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**ORAL HYGIENE STATUS AND PERIODONTAL TREATMENT NEEDS
 AMONG THE ELDERLY PEOPLE IN THE GLANTANGAN PLANTATION AREA
 JEMBER**

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ABSTRACT

Background: The aging process leads to several physical changes in the elderly. These include changes in periodontal tissues and decreased musculoskeletal function. These changes reduce the ability of older people to clean the oral cavity, increasing the risk of periodontal disease in older adults. **Purpose:** This study aims to describe the oral hygiene status and periodontal treatment needs of the elderly in the Glantangan Plantation Area, Jember. **Methods:** This is a descriptive observational study with a purposive sampling technique conducted on 98 older adults aged 60-74 years in three villages of Glantangan Plantation Area Jember who fulfilled the inclusion and exclusion criteria. Oral hygiene status was examined using the OHI-s, and periodontal treatment needs were examined using the CPITN. **Results:** The mean age of the respondents was 66 ± 4.11 years, with the majority being female (90.82%). The mean OHI-s score was 4.62 ± 0.95 , and most older people had poor oral hygiene (81%). 49% of the elderly had a CPITN score of 3, and 7.1% had a CPITN score of 4. The most common periodontal treatment needs of older people in the Glantangan Plantation Area are improving personal oral hygiene and professional scaling and root planing (93%). **Conclusion:** The oral hygiene status of older individuals in the Glantangan Plantation Area is poor, with periodontal treatment needs including personal oral hygiene improvement, scaling and root planing, and complex periodontal treatment.

Keywords: CPITN, Elderly people, Glantangan Plantation, OHI-s

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INTRODUCTION

The elderly population in Indonesia is increasing, requiring particular attention. The degenerative process leads to physical changes, including in the oral cavity.^{1,2} The changes in the oral cavity, especially in the periodontal tissue, contribute to the susceptibility of older people to periodontal disease.^{3,4} In addition, decreased musculoskeletal function leads to reduced dexterity, resulting in an optimal oral cavity cleaning.⁵ The decreased ability of older people to maintain oral hygiene can lead to periodontal disease. Riskesdas data from 2018 shows that the prevalence of periodontitis among older adults aged 55–64 years is 75.9%.⁶ Older people with periodontal disease will have limitations that affect the normal function of the oral cavity.⁷ Only 0.3% of older people receive treatment, and 95.4% never visit a dental health professional.⁶ Older people's infrequent visits to the dentist can increase the severity of periodontal disease and the rate of tooth loss, which can reduce older people's quality of life.^{8,9}

Data in the dental poly of Puskesmas Tempurejo shows that the visits of older people to the Glantangan Plantation Area, which includes three villages, namely Pondokrejo Village, Curahtakir Village, and Tempurejo Village, in 2021 only reached 1.96% and in 2022 only 1.73%. Furthermore, according to the researchers' preliminary observations, there has never been a special program for the oral health of older people, and oral screening has never been conducted. This study aimed to assess the oral hygiene and periodontal treatment needs of older people in the Glantangan Plantation Area so that periodontal treatment needs can be immediately identified and resolved.

METHODS

This descriptive observational study with a cross-sectional approach was conducted on 98 older people in the Glantangan Jember Plantation Area, which includes three villages: Pondokrejo Village, Curahtakir Village, and

Tempurejo Village in Tempurejo District, Jember Regency. The study was conducted in February 2023-April 2023 which was held in collaboration with older people in posyandu and door to door. The inclusion criteria were older people aged 60-74 years living in the Glantangan Plantation Area and agreed to become research subjects. The exclusion criteria for this study were fully edentulous older people and older people wearing complete dentures.

All of the subjects had signed informed consent. Subjects who agreed to participate were interviewed and asked to complete a respondent characteristics questionnaire. Then, the OHI-s examination consists of Debris Index simplified (DI-s) and Calculus Index simplified (CI-s) examinations on six tooth surfaces using a half-moon sonde.¹⁰ Afterward, the CPITN examination includes bleeding on probing, calculus examination, and probing depth examination with a WHO probe on ten index teeth.¹¹ All study procedures have been approved by the Health Research Ethics Commission of the Faculty of Dentistry, University of Jember, with No.1869/UN25.8/KEPK/DL/2023. The data collected were analyzed in a descriptive method to describe the subject of the study by explaining the characteristics of each respondent, OHI-s data and periodontal treatment needs. The data is presented in the form of a frequency distribution table, diagram, and mean value.

RESULTS

A total of 98 elderly individuals participated in this study, with more older women (90.8%) than older men (9.2%). The average age of the elderly participants was 66 ± 4.11 years, with most being aged 60–64 (45.9%). Most of the older people were not in school (58.2%). Most of the older people had hypertension systemic disease, at 32.7% (Table 1).

Table 1. Characteristics of Elderly people in the Glantangan Plantation Area

Characteristics	n	%
Gender		
Male	9	9,2
Female	89	90,8
Age		
60-64	45	45,9
65-69	31	31,6
70-74	22	22,5
Last Education		
Not in School	57	58,2
Elementary Education	35	35,7
Junior Secondary Education	6	6,1
Work Status		
Working	71	72,4
Not Working	27	27,6
Systemic Disease		
Yes	53	54,1
Anemia	2	2,0
Diabetes	7	7,1
Hypertension	32	32,7
Lung disease	2	2,0
Myalgia	10	10,2
No	43	45,9
Smoking		
Not Smoking	92	93,9
1-4 cigarette	1	1
5-14 cigarette	2	2
>15 cigarette	3	3,1

The results of the oral hygiene examination showed that most of older people in the Glantangan Plantation Area had poor oral hygiene status (81%). Older people with fair oral hygiene status (7%) and no older people with good oral hygiene status (Table 2).

Tabel 2. Oral Hygiene Status of Elderly People in the Glantangan Plantation Area

OHI-s Criteria	n	%
Good	0	0
Fair	7	19
Poor	91	81

Oral hygiene status based on gender shows that all of the older men in the Glantangan Plantation Area have poor oral hygiene status. The oral hygiene status of most older women in the Glantangan Plantation Area was classified as poor at 92.1% (Table 3).

The oral hygiene status of older people based on age is known that all age groups have poor oral hygiene status of 91.1%, 90.3%, and 100%. All older people aged 70-74 years have poor oral hygiene status (Table 3).

Oral hygiene status based on education level shows that older people who not in school and older people with primary education mostly have poor oral hygiene status at 94.7% and 94.3%. Older people with junior secondary education have fair oral hygiene status of 33.3% and poor oral hygiene status of 66.7% (Table 3).

Table 3. Oral Hygiene Status of Elderly people Based on Age, Gender, and Education Level in Glantangan Plantation Area

Characteristic		OHI-s Criteria					
		Good		Fair		Poor	
		n	%	n	%	n	%
Age	60-64	0	0	4	8,9	41	91,1
	65-69	0	0	3	9,7	28	90,3
	70-74	0	0	0	0	22	100
Gender	Male	0	0	0	0	9	100
	Female	0	0	7	7,9	82	92,1
	Not in school	0	0	3	5,3	54	94,7
Education Level	Elementary Education	0	0	2	5,7	33	94,3
	Junior Secondary Education	0	0	2	33,3	4	66,7

The periodontal status of older people in the Glantangan plantation area was 49% with 4-5 mm pockets (CPITN score 3) and 7.1% with pockets >6 mm (CPITN score 4) (Table 4).

Table 4. Periodontal Status of Elderly People in the Glantangan Plantation Area

CPITN Score	n	%
0	-	-
1	-	-
2	43	43,9
3	48	49,0
4	7	7,1
Total	98	100

The most common periodontal treatment needs in the older people in the Glantangan Plantation Area were personal oral hygiene improvement and professional scaling root planing (TN II) at 92.9%. Treatment needs in the form of improving personal oral hygiene, professional scaling root planing and complex periodontal treatment (TN III) amounted to 7.1% (Table 5).

Table 5. Periodontal Treatment Needs of Elderly People in the Glantangan Plantation Area

Periodontal Treatment Needs	n	%
TN 0	-	-
TN I	-	-
TN II	91	92,9
TN III	7	7,1
Total	98	100

Periodontal status based on age group is known that older people aged 60-64 years have the most periodontal status is supragingival and subgingival calculus (53.3%). The periodontal status at the age of 65-69 and 70-74 years is mostly 4-5 mm pockets at 51.6% and 63.6% (Table 6).

The most periodontal treatment needs in all age groups were personal oral hygiene improvement and professional scaling root planing (TN II) at 93.3%, 93.5% and 90.9%. Treatment needs in the form of personal oral hygiene improvement, professional scaling root planing, and complex periodontal treatment were highest in the 70-74 years age group at 9.1% (Table 7).

The periodontal status of the older people in the Glantangan Plantation Area based on gender shows that both male and female older people have the most periodontal conditions with 4-5 mm pockets at 55.6% and 48.3% (Table 6).

The most periodontal treatment needs in older males and females were personal oral hygiene improvement and professional scaling root planing (TN II) at 88.9% and 93.3%. Treatment needs in the form of personal oral

hygiene improvement, professional scaling root planing, and complex periodontal treatment in males amounted to 11.1% and in females 6.7% (Table 7).

The periodontal status of older people in the Glantangan Plantation Area based on education level shows that older people who are not in school and with elementary education have the most periodontal conditions with 4-5 mm pockets at 47.4% and 54.3%. Older people with junior secondary education had the most periodontal conditions in the form of supragingival and subgingival calculus at 66.7% (Table 6).

The periodontal treatment needs of older people who are not in school and older people with elementary education are mostly improving personal oral hygiene and professional scaling root planing (TN II) by 93%, and 91.4%. The periodontal treatment needs of all older people with junior secondary education are personal oral hygiene improvement and professional scaling root planing (TN II) by 100% (Table 7).

Table 6. Periodontal Status of Elderly People Based on Age, Gender, and Education Level in the Glantangan Plantation Area

Characteristic		CPITN Score									
		0		1		2		3		4	
		n	%	n	%	n	%	n	%	n	%
Age	60-64	0	0	0	0	24	53,3	18	40	3	6,7
	65-69	0	0	0	0	13	41,9	16	51,6	2	6,5
	70-74	0	0	0	0	6	27,3	14	63,6	2	9,1
Gender	Male	0	0	0	0	3	33,3	5	55,6	1	11,1
	Female	0	0	0	0	40	44,9	43	48,3	6	6,7
Education Level	Not in school	0	0	0	0	26	45,6	27	47,4	4	7
	Elementary Education	0	0	0	0	13	37,1	19	54,3	3	8,6
	Junior Secondary Education	0	0	0	0	4	66,7	2	33,3	0	0

Table 7. Periodontal Treatment Needs of Elderly People Based on Age, Gender, and Education in the Glantangan Plantation Area

Characteristic		CPITN Score									
		TN 0		TN I		TN II		TN III			
		n	%	n	%	n	%	n	%	n	%
Age	60-64	0	0	0	0	42	93,3	3	6,7		
	65-69	0	0	0	0	29	93,5	2	6,5		
	70-74	0	0	0	0	20	90,9	2	9,1		
Gender	Male	0	0	0	0	8	88,9	1	11,1		
	Female	0	0	0	0	83	93,3	6	6,7		
Education Level	Not in school	0	0	0	0	53	93	4	7		
	Elementary Education	0	0	0	0	32	91,4	3	8,6		
	Junior Secondary Education	0	0	0	0	6	100	0	0		

The consumption pattern of older people in Glantangan Plantation shows that the most consumed protein is vegetable protein at 36.7% with the highest frequency is 1-2 times a week (48%). The most consumed animal protein by older people in the Glantangan Plantation Area is fish meat at 30.6%. The frequency of vegetable and fruit consumption in a week was mostly >4 times (69.4%). Drinks that are often consumed besides mineral water are coffee at 23.5% and the 12.2% (Table 8).

The older people in Glantangan Plantation never brush their teeth at the right time by 93.9%. The majority of older people brush their teeth ≥ 3 times a day by 53.1%. Older people who never visited the dentist regularly once every six months amounted to 98%. Older people who never scaling were 96.9% (Table 9).

Table 8. Consumption Pattern of Elderly People in the Glantangan Plantation Area

Characteristic	n	%
Frequency of fruit and vegetable consumption		
1-2 times	22	22,4
3-4 times	8	8,2
>4 times	68	69,4
Protein consumed		
Ruminant meat	3	3,1
Poultry meat	29	29,6
Fish meat	30	30,6
Other (Vegetable protein)	36	36,7
Frequency of protein consumption		
1-2 times	47	48,0
3-4 times	22	22,4
> 4 times	29	29,6
Frequently consumed beverages		
Mineral water	98	100,0
Coffee	23	23,5
Milk	2	2,0
Tea	12	12,2
Others	-	-

Table 9. Elderly People Habits in Maintaining Oral Hygiene in the Glantangan Plantation Area

Characteristic	n	%
Brush teeth at the right time		
Never	92	93,9
Sometimes	6	6,1
Yes	0	0,0
Frequency of toothbrushing in 1 day		
≤ 1 times	10	10,2
2 times	36	36,7
≥ 3 times	52	53,1
Regular dental check-ups to the dentist		
Never	96	98,0
Sometimes	2	2,0
Yes	0	0,0
Last dental check-up		
Never	87	88,8
≤ 1 year	1	1,0
≥ 1 years	10	10,2
Bleeding gums when brushing teeth		
Never	83	84,7
Sometimes	11	11,2
Yes	4	4,1
Scaling		
Never	95	96,9
≤ 1 year	0	0,0
≥ 1 years	3	3,1

DISCUSSION

Oral Hygiene Status of The Elderly People In The Glantangan Plantation Area

A person's oral hygiene can be influenced by several factors, such as age, gender, education level, consumption patterns, and behavior in maintaining oral hygiene.¹² The results showed that 81% of older people in the Glantangan plantation area had poor oral hygiene status. This is in line with Ermawati's (2017) study, which found that 60-74-year-olds in Darsono village, Arjasa district, had poor oral hygiene status.¹³ In this study, poor oral hygiene was caused by many older people who did not understand how to clean their oral cavities properly. In this study, it was found that 93.9% of older people did not brush their teeth at the right time. In fact, the ideal time to brush teeth is after meals or breakfast and before bed to remove plaque.¹⁴ In addition, 96.9% of older adults never

cleaned calculus or scaling. This accumulation of calculus will have an impact on the examination of the oral hygiene status of older people.

Based on the study's findings, the consumption patterns of the older people in Glantangan Plantation showed that 23.5% of the older people consumed coffee and 12.2% consumed tea. The presence of caffeine and tannin in coffee and tea can easily make the color of compounds in coffee attach to the dental plaque and form stains.¹⁵ Stain itself is measured in the examination of oral hygiene with OHI-s.

Based on gender, all older males in the Glantangan plantation area have poor oral hygiene status. Men are less likely to maintain oral hygiene and, in general, are more likely to use tobacco products.¹⁶ Men's smoking habits may facilitate plaque retention due to the tar in cigarettes, which causes the tooth surface to become rough.¹⁷ In several studies, it has been mentioned that someone with a smoking habit will develop more stains.¹⁸ In this study, it was found that out of 9 older men, 6 of them smoked with the highest number of cigarettes consumed, as much as >15 cigarettes per day.

The oral hygiene status of the majority (92.1%) of older women in the Glantangan plantation area was poor. Some literature suggests that women have a better attitude towards maintaining oral health and visit the dentist more often.¹⁶ However, this study found that the oral hygiene of older women was mostly poor. The researchers suggest that there may be other influencing factors. These include education level, oral hygiene habits, and food/drink consumption patterns. Therefore, further research is needed to determine the effect of these factors on oral hygiene in older people.

Based on age, it is known that older people aged 60-64 and 65-59 mostly have poor oral hygiene. All older people aged 70-74 years have poor oral hygiene status. Aging causes a reduction in nervous system function, which can affect the rate of salivary flow production and the self-cleaning process in the oral cavity of older people.^{1,19} In addition, the aging process will reduce the ability of older people to brush their teeth.²⁰

According to the level of education, older people who did not go to school and older people with elementary education mostly have poor oral hygiene. Education may be one of the factors that impact oral health. A person with low education tends to have less knowledge in maintaining oral hygiene.²¹ On the other hand, high knowledge will form positive attitudes and behaviors in maintaining oral hygiene.²²

Periodontal Status and Treatment Needs of Elderly People In The Glantangan Plantation Area

Periodontal status and periodontal treatment needs can be influenced by several factors, including age, gender, education, knowledge, attitudes, and behaviors about maintaining oral health, as well as systemic diseases.^{23,24} In this study, 96.9% of older adults in the Glantangan Plantation area never cleaned their calculus or scaling. The rough surface of calculus increases plaque retention and creates areas where plaque is difficult to clean. This causes inflammation in the gingiva.²⁴ In this study, 49% of older people in the Glantangan Plantation Area were found to have 4-5 mm pockets that required treatment in the form of improved personal oral hygiene and professional scaling and root planing. The results of this study are in line with the study of Lumentut et al. (2013) that the periodontal status of older people in Ratatotok village, Southeast Minahasa Regency, in the form of 4 to 5 mm pockets is 46.34%.²⁵ Sazali's study (2016) showed the same results: 76.4% of older people in Panti Wredha Dharma Bakti Surakarta needed treatment in the form of improving personal oral hygiene and professional scaling and root planing.²⁶

In this study, 98 percent of older people had never been to a dentist before. Older people in Glantangan Plantation tend to visit the health center when they have complaints about the condition of their oral cavity. Research on older people in the United States has shown that older people who live in rural areas tend to give less priority to oral health services. Older people tend to visit health facilities when they are sick and need professional care.²

In this study, 69.4% of the older people in the Glantangan Plantation consumed fruits and vegetables more than four times a week and 36.7% of the older people consumed vegetable protein. The consumption of fruits and vegetables can reduce chronic periodontal disease.²⁷ In addition, protein intake plays a role in the repair of periodontal tissues and the maintenance of normal immunity.²⁸ However, in this study, there were still many older people with periodontal disease in the form of 4-5 mm pockets. The researchers suggest that there may be other factors involved, such as oral hygiene behaviors, not brushing or scaling, or not seeing a dentist regularly.

Based on the results of the study, it is known that older people in the Glantangan Plantation Area predominantly suffer from hypertension systemic disease at 32.65%. High blood pressure can be the cause of high pressure on the gum tissue. This causes thickening of the gingival blood vessels, resulting in microcirculation abnormalities, and has an impact on periodontal tissue damage.²⁹

Based on gender, the most common periodontal status among older men in the Glantangan plantation area was 4-5 mm pockets required to improve personal oral hygiene and scaling and root planing. Periodontal damage in men is not only associated with behavior but there is a common phenomenon of smoking that can trigger periodontal tissue damage.¹⁶ Nicotine in cigarettes can alter the immune system and increase periodontal tissue inflammation.²⁴ In this study, 6 out of 9 older men consumed the highest number of cigarettes, more than 15 cigarettes per day.

The most common periodontal status among older women in the Glantangan Plantation Area is 4-5 mm pockets requiring periodontal treatment by improving personal oral hygiene and professional scaling and root planing. Menopause in older people can reduce the estrogen, making them susceptible to periodontal infection and inflammation. This inflammation triggers collagen degradation, resulting in damage to the periodontal tissues.¹⁹

According to age, the periodontal status of people aged 60-64 years is supragingival and subgingival calculus with a probing depth of no more than 3 mm. Older people aged 65-69 and 70-74 years have periodontal conditions in 4-5 mm pockets. The highest treatment needs are improving personal oral hygiene and scaling and root planing. The results of this study are in line with the study of Lumentut et al. (2013) on older people in Ratatotok Muara, Southeast Minahasa Regency, who found that the periodontium status of older people 60 to 64 years of age has supragingival and subgingival calculus. Older people 70 to 74 have 4 to 5 mm pockets.²⁵ This study stated that periodontium damage and the need for periodontal treatment will increase with age. The aging process results in a weakened host response to the inflammatory bacteria in the plaque, leading to periodontal damage.^{2,24,30}

Based on education level, the periodontal status of non-school and elementary-educated older people has 4-5 mm pockets. Older people with junior secondary education mostly have supragingival and subgingival calculus. Periodontal treatment needs at all levels of education are improving personal oral hygiene and scaling and root planing. Education level is related to a person's knowledge of maintaining oral health.³¹ Education is the second largest socioeconomic factor that can affect health status. Although not the most crucial factor, education can be one of the factors that influence a person's oral health.²³ In conclusion, the oral hygiene status of older people in the Glantangan Plantation Area is poor. Their periodontal treatment needs are improving personal oral hygiene, scaling and root planing, and complex periodontal treatment. Health agencies must collaborate to provide comprehensive periodontal care for the elderly. It is essential to prioritize oral hygiene and health improvement among the elderly.

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