

The Role of Education in Increasing Public Awareness of Dental and Oral Health

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ARTICLE INFO

Article history:

Received Jul 03, 2025

Revised Jul 16, 2025

Accepted Jul 22, 2025

Keywords:

Dental and Oral Health
Health Education
Public Awareness

ABSTRACT

The level of public awareness of dental and oral health in Indonesia is still relatively low, as indicated by the high prevalence of dental disorders and minimal access to dental health services. This study aims to explore the role of education in increasing public awareness of the importance of dental and oral care. The study used a mixed methods approach with an exploratory sequential design, starting from a qualitative study through in-depth interviews with 10 informants, then continued with a quantitative survey of 60 respondents in the Bonebobakal Health Center work area, Central Sulawesi. The results showed that education delivered by health workers, especially through direct counseling and visual media such as leaflets and videos, was able to increase public knowledge and awareness. However, behavioral changes have not yet occurred evenly. The SEM-PLS model shows that the effectiveness of education is not only influenced by the delivery of information, but also by active community participation. The main obstacles found include the lack of continuity of counseling, limited coverage, and cultural factors and fear of medical procedures. Contextual education, involving local cadres, and utilizing digital media can increase the effectiveness of delivering health messages. These findings emphasize the importance of integrating dental and oral education into the integrated health post program and strengthening the communication capacity of health workers to bridge the gap between knowledge and practice. This study recommends the development of sustainable and community-based educational strategies to improve the quality of life of the community as a whole.

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1. INTRODUCTION

Oral and dental health plays a crucial role in determining a person's overall quality of life. The mouth is not just a gateway to the digestive system, but also a part of social interaction and self-expression. Disorders of this organ, such as caries and periodontal disease, not only cause physical discomfort, but also have psychological, social, and economic impacts (Budihargono et al., 2025). Oral and dental health problems in Indonesia still show a high prevalence, as reported in the Basic Health Research (Riskesdas) 2023, which noted that 56.9% of the population experienced dental health problems and only 11.2% accessed professional dental care services.

This condition reflects the low public awareness of the importance of maintaining dental and oral health. One of the determining factors for this low awareness is the lack of targeted and sustainable health education. When the public is not provided with sufficient information, preventive behavior will not develop. Education is a central point in changing people's behavior, from being

curative to being promotive and preventive (Bariyah et al., 2024; Dewi et al., 2025). Health education can build better understanding and instill positive habits from an early age (Mulyana et al., 2024).

Dental caries is still the most dominant disease in Indonesia. Caries that is not treated early can cause complications, such as pulp infection to tooth loss (Sutanti et al., 2021). In the pediatric population, caries has long-term effects because it can affect speech development, nutrition, and learning performance. Caries is also closely related to the low quality of life of children (Marcdante et al., 2021). This shows that health education should be focused not only on individuals who have experienced disorders, but also on vulnerable groups such as children and the elderly (Prasetyo, 2021).

Previous studies have emphasized the importance of education in shaping health behavior. Research by Ulfah and Utami (2020) stated that the level of parental knowledge significantly influences their children's dental hygiene. Educational interventions provided through counseling media, both verbal and visual, have been shown to be able to change community behavior patterns towards dental and oral hygiene. Changes in community knowledge after being given education were also observed through increased visits to health centers for routine dental check-ups (Bekak et al., 2025).

Educational efforts will be more effective if implemented contextually according to the cultural and social characteristics of the local community. Most people prefer to self-medicate with traditional herbs rather than visit health facilities. This pattern reflects strong cultural beliefs, but also indicates an unbridged health information gap. Educational activities that integrate local approaches can increase community acceptance of the information provided (Melviani & Rohama, 2022; Nonasri, 2021).

The low level of community education also contributes to ignorance about the importance of maintaining dental and oral health (Maliga et al., 2021). In Poroan Village, which is part of the Bonebobakal Health Center working area, the majority of residents have only graduated from high school and most of them work as housewives or fishermen. The lack of access to information and education causes people to only come to the health center when their dental condition is severe and causes pain, not as part of a preventive routine. This condition shows the urgency of the role of systematic, targeted, and sustainable education.

The implementation of the integrated health post program in the Bonebobakal Health Center working area has not fully accommodated dental and oral health education. Integrated health post activities tend to be limited to weighing toddlers and providing additional food, while dental and oral counseling has not become an integral part. In fact, according to Kemenkes (2012), integrated health post cadres should play an active role in conveying health information to the community. Their lack of involvement in dental and oral education indicates that there is potential that has not been optimally utilized.

Good knowledge is the basic capital in forming healthy behavior. Lawrence Green's theory emphasizes that health behavior is influenced by predisposing factors, namely a person's knowledge, beliefs, and attitudes (Yusmunijar, 2020). This means that educational interventions that target increased knowledge can result in more positive changes in attitudes towards dental and oral care behavior. In this context, educational media such as leaflets, posters, and digital content can be effective tools in reaching the wider community.

Digital media has become part of the daily lives of modern society, including in remote areas. The dissemination of information through social media, short messages, and educational videos is a more efficient and interactive way to deliver health materials. According to Katmini (2023), digital-based communication, information, and education (CIE) shows significant results in increasing public awareness of dental and eye care. This strategy is very relevant to reach the younger generation and people of productive age. This study aims to explore the role of education in increasing public awareness of dental and oral health.

2. RESEARCH METHOD

This type of research uses a mixed methods approach with an exploratory sequential design. This approach was chosen to obtain a comprehensive understanding of the role of education in increasing public awareness of dental and oral health. The research process begins with a qualitative stage to

explore in depth the social phenomena and community behavior, then continues with a quantitative stage to test exploratory findings on a wider scale.

The research location is in the Bonebobakal Health Center working area, Banggai Regency, Central Sulawesi Province. This area was chosen because the level of public awareness of dental and oral health is still low, as indicated by internal health center data and the lack of community visits for preventive dental care. The research was conducted over a period of three months, starting from January to March 2025.

The participants in the qualitative research stage consisted of 10 informants who were selected purposively. Informants consisted of the general public, integrated health post cadres, health center officers, and community leaders who were considered to know the health conditions of the community directly. In-depth interviews were conducted using semi-structured guidelines that had been tested through readability and contextual suitability tests.

The quantitative stage involved 60 respondents taken from the population of the Bonebobakal Health Center working area using a purposive sampling technique. Inclusion criteria included age over 18 years, living in the area for at least one year, and having experience participating in health education activities. Respondents filled out a closed questionnaire consisting of variables on the role of education, knowledge, and awareness of dental and oral health.

The qualitative instrument in the form of an interview guideline was tested for validity through peer debriefing and member checking, while the quantitative instrument in the form of a questionnaire was tested for content validity by public health experts and hospital management. Statistical validity and reliability tests were carried out using SmartPLS4 software. The Cronbach Alpha and Composite Reliability values must each be above 0.7 to ensure the internal consistency of the instrument.

Qualitative data collection was carried out through participant observation, field notes, and interview recordings. Data were analyzed using thematic techniques that refer to the Miles and Huberman analysis approach, including data reduction, data presentation, and drawing conclusions. Thematic categories that emerged included the role of health workers, barriers to education, community perceptions, and motivation for dental care.

Quantitative data analysis used Structural Equation Modeling (SEM) based on Partial Least Square (PLS) with SmartPLS4 software. The analysis model built includes the relationship between the role of education variables as independent variables, knowledge as a mediating variable, and community awareness as a dependent variable. Significance testing was carried out at a 95% confidence level with a t-statistic value > 1.96 and a p-value < 0.05 as an indicator of statistical significance. The external validity of the study was maintained through data triangulation between qualitative and quantitative findings. The integration of results was carried out at the data interpretation stage, where information from in-depth interviews was used to explain and strengthen quantitative results. This approach allows the study to capture the social and cultural dynamics that influence the effectiveness of health education in local communities.

3. RESULTS AND DISCUSSIONS

The qualitative approach in this study revealed the public's perception of the role of dental and oral health education at the Bonebobakal Health Center. Education was delivered through various methods such as direct counseling, school visits, and social media. Informants stated that the public was quite enthusiastic about participating in education, especially when delivered through media such as leaflets or videos. Education is considered effective if it uses language that is easy to understand and is carried out face-to-face, as conveyed by informant N1, "*Usually counseling is good directly with the media... they are also enthusiastic about listening to education.*"

The effectiveness of counseling is largely determined by the method of delivery and frequency of activities. Although some people welcome the information provided, most have not made routine dental check-ups a habit. Informant N2 conveyed the importance of easy-to-understand delivery, while other informants said that education has not continued into real action. "*The delivery must be good and understandable to the community,*" said informant N2. This shows that there is still a gap between community knowledge and behavior in maintaining dental health.

The main obstacles found were the lack of continuity of counseling and the low level of preventive orientation in the community. Many residents only visit health facilities when they already

have complaints, not as a preventive measure. *"If you have a toothache, you'll go to have your tooth pulled... routine dental check-ups are very rare,"* said informant N4. This curative behavior pattern still dominates, driven by the lack of ongoing education and hereditary habits that have not shifted towards promotive.

In addition, the scope of education is not evenly distributed. Counseling activities more often target school children, while adults and vulnerable groups such as pregnant women have not been fully reached. Informant N6 said, *"I heard that it is only in schools for children... I have never received counseling."* Even so, some residents showed initial awareness of the importance of healthy teeth for quality of life, as expressed by informant N7, *"We have difficulty eating if we don't have teeth."* This finding emphasizes the need to expand the reach of education and improve communication strategies so that dental health messages truly shape community behavior.

Table 1. Respondent characteristics (n=60)

Characteristics	n	%
Gender		
Man	38	63,3
Woman	22	36,7
Age		
< 24 Years	8	13,3
26 – 35 Years	31	51,7
36 – 45 Years	16	26,7
≥ 46 Years	5	8,3
Education		
Elementary School	17	29,0
Junior High School	9	15,0
High School	34	56,0

Table 2. Summary of quantitative research results related to dental and oral health education (n=60)

Variables	Number of Items	Average Score (Mean)	Category	Interpretation
The Role of Education by Health Workers	8	4,24	Very good	Education is delivered with an interactive approach and is easy for the public to understand.
Health Center Efforts in Prevention	8	4,95	Very good	Promotive and preventive services are effective and well received.
Community Knowledge Before–After Education	8	4,18	Good	Education increases understanding, although it does not necessarily form habits.

The respondents in this study were mostly male (63.3%), were in the productive age of 26–35 years (51.7%), and had a final education of high school (56.0%). These characteristics reflect that the study participants have sufficient literacy potential to receive health information (Table 1). The results of the quantitative analysis showed that the educational role of health workers (mean 4.24) and the promotive-preventive efforts of the Health Center (mean 4.95) were in the very good category, while community knowledge before and after education showed good results (mean 4.18). These findings indicate that the education carried out has been well received and has been able to increase community awareness and understanding, although strengthening is still needed so that this knowledge can form real habits in healthy living behavior (Table 2).

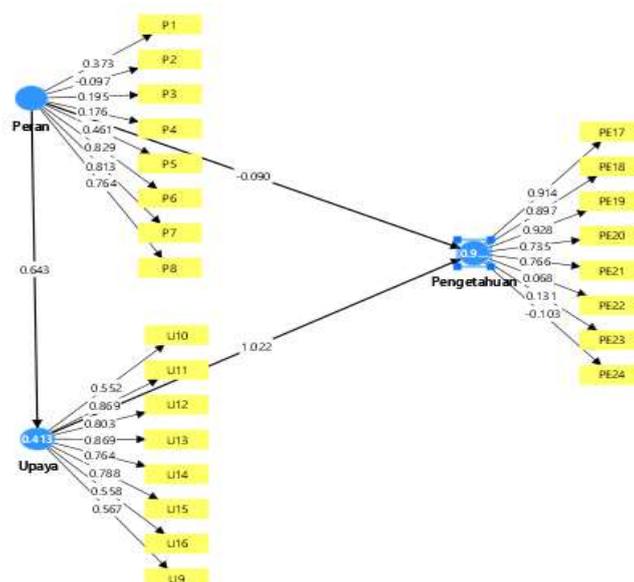


Figure 1. SmartPLS4 results

The role of health workers in providing education has a positive and strong influence on community efforts (path coefficient = 0.643), meaning that the more effective the educational role is carried out, the higher the community involvement in preventive dental and oral health actions. However, the direct relationship between the role and knowledge actually shows a negative and weak direction (path coefficient = -0.090), indicating that the education provided does not automatically increase knowledge if it is not accompanied by interesting, contextual, and sustainable delivery. In contrast, community efforts have a very strong and significant relationship to increasing knowledge (path coefficient = 1.022), indicating that knowledge is more effectively formed through active participation such as attending counseling, discussing, and seeking independent information. This finding confirms that community efforts are an important mediator in the relationship between the role of education and knowledge, and strengthens the theory of health behavior which states that behavioral change and increased knowledge require a combination of external interventions and active internal involvement (Figure 1).

The qualitative approach revealed that current educational materials still predominantly emphasize dental hygiene—especially “just brush your teeth”—while messages about routine check-ups have not been sufficiently emphasized. Although information from the Health Center helps increase residents' insight, the community's response still tends to be reactive: visits are only made when they are sick. This indicates a paradigm shift from prevention to reaction to symptoms. Confidence in carrying out prevention remains low, even though education has been provided directly through health cadres and medical personnel. Similar findings from Mujiyati (2023) showed that education can increase the knowledge of Posyandu cadres, while Tardiyana (2023) proved that community empowerment through counseling significantly increased the practice of Clean and Healthy Dental Behavior. To overcome this, a structural education strategy is needed: systematic cadre training to be able to convey messages about routine check-ups clearly, visual reminders such as creative cards, and direct sessions with dentists at the Village Hall or Posyandu to reduce fear and doubt about professional intervention (Monica, 2020).

Interviews with community leaders confirmed that the majority of residents had never been directly involved in the Puskesmas education program. Information only seemed school-centric and did not reach adult and elderly levels of society. This shows that the Puskesmas socialization network has not utilized strategic community figures as liaisons between health workers and residents, so that much potential information is overlooked. Setiawan & Handayani (2022) and Himawati (2023) emphasized that health promotion needs to include various elements of society including teachers and local leaders so that counseling is more comprehensive and impactful. Gusti (2022) highlighted

the importance of the presence of UKGS teachers in school activities, considering that their involvement still needs to be strengthened.

The PLS-SEM model shows a path coefficient of the variable "Role" to "Effort" of 0.643, indicating a strong positive correlation between the quality of education and preventive actions taken by the community. The mean-median graph also indicates an asymmetrical data distribution—possibly triggered by outliers in the high category—but most categories are close to consistency. These results are consistent with the findings of Rahmawati & Susanto (2021) and Prasetyo & Lestari (2020), which show that education increases patient knowledge and reduces the incidence of dental disease, especially if the education is carried out consistently and in a structured manner.

Qualitative results also show that interpersonal counseling methods—supported by visual media such as posters and short videos—provide better understanding than passive counseling. This is in line with international research: BMC Oral Health by Al Bardaweel and Dashash (2018) concluded that direct counseling with leaflets and videos resulted in significant increases in plaque index and gingival index in school children in both Syria and Myanmar. The use of multimedia combined with a face-to-face approach has been shown to increase the adoption of dental hygiene habits, in accordance with Social Cognitive theory Notoatmodjo (2020) which encourages self-efficacy through demonstrations and visual reinforcement.

Bonebobakal Health Center only holds periodic education, usually in conjunction with Posyandu activities, pregnancy classes, or UKS. The main obstacle arises from the limited time of the community—most of whom work as farmers—and the limited promotional staff. This causes the coverage of education to be uneven, especially for adults and the elderly. Research by Rahmawati & Widodo (2020) shows a similar pattern, where the continuity of education is a crucial factor in increasing access to dental services. In rural areas, education strategies must consider schedule flexibility and a community approach to ensure participation.

Qualitative findings confirm that people already understand the importance of brushing their teeth twice a day and the function of teeth in chewing. However, they do not fully understand the aspects of regular check-ups, flossing, or early identification of symptoms. This indicates a gap between knowledge and actual practice—a factor supported by Behavior Change Theory models such as HBM and TPB (Notoatmodjo, 2020). Lestari & Kurniawan (2019) and Wardhani et al. (2022) show that direct education plus visual media enriches understanding and encourages the adoption of good habits, especially when education is interactive.

One significant obstacle that emerged was the public's fear of dental medical procedures, such as extractions or the use of drugs. Pregnant women in particular were concerned about the side effects of supplements or treatments, reflecting an inadequate information gap. Mega (2020) highlighted that this kind of anxiety reduces visits to health facilities. Therefore, therapeutic communication from medical personnel is very important in building a sense of security, answering concerns, and increasing patient self-efficacy.

Quantitative findings show that groups active in the Posyandu program—especially mothers—have a higher level of knowledge. Graph 4.5 reflects that these mothers are better able to recognize early caries, the importance of tartar cleaning, and choose the right treatment media. Damayanti et al. (2020) also support that community involvement in Posyandu increases motivation and adoption of healthy behaviors. This emphasizes that empowering local cadres and integrating dental-oral education into Posyandu programs has the potential to strengthen health promotion in rural areas.

Leaflets and direct counseling have proven to be an effective combination—where leaflets act as a source of information that can be taken home, while direct counseling provides a space for clarification, interaction, and emotional bonding between officers and the community. Al Bardaweel and Dashash (2018) concluded that in school children, direct counseling with visual materials is more effective than passive or e-learning. This success is further emphasized by a study at BMC Oral Health (2020) which emphasizes the importance of a combination of visual and interactive media to improve oral hygiene behavior. Bonebobakal Health Center needs to strengthen this strategy with the communication capacity of officers and the expansion of local media such as village radio and bulletin boards.

The PRECEDE–PROCEED and HAPA models are suitable as theoretical frameworks for dental–oral education programs in Bonebobakal. The diagnostic phase in PRECEDE helps identify predisposing and enabling factors, while the implementation phase in PROCEED ensures sustainable implementation, including monitoring and evaluation. On the other hand, HAPA helps address self-efficacy and preventive action planning. Improving the communication competence of officers through training, increasing the frequency of counseling, using regional languages, and strengthening educational media is expected to be able to transform knowledge into long-term healthy habits—in line with Law No. 23/1992 concerning improving public health.

4. CONCLUSION

The educational role carried out by health workers has been proven to be able to encourage changes in community behavior towards a more positive direction, marked by an increase in the frequency of tooth brushing and the growing awareness to have regular dental check-ups, although not evenly distributed. Promotive and preventive efforts carried out through regular counseling and education have contributed to improving the quality of life of the community through maintaining dental and oral health. Community knowledge also showed a significant increase after educational interventions, especially when delivery was carried out through a combination of leaflets and direct counseling. For further researchers, it is recommended to expand the research location to other health centers in rural areas around Bonebobakal in order to obtain a more comprehensive picture of the effectiveness of dental and oral health education, as well as to identify variations in challenges and educational strategies that are most relevant according to the local characteristics of each region.

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