

Research Article

Awareness–Action Gap in Oral Health: The Relationship between Awareness and Caries Status, Periodontal Status, and Dental Visits among Prolanis Participants

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ABSTRACT

Introduction: Oral health awareness is considered an important factor in maintaining oral health and encouraging the utilization of dental services. However, awareness does not always translate into actual health-seeking behavior, particularly among individuals with chronic diseases. This study aimed to analyze the relationships among oral health awareness, dental caries experience, periodontal status, and dental attendance among participants in the Chronic Disease Management Program (Prolanis).

Materials and Methods: A cross-sectional study was conducted among 100 Prolanis participants. Oral health awareness was assessed using a structured questionnaire. Dental caries experience was measured using the Decayed, Missing, and Filled Teeth (DMF-T) index, while periodontal status was assessed using the Community Periodontal Index of Treatment Needs (CPITN). Data regarding dental attendance were collected through interviews. Spearman's correlation analysis was performed at the $p < 0.05$ significance level.

Results and Discussion: Oral health awareness was significantly associated with dental caries experience and periodontal status ($p \text{ value} < 0.001$). Participants with higher awareness tended to have lower DMF-T scores and better periodontal conditions. However, no significant association was found between oral health awareness and dental attendance. These findings indicate that awareness contributes to better oral health status but does not necessarily lead to routine utilization of dental services.

Conclusion: Oral health awareness was associated with dental caries experience and periodontal status but not with dental attendance among Prolanis participants. The findings suggest an awareness–action gap, suggesting that awareness alone may be insufficient to promote regular dental visits.

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INTRODUCTION

Oral health is an important indicator of a person's overall health, well-being, and quality of life.¹ Oral health is defined as the healthy condition of the hard and soft tissues of the oral cavity and their supporting structures, allowing individuals to eat, speak, and interact socially without functional impairment, discomfort, or aesthetic impairment due to disease or tooth loss.² Good oral health contributes to an individual's quality of life, both physically and psychologically.³ Efforts to maintain oral health are influenced by various factors, including knowledge, education, awareness, access to health services, and socioeconomic conditions.⁴ One form of oral health maintenance behavior is regular dental checkups to support the prevention and early detection of oral diseases.⁵ Visits to the dentist are recommended at least every six months to maintain oral health and prevent the development of more severe diseases.⁶

Awareness is an important factor influencing a person's health behavior, including maintaining oral health.⁴ However, utilization of dental health services is still influenced by various barriers, such as low education levels, economic constraints, inadequate access to services, poor health conditions, and the perception that dental care is not necessary if there are no complaints.³ Regular dental checkups play a crucial role in the prevention and control of dental and oral diseases because they provide healthcare workers with the opportunity to perform early detection and manage disease at an early stage.⁷

Oral and dental health is closely linked to systemic health through various biological and behavioral mechanisms.⁸ Various studies have shown a link between oral diseases and systemic chronic diseases, such as diabetes mellitus, cardiovascular disease, coronary heart disease, and pneumonia.^{9,10} In

hypertensive patients, the use of certain antihypertensive medications can cause gingival enlargement and xerostomia, thereby increasing the risk of oral health problems.¹¹ Xerostomia can reduce the protective function of saliva, increasing the risk of dental caries, candidiasis, and masticatory disorders, and reducing the patient's quality of life.¹² In addition, the use of certain antihypertensive medications has been reported to affect the balance of the oral microbiota, increasing the risk of dental caries.¹³ Patients with diabetes mellitus have a higher risk of developing periodontal disease than the general population.¹⁴ Long-term use of diabetes medications has also been reported to affect salivary gland function and increase the risk of oral health problems.¹⁵

The Chronic Disease Management Program (Prolanis) is one of the promotive and preventive programs organized by BPJS Kesehatan to improve the quality of life of participants with chronic diseases, especially hypertension and type 2 diabetes mellitus.¹⁶ Prolanis participants have a higher risk of experiencing dental and oral health problems due to underlying systemic diseases and long-term use of medications.¹³ Data from the 2023 Indonesian Health Survey show that the prevalence of hypertension among Indonesians aged >18 years, based on a doctor's diagnosis, was 8.6%, and based on measurement results, 30.8%. The prevalence of diabetes mellitus based on a doctor's diagnosis reached 1.7% in the Indonesian population.

The prevalence of dental caries was 82.8%, with an average DMF-T score of 5.4.¹⁷ Dental caries often causes pain and can affect the quality of life, with varying prevalence and severity. Several factors, such as age, knowledge, and gender, will influence an individual's behavior when they experience pain and decide to visit the dentist.¹⁸ Periodontal health status can be evaluated using the Community

Periodontal Index of Treatment Needs (CPITN), an index that assesses periodontal tissue condition and treatment needs in a population.¹⁹ In addition, periodontal disease is still commonly found in adults and the elderly.²⁰ The 2023 Indonesian Health Survey also showed that the prevalence of gum problems in adults is still quite high. Survey results show that of the 56.9% of the population with dental and oral health problems, only 81.4% received treatment from a dental professional. A total of 91.1% of the population never sought dental care, partly because they felt they never had a toothache (61.1%). Previous studies have consistently shown that oral health awareness is associated with better oral hygiene practices and improved oral health outcomes, including lower risks of dental caries and periodontal disease (Kumar et al., 2015).²¹ However, most of these studies have primarily focused on the relationship between awareness and oral health status or oral hygiene behavior. These data indicate that efforts to increase awareness and regular dental checkups are still needed to prevent more serious dental and oral diseases.

The simultaneous relationship between oral health awareness, dental caries experience (DMF-T), periodontal status (CPITN), and dental attendance has rarely been investigated, particularly among individuals with chronic diseases such as participants of the Indonesian Chronic Disease Management Program (Prolanis). In addition, it remains unclear whether increased awareness alone is sufficient to encourage routine dental visits. This unresolved issue represents an awareness-action gap, in which individuals may recognize the importance of oral health but fail to translate that awareness into actual utilization of dental services. Therefore, further research is needed to better understand the relationship between awareness, oral health status, and dental attendance behavior in

Prolanis participants. Although oral health awareness is believed to play a role in maintaining oral health, the relationship between awareness, caries status, periodontal status, and dental visit behavior remains unclear.

MATERIALS AND METHODS

The design of this research is an observational-analytic, cross-sectional study. The population in this study was Prolanis participants at the Firdaus Yogyakarta 24 Hour Pratama Clinic, with a sample size of 100 respondents. The inclusion criteria for this study were Prolanis participants who had been participating for at least 3 months, who did not have disabilities, and who were willing to become research respondents. This research took place in June-August 2024 and received permission to carry out research from the Research Ethics Commission of the Faculty of Medicine and Health Sciences, Muhammadiyah University of Yogyakarta, with number 185/EC-KEPK FKIK UMY/V/2024.

This study used a questionnaire to measure awareness of performing routine dental and oral examinations, consisting of 11 statements. The questionnaire score results were obtained by adding all statement scores, then assigning awareness criteria as low (11-26), medium (27-42), or high (43-55). The results of the validity and reliability tests indicate a Cronbach's alpha of 0.809, indicating that the questionnaire is valid and reliable. In addition to the questionnaire, this study also collected data on the DMF-T and CPITN indices and dentist visit behavior. The behavior during the last dental visit was categorized into 4 groups: 0-6 months, 7-12 months, >12 months, and never.

The DMF-T index is measured by considering three scoring components: D (Decayed teeth), M (Missing teeth due to caries), and F (tooth fillings due to caries). The measurement results are then

scored according to the formula in the WHO guidelines. The scores are categorized as very low (0.1-1.1), low (1.2-2.6), moderate (2.7-4.4), high (4.5-6.5), and very high (DFMT index > 6.5).²² The CPITN index is used to assess the general condition of periodontal tissues, including periodontal pockets, calculus, and gingival inflammation (bleeding on probing). Periodontal status and treatment needs for each study subject and sextant were evaluated using a mouth mirror and WHO probe. The CPITN index is used to assess the general condition of periodontal tissues, including periodontal pockets, calculus, and gingival inflammation (bleeding on probing). Periodontal status and treatment needs in each study subject and sextant were evaluated using a mouth mirror and WHO probe. The CPITN index scores 0 (healthy), 1 (bleeding gums), 2 (calculus), 3 (pockets 4-5 mm), and 4 (pockets >6 mm).¹⁹ The data obtained was then analyzed using the normality test and the Spearman correlation test, which were valid if $p < 0.05$.

RESULT AND DISCUSSION

Table 1. Characteristics of respondents based on gender, age, and education

Respondents Characteristics	n	%
Gender		
Female	61	61
Male	39	39
Age		
25-34	2	2
35-44	4	4
45-54	14	14
55-64	54	54
65-74	23	23
75-84	3	3
Education		
Elementary school	8	8
Junior high school	6	6
Senior high school	39	39
Bachelor degree	42	42
Master degree	5	5

Table 1 shows that the majority of respondents were female (61%). More than half of the respondents were aged 55-64. The majority of respondents had a bachelor's degree (42%).

Table 2. Cross tabulation of awareness categories with DMF-T index

Level of awareness	Very low, n (%)	Low, n (%)	Medium, n (%)	High, n (%)	Very high, n (%)
Low	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)
Medium	44 (44.0)	9 (9.0)	0 (0.0)	0 (0.0)	1 (1.0)
High	43 (43.0)	2 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	87 (87.0)	11 (11.0)	0 (0.0)	1 (1.0)	1 (1.0)

Table 2 shows that many respondents had a moderate level of awareness regarding routine dental visits with a very low DMF-T index (44%).

There was 1% of respondents with a moderate level of awareness regarding routine dental visits with a very high DMF-T index.

Table 3. Cross tabulation of awareness categories with CPITN index

Level of awareness	Healthy, n (%)	Bleeding, n (%)	Calculus, n (%)	Pocket 4-5 mm, n (%)	Pocket >6 mm, n (%)	Total, n (%)
Low	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	1 (1.0)
Medium	4 (4.0)	0 (0.0)	36 (36.0)	11 (11.0)	3 (3.0)	54 (54.0)
High	16 (16.0)	4 (4.0)	17 (17.0)	7 (7.0)	1 (1.0)	45 (45.0)
Total	20 (20.0)	4 (4.0)	53 (53.0)	18 (18.0)	5 (5.0)	100 (100.0)

Table 4. Cross Tabulation of awareness categories with last dental visit

Level of awareness	0–6 months, n (%)	7–12 months, n (%)	>12 months, n (%)	Never, n (%)	Total, n (%)
Low	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	1 (1.0)
Medium	17 (17.0)	6 (6.0)	26 (26.0)	5 (5.0)	54 (54.0)
High	14 (14.0)	4 (4.0)	24 (24.0)	3 (3.0)	45 (45.0)
Total	31 (31.0)	10 (10.0)	51 (51.0)	8 (8.0)	100 (100.0)

Regarding the CPITN index (table 3), the majority of respondents had moderate awareness of routine dental visits, with 36% in the calculus category.

Table 4 shows that respondents' last dental visit categories varied, with visits >12 months (51%) most common. Regarding awareness, most respondents were in the moderate awareness category, with their last dental visit >12 months ago (26%).

Table 5. Correlation test between awareness with DMF-T index, CPITN index, and last dental visit

Awareness	Correlation Coefficient	P value
DMF-T index	-.460	.000
CPITN index	-.453	.000
Last dental visit	-.045	0.656

Table 5 shows that, from the Spearman correlation analysis, two variables show significant results (p -value<0.001) with awareness: the DMF-T and CPITN indices. The correlation test results show negative correlations, meaning that low awareness of routine dental and oral examinations will increase the DMF-T and CPITN indices, and vice versa. Spearman's correlation test showed no significant relationship between the last dental visit and respondents' level of awareness ($r = -0.045$; p value= 0.656). The very small correlation coefficient indicates that the timing of the last dental visit was not associated with dental health awareness among Prolanis participants.

The present study demonstrated that oral health awareness was associated with dental caries experience (DMF-T) and periodontal status

(CPITN), but was not associated with dental attendance among Prolanis participants. These findings suggest that respondents with greater awareness tended to have better oral health; however, this awareness did not necessarily translate into regular dental visits. Similar findings have been reported in previous studies showing that oral health awareness contributes to improved oral hygiene practices and better oral health outcomes.²¹

This finding highlights an awareness–action gap, a condition in which individuals recognize the importance of maintaining oral health but fail to translate that awareness into action. In behavioral science, this phenomenon is referred to as the intention–behavior gap, describing the discrepancy between an individual's awareness or intention and their actual behavior.²³ The Theory of Planned Behavior (TPB) explains that behavior is not determined solely by knowledge or awareness but is influenced by behavioral intention, which is shaped by attitudes, subjective norms, and perceived behavioral control. Consequently, individuals may understand the importance of regular dental check-ups but still fail to attend if they perceive barriers that limit their ability to do so (McNeil, 2023).²⁴

The findings of this study can also be interpreted using Andersen's Behavioral Model of Health Services Use, which proposes that healthcare utilization is influenced by three inter-related components: predisposing factors, enabling factors, and need factors. Oral health awareness represents only one predisposing

factor, whereas access to healthcare services, financial resources, social support, and perceived treatment needs also play important roles in determining whether an individual seeks professional dental care.²⁵ Therefore, awareness alone may be insufficient to encourage regular dental attendance.

This phenomenon is particularly relevant among Prolanis participants, who are predominantly older adults living with chronic diseases. Their primary attention is often directed toward managing systemic conditions such as diabetes mellitus or hypertension rather than maintaining oral health. As a result, despite having adequate awareness of the importance of dental examinations, routine dental visits may not become a healthcare priority. Previous studies have also demonstrated that the relationship between intention and behavior explains only part of health behavior, while environmental barriers, healthcare accessibility, socioeconomic conditions, and perceived needs substantially influence the translation of awareness into action.²⁶

These findings imply that oral health promotion programs for Prolanis participants should extend beyond increasing awareness alone. Future studies should focus on developing and evaluating theory-based interventions that address not only awareness but also the enabling factors and perceived needs that influence dental attendance. Longitudinal or intervention studies are warranted to determine whether integrating oral health promotion into routine Prolanis services can improve regular dental attendance and oral health outcomes. Such approaches may help bridge the awareness–action gap and facilitate the translation of awareness into regular dental attendance.²⁷

CONCLUSION

Oral health awareness was significantly associated with dental caries experience and periodontal status among Prolanis participants. However, no significant association was found between oral health awareness and dental attendance, indicating a potential awareness–action gap in oral health behavior.

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