6) 46.2	
Diabetes	(3) 5.5	(2) 4.8	(1) 7.7	
Cardiovascular	(6) 10.9	(4) 9.5	(2) 15.4	
Stroke	(2) 3.6	(2) 4.8	-	
Tooth loss (mean,SD)				
Anterior tooth loss (mean, SD)	3.07 (± 4.07)	2.36 (± 3.75)	5.38 (± 4.35)	*p < 0.05
Posterior tooth loss (mean, SD)	8.89 (± 4.48)	8.60 (± 4.43)	9.84 (± 4.70)	

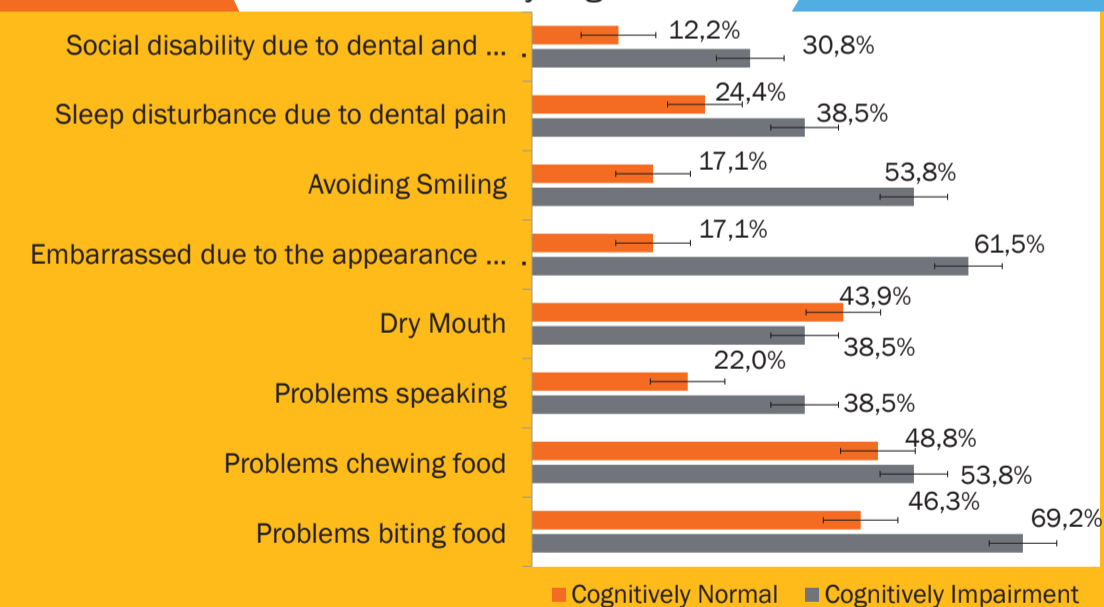


Figure 1. Elderly's perception in OHR-QoL

Reference:

- Karmacharya, P., Saha, S. & Kumari, M., 2017. Comparison of Chewing Ability, Oral Health - related Quality of Life, and Nutritional Status before and after the Insertion of Complete Denture among Edentulous Patients in Lucknow. pp.145-150. Kimura, Y. et al., 2013. Evaluation of chewing ability and its relationship with activities of daily living, depression, cognitive status and food intake in the community-dwelling elderly. *Geriatrics and Gerontology International*, 13(3), pp.718-725.
- Kubo, K., Chen, H. & Onozuka, M., 2013. The Relationship Between Mastication and Cognition.
- Luo, J. et al., 2015. Association between tooth loss and cognitive function among 3063 Chinese older adults: A community-based study. *PLoS ONE*, 10(3).
- Mummolo, S. et al., 2014. Relationship between mastication and cognitive function in elderly in L' Aquila. 7(4), pp.1040-1046.
- Musacchio, E. et al., 2007. Tooth loss in the elderly and its association with nutritional status, socio-economic and lifestyle factors. (December 2005), pp.78-86.
- Nilsson, H., Berglund, J. & Renvert, S., 2014. Tooth loss and cognitive functions among older adults. *Acta odontologica Scandinavica*, 72(8), pp.639-644.
- Pusat data dan Informasi Kementerian Kesehatan Republik Indonesia, 2017. *SITUASI LANSIA DI INDONESIA TAHUN 2017 INDONESIA GAMBAR STRUKTUR UMUR PENDUDUK INDONESIA TAHUN 2017*, Indonesia.
- Batista MJ, Lawrence HP, Rosário L. Impact of tooth loss related to number and position on oral health quality of life among adults. *Health Qual Life Outcomes* [Internet]. 2014;12:1-10. Available from: <http://www.hqlo.com/content/12/1/165>.
- Umiyati H, Surachmin A, Ambarsati G. The relationship between anterior tooth loss and quality of life among elderly in Posbindu, Bojongsangka, Kelapa Dua Sub-District, Tangerang, Jakarta-Indonesia. *Bali Med J*. 2018;7(3):626-30.
- Kusdhany LS, Sundjaja Y, Fardaniah S, Ismail RI. Oral health related quality of life in Indonesian middle-aged and elderly women. *Med J Indones*. 2011;20(1):62-5.

The elderly's perception of OHR-QoL is presented more frequent and worse in the cognitive impairment group (Figure 1). The feeling of embarrassment due to the appearance of the teeth was significantly different between the groups, $p < 0.05$, and there was a weak correlation between feeling embarrassed due to the appearance of the teeth with MMSE score ($r = 0.298$; $p < 0.05$). The large number of anterior teeth lost may be due to caries or traumatic injury. In this study, we found a significantly lower education level in the cognitive impairment group. These conditions will impact the possibility of minimal access to health information and low income. Missing teeth should be replaced with removable or fixed prostheses. This treatment is expensive. Elderly with a low education level have cognitive impairment and low focus in general health issues. They have not prioritised oral health for treatments that will improve speech, chewing, aesthetic, and even cognitive function. The paradigm in old age, who accepts the slowly degenerating process as a part of a cycle of life. Future studies should take these into consideration with a large sample size and need to explore the underlying mechanism.

5. Conclusion

Elderly with a low education level have cognitive impairment, anterior tooth loss, and feel embarrassed due to the appearance of their teeth. There is a weak association between anterior tooth loss and feeling embarrassed due to the appearance of the teeth with cognitive function.