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Understanding Utilization of Basic Oral Health Services Through the Health Belief Model: A Population-Based Study in Kediri, East Java, Indonesia

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ABSTRACT

Background: The utilization of basic oral and dental health services remains suboptimal despite the availability of services within primary healthcare systems. This gap suggests that service utilization is influenced not only by access but also by individual health beliefs and perceptions. The Health Belief Model provides a theoretical framework to explain how cognitive and behavioral factors shape health-seeking behavior. This study aimed to examine determinants of basic oral health service utilization in Kediri Regency, Indonesia, using the Health Belief Model framework.
Subjects and Method: A cross-sectional study was conducted among 363 residents of Kediri Regency selected through multistage sampling. The dependent variable was the utilization of basic oral and dental health services. Independent variables included perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action. Data were collected using structured questionnaires and analyzed using multiple logistic regression with a significance level of $p < 0.005$.
Results: Perceived benefits showed a positive and significant association (OR = 1.30; 95% CI: 0.71 to 2.44; p = 0.037), cues to action demonstrated a significant negative association (OR = 0.59; 95% CI: 0.31 to 1.13; p = 0.012), perceived susceptibility (OR = 2.42; 95% CI: 0.90 to 6.48; p = 0.074), perceived severity (OR = 0.84; 95% CI: 0.41–1.72; p = 0.062), perceived barriers (OR = 0.71; 95% CI: −0.41 to 1.22; p = 0.228), and self-efficacy (OR = 1.86; 95% CI: −0.82 to 4.37; p = 0.146) were not statistically significant predictors of dental service utilization.
Conclusion: Utilization of basic oral health services was primarily influenced by perceived benefits and cues to action. Strengthening public awareness of the benefits of dental care and enhancing behavioral triggers may improve the utilization of oral health services in the community.

Keywords: Oral health services; Service utilization; Health Behavioral; Health Belief Model

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BACKGROUND

Health is a fundamental human right that underpins individual well-being and quality of life. Oral and dental health constitutes an integral component of overall health and cannot be separated from general physical

and psychosocial well-being, as emphasized in Indonesia's Health Law No. 17 of 2023. Poor oral health has been shown to negatively affect daily functioning, academic performance, and long-term quality of life across the life course (Nagdev *et al.*, 2023). Nevertheless, individuals with special health care needs and other vulnerable groups often face substantial barriers in accessing oral health services (Zare *et al.*, 2024).

Globally, the burden of oral and dental diseases remains high. The World Health Organization (WHO) estimates that nearly half of the world's population is affected by oral diseases, with dental caries being the most prevalent condition (WHO, 2021). Oral diseases disproportionately affect populations in low- and middle-income countries, where access to preventive and curative services is often limited (Ojok *et al.*, 2024). Despite the high disease burden, utilization of oral health services remains suboptimal, highlighting a critical gap between need and service use (Sidharthan *et al.*, 2024).

In Indonesia, oral and dental health problems continue to represent a significant public health challenge. National data indicate that dental caries, periodontal diseases, and tooth loss remain highly prevalent, with notable regional variation (Ministry of Health of the Republic of Indonesia, 2023). In East Java Province, the prevalence of oral health problems remains substantial, yet a considerable proportion of the population still practices self-treatment rather than seeking care from dental professionals (Ministry of Health of the Republic of Indonesia, 2023; Lukis et al., 2025). This pattern reflects persistent barriers to accessing appropriate oral health care and suboptimal utilization of available services.

Primary health care facilities, particularly community health centers (*Puskesmas*), play a strategic role in delivering basic oral and dental health services through promotive, preventive, and limited curative approaches (Yuliani and Dety, 2023). These services include routine dental examinations, simple restorative procedures, tooth extractions, scaling, and oral health education (Baiquni Natsir and Khidri Alwi, 2022). However, evidence suggests that utilization of oral health services at *Puskesmas* remains far below national expectations, with only a small proportion of the population accessing these services (Radiani *et al.*, 2021).

Previous studies have identified multiple determinants of oral health service utilization based on the Health Belief Model, showing that constructs such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy significantly influence individuals' oral health–seeking behaviors. For example, research applying the Health Belief Model to children's dental visiting behavior found that perceived susceptibility and perceived barriers were associated with regular dental attendance, alongside sociodemographic factors such as mother's education level and school location (Lee et al., 2018). Similarly, studies among adolescents have demonstrated that psychological factors derived from the Health Belief Model, including susceptibility and severity beliefs, relate to oral health behaviors and outcomes, suggesting these constructs can shape care utilization patterns (Xiang *et al.*, 2020). Other recent work has shown that parental HBM constructs, such as perceived benefits and barriers, are significantly associated with children's oral health behaviors and caries experience, underscoring the role of

caregiver beliefs in service uptake (Liu *et al.*, 2024).

Despite growing evidence on determinants of oral health service utilization, empirical studies that comprehensively examine behavioral determinants within the context of basic oral health services at primary health care facilities remain limited in Indonesia, particularly at the local level. Understanding these determinants is essential for informing evidence-based policies and strengthening primary oral health care systems.

Therefore, this study aims to analyze the determinants of behavioral utilization of basic oral and dental health services based on health belief model theory. The findings are expected to provide evidence-based insights to support policy formulation, improve service quality and accessibility, and enhance the effectiveness of oral health programs within primary health care settings.

SUBJECTS AND METHOD

1. Study Design

This study employed an observational cross-sectional design. The research was conducted in Kediri Regency, East Java, Indonesia, from November 2025 to January 2026.

2. Population and Sample

The study population comprised 1.69 billion residents registered at 37 public health centers which had dental clinic in Kediri Regency, East Java. The study sample was drawn from 363 residents attending 18 public health centers which had dental clinic. The public health centers sample were selected using a multistage random sampling method.

3. Study Variables

The dependent variable in this study was behavioral utilization of basic oral and dental health services. The independent variables comprised constructs derived from the Health Belief Model, namely perceived susceptibility-severity, perceived benefits-barriers, cues to action, and self-efficacy; as well as quality of health services and accessibility to health services.

4. Operational Definition of Variables

Basic Oral and Dental Health Service Utilization Behavior: The extent to which individuals utilize basic oral and dental health services at community health centers.

Perceived Threats Severity-Susceptibility to Basic Dental and Oral Health Service: Respondents' beliefs regarding the seriousness of oral and dental health problems and their perceived susceptibility to such conditions that may require basic oral and dental health services.

Perceived Benefits-Barrier for Basic Dental and Oral Health Service: Respondents' beliefs about the advantages of utilizing basic oral and dental health services and the perceived obstacles to accessing these services.

Self Efficacy in Basic Dental and Oral Health Service: Respondents confidence in their ability to engage in preventive behaviors and to maintain oral and dental health.

Cues to Action for Basic Dental and Oral Health Service: Internal or external stimuli that motivate respondents to take action to utilize basic oral and dental health services.

Quality of Health Services: The level of patient satisfaction with the quality of basic oral and dental health services received at community health centers.

Accessibility of Health Service: The degree of affordability and ease with which patients can access basic oral and dental health services at community health centers.

5. Study Instruments

Data were collected using a structured questionnaire. The questionnaire was tested for validity and reliability to ensure its appropriateness and standardization for the study. The instrument included all study variables and was used to obtain relevant information from the respondents.

6. Data Analysis

Three levels of data analysis were conducted in this study. First, univariate analysis was performed to describe the data using the mean, standard deviation, and minimum–maximum values. Second, bivariate analysis was conducted to examine the association between independent variables and the dependent variable using linear regression, with a significance level set at $p < 0.005$. Third, multivariate analysis was performed using multiple logistic regression.

7. Research Ethics

This study received ethical approval from the Research Ethics Committee of the Islamic Hospital of Malang, Indonesia (Approval No. 93/KEPK/RSI-U/XII/2025), dated 15 December 2025.

RESULTS

1. Sample Characteristics

In this study, respondent characteristics were assessed based on age, sex, income level, and educational attainment. Table 1 presents the demographic characteristics of the 363 respondents included in the analysis. The sample distribution indicates that most participants were adults aged 18–59 years 165 people (45.45%). Female respondents slightly higher than male 185 people(50.96%). Regarding income, the largest proportion of respondents reported earnings equivalent to the Regional Minimum Wage 141 people (38.84%). In terms of educational attainment, the majority of respondents held a bachelor's degree or higher 144 people (39.67%).

Table 1. Univariate Results of Respondent Characteristics

Characteristics	Frequency (n)	Percentage (%)
Age		
Adolescents (10-17 years)	112	30.85
Adults (18-59 years)	165	45.45
Older Adults (>60 years)	86	23.69
Sex		
Male	178	49.04
Female	185	50.96
Income Level		
Below Regional Minimum Wage (RMW) Rp. 2.492.000	121	33.33
Equal Regional Minimum Wage (RMW) Rp. 2.492.000	141	38.84
Above Regional Minimum Wage (RMW) Rp. 2.492.000	101	27.82
Educational Level		
No Formal Education	3	0.83
Completed Primary School/Equivalent	28	7.71
Completed Junior Secondary School/Equivalent	42	11.57
Completed Senior Secondary School/Equivalent	73	20.11
Diploma (D-I/D-III)	73	20.11
Bachelor's/Higher Degree (D-IV/S-1/S-2/S-3)	144	39.67%

Based on Table 2, regarding Health Belief Model constructs, perceived threat–susceptibility had a mean score of 19.41 (SD = 1.85), and perceived threat–severity

demonstrated the highest mean value at 24.25 (SD = 1.82). Furthermore, the mean scores for perceived benefits and perceived barriers were 16.98 (SD = 2.26) and 16.73 (SD = 2.84), respectively. Self-efficacy had a mean score of 12.65 (SD = 2.55), while cues to action showed a mean value of 17.06 (SD = 2.06).

Table 2. The Result of Univariate Analysis

Variables	Mean	SD	Min.	Max.
Perceived Threats Susceptibility	19.41	1.85	9	25
Perceived Threats-	24.25	1.82	15	30
Perceived Benefits	16.98	2.26	2	25
Perceived Barriers	16.73	2.84	6	25
Self-efficacy	12.65	2.55	6	25
Cues to Action	17.06	2.06	2	25

2. Bivariate Analysis

Table 3 shows that a positive and significantly associated between perceived threat–susceptibility and basic oral and dental health service utilization behavior (b= 0.05; 95% CI: 0.03 to 0.07; p= 0.004). Perceived threat–severity was also positively associated with utilization behavior (b= 0.03; 95% CI: 0.02 to 0.06; p = 0.006).

Similarly, perceived benefits showed a positive and significant relationship with utilization behavior (b = 0.09; 95% CI: 0.03 to 0.18; p = 0.001).

In contrast, perceived barriers were not significantly associated with utilization behavior (b= −0.09; 95% CI: −0.14 to 0.02; p= 0.564), although the direction of the association suggested a decrease in utilization with increasing perceived barriers.

Self-efficacy also showed no statistically significant association with utilization behavior (b = −0.02; 95% CI: −0.01 to 0.07; p = 0.968). Conversely, cues to action were significantly associated with basic oral and dental health service utilization behavior (b= 0.06; 95% CI: 0.04 to 0.07; p = 0.005).

Table 3. Results of Bivariate Analysis

Variables	Regression Coef. (b)	95% CI		p
		Lower Limit	Upper Limit	
Perceived Threats-Susceptibility	0.05	0.03	0.07	0.004
Perceived Threats-Severity	0.03	0.02	0.06	0.006
Perceived Benefits	0.09	0.03	0.18	0.001
Perceived Barriers	-0.09	-0.14	0.02	0.564
Self-Efficacy	-0.02	-0.01	0.07	0.968
Cues to Action	0.06	0.04	0.07	0.005

3. Multivariate analysis

Multiple logistic regression demonstrated that perceived threats–susceptibility was positively associated with utilization behavior of basic oral and dental health services (OR) of 2.42 (95% CI: 0.90–6.48; p= 0.074). In contrast, perceived threats–severity showed a negative association with utilization behavior of basic oral and dental health services (OR = 0.84; 95% CI: 0.41–1.72; p = 0.062). Perceived benefits were positively and significantly associated with utilization behavior of basic oral and dental health services (OR = 1.30; 95% CI: 0.71–2.44; p = 0.037). Meanwhile, perceived barriers showed a negative association with utilization behavior of basic oral and dental health services (OR = 0.71; 95% CI: -0.41–1.22; p = 0.228).

Self-efficacy was positively associated with utilization behavior of basic oral and dental health services (OR = 1.86; 95% CI: -0.82–4.37; p = 0.146). Cues to action showed a negative association with utilization behavior of basic oral and dental health services (OR = 0.59; 95% CI: 0.31–1.13; p = 0.012).

Table 4. Results of multiple logistic regression

Variables	OR	95% CI		p
		Lower Limit	Upper Limit	
Perceived Threats-Susceptibility	2.42	0.90	6.48	0.074
Perceived Threats-Severity	0.84	0.41	1.72	0.062
Perceived Benefits	1.30	0.71	2.44	0.037
Perceived Barriers	0.71	-0.41	1.22	0.228
Self-Efficacy	1.86	-0.82	4.37	0.1462
Cues to Action	0.59	0.31	1.13	0.012
N Observation=363				
Pearson chi2(119) = 93.20				
Prob > chi2 = 0.961				

DISCUSSION

This study examined the relationship between constructs of the Health Belief Model and the utilization of basic oral and dental health services. The results indicated that perceived benefits and cues to action were significantly associated with service utilization, whereas perceived susceptibility, perceived severity, perceived barriers, and self-efficacy were not statistically significant predictors after adjusting for other variables. These findings suggest that motivational beliefs and behavioral triggers may play a more critical role in determining dental service utilization than cognitive perceptions of disease risk alone (Tsai *et al.*, 2021).

Perceived Benefits and Dental Service Utilization

This study found that perceived benefits were significantly associated with the utilization of basic oral and dental health services. Within the Health Belief Model framework, perceived benefits reflect individuals beliefs regarding the effectiveness of preventive and curative oral health care in reducing disease risk and its consequences. Individuals who believe that dental visits can prevent oral diseases, minimize complications, and improve overall health are more likely to seek professional care.

This finding is consistent with previous studies demonstrating that perceived benefits strongly influence oral health behaviors and dental service utilization (Sukhabogi et al., 2024; Nasir and Suliman, 2022; Hajek et al., 2021). Evidence from community-based research further supports that individuals who recognize the preventive value of routine dental check-ups are significantly more likely to engage in regular dental visits and maintain good oral health practices (Amarasena et al., 2025; Bahramian et al., 2015). These findings reinforce the role of perceived benefits as a key motivational determinant of preventive health behavior.

Cues to Action and Dental Service Utilization

Cues to action were significally associated with dental service utilization. Cues to action refer to internal or external stimuli that trigger individuals to initiate health-related behaviors. These may include dental pain, recommendations from healthcare providers, public health campaigns, or encouragement from family members. The significant role of cues to action suggests that

individuals often require such triggers to translate health beliefs into actual behavior (Sukhabogi et al., 2024; Xiang et al., 2020).

Previous studies have highlighted the importance of health communication, provider reminders, and social influences in motivating dental visits (Watt et al., 2019; Thongchotchat et al., 2025; Idrees et al., 2024). Additionally, community-based interventions and educational programs have been shown to function as effective cues that promote preventive dental care utilization (Petersen, Baez and Ogawa, 2020; Spinler et al., 2019).

Perceived Susceptibility and Dental Service Utilization

The present study showed that perceived susceptibility was not significantly associated with dental service utilization. Although this construct represents individuals' perceived risk of developing oral diseases, the findings suggest that awareness of vulnerability alone may not be sufficient to motivate individuals to seek professional dental care (Sumita et al., 2022).

Similar findings have been reported in behavioral research indicating that perceived susceptibility often has weaker predictive power compared with more motivational constructs such as perceived benefits (Hajek et al., 2025; Zardak et al., 2025). Individuals may acknowledge their risk but still delay care due to low perceived urgency or competing priorities.

Perceived Severity and Dental Service Utilization

Perceived severity was also not significantly associated with dental service utilization in this study. While this construct reflects individuals' beliefs about the seriousness of oral diseases and their potential consequences, the findings indicate that perceived seriousness alone does not necessarily translate into action. This is consistent with prior studies suggesting that perceived severity, as part of the perceived threat construct, may not be a strong standalone predictor of preventive health behaviors when not accompanied by strong motivational drivers (Hajek et al., 2025).

Recent evidence further supports this finding, indicating that perceived severity often plays a limited or indirect role in influencing dental care–seeking behavior. A study by Goldstein et al. (2024) found that perceived severity alone was insufficient to predict dental service utilization, particularly when other enabling factors such as perceived benefits and external cues were more influential. Moreover, contemporary behavioral research highlights that components of perceived threat—including severity—tend to have weaker predictive power compared to motivational constructs, as individuals may cognitively recognize disease seriousness but fail to act without clear perceived advantages or triggers (Taflinger and Sattler, 2024).

In oral health contexts, recent studies have also demonstrated that perceived severity is more strongly associated with emotional responses, such as dental anxiety, rather than actual service utilization behavior, suggesting an indirect pathway of influence (Xiang et al., 2020). Additionally, theory-based oral health research emphasizes that behavioral change requires not only risk awareness but also actionable motivation and contextual support, reinforcing that severity alone is insufficient to drive preventive service use (Leggett et al., 2024).

Perceived Barriers and Dental Service Utilization

Perceived barriers were not associated with dental service utilization. Common barriers such as treatment cost, dental anxiety, accessibility issues, and time constraints are often reported as major obstacles to

dental care (Sukhabogi et al., 2024; Negi et al., 2025).

However, the lack of significance in this study may indicate that these barriers were either less pronounced in the study population or were outweighed by stronger facilitating factors such as perceived benefits. Previous studies have reported mixed findings regarding perceived barriers, suggesting that their impact may be influenced by contextual factors such as healthcare system support, insurance coverage, and cultural perceptions (Zardak et al., 2023; Watt et al., 2019).

Self-Efficacy and Dental Service Utilization

Self-efficacy did not showed a significant association with dental service utilization in the multivariate analysis. Self-efficacy reflects an individual's confidence in their ability to perform a health-related behavior. Although this construct has been shown to strongly influence personal oral hygiene practices, such as tooth brushing, its role in seeking professional dental services may be less direct. Dental visits are often influenced by external and structural factors beyond individual control, including access to services and financial considerations (Spinler et al., 2019; Hajek et al., 2021). Therefore, self-efficacy may be more relevant for daily self-care behaviors than for healthcare utilization.

Overall, the findings of this study emphasize the importance of motivational beliefs and behavioral triggers in promoting oral health service utilization. Interventions aimed at improving dental care utilization should focus on strengthening individuals' perceptions of the benefits of preventive dental care while simultaneously enhancing cues to action through health education, community outreach programs, and reminders from healthcare providers. Such theory-based interventions grounded in the Health Belief Model have been shown to effectively improve oral health behavior and preventive dental practices in community settings.

This study provides empirical support for the application of the Health Belief Model in understanding oral health service utilization. Among the constructs examined, perceived benefits and cues to action emerged as the most influential determinants of dental service utilization. These findings highlight the importance of designing public health strategies that emphasize the benefits of preventive dental care while providing effective behavioral prompts that encourage individuals to seek timely and appropriate oral health services.

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CONFLICT OF INTEREST

There was no conflict of interest.

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