Vol 10 No 2, Juni 2026
ABDI DOSEN
Jurnal Pengabdian Pada Masyarakat
pISSN: 2614-6509
eISSN: 2620-5156

ORAL HEALTH IN RESIDENTS OF THE PUSKESMAS PEGIRIAN AREA: A STRUCTURAL EQUATION MODELING APPROACH

Dian Agustin Wahjuningrum *, Devi Eka Juniarti, Tamara Yuanita, Setyabudi, Eric Priyo Prasetyo, Galih Sampoerno

Department of Conservative Dentistry. Faculty of Dental Medicine. Universitas Airlangga
Jl. Mayjen Prof. Dr. Moestopo No. 47, Pacar Kembang, Kec. Tambaksari, Kota Surabaya, Jawa Timur 60132, Indonesia

Abstract

Oral and dental health remain major public health concerns because they significantly influence quality of life and general well-being. Although community members often demonstrate adequate knowledge and positive attitudes toward oral health, these factors do not always translate into appropriate preventive behaviors. This study aimed to analyze the structural relationship between knowledge, attitude, and oral health practices among residents in the Puskesmas Pegirian area using Structural Equation Modeling (SEM). A cross-sectional analytic study was conducted involving 250 adult participants selected through purposive sampling. Data were collected using a validated Knowledge, Attitude, and Practice (KAP) questionnaire related to oral health. Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate both measurement and structural models. The results demonstrated that knowledge significantly influenced attitude ($\beta = 0.61$; $p < 0.001$), while attitude significantly influenced oral health practice ($\beta = 0.54$; $p < 0.001$). Knowledge also showed a direct but weaker effect on practice ($\beta = 0.21$; $p < 0.05$). Attitude acted as a significant mediating variable between knowledge and oral health behavior. These findings indicate that improving knowledge alone is insufficient to promote sustainable oral health behavior without strengthening positive attitudes. Therefore, oral health promotion programs at the primary health care level should integrate behavioral reinforcement and motivational strategies to achieve long-term behavioral change.

Keywords: Oral Health, Knowledge, Attitude, Practice, Structural Equation Modeling, PLS-SEM, Community Health

INTRODUCTION

Oral and dental health are essential components of overall health and quality of life. Poor oral health conditions such as dental caries, periodontal disease, and tooth loss continue to affect populations globally and create substantial social and economic burdens (Johnson et al., 2024).

https://pkm.uika-bogor.ac.id/index.php/ABDIDOS/issue/archive
Submitted: June-2026 Received: June-2026 Available online: June-2026

Preventive oral health behavior is strongly influenced not only by access to health services but also by behavioral and psychosocial determinants, including knowledge, attitudes, perceptions, and self-efficacy (Guan et al., 2024).

In Indonesia, oral health problems remain highly prevalent despite ongoing preventive and promotive efforts through primary health care services. Community Health Centers (Puskesmas) play an important role in delivering oral health education and preventive programs to the community. However, previous studies have consistently demonstrated a discrepancy between oral health awareness and actual preventive practices (Oktadewi et al., 2024).

Structural Equation Modeling (SEM) provides a comprehensive analytical approach because it allows simultaneous examination of direct and indirect relationships between knowledge, attitudes, and practices (Hair et al., 2022). SEM also enables researchers to evaluate mediating effects and construct validity within behavioral models.

Recent oral health research increasingly recommends SEM approaches to better understand behavioral pathways and identify the strongest determinants influencing preventive health practices. By applying SEM, researchers can determine whether knowledge directly influences practice or whether its effect occurs indirectly through attitude formation. Understanding these pathways is essential for designing more effective oral health promotion interventions in community settings.

This study therefore aimed to analyze the structural relationships among oral health knowledge, attitudes, and practices among residents in the Puskesmas Pegirian area using Structural Equation Modeling. The findings are expected to provide evidence-based insights for strengthening behavior-oriented oral health promotion programs within primary health care systems.

IMPLEMENTATION METHOD

This study employed an analytic cross-sectional design using a Structural Equation Modeling (SEM) approach with Partial Least Squares (PLS-SEM) (Dash & Paul, 2021). The study population consisted of adult community members residing in the Puskesmas Pegirian area, Surabaya, Indonesia. A total of 250 participants were recruited using purposive sampling.

Data collection was conducted using a structured and validated questionnaire adapted from previous oral health KAP studies (Rajbhandari & Aryal, 2024). Data were analyzed using SmartPLS software.

The analysis included:

1. Measurement model evaluation (outer model)
2. Structural model evaluation (inner model)
3. Hypothesis testing using bootstrapping
4. Path coefficient analysis
5. Mediation effect analysis

The structural relationship tested was:
Knowledge → Attitude → Practice
Ethical approval was obtained prior to data collection, and informed consent was secured from all participants.

RESULTS

The SEM analysis revealed that knowledge significantly influenced attitude ($\beta = 0.61$; $p < 0.001$), while attitude significantly influenced oral health practice ($\beta = 0.54$; $p < 0.001$). Knowledge also demonstrated a direct influence on practice ($\beta = 0.21$; $p < 0.05$).
The findings indicated that attitude significantly mediated the relationship between knowledge and oral health practice. The model explained 37% variance in attitude and 48% variance in oral health practice.

All measurement indicators met validity and reliability requirements with outer loading values >0.70, AVE >0.50, and composite reliability >0.

DISCUSSION

This study demonstrated that knowledge significantly influences attitudes toward oral health, supporting behavioral health theories stating that cognitive understanding contributes to the formation of positive health perceptions (Guan et al., 2024). Individuals with better oral health knowledge are more likely to appreciate the importance of preventive oral hygiene behaviors.

The strongest relationship identified in this study was between attitude and oral health practice. This finding suggests that attitude functions as a critical motivational factor in transforming knowledge into actual behavior. Although individuals may possess adequate information regarding oral health, behavior change may not occur unless positive attitudes and behavioral intentions are established. These findings align with contemporary behavioral models emphasizing the importance of psychosocial determinants in preventive health practices.

Interestingly, knowledge also demonstrated a direct influence on oral health practices, although the effect size was weaker than the indirect pathway through attitude. This indicates that educational interventions alone may not sufficiently produce sustainable behavioral changes. Effective oral health promotion programs should therefore integrate motivational reinforcement, practical demonstrations, and continuous community engagement to strengthen positive attitudes and behavioral commitment.

The SEM approach provides a more comprehensive understanding of oral health behavior compared with conventional descriptive KAP studies because it simultaneously evaluates direct and indirect pathways (Hair et al., 2022). Effective oral health promotion programs should integrate motivational reinforcement, practical demonstrations, and continuous community engagement to strengthen positive attitudes and behavioral commitment (Johnson et al., 2024).

The role of Puskesmas as the primary health care provider is crucial in implementing continuous and community-centered oral health interventions. Programs integrating education, practical training, motivational counseling, and regular follow-up may contribute to stronger and more sustainable oral health behavior among community members.

Figure 1. Oral health education activities conducted for community members at Puskesmas Pegirian, Surabaya (Personal documentation)

CONCLUSION

Knowledge significantly influences attitudes toward oral health, while attitudes strongly affect oral health practices among community members in the Puskesmas Pegirian area. Attitude also mediates the relationship between knowledge and preventive oral health behavior. These findings indicate that oral health promotion programs should move beyond information delivery and prioritize behavioral reinforcement approaches to achieve sustainable improvements in community oral health practices.

REFERENCES

Dash, G., & Paul, J. (2021). CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change*, 173, 121092. https://doi.org/10.1016/j.techfore.2021.121092

Guan, X., Li, D., Zou, D., Yu, X., Pan, S., Yang, Z., & Huang, J. (2024). Investigation on the knowledge, attitude and practice of oral health among medical college and university undergraduate. *Health*, 16(7), 602–614. https://doi.org/10.4236/health.2024.167042

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage Publications.

Johnson, A. M., Kenny, A., Ramjan, L., Raeburn, T., & George, A. (2024). Oral health knowledge, attitudes, and practices of people living with mental illness: A mixed-methods systematic review. *BMC Public Health*, 24(1). https://doi.org/10.1186/s12889-024-19713-1

Oktadewi, F. D., Romdlon, M. A., Laksitasari, A., & Hidayah, R. A. (2024). Oral health literacy, knowledge, attitude, and oral health practices among college students. *Dental Journal*, 57(4), 280–285. https://doi.org/10.20473/j.djmkg.v57.i4.p280-285

Rajbhandari, A., & Aryal, N. (2024). Assessment of knowledge, attitude and practice on oral health among secondary-level students: A cross-sectional study in Kathmandu, Nepal. *BMJ Public Health*, 2(1), e000438. https://doi.org/10.1136/bmjph-2023-000438