



The Relationship Between Dietary Pattern Scores and Debris Index Scores in Visually Impaired

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ARTICLE INFORMATION	ABSTRACT
<i>Article History:</i> <i>Received: May 28, 2025</i> <i>Revised: August 12, 2025</i> <i>Published: August 15, 2025</i> Keywords: Dietary Patterns Debris Index Oral Hygiene Visually Impaired Oral Health Behavior	Visually impaired individuals generally experience poorer oral health compared to those without visual impairments. Limitations in vision hinder effective oral hygiene maintenance, leading to suboptimal oral care. This study aimed to assess debris index scores among visually impaired individuals aged 19–59 years in the Regional Representative Council of Pertuni Surabaya and to examine the correlation between dietary patterns and debris index scores in 2024. An analytical approach with a cross-sectional design was employed. The study involved 37 visually impaired members aged 19–59 years. This study involved 37 visually impaired members aged 19-59 years. The number of samples in this study was 30 people with inclusion criteria selected using simple random sampling. Data were collected using questionnaires to assess dietary patterns and objective clinical examinations to measure debris index scores. Statistical analysis was performed using the Chi-Square test. The results showed a p-value of 0.558 ($p > 0.05$), indicating no significant association between dietary patterns and debris index scores. Although debris index scores were generally high, dietary patterns did not appear to be a major determinant of oral hygiene status. Other factors, such as toothbrushing technique, frequency of oral hygiene practices, and access to dental care, may play a more critical role. Further research is recommended to explore these factors, involve larger and more diverse populations, and evaluate targeted oral health education programs designed for visually impaired individuals.

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INTRODUCTION

Oral health in visually impaired individuals is a crucial aspect of overall well-being, as it not only affects physical appearance but also influences communication abilities, as well as biological, psychological, and social interactions (Abebe, 2021; Barranca-Enríquez, & Romo-González, 2022; Rahmah et al., 2022; Ragavane, & Chandrasekaran, 2025). Suboptimal oral hygiene in this population is often linked to dietary habits that promote dental caries,

malpositioned teeth, and a lack of adequate education on oral hygiene practices (Orisa-Ubi et al., 2020; Al Anouti et al., 2021; Dimopoulou et al., 2023; Folayan et al., 2023; Nurjannah et al., 2023; Chamut et al., 2024; Orishko, et al., 2024). A study by Niakurniawati, & Imran (2020) involving 34 visually impaired respondents aged 12–35 years found that 52.2% had poor OHI-S scores, highlighting the generally lower oral health status of visually impaired individuals compared to those without visual impairments. Common oral health problems in this group include dental caries, dental trauma, and periodontal disease. Due to visual limitations, they face challenges in self-monitoring their oral hygiene, leading to inadequate oral care (Günay, & Meyer-Wübbold, 2021; Rogers et al., 2022; Badea et al., 2023; Chan et al, 2023; Nurjannah et al., 2023).

Dietary patterns, defined as the regulation of portion sizes and food types to maintain health, nutritional balance, and disease prevention (Cena, & Calder, 2020; Pariati & Jumriani, 2021; Dominguez et al., 2022; Wang et al., 2023), may influence debris index scores. Accumulated debris, if not removed promptly, can increase the risk of various oral diseases (Ulfah et al., 2023). In a preliminary survey of 10 visually impaired individuals aged 19–59 years in the Regional Representative Council of Pertuni Surabaya, the average debris index score was 1.9, categorized as poor. This finding indicates a serious concern regarding oral hygiene in this group.

The novelty of this study lies in its focus on the relationship between dietary patterns and debris index scores specifically among adult visually impaired individuals in an organizational setting, a topic that has received limited research attention in Indonesia. Therefore, this study aims to examine the relationship between dietary patterns and debris index scores among visually impaired members of the Regional Representative Council of Pertuni Surabaya in 2024, by assessing their dietary habits, evaluating debris index levels, and analyzing the association between these variables.

METHOD

This study employed an analytical method with a cross-sectional approach. The research was conducted at Balai RW 04 Karah, Jambangan District, Surabaya, from January to March 2025. The study population consisted of 37 visually impaired individuals who were members of the Regional Representative Council of Pertuni Surabaya. From this population, 30 respondents who met the inclusion criteria were selected using a simple random sampling technique. Dietary pattern data were collected using a structured questionnaire, while debris index data were obtained through objective clinical examinations.

Prior to data collection, informed consent forms were provided to all selected participants to obtain their approval for oral examination. Respondents then completed the questionnaire in Braille format, with an allotted time of 30 minutes per group. Subsequently, disclosing solution was applied to the participants' index teeth using a cotton bud for approximately 5 minutes. Participants were then instructed to rinse once with mineral water and dispose of the rinse into a prepared container. Following this, debris index assessments were performed using a standardized evaluation sheet. All examination results were recorded for further analysis. Data were analyzed using the Chi-Square test with used computer application.

This study obtained ethical approval from the Health Research Ethics Committee (KEPK) of Poltekkes Kemenkes Surabaya under ethical clearance number: EA/3113/KEPK-Poltekkes_Sby/V/2024.

RESULTS AND DISCUSSION

Table 1. Results of the distribution of Dietary Values of the Visually Impaired of the Pertuni Surabaya Branch Representative Council Year 2024.

Criteria	Frequency (n)	Percentage (%)
Good	25	83.4%
Fair	4	13.3%
Poor	1	3.3%
Total	30	100

Table 1 shows that the most common category is the good category, with a total of 25 visually impaired, with a percentage of 83.4%.

Table 2. Results of the distribution of the Debris Index Value of the Visually Impaired of the Pertuni Surabaya Branch Representative Council in 2024.

Criteria	Frequency (n)	Percentage (%)
Bad	20	66.7%
Medium	6	20.0%
Good	4	13.3%
Total	30	100

Table 2 shows that the most frequently occurring category is the good category, with a total of 20 blind people, a percentage of 66.7%.

Table 3. The results of the relationship between the value of diet and the value of the debris index in the blind of the Pertuni Surabaya Branch Representative Council in 2024.

Variable	N	p-value
Diet	30	0.558
Debris Index	30	

Table 3 shows a p-value of 0.558, which is greater than the significance level ($\alpha = 0.05$). This indicates that there is no statistically significant relationship between dietary patterns and debris index scores among the visually impaired respondents in this study

DISCUSSION

The results showed that the majority of visually impaired respondents in the Regional Representative Council of Pertuni Surabaya in 2024 had dietary patterns categorized as good. This finding reflects an adequate understanding of healthy eating principles, including selecting foods that support oral health, regulating mealtimes, and maintaining regular eating frequency. Such awareness can potentially help prevent oral health problems, considering that the frequency and type of cariogenic foods consumed are directly related to oral cleanliness status (Asiani, & Wahyudi, 2024).

Although the respondents' dietary patterns were generally good, debris index assessments indicated a poor category. This condition suggests a gap between knowledge and actual practice in maintaining oral hygiene. Respondents understood the importance of brushing teeth twice a day but faced difficulties in its implementation. According to Blum's theory cited in Notoatmodjo (2021), behavior is one of the main determinants of health. In this context, visual impairment becomes a barrier for respondents to independently maintain optimal oral hygiene, leading to debris accumulation and plaque formation (Pohilihu, 2020; Nurjannah et al., 2023).

These results align with Nurjannah et al. (2023), who reported that high debris index scores are associated with food residue accumulation due to suboptimal tooth cleaning and frequent consumption of cariogenic foods. In contrast, they differ from the findings of Pariati and Jumriani (2021), who reported poor dietary patterns among respondents, possibly due to differences in respondent characteristics and variations in food types consumed. This indicates that while a healthy diet plays an important role, oral hygiene habits such as brushing technique and frequency remain key factors in maintaining oral and dental health.

Previous research by Arsad et al. (2022) emphasized that excessive consumption of cariogenic foods increases the risk of dental caries by raising oral acidity and accelerating demineralization. In this study, although cariogenic food consumption was not high, limitations in oral hygiene care among visually impaired individuals still had a negative impact on their oral health status. This study has several limitations, including a relatively small sample size and data collection limited to a single location, which may restrict the generalizability of the findings to the broader visually impaired population. In addition, dietary pattern data were obtained through questionnaires, which rely on respondents' honesty and recall ability, potentially introducing information bias. Other factors such as toothbrushing technique, the use of

assistive devices, and caregiver support were not analyzed in depth, indicating the need for further research.

CONCLUSION

The findings of this study indicate that there is no significant association between dietary patterns and debris index scores among visually impaired individuals. Despite the generally high debris index scores observed, dietary patterns do not appear to be the primary determinant of oral hygiene status in this population. It is likely that other factors, such as toothbrushing technique, frequency of oral hygiene practices, and access to dental care services, play a more influential role. Further research involving larger and more diverse samples is recommended to investigate these determinants in greater depth and to assess the effectiveness of targeted oral health education programs tailored for visually impaired individuals.

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