

## Oral Health Knowledge, Denture Status, and Oral Health Related Quality of Life of the Elderly

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### Abstract

The knowledge level about oral health and denture status are factor that affects elderly people's quality of life. Indonesia needs an instrument to measure/analyze the correlation between oral health knowledge as well as denture status and quality of life. The research objective of this study is to describe the oral health knowledge, denture status and oral health related quality of life of the elderly. 101 elderly people were analyzed using data recording, intraoral examination, and an interview questionnaire for oral health knowledge and quality of life. In rural areas, the elderly have less knowledge of oral health, and thus the denture demand is lower in rural areas than in urban areas. OHI-S and economic levels are the main factors that associated with the quality of life of the elderly.

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### Introduction

The aging process is a normal, biological condition, and is a universal phenomenon. However, the aging process is accompanied by declining overall body function, which may contribute to the quality of life of the elderly.<sup>1</sup> In Indonesia, according to Law No. 13 of 1998, the term elderly (elderly) is defined as a person who is age 60 or older.<sup>2</sup> According to the Indonesian Ministry of Health, the elderly category has two levels; the first level is termed pre-aged (age 45-59 years old), and the second level is termed elderly (age ≥60 years old).<sup>3</sup> The results of the Indonesian basic health research study showed a tooth loss prevalence of 1.8% for the age range of 45-54 years old and a tooth loss prevalence of 17.6% for the 65 years and older group.<sup>4</sup> Quality of life disorders due to decreased chewing and swallowing function was higher in patients with tooth loss that was not replaced with dentures.<sup>5</sup>

In India, a study by Verma (2008) showed that the elderly had a better quality of life in urban areas than in rural areas<sup>1</sup>. In another study, Smith A et al (2013) stated that a higher level of education or frequent visits to the dentist is closely related to a high level of oral health knowledge. These studies seem to indicate the possibility of a relationship between the level of knowledge of oral health and the quality of life of the elderly.<sup>6</sup> A good level of oral hygiene will improve the prevention and treatment of oral hygiene.<sup>6</sup> This will encourage the elderly to improve oral hygiene, including using artificial as a means to improve their quality of life. Based on these assumptions, this research tries to analyze the correlation of the elderly's knowledge level of oral health and denture status to the quality of life of elderly in Indonesia. In order to determine the level of knowledge one possesses about oral hygiene, a valid measuring tool is needed. Therefore, this study also aims to ascertain the elderly's general level of knowledge regarding oral health. The results of this study are expected to be used in promoting oral hygiene among the elderly, particularly emphasizing the role of dentures in improving the elderly's quality of life.

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### Materials and methods

This study is a cross-sectional study. Subjects were taken by convenience from the

elderly group in the Posbindu Lansia community, Sukmajaya Subdistrict, Depok, and Cicantayan Village, Sukabumi. This research began with an explanation of the subject. This was followed by filling an informed consent, a general health information retrieval, a dental status checkup, and filling the quality of life questionnaire of oral health knowledge and quality of life of the elderly. A univariate data analysis was conducted to determine the general description of the sample population. Furthermore, the data was processed categorically, thus the continuous variable was modified into categorical data as well. Then, the Chi Square test was used to determine the correlation between the variable level of knowledge of oral hygiene, denture status, sociodemographic factor, OHIS, and quality of life of the elderly. The multivariate logistic regression was employed to analyze the determinant factors of the elderly's quality of life.

## Results

Overall, of the 101 subjects obtained, according to inclusion and exclusion criteria, the age of the subjects in the study was 60-93 years old. The majority of the subjects were women, that is 82.2% (83 people), while the male subjects accounted for 17.8% (18 people). A total of 65 study subjects lived in the city (64.4%), and 36 study subjects were located in the village (35.6%). Based on the number of original teeth, there were 8 subjects (7.9%) who still had complete set of teeth, 42 subjects (41.6%) had lost 1-8 teeth, and 51 subjects (50.5%) had lost more than 8 teeth. Based on the data of the number of teeth lost, only 24 subjects (23.8%) used dentures, while 77 (76.2%) subjects did not replace the lost teeth with dentures. Furthermore, out of a total of 24 subjects using artificial teeth, all of them use partially removable partial dentures from acrylic materials. Of the total 24 subjects, there are 2 subjects who claim to have had their dentures made by a dentist, and these subjects resides in urban areas.

Regarding level of education, most of the subjects did not complete primary school (77.8%), while the remaining 8 subjects (22.2%) only finished primary school. This shows that the level of education and oral health knowledge for subjects in the village is very low. There were only 5 subjects (13.9%) who fell into the category of high oral knowledge levels. 31 subjects (86.1%) had low oral knowledge levels. There

were 23 subjects (63.9%) who experienced a tooth loss of more than eight teeth. The level of subject education in urban areas is more evenly distributed with 46.2% graduated from senior high school, and there are 10.8% who continued their education to diploma, and only one subject 1.5% who earned a Bachelor's degree. Level of education might effects the denture utilization status. Of the 28 elderly people (43.1%) who had lost more than eight original teeth, 23 of them were using artificial teeth.

This questionnaire consisted of five dimensions and a total of 23 questions. The initial questionnaire of level knowledge of oral hygiene, comprised of 20 questions. In the end, 13 questions were obtained after a validity and reliability test. The correlation strength of the two variables can be qualitatively divided into four categories namely,  $r = 0.00-0.25$  no relationship or weak relationship,  $r = 0.26-0.50$  intermediate relationship,  $r = 0.51-0.75$  strong relationship, and  $r = 0.76-1.00$  strong/perfect relationship.<sup>7</sup> Then, determination of intersection of oral health knowledge level with receiver operating characteristic (ROC) was conducted. The result was obtained by having a cut of point of oral knowledge at point 17 on score 20 with a 61.3% sensitivity value and specificity value of 64.1% and an under-the-curve-value (AUC) of 0.674 as in figure 1.

The level of knowledge of oral health on the subject of research after applied to the intersection is as follows: 49 subjects (48.5%) have high oral knowledge (0-20 score), and the rest, 52 subjects (51.5%), have a low level of oral hygiene (score greater than 20). After obtaining the intersection, a bivariate analysis was done to find out the correlation between the sociodemographic factor and the level of oral health knowledge using Chi Square test. This research shows the existence of a sociodemographic factor correlation to the level of knowledge of oral hygiene, relationship of denture status, OHIS status, and to the quality of life of the elderly. The OHIS score and the economic level have a significant relationship with the quality of life. The association of age, gender, education level, geographical location, and denture ware are statistically not significant to quality of life. From the results of the statistical analysis process for the multivariate model, the age and knowledge level variables were excluded because they did not have a significant

relationship with the quality of life. Based on the observation of the odds ratio, subjects with poor quality of life is 3.2 times greater in subject with OHIS score above 3. For subjects with high economic level (above Rp 1,400,000 / month), the potential for a non-occurrence of poor quality of life is 3.1 times greater than the subject who has a low economic level (less than Rp.1.400.000 / month).

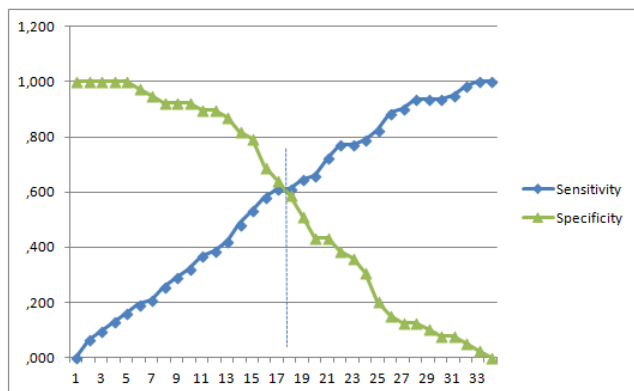


Figure 1. Intersection of knowledge of oral health

## Discussion

In this study, knowledge level of oral hygiene of the elderly was measured using a validated questionnaire. Based on all data obtained, 101 elderly people entered the study, and this included 83 female subjects and 18 male subjects. Of the 101 subjects, 65 of the subjects live in the city, and the remaining 36 subjects live in the village. Only 24 elderly people wore dentures, and of these, one subject came from a rural area while the other 23 subjects came from urban areas. This suggests that elderly dental treatment or care in the village is lower than in urban areas. Many factors influenced this study, such as knowledge level of the elderly about oral hygiene, socioeconomic level, demographic characteristics in addition to gender, social structure, ability factor, physical condition, respondent's perception of the price of making artificial teeth, the distance from the house to the nearest service, and the fear of procedures for the manufacture and installation of artificial teeth.<sup>8</sup> The use of questionnaires provides an advantage because the questions posed to the subject can be complete, systematic, and uniform for all subjects. The tendency of the interviewer to direct the answer of the subject can reduce the accuracy of research data. This can be anticipated

by conducting extensive interviewer and calibration training.

The oral knowledge questionnaire used in this study is a simplification of the questionnaire generated by Sharda et al., which is a general oral hygiene level questionnaire rather than a questionnaire devoted to the subject of the elderly.<sup>6,9</sup> This is done to obtain more accurate and targeted results regarding the societal condition of the elderly in Indonesia. Thirteen questions were obtained after a validity and reliability test. The receiver operating characteristic (ROC) results obtained a cutoff point of oral knowledge at point 17 on a score of 20 with a sensitivity value of 61.3% and a specificity value of 64.1% and an under-the-curve (AUC) value of 0.674. The reliability of the questionnaire test was conducted to ensure that the questionnaires used in this study were valid and reliable. This was done by determining Chronbach's alpha coefficients. Based on statistical calculation, the Cronbach alpha coefficient value in this research is 0.816, which shows the internal consistency and reliable questionnaire. Questions that have a Chronbach's alpha coefficient value above 0.816 are excluded from the questionnaire to prevent the occurrence of bias.

The first step in doing a bivariate analysis between the variables of oral health knowledge level and various other variables is to find and determine the cut point of the oral health knowledge level. The intersection is the boundary between normal and abnormal conditions.<sup>10</sup> With the ROC procedure, there was a cut point of the oral knowledge level at point 17 on a 20-point scale with a sensitivity value of 61.3%, a specificity value of 64.1%, and an under-the-curve (AUC) value of 0.674, as shown in Figure 1. The intersection with high sensitivity values indicates the high ability of measuring devices to detect abnormalities, so that nothing is missed in the screening of quality of life. The level of knowledge of oral health on the study sample after application was applied according to the cut point, 49 subjects (48.5%) had high oral knowledge (0-20 score) and the remaining 52 subjects (51.5%) had low oral health knowledge (score more than 20). Our results are in accordance with the results of other studies. The 2007 Indonesian basic health study also found that there was a correlation between one's economic level and one's level of oral health knowledge. Groups with a low economic level have a low oral

knowledge. This is in accordance with previous research, which states that socio-economic level are associated with the level of oral hygiene knowledge. Based on the results of the study, 39 (38.6%) of the elderly subjects had an OHIS 0-3 score, and 62 (61.4%) of the elderly subjects had an OHIS score above 3. The results showed that, individually, elderly subjects paid less attention to their oral hygiene. Please verify. As in other studies,<sup>7</sup> this suggests that oral hygiene is a problem among elders, who may be at an increased risk of periodontal diseases. The high OHIS score may suggest that the elderly have not experienced any disruption or limitations of function, and thus they do not feel that oral hygiene is important. Based on the data of the study, of a total of 101 subjects, only 24 subjects (23.8%) used dentures, while 77 subjects (76.2%) had lost at least one tooth, but did not use dentures. The small number of subjects who wear dentures can be explained by various factors. Some of the reasons expressed by the subjects who do not use artificial teeth are expensive cost of making teeth, discomfort with artificial teeth considered as foreign objects in the mouth, not feeling the need for dentures, resigned to their current condition, and also reluctance to come to dentist. Riadiani B<sup>11</sup> a study on the association between tooth loss and denture wear and concluded that the elderly's quality of life using artificial teeth was better than of those not using artificial teeth. The study further suggested that the number of teeth lost worsened the quality of life, there was a gap between need and demand (Demand) to the dentures and found that the need (need) is higher than the demand (demand).<sup>11,12</sup> The high rate of tooth loss and the low use of dentures to replace the missing original teeth in this study can be a contributing factor to poor oral health and can affect the quality of life of the elderly.

Based on the geographical location of the subjects using artificial teeth, there is a gap between rural and urban. Of a total of 24 subjects who used artificial teeth, only one subject came from a rural area, while 23 other subjects came from urban areas. When comparing the percentage of rural and urban elderly knowledge levels, it was found that the knowledge level of oral hygiene of elderly people in the high category (five subjects out of a total of 36 subjects) was lower than in urban elderly (44 subjects out of a total of 65 subjects). Overall, by

percentage, it is known that the elderly in rural areas have a low level of oral hygiene knowledge and low dentures demand. Elderly in urban areas have a high level of oral hygiene knowledge with high denture demand as compared to rural areas. In this study, factors that influence the quality of life include: age, gender, education level, economic level, OHIS, denture status, oral health knowledge level, and geographical location. From the results of the quality of life questionnaire in this study, it is known that the OHIS score and the economic level have a significant relationship to the quality of life. The OHIS score in this study represents the status of oral hygiene of the elderly. oral hygiene conditions that affect quality of life as the limiting one's ability to eat and feeling uncomfortable.<sup>10,13</sup> This is in accordance with the research of Rahardjo, et al., which states that in tooth loss that is not replaced by artificial teeth there is a decrease in the quality of life due to decreased mastication and ingestion function.<sup>14</sup> Further research needs to be conducted with more balanced subjects on dentures and geographic aspects in order to improve the analyses of the relationship between denture status, quality of life, and the knowledge level of oral health of the elderly in Indonesia.

## Conclusions

This study obtained a valid and reliable measure of the knowledge level of oral health of Indonesian elderly. There are significant correlations between the OHIS score, gender, economic level, and geographic position and the knowledge level of oral hygiene of elderly. The use of dentures and the knowledge level of oral hygiene of the elderly are higher in urban areas than in rural areas. The OHIS score and the economic level are the factors that most associated with the quality of life of the elderly.

## Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

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