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The Relationship Between Elderly Knowledge and Oral Hygiene Maintenance at the Werdha Hargo Dedali Nursing Home, Surabaya

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ABSTRACT

Older adults are at high risk of experiencing oral and dental health problems. Poor knowledge of oral health contributes significantly to the prevalence of these issues among the elderly. This study aims to examine the relationship between knowledge and oral hygiene maintenance among older adults at the Werdha Hargo Dedali Nursing Home, Surabaya. This research used a cross-sectional design involving 32 individuals who visited the Werdha Hargo Dedali Nursing Home in April 2024. Data were collected using a questionnaire. Statistical analysis was conducted using the chi-square test, which indicated poor overall conditions. The results show that the knowledge of older adults regarding oral and dental hygiene at the Werdha Hargo Dedali Nursing Home was mostly in the moderate category. The debris index for most elderly participants was classified as poor. The results of the chi-square test analysis also showed that the p-value of 0.029 was smaller than the specified significance level. The conclusion is that there is a relationship between knowledge and the maintenance of oral and dental hygiene among older adults at the Werdha Hargo Dedali Nursing Home in Surabaya.

INTRODUCTION

Older adults represent an age group that is vulnerable to a range of health issues, including oral and dental health problems (Nubatonis, Wali, & Sakbana, 2021; Regina et al., 2023; Fatimah, Fatikhah, & Chaeruddin, 2025). These issues are often attributed to poor oral hygiene, which is further exacerbated by limited education and reduced capacity to maintain oral health (Manbait et al., 2019; Tanu, Manu, & Ngadilah, 2019; Miftahul'uyun, Mahmiyah, & Rusmali, 2021). Among the elderly population, oral hygiene tends to receive less attention, primarily due to physical decline that affects their ability to perform self-care (Auli, 2020).

Poor oral hygiene can lead to various health complications, such as open sores or toothaches, that may result in oral infections. These infections, in turn, can contribute to respiratory problems in older adults (Bintari, 2020). A survey conducted by Aqidatunisa, Hidayati, & Ulfah (2022) among older adults in Balungmasin Village revealed that out of 10

respondents, eight were categorised as having poor oral hygiene, while two were classified as having moderate hygiene. Similarly, a study by Nurhalisah and Hidayati (2023) at the Werdha Theodora Nursing Home in Makassar showed that, of the 39 elderly residents examined, 20 were found to have poor oral hygiene, 15 had moderate hygiene, and only four had good hygiene.

Oral hygiene is defined as the condition of the oral cavity being clean, free from plaque, calculus, debris, and food residue, and without unpleasant odour (Dewi et al., 2022). One of the key indicators used to assess oral hygiene is the Simplified Oral Hygiene Index (OHI-S), which is calculated by summing the debris index and calculus index. According to the OHI-S classification, a score of 0.0–1.2 indicates good hygiene, 1.3–3.0 indicates moderate hygiene, and 3.1–6.0 indicates poor hygiene (Baishya et al., 2019).

According to Riskesdas (2018), older adults are individuals aged 60 years and above, who exhibit physical changes distinct from those of younger age groups (Badan Penelitian dan Pengembangan Kesehatan, 2019). Knowledge is one of the crucial factors influencing individual behaviour, including the practice of maintaining oral hygiene. This knowledge can be influenced by educational background, socioeconomic status, and family involvement in the lives of older adults (Muhida & Suharnowo, 2021). However, knowledge alone is not sufficient; strong motivation is also essential to ensure that older adults consistently engage in proper oral hygiene practices (Pili, Utami, & Yanti, 2020). This study aims to examine the relationship between knowledge and behaviour in maintaining oral and dental hygiene among older adults at the Werdha Hargo Dedali Nursing Home in Surabaya.

METHOD

This study is an analytical research with a cross-sectional approach. The population consisted of all elderly individuals residing at Panti Werdha Hargo Dedali Surabaya, totalling 32 people. The sample size was also 32 respondents, selected using a total sampling technique. The study was conducted at Panti Werdha Hargo Dedali Surabaya, located at Jl. Manyar Kartika IX/22-24, Menur Pumpungan, Sukolilo District, Surabaya City, East Java. The research was carried out from April to June 2024. The instrument used to assess the elderly's knowledge was a questionnaire, while oral hygiene was evaluated using an observation sheet. Data analysis was performed using the chi-square test to determine the relationship between the level of knowledge and oral hygiene maintenance behaviour among the elderly at Panti Werdha Hargo Dedali Surabaya. This study received ethical approval from the Ethics Committee of the Health Polytechnic of the Ministry of Health Surabaya, with reference number: EA/3095/KEPK-Poltekkes_Sby/V/2024.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Gender and Age Characteristics of Elderly Residents at Panti Werdha Hargo Dedali Surabaya in 2024

Respondent Characteristics	Frequency	Percentage
Gender		
Male	7	21%
Female	26	79%
Total	33	100%
Age		
60-68	11	33%
73-79	10	30%
80-90	12	36%
Total	33	100%

Table 1 shows that out of a total of 33 respondents, 79% (26 individuals) were female, while 21% (7 individuals) were male. This indicates that the female respondents significantly outnumbered their male counterparts. The age distribution of the 33 respondents is divided into three different age groups. The 60–68 age group includes 11 respondents, accounting for 33% of the total. The 73–79 age group comprises 10 respondents, or 30%. These two groups

represent respondents in the relatively younger age categories compared to the oldest group. The majority of respondents—12 individuals or 36%—fall within the 80–90 age range, making it the largest age group represented. This suggests that most of the respondents are older adults. In summary, the age distribution indicates that the respondent population is predominantly composed of elderly individuals, with a higher proportion in the older age brackets compared to the younger ones.

Table 2. Kategori Pengetahuan Lansia Dengan Memelihara Kebersihan Gigi dan Mulut di Panti Werdha Hargo Dedali Surabaya Tahun 2024.

Elderly Knowledge	Category		
	Good (76-100%)	Fair (56-75%)	Poor (<56%)
Knowledge of the elderly about the importance of maintaining dental health	40%	40%	20%
Issues related to oral and dental hygiene and their contributing factors	40%	30%	30%
Maintaining oral and dental hygiene	20%	40%	40%

Based on Table 2, it can be concluded that the category of elderly knowledge regarding the importance of maintaining oral and dental hygiene is mostly in the “good” and “fair” categories, each with an equal percentage of 40%. In terms of knowledge about oral and dental hygiene issues and their contributing factors, the majority of respondents fall into the “good” category, with 40%. For knowledge related to maintaining oral and dental hygiene, most respondents are in the “fair” and “poor” categories, both with the same percentage of 40%.

Table 3. Frequency Distribution of Elderly Knowledge on Maintaining Oral and Dental Hygiene at Panti Werdha Hargo Dedali Surabaya in 2024.

No	Question	Respondent Answers (%)			
		Correct		Incorrect	
A.	Elderly knowledge about the importance of maintaining oral and dental hygiene				
1.	What is the definition of oral and dental hygiene?	26	79	7	21
2.	Is maintaining oral and dental hygiene important?	22	67	11	33
3.	How do you maintain oral and dental hygiene?	30	91	3	9
4.	What is the purpose of brushing your teeth?	20	61	13	39
5.	How can you keep the oral cavity healthy?	14	42	19	58
Total		112	340	53	160
Average		22.4	68	10.6	32
B.	Issues Related to Oral and Dental Hygiene and Their Contributing Factors				
6.	What causes cavities?	12	36	21	64
7.	What types of food are good for the teeth?	26	79	7	21
8.	Examples of foods that can damage teeth	27	82	6	18
9.	When is the right time to brush your teeth?	10	30	23	70
10.	Brushing teeth daily should be done a maximum of how many times?	6	18	27	82
11.	How many times should brushing be done on each surface of the teeth?	20	61	13	39
12.	What action should be taken when experiencing a toothache?	28	85	5	15
13.	What should be done if there is tartar buildup?	29	88	4	12
14.	To maintain dental health, how often should you visit the dentist at minimum?	23	70	10	30
15.	How often should you replace your toothbrush at minimum?	23	70	10	30
Total		204	619	126	381
Average		20.4	61.9	12.6	38.1

C.	Maintaining Oral and Dental Hygiene				
16.	What type of toothbrush bristles is best?	28	85	8	15
17.	How should a toothbrush be maintained?	26	79	7	21
18.	What is the best tool to help clean between the teeth?	11	33	22	67
19.	What type of toothpaste should be used?	20	61	13	39
20.	How should the correct brushing motion be performed on the front teeth?	18	55	15	45
21.	How should you brush the tongue-facing side of your teeth?	24	73	9	27
22.	How should you brush the cheek-facing side of your teeth?	17	52	16	48
23.	Why is it important to brush your tongue in one direction?	18	55	15	45
24.	What part of the teeth should be brushed?	28	85	5	15
25.	What tools are used for brushing teeth?	22	67	11	33
Total		210	645	121	355
Average		12	64.5	12.1	35.5

Based on Table 3, it can be concluded that the level of elderly knowledge about maintaining oral and dental hygiene at Panti Werdha Hargo Dedali Surabaya shows that 68% of respondents answered correctly, placing them in the "fair" category, while 32% answered incorrectly. This indicates that respondents have a limited understanding of the importance of maintaining oral and dental hygiene for the elderly. The level of elderly knowledge about oral and dental hygiene issues and their contributing factors shows that 61.9% of respondents answered correctly, also placing them in the "fair" category, while 38.1% answered incorrectly. This suggests that respondents have limited knowledge about how plaque or food residues left for too long can become tartar. The level of elderly knowledge about maintaining oral and dental hygiene shows that 64.5% of respondents answered correctly, placing them in the "fair" category, while 35.5% answered incorrectly. This indicates that respondents have a limited understanding of proper tooth brushing techniques and the appropriate time to brush their teeth.

Table 4. Recap of Elderly Knowledge on Maintaining Oral and Dental Hygiene at Panti Werdha Hargo Dedali Surabaya in 2024.

No	**Question**	**Respondent Answers (%)**	
		Correct	**Incorrect**
1.	Elderly knowledge about the importance of maintaining oral and dental hygiene	68	32
2.	Issues related to oral and dental hygiene and their contributing factors	61.9	38.1
3.	Maintaining oral and dental hygiene	64.5	35.5
Total		194.4	105.6
Average		64.8	35.2

Based on the data from Table 4, it can be observed that the elderly's knowledge about maintaining oral and dental hygiene is 64.8%, which falls into the "fair" category.

Table 5. Frequency Distribution of Elderly Oral and Dental Hygiene Scores

Debris Index Criteria	**Frequency**	**Percentage**	**Score Debris**
Good	13	40%	5,3
Fair	12	36%	20,6
Poor	8	24%	15,8
Total	33	100%	

Table 5 shows that the data collection results for the Debris Index reveal an average of 15.8 (24%) in the "poor" category, 20.6 (36%) in the "fair" category, and 5.3 (40%) in the "good"

category.

Table 6. Cross-tabulation of Elderly Knowledge on Maintaining Oral and Dental Hygiene at Panti Werdha Hargo Dedali Surabaya in 2024.

Elderly Knowledge	Index Debris			Total	*p-value*
	Good	Fair	Poor		
Good	2	8	6	16	0,029
Fair	9	4	1	14	
Poor	2	0	1	3	
Total	13	12	8	33	

Table 6 shows the results of the chi-square test analysis using SPSS software, which produced a p-value of 0.029. This p-value is smaller than the established significance level of 0.05 (0.029 < 0.05). Therefore, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted. Based on this, it can be concluded that there is a significant relationship between knowledge of oral and dental health and the elderly at Panti Werdha Hargo Dedali Surabaya.

DISCUSSION

Elderly Knowledge on Maintaining Oral Hygiene at Panti Werdha Hargo Dedali Surabaya.

Based on the data analysis, it is evident that most of the elderly participants at Panti Werdha Hargo Dedali Surabaya possess a moderate level of knowledge regarding the importance of maintaining oral hygiene. Knowledge plays a crucial role in oral care, as a better understanding of dental hygiene can lead to improved oral health outcomes. In particular, the elderly's knowledge directly impacts their oral hygiene practices, and the better their understanding of oral health, the healthier their teeth tend to be.

According to a study by Sari and Jannah (2021), the majority of elderly individuals recognize that oral health directly influences overall bodily health. However, gaps remain in their knowledge about proper brushing techniques and the need for routine dental check-ups every six months. Many respondents in this study were unaware that tongue cleaning is part of oral hygiene, and others lacked knowledge about regular visits to a dentist.

Similarly, research by Sari and Azizah (2022) confirmed a significant relationship between knowledge and oral cleanliness, with a p-value of 0.004. This finding highlights that a higher level of knowledge about oral hygiene is likely to result in better oral health behaviors. Elderly individuals who are well-informed about maintaining oral cleanliness, such as limiting sugary foods and brushing regularly, tend to have healthier teeth compared to those with less knowledge.

Further support comes from Nora, Amin, and Arifin (2023), who found that elderly individuals with good knowledge of oral hygiene were more likely to have clean teeth. Conversely, those with limited knowledge often exhibited poor oral cleanliness. Interestingly, there were some elderly individuals who, despite possessing good knowledge, had inadequate oral hygiene, and vice versa. This suggests that other factors, such as a positive attitude towards dental care, may also play a significant role.

The failure to maintain oral hygiene results in food residues that allow bacteria to thrive within plaque, which can lead to dental issues (Kusmana & Rahayu, 2022). Moreover, the frequency of oral hygiene practices among the elderly is a determining factor in their overall health. Research by Silalahi and Suparma (2023) in Indonesia highlighted that oral hygiene status directly impacts the quality of life among the elderly, with nutrition being a key factor in improving their well-being.

Therefore, it can be concluded that knowledge significantly influences the debris index. With proper knowledge, elderly individuals can effectively maintain oral hygiene, leading to better outcomes. The knowledge acquired should transform behaviors, especially in terms of brushing techniques, which can positively affect the debris index. This finding aligns with the earlier data that showed a high percentage of elderly individuals in the "poor" category for

debris index, which shifted to the "moderate" category as their knowledge improved. Hence, with the right knowledge, oral hygiene problems among the elderly can be minimized.

Oral Hygiene in the Elderly.

The data analysis revealed that the majority of elderly individuals had a poor debris index. This can be attributed to a combination of internal and external factors. Internal factors include physical and psychological conditions, while external factors comprise behavioral, environmental, genetic, and healthcare service-related influences. Notoatmodjo (2018), suggests that oral hygiene status can be influenced by four factors: heredity, the physical and social environment, behavior, and healthcare services. Oral hygiene, defined as the practice of cleaning and refreshing the mouth, teeth, and gums, is essential for preventing dental diseases and improving the body's immune system.

The Green and Vermillion Oral Hygiene Index (OHI-S) is one tool used to measure oral cleanliness (Danendra et al., 2024). Oral hygiene ensures that a person's mouth is free from contaminants such as plaque and calculus. When oral hygiene is neglected, plaque forms on the teeth and can spread across their surfaces. A wet, dark, and moist oral environment supports bacterial growth, leading to plaque formation (Pariati, & Lanasari, 2021).

Debris refers to soft material found on the tooth surfaces, including plaque, material alba, and food debris. Plaque is a soft deposit that adheres to the tooth surface and consists of microorganisms that thrive in an intracellular matrix when oral hygiene is neglected. Material alba is a yellowish or white-grayish soft deposit that adheres to the teeth, restorations, calculus, and gums. It can be easily removed by water spray but requires mechanical cleaning for complete removal (Armas-Vega et al., 2019).

As stated by Pariati, and Lanasari (2021), when oral hygiene is neglected, plaque accumulates on the teeth and spreads, promoting bacterial growth. Poor oral hygiene in the elderly can lead to serious health problems, such as periodontitis and gum disease. If left untreated, these issues can damage the jawbone structure, leading to deeper infections that spread to other parts of the body, potentially causing more severe health conditions such as heart disease, lung infections, kidney, and liver problems (Cahyani, Azali, & Listrikawati, 2023).

The decline in oral hygiene among the elderly is influenced by various factors, including physical limitations, cognitive changes, and a lack of knowledge or access to dental healthcare services. Given the elderly's increased vulnerability to diseases, it is crucial to emphasize the importance of oral hygiene (Aisyah et al., 2024; Lipsky et al., 2024).

Analysis of the Relationship Between Elderly Knowledge and Oral Hygiene Status.

The findings of this study indicate a strong correlation between elderly knowledge and their oral hygiene status. The better the elderly's knowledge about maintaining oral hygiene, the better their oral health status. This assertion is supported by Patrycia et al. (2020), who demonstrated a relationship between dental health knowledge and the Oral Hygiene Index (OHI-S) in elderly individuals from the Kalisat Public Health Center in Jember. Their study showed that respondents with moderate knowledge had a moderate OHI-S, while those with good or poor knowledge had more extreme scores.

Further confirmation comes from Pili, Utami, and Yanti (2020), who found a similar relationship between knowledge and oral health status among elderly individuals at the Penebel Public Health Center. The research concluded that a higher level of knowledge leads to better oral hygiene behaviors, while a lack of knowledge often results in poor oral health outcomes.

Knowledge plays a critical role in maintaining good oral hygiene. As individuals gain more knowledge about proper oral care, they are more likely to adopt correct behaviors. This is particularly relevant in the elderly, whose lower educational levels often correlate with poor oral hygiene knowledge. Moreover, the findings of this study highlight the need for targeted interventions and better information dissemination to improve the oral health of the elderly.

CONCLUSION

It can be concluded that there is a significant relationship between the knowledge of elderly individuals and their ability to maintain oral hygiene at Panti Werdha Hargo Dedali Surabaya. It is recommended that future researchers use a larger and more diverse sample to obtain more comprehensive results and a deeper understanding of the relationship between knowledge and the maintenance of oral hygiene. Additionally, considering longitudinal and qualitative research methods could further enhance the study's findings.

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