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The Quality of Life Related to Oral Health Among The Elderly Based on Pathological Lesions in Soft Tissues: A Cross-Sectional Study

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Abstract

Background: *The elderly are defined as individuals aged 60 years and older. Oral health is important for the overall health and quality of life in the elderly population. The presence of soft tissue lesions in the oral cavity in the elderly, as a vulnerable group, merits attention due to its potential association with systemic health conditions and overall quality of life. Maintaining a high quality of life is crucial as it is closely linked to health, life satisfaction or happiness, which is being significantly influenced by health status. This study aimed to elucidate the quality of life related to oral health among the elderly based on pathological lesions in soft tissues.*

Method: *A descriptive analytical cross-sectional study was conducted using a purposive sampling technique. Data collection included participants' demographic information, administration of the Oral Health Impact Profile (OHIP-14) questionnaire, and comprehensive intra-oral examinations to detect pathological lesions. Data were analyzed using SPSS version 26. The Mann-Whitney U test was applied to compare quality of life scores between elderly individuals with and without pathological lesions.*

Results*: Among the 94 subjects examined, 36 were found to have pathological lesions while none of the 58 ($p=0.024$, $p<0.05$) showed a difference in the quality of life between elderly individuals with and without pathological lesions.*

Conclusion*: There is a significant difference in the quality of life related to oral health among the elderly, attributed to the presence of pathological soft tissues lesions.*

Keywords*: Elderly, Oral health, Pahological lesions, Quality of life, Soft tissues*

INTRODUCTION

The global population is witnessing a rise in longevity, with the majority anticipating to live beyond their sixties. By 2030, it is anticipated that almost one-sixth of the global population will be 60 years of age or older. Aging is linked to a gradual deterioration of physiological functions in the elderly, leading to the onset of different non-communicable diseases in later life. This group is increasingly susceptible to chronic diseases and disabilities, adversely impacting their quality of life. Hypertension, stroke, diabetes mellitus, and arthritis are common non-communicable disorders in elderly adults.[1,2] Furthermore, infectious diseases such as tuberculosis, pneumonia, and hepatitis present considerable health threats when immune systems deteriorate. The aging process induces physiological alterations in the oral mucosa and glands, characterized by diminished vascularization, decreased flexibility, and

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heightened mucosal permeability, hence rendering the oral cavity more vulnerable to infections and irritations.[3] Oral health is essential for the general well-being and quality of life in the elderly demographic. Poor oral circumstances, characterized by a significant prevalence of tooth loss, might impair oral cavity functionality and activities, hence influencing nutritional status and overall quality of life.[4] The occurrence of soft tissue lesions in the oral cavity among the elderly, a susceptible demographic, warrants consideration due to its possible correlation with systemic health issues and overall quality of life. Sustaining an improved quality of life is essential, since it is closely linked to health, life satisfaction, and happiness, all of which are significantly influenced by health condition.[5]

Worldwide, poor oral health in elderly people has been demonstrated by elevated rates of tooth loss, dental caries, and periodontal diseases, as well as other oral problems including xerostomia, mucosal lesions, precancerous lesions, and oral cancer.[6] Chronic hyposalivation leading to xerostomia is linked to numerous oral health complications, such as periodontal disease, dental caries, candidiasis, burning mouth syndrome, atrophy of tongue papillae, tongue fissures, and mucosal ulcers. These diseases may significantly impact the quality of life associated with oral health.[7,8]

Studies shows that oral mucosal lesions are more frequent in the elderly than to younger individuals, due to the aging process. Pathological lesions of the oral soft tissue, often resulting in considerable discomfort, are more common in the elderly due to heightened susceptibility to different pathologies associated with systemic disorders, age-related metabolic alterations, pharmacological treatments, and nutritional inadequacies. Consequently, the elderly are especially susceptible to common oral lesions such as traumatic ulcers, angular cheilitis, oral candidiasis, and various other illnesses.[9,10]

The Oral Health Impact Profile (OHIP) is one of the most commonly used instruments to assess Oral Health-Related Quality of Life (OHRQoL). The OHIP-14, is a shortened version of the original 49-item questionnaire. It consists of 14 questions designed to measure the frequency of oral health-related problems experienced by individuals. These questions cover seven components: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Responses were recorded on a 5-point Likert scale ranging from 0 (never) to 4 (very often). Higher summed scores indicate a greater negative impact on quality of life, reflecting poorer oral health–related quality of life.[11,12] This research aimed to elucidate the quality of life related to oral health among the elderly based on pathological lesions in soft tissues.

METHOD

Participants and Study Design

A cross-sectional descriptive analytical study was conducted using purposive sampling among residents of government-run nursing homes in East Jakarta in November 2023. Participants were eligible for inclusion if they were aged 60 years or older, resided at Panti Sosial Werdha Budi Mulia, and had provided written informed consent to participate in the study. This facility accommodates approximately 250 older adults and operates under government supervision, providing basic medical and dental services. Participants were selected through purposive sampling based on availability, willingness to participate, and ability to provide informed consent. Exclusion criteria included individuals with cognitive impairment or incomplete responses to the OHIP-14 questionnaire.

Measurement and Procedure

The Oral Health Impact Profile (OHIP-14) questionnaire was used as the primary assessment instrument. It consists of 14 items rated on a five-point Likert scale ranging from 0 (“never”) to 4 (“very often”). Individual item scores were summed to generate a total score ranging from 0 to 56, with higher scores indicating a greater negative impact on oral health-related quality of life. The primary outcome variable was the OHRQoL score from the OHIP-14. The exposure variable was the presence of clinically diagnosed pathological oral lesions. Confounders considered included age, gender, presence of systemic diseases, and medication use.

Statistical Analysis and Ethical Clearance

The sample size was 100 participants. Due to incomplete data submission, 6 subjects were excluded, resulting in a final sample size of 94 participants who met the inclusion and exclusion criteria. The sample size in this study was determined using Slovin’s formula, as the total population of elderly

individuals in the selected nursing homes was known to be 250. Assuming a margin of error of 10% (e = 0.10) and a 95% confidence level, the minimum required sample size was estimated to be 71 participants. In practice, 100 older adults were recruited; after the exclusion of incomplete responses, data from 94 participants were included in the final analysis. This exceeded the minimum requirement and ensured that the study had sufficient statistical power to generate reliable and representative results.

The collected data were analyzed using statistical software. The Kolmogorov–Smirnov test was performed to assess the normality of the data distribution. As the OHIP-14 scores were not normally distributed, the non-parametric Mann–Whitney U test was used to compare quality of life scores between groups. The results were presented in table format and further described narratively for clarity. To minimize selection bias, only residents who were able to fully cooperate during data collection were included. Measurement bias was reduced through standardized examiner training and the use of the validated OHIP-14 instrument. The study was approved by the Research Ethics Committee of the Research Institute, Universitas YARSI (Ethical Clearance No: 289/KEP-UY/EA.10/X/2023).

RESULT

This study was conducted at government nursing homes in Jakarta, involving a sample of 94 subjects. According to Table 1, the youngest subject was 60 years old, whilst the oldest was 90 years old, with an average age of 68 years. The most represented age group was the elderly (60-74 years) at 81.9%, while the oldest age group (75-90 years) constituted 18.1%. The gender distribution showed a predominance of female subjects, totaling 68 subjects (72.3%), compared to 26 male subjects (27.7%).

Table 1. Demographic Data

Variable	Category	N = 94	Percentage
Gender	Male	26	27.7%
	Female	68	72.3%
Age	60—74 years	77	81,9%
	75—90 years	17	18.1%
Systemic Diseases	Present	50	53.2%
	Absent	44	46.8%
Medication Use	Yes	54	57.4%
	No	40	42.6%

Table 2. Characteristics Pathological Lesions and Quality of Life of Elderly People

Variable	Category	N	Percentage
Type of Pathological Lesions	Traumatic Ulcer	18	19.1%
	Angular Cheilitis	8	8.5%
	Oral Candidiasis	5	5.3%
	Oral Lichen Planus	5	5.4%
	Atrophic Glossitis	3	3.2%
	Denture Stomatitis	1	1.1%
Number of Lesions per Subject	No lesion	58	61.7%
	One lesion	32	34.4%
	Two lesions	4	4.3%
Quality of Life Category	High (0—18)	64	68.1%
	Medium (19—37)	25	26.6%
	Low (38—56)	5	5.3%

The findings from this study revealed that among the 94 subjects examined, 36 presented with pathological lesions in the soft tissues of the oral cavity. A total of 7 different types of pathological lesions were identified, as shown in Table 2. Some subjects were found to have more than one pathological lesion upon examination. The prevalence of pathological lesions varied among the subjects, with 32 subjects (34.4%) having one lesion and 4 subjects (4.3%) presenting with two lesions.

In this study, the OHIP-14 total score was analyzed both as a continuous variable (ranging from 0 to 56) and categorized into three levels of oral health-related quality of life (OHRQoL) for descriptive

purposes: high (0–18), moderate (19–37), and low (38–56). These cut-off points were adapted from previous studies that applied similar thresholds in elderly populations to facilitate interpretation.[11,12] While these categories are not formally standardized, they have been commonly used in cross-sectional research involving OHIP-14 to support practical comparisons across studies. The chosen ranges also reflected the distribution of responses in our sample. This classification approach aimed to enhance interpretability while retaining the original scoring's sensitivity. The frequency distribution of subjects based on their OHIP-14 questionnaire responses, categorized into high, medium, and low quality of life, revealed that 64 subjects (68.1%) reported a high quality of life, 25 subjects (26.6%) a medium quality, and 5 subjects (5.3%) a low quality.

Table 3. The OHIP-14 Results as a Percentage of Each Score in All Participants

List of Question of OHIP 14	Never N (%)	Rarely N (%)	Occasionally N (%)	Fairly Often N (%)	Very Often N (%)
Functional Limitations					
Difficulty in speaking	63 (67.0)	8 (8.5)	8 (8.5)	10 (10.6)	5 (5.3)
Disturbed sense of taste	56 (59.6)	17 (18.1)	9 (9.6)	8 (8.5)	4 (4.3)
Physical Pain					
Pain/discomfort due to oral health issues	43 (45.7)	20 (21.3)	14 (14.9)	13 (13.8)	4 (4.3)
Discomfort when chewing	37 (39.4)	12 (12.8)	24 (25.5)	9 (9.6)	12 (12.8)
Psychological Discomfort					
Lack of confidence due to oral health issues	34 (36.2)	16 (17.0)	23 (24.5)	14 (14.9)	7 (7.4)
Emotional impact of oral health issues	52 (55.3)	15 (16.0)	13 (13.8)	8 (8.5)	6 (6.4)
Physical Disability					
Dissatisfaction with consumed food	48 (51.1)	18 (19.1)	15 (16.0)	5 (5.3)	8 (8.5)
Stopping chewing food due to oral health issues	43 (45.7)	12 (12.8)	26 (27.7)	9 (9.6)	4 (4.3)
Psychological Disability					
Difficulty relaxing due to oral health issues	45 (47.9)	20 (21.3)	18 (19.1)	6 (6.4)	5 (5.3)
Feeling embarrassed due to oral health issues	57 (60.6)	13 (13.8)	12 (12.8)	8 (8.5)	4 (4.3)
Social Disability					
Easily offended due to oral health issues	67 (71.3)	8 (8.5)	10 (10.6)	4 (4.3)	5 (5.3)
Difficulty in daily activities due to oral health issues	60 (63.8)	8 (8.5)	12 (12.8)	7 (7.4)	7 (7.4)
Handicap					
Feeling life is meaningless due to oral health issues	63 (67.0)	9 (9.6)	14 (14.9)	6 (6.4)	2 (2.1)
Feeling unable to function fully in society due to oral health issues	58 (61.7)	13 (13.8)	10 (10.6)	8 (8.5)	5 (5.3)

The analysis indicated that the most frequently reported OHIP-14 items were discomfort during chewing attributable to dental and oral problems (22.4%), lack of confidence due to oral health issues (22.3%), and spontaneous pain or discomfort in the mouth associated with dental problems (18.1%). Based on the categorized OHIP-14 scores, 64 participants (68.1%) were classified as having a high oral health-related quality of life, 25 participants (26.6%) as medium, and 5 participants (5.3%) as low. The analysis indicated in Table 3 that the highest percentages from the OHIP-14 questionnaire responses were related to frequently experiencing discomfort while chewing due to dental and oral problems (22.4%), often feeling a lack of confidence due to dental and oral issues (22.3%), and commonly experiencing spontaneous pain or discomfort due to dental and oral problems (18.1%).

The distribution of OHIP-14 scores deviated from normality, as indicated by the Kolmogorov–Smirnov test (significance values <0.001 and 0.200). Consequently, the Mann–Whitney U test was applied to compare differences between groups. Table 4 shows a p-value of 0.024 (<0.05), indicating a significant difference in quality of life between elderly individuals with and without pathological lesions. Other variables showed no statistically significant associations: gender (p = 0.964), age group (p = 0.293), systemic diseases (p = 0.792), and medications use (p = 0.713).

Table 4. Variables Affecting OHIP-14 Score

Variable	Category	N	OHIP-14 Median (Min-Max)	p-value	Significance
Pathological Lesions	Present	36	15.00 (0—48)	0.024	Significant
	Absent	58	7.50 (0—48)		
Gender	Male	26	10.50 (0—48)	0.964	Not significant
	Female	68	10.00 (0—48)		
Age Group (years)	60–74	77	9.00 (0—48)	0.293	Not significant
	75–90	17	13.00 (0—48)		
Systemic Disease	Present	50	11.00 (0—48)	0.792	Not significant
	Absent	44	9.00 (0—48)		
Medication Use	Yes	54	10.50 (0—48)	0.713	Not significant
	No	40	9.00 (0—48)		

DISCUSSION

This study found that the majority of the participants were females (72.3%), while males accounted for 27.7%. This gender distribution reflects the study setting in a residential care facility, where women typically predominate, and is consistent with previous research demonstrating a higher proportion of females in elderly care settings due to longer life expectancy.[13] In addition, 81.9% of the participants were aged 60—74 years, while the remaining 18.1% were aged 75—90 years old.

Among the 94 subjects examined, more than half did not present with any pathological lesions of the oral soft tissues. Of the seven types of pathological lesions identified, traumatic ulcers were the most prevalent (19.1%), whereas denture stomatitis was the least common (1.1%). These findings are consistent with those reported by Angelia et al. who likewise identified traumatic ulcers as the most frequent lesion and denture stomatitis as the least prevalent.[14] Traumatic ulcers, often resulting from mechanical trauma linked to various factors such as xerostomia, malocclusion, inadequate dental prostheses, harsh tooth brushing, and oral piercings, are widespread among older adults. Pathophysiological, traumatic ulcers begin with trauma that triggers a vascular and cellular response during inflammation. This includes a vascular response of vasoconstriction and vasodilation of blood vessels, followed by a cellular response including the release of histamines and leukocyte margination. Once the inflammatory agents are neutralized, the stimuli promoting the exudation of fluids and cells gradually diminish, leading to epithelial regeneration and repair. Although not life-threatening and considered a mild disease, traumatic ulcers can significantly decrease the quality of life for those affected.[14,15]

The present study reported the lowest prevalence of pathological lesions for denture stomatitis, with a single case (1.1%), corresponding to the only participant (1.1%) who wore dentures. In contrast, a study conducted by Alfredo et al. reported a substantially higher prevalence of denture stomatitis (37.1%), which was attributable to a greater proportion of denture users in their sample (76.9%).[16] Denture stomatitis is characterized by pathological changes associated with chronic inflammation that may be localized or generalized, typically presenting with edema and erythema. The condition is often asymptomatic and affects the mucosa and supporting gingiva in contact with the fitting surface of removable dentures. This condition is common among denture wearers, with two-thirds or more of the elderly who use full removable dentures potentially suffering from denture stomatitis. Studies have reported that 60—70% of those affected are geriatric patients over 60 years of age, with a higher prevalence in middle-aged or older women. [16]

Another pathological lesion found in this study was angular cheilitis, accounting for 8.5%, which also aligns with research by Asih et al. reporting a prevalence of 5.4%. The prevalence rates in

other studies varied, which could be attributed to differences in subjects, particularly in terms of demographic background dental prosthesis usage, systemic conditions and oral mucosal abnormalities.[17,18]

This study highlights the substantial impact of physical oral conditions, such as traumatic ulcers, on the quality of life of older adults, contributing to discomfort during eating, lack of confidence, and oral pain. These findings underscore the need for comprehensive oral health care and management strategies for the elderly, particularly those residing in long-term care facilities, to improve their overall quality of life.

With respect to the analytical approach, this study deliberately employed a bivariate analysis in line with its primary objective of comparing OHIP-14 scores between participants with and without oral lesions. Since the dependent variable is numeric, categorization would have reduced analytical sensitivity. Accordingly, the focus of the analysis was on group comparisons rather than the development of a predictive model. Therefore, in accordance with previous OHIP-14 research, the Mann–Whitney U test is the most appropriate approach for this study's purposes. The bivariate results remain scientifically meaningful and can serve as a foundation for future studies employing more complex multivariate analyses.

This study has several limitations. First, the cross-sectional design limits the ability to infer causal relationships between pathological oral lesions and oral health-related quality of life. Although associations can be identified, the temporal sequence and directionality of these relationships cannot be established. Second, despite efforts to reduce bias through examiner calibration and the use of validated instruments, the potential for information bias remains due to the self-reported nature of the OHIP-14 questionnaire. Additionally, residual confounding may exist as not all possible influencing factors, such as socioeconomic status, nutritional intake, or oral hygiene habits, were controlled for in the analysis. Future studies should incorporate longitudinal designs and multivariate analyses to strengthen causal inference and adjust for a broader range of confounders.

The interpretation of the findings was based on the observed association between pathological oral lesions and reduced quality of life. Although the results were statistically significant, the findings should be interpreted with caution, as unmeasured factors such as mental health status, denture fit, and lesion duration, may also influence oral health-related quality of life. Future studies should address these variables to provide a more comprehensive understanding of the clinical implications.

CONCLUSION

This study concludes that there is a significant difference in the quality of life related to oral health among the elderly, attributed to the presence of pathological soft tissue lesions. This suggests the need for further research to explore the relationship between pathological lesions and the quality of life among the elderly, with a larger sample size to validate these findings and develop targeted interventions.

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