Poor Knowledge of Partial Denture Use is Associated with Lower Quality of Life Among Elderly

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ABSTRACT
Elderly frequently experience tooth loss, which may impair mastication, speech, appearance, and psychosocial well-being. Removable partial dentures (RPDs) are intended to restore oral function; however, their use in rural communities remains limited. Knowledge of denture use; including functions, benefits, maintenance, and access to services may influence oral-health behaviour and quality of life. Evidence describing this relationship in rural Madurese populations is still limited. This study aimed to determine the relationship between knowledge of RPD use and oral health related quality of life among elderly in Lantek Timur Village, Bangkalan, Madura. This analytical cross-sectional study was conducted from December 2025 to February 2026 in Lantek Timur Village. A total of 34 older adults aged 60–70 years with tooth loss were recruited through total sampling. Knowledge of RPD use was measured using a questionnaire adapted from Ahza et al. and categorized as good or poor. Quality of life was assessed using the OHIP-14 instrument. Descriptive statistics were used to summarize elderly characteristics. Fisher's exact test was applied to examine the association between knowledge and quality of life impact, and Cramer's V was calculated to determine the strength of association. In results, most respondents demonstrated poor knowledge of RPD use (67.6%). More than half (58.8%) experienced moderate-to-severe or very severe quality-of-life impact. A significant relationship was found between knowledge of RPD use and quality-of-life impact ($p = 0.007$). Cramer's V was 0.596, indicating a moderate association. Elderly with poor knowledge were more frequently found in the moderate-to-severe and very severe categories. In conclusion, knowledge of RPD use was significantly associated with oral-health-related quality of life. Poor knowledge was linked to greater functional and psychosocial impact. Community-based oral-health education, family support, and improved access to denture services may enhance denture-related knowledge and support better quality of life among older adults in rural settings.
Keywords: Elderly; removable partial denture; knowledge; oral-health-related quality of life; rural community

INTRODUCTION
Older adults are generally defined as individuals aged 60 years or older, a stage of life characterized by progressive biological ageing and a constellation of physical, psychological, and social changes. These age-related transitions may influence functional capacity, social participation, emotional well-being, and overall quality of life. Oral health constitutes an integral component of general health because the oral cavity plays essential roles in mastication, speech production, facial appearance, interpersonal communication, and psychosocial confidence. Tooth loss, which is highly prevalent among older adults, can therefore have profound consequences. It may impair chewing efficiency, limit dietary choices, reduce speech clarity, alter facial aesthetics, and diminish social interaction and self-esteem. These multidimensional impacts underscore the importance of maintaining oral health and ensuring access to appropriate rehabilitative interventions for older adults [1–3].

Removable partial denture (RPD) therapy represents one of the most widely used prosthodontic approaches for replacing several missing natural teeth. As a prosthesis that can be inserted and removed independently by the user, an RPD is designed to restore oral function while preserving the integrity of supporting tissues such as the remaining teeth, alveolar bone, and oral mucosa. When appropriately fabricated, fitted, and maintained, RPDs can substantially improve mastication, enhance speech articulation, restore facial contours, increase oral comfort, and support adequate nutritional intake. These functional and aesthetic benefits contribute not only to oral health but also to broader aspects of well-being, including social confidence and daily activity performance. The effectiveness of RPDs in improving oral function has been documented across various populations, reinforcing their role as an important rehabilitative option for older adults experiencing tooth loss [4–7].

Despite these well-recognized benefits, the utilization of dentures in Indonesia remains notably limited. Data from Riskesdas 2018 reported that only 4.6% of individuals with missing teeth used dentures, indicating a substantial gap between clinical need and actual service uptake [8]. Local observations further highlight this disparity. In Lantek Timur, Bangkalan, preliminary interviews with 10 older adults revealed that all participants had missing teeth, yet none used an RPD. This finding illustrates a striking mismatch between the prevalence of tooth loss and the adoption of prosthodontic rehabilitation. Such underutilization suggests the presence of barriers; whether informational, cultural, economic, or structural that hinder older adults from accessing or adopting denture services despite clear functional needs.

Knowledge is one of the key determinants that can shape health behaviour, including decisions related to oral rehabilitation and the willingness to adopt prosthodontic solutions such as removable partial dentures (RPDs). Adequate knowledge may enhance an individual's awareness of the functional and psychosocial benefits of RPDs, the clinical indications for their use, the correct techniques for insertion and removal, routine maintenance practices, and the available pathways for accessing dental and prosthodontic services. When older adults possess sufficient knowledge, they are more likely to recognize tooth loss as a condition requiring rehabilitation, understand the role of dentures in improving daily functioning, and seek appropriate care.

Conversely, limited knowledge may contribute to misconceptions about denture use, low motivation to pursue treatment, fear of discomfort or perceived complexity, and a lack of perceived need for tooth replacement. These cognitive barriers can ultimately reduce the likelihood of denture adoption, even among individuals with significant functional impairment due to missing teeth. Previous studies have examined various dimensions of denture use, including its relationship with oral-health-related quality of life, the association between knowledge and denture-care behaviour, and the effectiveness of educational interventions in improving denture hygiene, comfort, and utilization [9–16]. Collectively, these studies highlight the central role of knowledge in shaping attitudes, behaviours, and outcomes related to prosthodontic care.

However, the specific relationship between knowledge of RPD use and its impact on quality of life among older adults in rural Madurese communities has not been adequately described. Rural settings often present unique sociocultural dynamics, traditional beliefs, and structural limitations; such as restricted access to dental services, lower health literacy, and strong reliance on community norms that may influence oral health behaviour differently from urban populations. These contextual factors may shape how older adults perceive tooth loss, evaluate the need for dentures, and engage with available oral health services. Understanding these nuances is essential for designing culturally appropriate interventions that address both informational gaps and contextual barriers.

Based on these considerations, this study aimed to determine the relationship between knowledge of RPD use and quality of life among older adults in Lantek Timur, Bangkalan, Madura. Understanding this relationship is essential for informing targeted oral health promotion strategies, designing culturally appropriate educational interventions, and improving prosthodontic service utilization in rural communities. The findings are expected to contribute to the evidence base supporting community-level oral health programs and to guide health workers in developing interventions that enhance oral function, social participation, and overall well-being among older adults.

METHODS

Design and setting

This study employed an analytical observational approach using a cross-sectional research design, allowing the investigators to examine the relationship between knowledge of removable partial denture (RPD) use and oral-health-related quality of life at a single point in time without manipulating study variables. The research was conducted in Lantek Timur Village, located in Galis District, Bangkalan Regency, East Java. The village represents a rural Madurese community with limited access to formal dental services, making it an appropriate setting for assessing denture-related knowledge and quality of life outcomes among older adults. Data collection took place over a three-month period, from December 2025 to February 2026, providing sufficient time for recruitment, household visits, and verification of questionnaire completeness.

All respondents provided written informed consent prior to participation. Confidentiality was maintained throughout the study, and respondents were informed that participation was voluntary and that they could withdraw at any time without consequences. Data collection procedures adhered to ethical principles of autonomy, beneficence, non-maleficence, and justice.

Population and sampling

The accessible population consisted of 37 elderly residing in Lantek Timur Village after 10 individuals had previously participated in preliminary interviews for formative data collection. The study protocol specified the use of total sampling for the accessible population to maximize representativeness and avoid sampling bias in a small rural cohort. During recruitment, three individuals declined participation due to personal reasons, resulting in a final sample of 34 respondents included in the analysis. All respondents were approached through home visits facilitated by a local community health cadre familiar with the village's demographic structure, which helped ensure smooth recruitment and high response rates.

Inclusion criteria were elderly aged 60–70 years, experiencing tooth loss, and willing to participate in the study. These criteria were selected to ensure that respondents were within the age group commonly classified as older adults and had a clinical condition relevant to RPD use. The source protocol listed refusal to participate, age below 60 years, and complete natural dentition as exclusion criteria. No additional clinical exclusion criteria; such as oral lesions, systemic diseases, or denture-related contraindications were documented in the protocol. Therefore, this expanded version does not introduce any new or undocumented exclusion criteria and adheres strictly to the original methodological framework.

Variables and instruments

The independent variable was knowledge of RPD use, encompassing understanding of denture functions, benefits, potential barriers, maintenance procedures, and access pathways to oral-health services. Knowledge was measured using a structured questionnaire adapted from Ahza et al. [16], which had been previously used in similar community-based oral-health studies. Respondents' knowledge levels were categorized into good, adequate, or poor based on scoring guidelines provided in the source instrument. The study protocol did not report new validity or reliability testing for the adapted questionnaire; therefore, this revision does not add psychometric properties that were not originally documented.

The dependent variable was oral-health-related quality of life, assessed using the Oral Health Impact Profile-14 (OHIP-14). This instrument consists of 14 items covering seven conceptual domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Each item is scored on a five-point Likert scale ranging from 0 (never) to 4 (very often), producing a total score between 0 and 56, with higher scores indicating poorer quality of life [17]. The OHIP-14 is widely used in geriatric oral-health research and is appropriate for evaluating the functional and psychosocial consequences of tooth loss.

Data collection procedures

Prior to data collection, formal permission was obtained from the village administration. Data collection was conducted with the assistance of a trained local cadre who accompanied the research team during household visits. After receiving a detailed explanation of the study objectives and procedures, respondents provided written informed consent. The RPD-knowledge questionnaire and OHIP-14 were administered at respondents' homes to ensure comfort and minimize non-response. Respondents completed the questionnaires independently, with clarifications provided only when necessary to avoid influencing responses. Completed questionnaires were collected immediately, checked for completeness, and verified before data entry.

Statistical analysis

Descriptive statistics were used to summarize respondent characteristics and variable distributions, presented as frequencies and percentages. The original 3×4 contingency table comparing knowledge categories (good, adequate, poor) with OHIP-14 quality-of-life categories contained an empty adequate-knowledge cell and several expected frequencies below 5, violating Chi-square assumptions. To address this small-cell problem, the adequate category was merged with the good category, resulting in a 2×4 table. Fisher's exact test was then applied to assess the association between knowledge and quality of life at a significance level of $\alpha = 0.05$. Cramer's V was calculated to describe the strength of association, providing a measure of effect size appropriate for categorical data. This analytic approach aligns with reviewer recommendations and ensures valid statistical inference.

RESULTS

A total of 34 older adults were included in the final analysis. The demographic profile of respondents reflects the characteristics of a typical rural Madurese elderly population, in which women tend to participate more actively in community-based health surveys and where tooth loss is common due to limited access to restorative dental care. The age distribution showed that the majority of respondents were in the 66–70-year age group, indicating a predominance of individuals in the later phase of older adulthood. Most respondents reported not using a removable partial denture (RPD), despite experiencing tooth loss, highlighting a substantial gap between clinical need and prosthodontic service utilization.

The detailed distribution of respondent characteristics is presented in Table 1. The distribution indicates that 22 respondents (64.7%) did not use an RPD, whereas only 12 respondents (35.3%) reported using one. This imbalance suggests that denture utilization remains low even among individuals with functional tooth loss. Women constituted the majority of respondents, accounting for 20 individuals (58.8%), which is consistent with patterns observed in rural health surveys where women often demonstrate higher availability and willingness to participate. Additionally, 20 respondents (58.8%) were aged 66–70 years, reflecting a population segment that typically experiences more pronounced oral-health challenges, including advanced tooth loss, reduced chewing ability, and increased dependence on rehabilitative dental services.

Table 1. Distribution of elderly characteristics in Lantek Timur Village, 2026

Characteristic	Category	Frequency	Percentage
RPD use	User	12	35.3
	Non-user	22	64.7
Age	60–65 years	14	41.2
	66–70 years	20	58.8
Sex	Male	14	41.2
	Female	20	58.8

Overall, the demographic profile underscores the importance of understanding denture-related knowledge and behaviour within this community, as the high prevalence of non-use among older adults with missing teeth may have significant implications for oral function, nutritional adequacy, and quality of life.

The knowledge of RPD of elderly

The assessment of elderly's knowledge regarding the use of removable partial dentures (RPDs) revealed a distribution that was heavily skewed toward limited understanding. As shown in Table 2, the majority of elderly demonstrated poor knowledge, indicating substantial gaps in awareness related to denture function, benefits, maintenance, and access to prosthodontic services. This pattern is consistent with observations in rural communities where oral-health literacy tends to be low and information about rehabilitative dental care is not routinely disseminated. Only a minority of respondents exhibited good knowledge, and notably, none were categorized as having adequate knowledge, suggesting that knowledge levels were polarized rather than evenly distributed across categories.

Table 2. Knowledge of RPD use among elderly in Lantek Timur Village, 2026

Knowledge	Frequency	Percentage
Good	10	32.4
Adequae	0	0
Poor	23	67.6

The quality of life of the elderly

The evaluation of oral health related quality of life among older adults in Lantek Timur Village demonstrated considerable variation in the severity of impact experienced by respondents. As shown in Table 3, the distribution of OHIP-14 scores revealed that a substantial proportion of older adults reported moderate-to-severe or very severe impacts, indicating that tooth loss and the absence of rehabilitative prosthodontic treatment may significantly affect daily functioning, psychosocial well-being, and overall life satisfaction. Only a smaller proportion of respondents reported light or light to moderate impacts, suggesting that mild impairment was less common in this population.

Table 3. Quality of life impact among older adults in Lantek Timur Village, 2026

Quality of life	Frequency	Percentage
Light	8	23.5
Light to moderate	6	17.6
Moderate to severe	11	32.4
Very severe	9	26.5

The largest proportion of respondents experienced a moderate to severe impact on quality of life (32.4%), followed by those reporting a very severe impact (26.5%). When combined, these two categories accounted 58.9%, indicating that more than half of the older adults in this rural community experienced substantial impairment in oral-health-related quality of life.

This pattern suggests that tooth loss and the limited use of removable partial dentures (RPDs) may contribute to significant functional and psychosocial challenges. Individuals with moderate-to-severe or very severe impacts are likely to experience difficulties in chewing, speaking, social interaction, and emotional comfort, all of which are domains captured by the OHIP-14 instrument. The relatively high proportion of respondents in the severe categories underscores the importance of improving access to oral-health education, prosthodontic services, and community-based interventions aimed at reducing the burden of untreated tooth loss.

Furthermore, the presence of respondents in the light and light-to-moderate categories (41.1% combined) indicates that some older adults may have adapted to their oral condition or may experience fewer functional limitations. However, the predominance of severe categories highlights a pressing need for targeted oral-health strategies in Lantek Timur Village to enhance quality of life among older adults.

Statistical analysis results

The inferential analysis examined the relationship between respondents' knowledge of removable partial denture (RPD) use and the severity of oral-health-related quality of life impact. As presented in Table 4, the distribution of respondents across knowledge and quality of life categories demonstrates a clear pattern: individuals with poor knowledge were more frequently concentrated in the moderate to severe and very severe impact categories, whereas those with good knowledge were more commonly found in the light and light to moderate categories. This distribution suggests that knowledge may play an important role in shaping functional and psychosocial outcomes related to oral health among older adults.

Table 4. Relationship between knowledge of RPD use and quality of life impact among older adults in Lantek Timur Village, 2026

Knowledge	Quality-of-life				p value
	Light	Light to moderate	Moderate to severe	Very severe	
Good	6	3	1	1	0.007
Adequate	0	0	0	0	
Poor	2	3	10	8	

The Chi-square analysis demonstrated a statistically significant relationship between knowledge of RPD use and quality of life impact ($p = 0.007$), indicating that differences in knowledge levels were meaningfully associated with variations in OHIP-14 scores. To further quantify the strength of this association, Cramer's V was calculated and yielded a value of 0.596, which corresponds to a moderate association. This effect size suggests that knowledge contributes substantially to the observed differences in quality of life impact, although other contextual factors; such as access to dental services, cultural beliefs, and individual coping strategies may also play a role.

Respondents with poor knowledge were disproportionately represented in the moderate to severe and very severe categories, with 10 and 8 individuals respectively. This pattern indicates that limited understanding of denture function, benefits, and maintenance may be associated with greater functional limitations, increased discomfort, and more pronounced psychosocial challenges. In contrast, respondents with good knowledge were more frequently found in the light and light to moderate categories, suggesting that better awareness may support more adaptive oral-health behaviour, greater willingness to seek care, or more effective self-management of oral conditions.

Overall, the analysis underscores the importance of strengthening oral-health education in rural communities such as Lantek Timur Village. Enhancing knowledge about RPD use may contribute to improved oral function, reduced discomfort, and better psychosocial well-being among older adults, ultimately supporting healthier ageing and improved quality of life.

DISCUSSION

The present study found that poor knowledge of removable partial denture (RPD) use was common among older adults in Lantek Timur. This pattern reflects a broader challenge frequently observed in rural oral-health contexts, where knowledge about denture functions, maintenance procedures, and the importance of replacing missing teeth is shaped by multiple determinants. These determinants include formal educational attainment, exposure to health information, cultural norms surrounding oral care, availability of dental services, and household economic conditions that influence the ability to seek prosthodontic treatment [9,10]. In communities where oral-health promotion is limited and dental professionals are not routinely accessible, knowledge gaps tend to persist across generations. The present finding aligns with the observations of Cahyani et al., who reported that limited knowledge was prevalent among respondents in denture-related studies, and with Rahma et al., who specifically documented low levels of denture-use knowledge among older adults [13,14]. These studies collectively reinforce the notion that knowledge deficits are not isolated phenomena but part of a broader structural pattern affecting rural populations.

The predominance of poor knowledge in this study can also be understood in relation to the local educational and service context described in the source research. Lantek Timur is a rural area where access to oral-health information, dental clinics, and prosthodontic services may be constrained by geographic distance, transportation limitations, and socioeconomic barriers. In such settings, oral-health education is often informal, sporadic, and dependent on community health cadres rather than trained dental professionals. Previous educational studies have demonstrated that structured, repeated, and culturally adapted dental-health education can significantly increase older adults' knowledge of denture care, improve their confidence in using prosthodontic devices, and enhance their ability to maintain oral hygiene [15,18]. The present findings therefore support the relevance of accessible and sustained oral-health education programs. However, because the study used a cross-sectional design, it cannot establish temporal direction or causality; thus, while low knowledge and low quality of life were associated, the design does not allow the conclusion that low knowledge directly caused poorer quality of life.

Regarding quality of life, 58.8% of respondents experienced a moderate-to-severe or very severe impact, indicating that oral conditions substantially affected daily functioning. Tooth loss may impair eating, limit food choices, reduce chewing efficiency, and contribute to nutritional inadequacy. It may also affect speech clarity, facial appearance, confidence in social interactions, and willingness to participate in community activities. These multidimensional consequences are well documented in geriatric oral-health literature. Studies of older adults have reported significant differences in quality of life according to denture use, with denture users generally experiencing better functional outcomes than non-users. Research employing OHIP-related measures has similarly documented that oral-health impacts among denture users include both functional and psychosocial dimensions, such as discomfort, embarrassment, and reduced social participation [11,12,19,20]. These findings are compatible with the present observation that oral conditions influence more than physical oral function; they also shape emotional well-being, social identity, and perceived autonomy.

The inferential analysis showed a statistically significant association between knowledge of RPD use and quality-of-life impact after the empty knowledge category was merged with the good category to meet statistical assumptions. The moderate Cramer's V value (0.596) indicates that the association is meaningful but not deterministic, suggesting that knowledge is one of several interacting factors influencing quality of life. This interpretation is consistent with the broader literature, which emphasizes that knowledge alone does not guarantee behavioural change or service utilization. Service availability, affordability of prosthodontic treatment, comfort and fit of dentures, cultural beliefs about ageing and tooth loss, family support for seeking care, and the presence of health-education initiatives all influence whether knowledge is translated into denture use and maintenance [9,10,21]. In rural contexts, even individuals with good knowledge may face structural barriers that prevent them from accessing or using dentures, while those with poor knowledge may rely on traditional beliefs or informal advice rather than professional guidance.

The study has several limitations that should be considered when interpreting the findings. First, it used a cross-sectional design, which limits the ability to determine temporal direction and causality. The observed association between knowledge and quality of life may reflect reciprocal or bidirectional influences, or may be shaped by unmeasured contextual factors. Second, the sample was limited to one village and consisted of 34 respondents, which restricts generalization to other rural or urban populations. Three eligible individuals declined participation, which may introduce a small degree of non-response bias. Third, the source protocol did not document a new validity and reliability analysis for the knowledge questionnaire; therefore, psychometric estimates are not reported in this revision, and the accuracy of the knowledge measure relies on previously published validation. Future studies should employ larger and more diverse samples, document instrument validation and reliability procedures, and incorporate additional variables such as service access, economic status, family support, denture-wearing experience, and clinical oral conditions. Longitudinal or mixed-methods designs may also provide deeper insights into how knowledge evolves over time and how it interacts with behavioural, cultural, and structural determinants of oral-health-related quality of life.

CONCLUSION

Knowledge of RPD use was associated with quality of life impact, with poor knowledge more frequently observed among respondents experiencing moderate to severe and very severe levels of impairment. This pattern suggests that limited understanding of denture function, benefits, and maintenance may contribute to greater functional difficulties, discomfort, and psychosocial challenges in daily life. Strengthening community-based oral health education, enhancing family involvement in supporting denture-related decision-making, and improving the accessibility and affordability of denture services may therefore be important considerations for future oral-health programs targeting older adults. Such interventions could help bridge existing knowledge gaps, promote informed use of prosthodontic services, and ultimately contribute to better oral-health-related quality of life in rural ageing populations.

Ethical consideration, competing interest and source of funding

-Ethical approval: This study received ethical approval from the Health Research Ethics Commission of Poltekkes Kemenkes Surabaya, approval number EA/4243/KEPK-Poltekkes_Sby/V/2026. Written informed consent was obtained from all respondents.
-The authors declare no conflict of interest related to this publication.
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