

Significant Influence of Family Support on Denture Utilization Among Elderly Individuals at Elderly School

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ABSTRACT

This study aims to analyze the relationship between family support and denture use among elderly individuals at the Tangguh Elderly School in Mojo Village, Surabaya City. Using an observational cross-sectional design, the study involved 60 elderly respondents and their accompanying family members. Data collection was conducted through structured questionnaires and direct observation of denture use, while statistical analysis employed the Chi-Square test with a significance level of 0.05. The findings revealed that more than half of the elderly respondents received low family support (53.3%), with smaller proportions reporting moderate (28.3%) and high support (18.3%). Denture utilization was also notably low, with only 11.7% of respondents using dentures despite experiencing tooth loss, whereas 88.3% did not use dentures. The Chi-Square analysis confirmed a significant association between family support and denture use ($p = 0.000$). Elderly individuals with high family support demonstrated substantially greater denture use (45.5%) compared to those with moderate support (11.8%), and none of the elderly with low support used dentures. These results underscore that family support is a critical determinant influencing denture-use behavior among older adults. Practically, the study highlights the need to actively involve families in oral health promotion and denture-related education to enhance awareness, motivation, and adherence among the elderly. Family-based interventions that integrate emotional, instrumental, informational, and appraisal support are recommended to optimize denture use and improve overall quality of life. Further research and community-driven programs are encouraged to strengthen the role of families in supporting oral health among the elderly.

Keywords: family support; denture use; elderly; oral health

INTRODUCTION

The aging process represents a universal and inevitable biological stage experienced by all living beings, including humans. From a biological standpoint, aging is characterized by a gradual and progressive decline in bodily functions, encompassing structural and functional changes across multiple organ systems, tissues, and even cellular components. These changes manifest not only in visible physical aspects; such as sagging skin, graying hair, reduced muscle tone, and stooped posture but also extend into cognitive, sensory, and psychosocial domains, all of which collectively influence the overall quality of life of older adults in substantial ways [1]. The deterioration occurring during aging is systemic, meaning that nearly all organs are affected, including the oral cavity, which is often overlooked compared to vital organs such as the heart, lungs, or kidneys. In reality, oral health constitutes an integral component of holistic health, and disturbances in oral function can exert far-reaching impacts on general well-being.

Among the most prevalent oral health problems in the elderly is progressive tooth loss, a condition that increases in frequency and severity with advancing age. Tooth loss should not be perceived merely as a natural physiological change; rather, it represents a complex health issue with significant consequences across three major domains: functional, aesthetic, and psychological. These domains are interrelated and mutually reinforcing. Functionally, tooth loss disrupts mastication efficiency, impairs speech articulation, and reduces the ability to process various types of food. Aesthetically, missing teeth alter facial structure, diminish facial harmony, and accelerate visible signs of aging such as sunken cheeks and thinner lips. Psychologically, tooth loss can reduce self-confidence, induce embarrassment during social interactions, and contribute to social withdrawal or isolation, particularly among older adults who experience profound changes in appearance and oral function [2].

Epidemiological data further highlight the urgency of addressing this issue. According to the Ministry of Health of the Republic of Indonesia, the prevalence of tooth loss among individuals aged 45–54 years reaches 26.4%, increases to 37.2% in the 55–64 age group, and peaks at 46.5% among those aged 65 years and above [3]. This consistent upward trend demonstrates that tooth loss is not incidental but follows a predictable linear pattern associated with aging. More concerning is the fact that the prevalence of tooth loss in Indonesia exceeds the ideal standard recommended by the World Health Organization (WHO), which states that older adults should ideally retain at least 20 functional teeth throughout their lifespan to maintain optimal oral function and quality of life [2]. A similar pattern is observed across Southeast Asia, where the elderly population is estimated at approximately 142 million individuals, equivalent to 8% of the region's total population; a demographic shift that underscores the growing importance of addressing oral health issues among older adults [4].

The consequences of tooth loss extend beyond oral function. Impaired mastication affects nutritional intake, limiting the consumption of fibrous or hard foods and potentially leading to nutritional deficiencies. Altered facial anatomy due to missing teeth can influence social identity and self-perception. Psychologically, tooth loss may trigger feelings of shame, reduce social participation, and increase the risk of social isolation; a condition known to accelerate cognitive decline and diminish overall quality of life [5]. Several studies have even suggested indirect associations between tooth loss and increased morbidity and mortality among older adults, primarily due to compromised nutritional intake and its long-term systemic effects [6].

In response to these challenges, the use of dentures; referred to medically as prosthodontic appliances emerges as a key rehabilitative strategy designed to restore both physiological and aesthetic functions in individuals who have lost their natural teeth. Dentures play a crucial role in improving chewing ability, enhancing speech clarity, restoring facial balance, and preventing undesirable tooth migration among remaining natural teeth [7]. Despite these benefits, the rate of denture use among older adults in Indonesia remains remarkably low. Data from national health surveys indicate that although 19% of the population has experienced tooth loss, only 1.4% actually use dentures as a rehabilitative measure [8]. This substantial gap between the high prevalence of tooth loss and the low utilization of dentures suggests the presence of structural, behavioral, and psychosocial barriers that hinder adoption of prosthodontic solutions.

Previous studies have attempted to identify factors influencing denture use among older adults. These include cognitive factors such as limited knowledge about the benefits of dentures, psychological factors such as fear or discomfort, and social factors such as inadequate support from

family or caregivers [9]. Among these determinants, family support appears to be a particularly influential yet often underexplored factor. This is surprising considering that the family constitutes the closest social unit interacting with older adults on a daily basis, thereby possessing substantial capacity to influence health-related decisions, including the decision to use dentures.

Empirical evidence reinforces the importance of family support. Older adults who receive consistent, high-quality support from family members demonstrate significantly higher likelihood of adopting and maintaining positive health behaviors, including routine denture use [10]. Family support is multidimensional, comprising emotional support (care, empathy), instrumental support (financial assistance, transportation, physical help), informational support (guidance, health education), and appraisal support (encouragement, reinforcement). These dimensions operate synergistically to enhance motivation, self-efficacy, and capability among older adults in sustaining denture use [11]. Direct accompaniment during dental visits, continuous reinforcement at home, and sustained encouragement have been shown to increase both initial adoption and long-term adherence to denture use [6]. Intervention studies further demonstrate that educational programs targeting families can significantly increase denture adoption and persistence among older adults [10].

However, most existing studies examine family support only in general contexts of elderly health, with relatively few focusing specifically on the relationship between family support and denture use. Research addressing this relationship within community-based settings; such as the Tangguh Elderly School remains limited. This gap in the literature highlights the need for more context-specific investigations. Preliminary surveys conducted at the study site further emphasize this urgency: among 10 randomly selected older adults, approximately 70% did not use dentures despite having fewer than 20 functional teeth, a number far below WHO's recommended standard. These findings suggest a substantial discrepancy between clinical needs and actual denture utilization, a gap likely influenced by inadequate or suboptimal family support.

Efforts to prevent dental health problems in the elderly

The elderly are defined as individuals aged 60 years and above, representing a stage of life characterized by the natural biological process of aging experienced by all living beings. As noted in the source document, "*Elderly is a group of individuals who have reached the age of 60 years and above, a phase of life characterized by the process of aging experienced by all living beings*" [4]. Aging is not a pathological condition but a natural physiological mechanism that produces cumulative changes across multiple aspects of human biological functioning, including progressive declines in immunity, motor abilities, and cognitive capacity [4].

Older adults are therefore viewed as a population undergoing complex transformations across physical, psychological, and social dimensions simultaneously. Physiologically, they experience decreased organ function, weakened muscle strength, reduced capacity of vital organs, and diminished effectiveness of the immune system. Psychologically, aging may lead to cognitive changes such as memory disturbances, slower thought processes, and emotional challenges associated with adapting to various forms of loss [1].

In addition to biological and psychological changes, the elderly often face significant shifts in social relationships, family roles, and economic conditions. Consequently, support from families and the surrounding community plays a crucial role in maintaining their overall well-being. Implementing a holistic nursing approach that focuses on the specific needs of older adults; and aims to maintain or improve their quality of life throughout the aging process requires a deep understanding of these fundamental concepts [1].

According to the Ministry of Health, the elderly population is classified into three age categories: pre-elderly (45–59 years), elderly (60–69 years), and high-risk elderly (≥ 70 years) [2]. The aging process varies across individuals, and no two people experience identical trajectories. The three primary phases of aging include: 1) The independence phase, in which older adults are still able to perform daily activities independently; 2) The interdependence phase, where they begin to require additional assistance despite remaining relatively independent; and 3) The full dependency phase, in which they are unable to live independently and require intensive support from health workers or family members [2].

Based on data from the Basic Health Research (RISKESDAS) in 2018, the average DMF-T index in the elderly in Indonesia reached 16.8, indicating that the majority of the elderly have around 16-17 teeth that are damaged due to dental caries. This figure reflects the very high rate of caries in this population. In the 55–64 age group, about 29% have lost all of their natural teeth, with Prevalence Caries reached 96.8%, while in the elderly aged 65+ years, caries cases Active recorded 95% [2].

Various dental health problems commonly experienced by the elderly include xerostomia, or dry mouth caused by reduced salivary gland function; tooth loss, which disrupts chewing and communication abilities and contributes to significant psychological distress; enamel thinning, which increases the risk of dentin hypersensitivity; dental caries resulting from bacterial activity within dental plaque; plaque accumulation as a bacterial biofilm that may harden into calculus (tartar); gingival recession, in which the gum margin recedes and exposes the tooth root; and periodontitis, a progressive inflammatory condition that damages the supporting tissues and alveolar bone surrounding the teeth [2,12–14]. These conditions tend to worsen with age due to physiological decline, reduced oral hygiene capability, and limited access to dental care.

Tooth loss in the elderly has substantial psychological consequences, including embarrassment, anxiety, decreased appetite leading to a heightened risk of malnutrition, sleep disturbances, inhibition of social interaction, social isolation, difficulty concentrating, and reduced ability to perform daily activities optimally [2]. The combined physical and psychosocial burden of tooth loss underscores the importance of timely oral rehabilitation, including the use of dentures, to maintain functional capacity and overall well-being in older adults.

Prevention of dental health problems in the elderly involves several strategies Comprehensive. First, maintaining dental and oral hygiene through brushing twice a day requires family support due to the decline Mobility and Cognitive in the elderly. Second, implementing a healthy diet with the consumption of fibrous foods that stimulate the production of saliva containing substances Antibacterial, Glycoproteins, calcium, and fluoride. Third, reducing sugar consumption which is not only related to Obesity and diabetes but also with the incidence of caries as a disease chronic in the elderly, where the family plays an important role in supervising Diet. Fourth, conducting routine check-ups at the dental clinic every six months for early detection of dental and oral problems [15]. Fifth, using dentures as a substitute tool to restore function Aesthetics, chewing, and communication, maintaining the health of surrounding tissues, with family support playing a major role in encouraging optimal adoption and treatment of dentures [16].

Family support

Teeth serve three major and interrelated functions: mastication, speech, and aesthetics [17]. The masticatory function involves the incisors, which cut food; the canines, which tear food; and the premolars and molars, which grind food into smaller, more manageable particles. The speech or verbal communication function also depends heavily on the presence and integrity of teeth, as they contribute to clear articulation; particularly for phonetic sounds such as /s/, /t/, and /r/. Consequently, tooth loss often results in articulation difficulties and impaired speech clarity. The

aesthetic function relates to facial harmony and appearance, as teeth support the lips and cheeks; thus, tooth loss alters facial contours and reduces self-confidence [17].

A family is defined as a group of two or more individuals who live together and share strong emotional bonds, which may arise from blood relations, marriage, or adoption [18,19]. Family characteristics include organized relationships marked by mutual dependence, clearly defined roles and responsibilities, and the performance of functions according to each member's role [10]. Friedman identifies five primary family functions: the affective function, which provides affection, security, and psychosocial support; the socialization function, which helps individuals learn and perform social roles; the reproductive function, which ensures family continuity; the economic function, which fulfills financial needs and develops skills; and the health care function, which maintains health and productivity through appropriate health practices [10].

Research by Nora, Amin, and Arifin demonstrates a significant relationship between family support and the dental health of older adults [20]. Families play an essential role in motivating the elderly to maintain oral health by accompanying them to dental visits, supporting treatment adherence, and providing necessary facilities [10]. Family support consists of four dimensions. Informational support involves providing knowledge to help older adults understand the benefits of dentures, how to use them, and the importance of oral health, thereby reducing anxiety and increasing confidence. Appraisal support (or evaluative support) includes constructive feedback, praise, validation, and positive reinforcement that enhance motivation to use and maintain dentures consistently. Instrumental support refers to tangible assistance such as helping with denture care, preparing appropriate food, facilitating adaptation, and preventing health disturbances. Emotional support provides security, comfort, attention, empathy, and willingness to listen, all of which reduce anxiety and increase readiness among older adults [10].

Dentures are prosthetic devices designed to replace missing teeth and restore essential oral functions, including mastication, aesthetics, and speech ability [7]. Dentures contribute to six major functions of the oral cavity: 1) aesthetic restoration, which improves facial appearance altered by tooth loss; 2) speech enhancement, which helps restore articulation impaired by missing teeth; 3) mastication, enabling even distribution of chewing forces; 4) preservation, preventing long-term adverse effects of tooth loss; 5) migration prevention, reducing the risk of displacement of remaining natural teeth; and 6) improved occlusal load distribution, which supports periodontal tissue health [7].

The classification of dentures is broadly divided into two categories. Removable dentures can be taken out by the patient and include full dentures; used when all natural teeth are missing and supported by a pink acrylic base with natural suction and partial dentures, which are used when some healthy teeth remain and are attached using small clasps. Fixed prosthetics, or permanent dentures, are designed for superior stability and include crowns that cover damaged teeth, bridges that replace several missing teeth using adjacent teeth as abutments, and dental implants that place an artificial root into the jawbone [21].

Denture materials are classified into metallic and non-metallic categories [7]. Metallic materials include dense yellow gold with strong mechanical properties; less dense white gold, which is more easily deformed; cobalt-chromium alloys with high stiffness; and stainless steel, which is strong and resistant to fracture. Non-metallic materials include economical acrylic resin used for denture bases through heat polymerization and autopolymerization; ceramics for high aesthetic quality such as conventional porcelain, glass ceramics, and zirconia; the strongest ceramic material; and thermoplastic resins, which are aesthetically pleasing, hypoallergenic, and composed of acetal, polyamide, polycarbonate, acrylic, polyester, and polypropylene [7]. Post-denture instructions include removing dentures at night and cleaning them with soapy water, performing speech exercises to aid adaptation, maintaining oral hygiene, and attending regular dental check-ups [7].

Family support levels can be measured using a Likert scale with a checklist-type questionnaire. Although the Likert scale commonly uses five categories (strongly agree, agree, hesitate, disagree, strongly disagree), Erinsyah et al. employed four categories: very often (score 4), often (score 3), sometimes (score 2), and never (score 1) [22]. Each item receives a score based on the respondent's answer, and the total score is converted into a percentage using the formula $p = (f/N) \times 100\%$, where p is the percentage, f is the score obtained, and N is the total possible score [23]. According to Puspitasari, Husni, and Meilianingsih, family support is categorized into three levels: $\leq 50\%$ (low), 51–75% (moderate), and $> 75\%$ (high), following the commonly used Likert-based scoring method in research [24].

PRECEDE-PROCEED theory

The PRECEDE–PROCEED theory positions the initial focus of health educators on the outcomes to be achieved, ensuring that health program planning begins with determining the ultimate goal of improving quality of life. The PRECEDE component consists of five stages: social analysis, epidemiological analysis, identification of behavioral and environmental factors, assessment of educational and ecological aspects, and a review of administrative and policy considerations. The PROCEED component comprises four stages: implementation of the intervention, process evaluation to assess how the intervention is carried out, impact evaluation to determine the influence of the intervention on behavioral factors, and outcome evaluation to examine its effects on population health and quality of life [25].

the assessment phases within the precede–proceed framework include several key components. the quality-of-life phase involves evaluating subjective concepts that are often difficult to define, complemented by objective assessments of measurable community factors such as oral health status, as well as subjective inquiries into the primary barriers affecting the quality of life of older adults. the health status phase identifies major health problems in the population based on prevalence, incidence, and risk factors; such as tooth loss and low denture utilization. the behavioral and environmental phase analyzes social and physical environmental factors that influence health behaviors, including dental care practices, denture hygiene, adherence to denture use, family support, access to services, and economic conditions. the educational phase examines predisposing factors (knowledge and attitudes), reinforcing factors (family support and health worker involvement), and enabling factors (accessibility of facilities and affordability). finally, the administrative and policy phase assesses resource needs, barriers, available facilities, and policy support required to ensure that the program operates optimally and sustainably [25].

Purpose

Based on these considerations, the present study was designed to address the existing knowledge gap by conducting an in-depth analysis of the dynamics of family support and its role as a strategic determinant in increasing denture adoption among older adults. Broadly, the study aims to analyze the relationship between family support and denture use among elderly individuals at the Tangguh Elderly School, Mojo RW 12 Village, Surabaya City. More specifically, the study seeks to assess the level of family support, evaluate denture use, and examine the statistical relationship between these variables. The findings are expected to contribute evidence-based insights for developing targeted, sustainable, family-centered, and community-based oral health promotion strategies.

METHODS

Research design

This study employed an analytical observational approach using a cross-sectional design, a methodological framework that enables researchers to collect data on both independent and dependent variables simultaneously at a single point in time. As stated, “a *research design that allows the collection of data of independent variables and bound variables to be carried out simultaneously at a single measurement point in time, without any period of follow-up or continuous observation*” [26]. The cross-sectional design is particularly suitable for identifying associations between variables, describing population characteristics, and generating empirical evidence within a defined timeframe. Although it does not allow causal inference, this design is efficient, cost-effective, and widely used in public health research, especially when the objective is to examine relationships between behavioral, environmental, and health-related factors.

Research location and time

The study was conducted at the Tangguh Elderly School located in Mojo Village, Gubeng District, Surabaya City, East Java. This location was selected based on several strategic considerations, including the availability of a sufficiently large elderly population, accessibility for researchers, and the presence of community-based elderly empowerment programs that support data collection activities. The data collection period spanned from August 2025 to January 2026, allowing adequate time for administrative preparation, ethical clearance processing, coordination with local stakeholders, mobilization of research personnel, and systematic implementation of field data collection procedures.

Sample design

The study population consisted of all elderly individuals registered at the Tangguh Elderly School in Mojo RW 12 Village, Gubeng District, Surabaya. The accessible population comprised 70 older adults who met the general criteria for participation. Respondent selection was based on predetermined inclusion and exclusion criteria. Inclusion criteria included: willingness to participate in the study, elderly individuals aged ≥ 60 years who had experienced partial or complete tooth loss, and elderly individuals accompanied by at least one family member during data collection. Exclusion criteria included: unwillingness to participate, absence of the elderly or their accompanying family member during data collection, and elderly individuals with motor impairments that hinder mobility and prevent attendance at data collection sessions. The sample size was calculated using the Slovin formula with a tolerated error rate of 5% (0.05), based on the accessible population of 70 elderly individuals. The calculation yielded a minimum sample size of 59.57, which was rounded to 60 respondents. This sample size is considered sufficiently representative of the elderly population at the study site and allows for reliable statistical analysis.

Variables

Two primary variables were examined in this study: the independent variable (family support) and the dependent variable (denture use among the elderly). Family support is operationally defined as the perception of assistance provided by family members; including spouses, children, or siblings to older adults. This support may take the form of emotional, informational, instrumental, or appraisal assistance. The variable was measured using an ordinal-scale questionnaire, and the resulting scores were categorized into three levels of support: high family support ($>75\%$), moderate family support (51–75%), and low family support ($\leq 50\%$) [24]. Denture use is defined as the condition of elderly individuals aged ≥ 60 years who either wear dentures or do not. This variable was measured using an examination checklist with a nominal data scale, categorized into two groups: using dentures (coded 1), and not using dentures (coded 0). This operationalization ensures clarity in measurement and facilitates statistical analysis of the relationship between family support and denture utilization.

Research flow

The implementation of this study followed a structured and systematic sequence of activities. The process began with the formulation of the research problem, followed by the development and validation of research instruments. Administrative procedures; including obtaining research permits and ethical clearance were completed prior to fieldwork. Sampling was conducted according to established criteria, after which data collection was carried out through direct observation and questionnaire administration. The final stage involved statistical data processing, analysis, and interpretation, culminating in the presentation of findings.

Data processing and analysis

The collected data were processed and analyzed quantitatively using the Statistical Package for the Social Sciences (SPSS). The analytical procedure consisted of two major stages. First, a univariate analysis was conducted to describe the frequency and percentage distribution of each research variable, including family support and denture use among the elderly. The results of this stage were presented in the form of simple frequency tables to provide an initial overview of the characteristics of the study population. Second, a bivariate analysis was performed to examine the relationship between the independent variable (family support) and the dependent variable (denture use among the elderly). Considering that the variables were measured using ordinal and nominal (categorical) scales, the Chi-Square test was employed as the appropriate statistical method. This test aims to determine whether a statistically significant association exists between the two variables, thereby providing empirical evidence regarding the influence of family support on denture utilization among older adults [26].

RESULTS

Overview of research subjects

This research was conducted in RW 12 of Mojo Village, located within Gubeng District, Surabaya City, East Java Province. The area was selected as the study site due to its classification as an urban settlement with relatively high population density and the presence of adequate social infrastructure that supports various elderly empowerment initiatives. Geographically, Mojo Village is situated in the eastern part of central Surabaya and is characterized by lowland topography, with an elevation ranging from approximately 4 to 5 meters above sea level. These geographical features contribute to its accessibility, as the area is connected through an extensive network of urban roads that facilitate mobility for residents, visitors, and research teams. Covering an area of approximately 2.40 km² and bordered by several neighboring villages, Mojo Village is considered one of the larger administrative units within the district.

RW 12 is widely recognized for its active community participation in environmental management and empowerment programs, a commitment reflected in the awards it has received through the Surabaya Smart City initiative. Several structured programs specifically targeting the elderly

population are routinely implemented in this area. These include the *Tangguh Elderly School (Selantang)*, weekly elderly exercise sessions held every Saturday, and the Elderly Activity Post (POSGA), which operates periodically. Collectively, these programs serve as platforms for health promotion, social engagement, and community empowerment among older adults. However, despite the availability of these initiatives, participation levels remain suboptimal, as not all elderly residents actively engage in the full range of activities offered.

The selection of this location was further supported by findings from a preliminary study, which revealed a high prevalence of tooth loss among the elderly population accompanied by a notably low rate of denture use. This condition aligns closely with the objectives of the present research, making RW 12 an appropriate and relevant setting for examining the relationship between family support and denture utilization. Socioeconomic characteristics of the elderly population in this area also contribute to the relevance of the study. Most older adults belong to middle-to-lower socioeconomic groups, with many being unemployed or engaged in domestic roles such as housewives. A smaller proportion operates modest informal businesses. These socioeconomic constraints influence access to quality dental health services, thereby increasing the importance of family support and community-based programs such as Selantang in enhancing awareness and encouraging the adoption of dentures among the elderly.

In this context, the presence of structured elderly empowerment programs, combined with the socioeconomic challenges faced by the population, underscores the strategic significance of family involvement in promoting oral health behaviors. The integration of family support with community initiatives provides a potentially effective pathway for improving denture use and overall oral health outcomes among older adults in Mojo Village.

Characteristics of elderly family

Before discussing the results of the analysis of the relationship between family support and the use of dentures in the elderly, it is important to first understand the general overview of the demographic characteristics of family respondents who play the role of the main companion of the elderly in this study. Understanding the profile of family respondents is a crucial starting point, considering that characteristics such as age, gender, and employment status have the potential to influence the pattern and intensity of support provided to the elderly in the context of the use of dentures. This characteristic data was obtained through a questionnaire filled out directly by family members who accompanied the elderly during the data collection process. Through *this demographic* picture, a more comprehensive context can be obtained regarding who is actually the party that plays the role of providing support for the elderly in the Mojo Village Tangguh Elderly School. More details on the distribution of family respondent characteristics are presented in Table 1.

The analysis of the characteristics of family respondents revealed several important demographic patterns that help contextualize the caregiving dynamics within the study population. The most dominant age group among family respondents was those aged 60–69 years, accounting for 31.7% of the sample. This was followed closely by respondents aged 30–39 years, who represented 30% of the total. This distribution suggests that caregiving responsibilities for elderly individuals are shared across both older adults and middle-aged family members, reflecting a multigenerational caregiving structure commonly observed in Indonesian households.

In terms of gender composition, the findings showed a clear predominance of female respondents, with 50 women (83.3%) participating in the study, compared to only 16.7% men. This pattern aligns with broader sociocultural norms in Indonesia, where women traditionally assume primary roles in domestic management, caregiving, and health-related decision-making within the family. The gender distribution therefore underscores the central role of women as the primary caregivers for elderly family members, particularly in matters related to daily assistance, emotional support, and health maintenance.

Employment status further reinforces this interpretation. More than half of the respondents (53.3%) were housewives, indicating that they spend most of their time managing household responsibilities and providing direct care to elderly relatives. An additional 16.7% of respondents were not employed, which similarly suggests greater availability for caregiving activities. The remaining respondents were distributed across various occupations, including health cadres, traders, civil servants, teachers, and drivers. Although these groups represent a smaller proportion of the sample, their presence indicates that caregiving responsibilities are also undertaken by individuals with diverse professional backgrounds.

Overall, this distribution pattern highlights that elderly caregiving in the study area is predominantly carried out by women who hold central roles in household management and family care. Their availability, cultural expectations, and established caregiving roles position them as key actors in influencing elderly health behaviors, including the use of dentures. This demographic profile provides essential context for interpreting the relationship between family support and denture utilization, as it reflects the social structure within which health-related decisions for the elderly are made.

Characteristics of elderly

In addition to analyzing the characteristics of family respondents, it is essential to present a comprehensive demographic profile of the elderly who constitute the primary subjects of this study. A detailed elaboration of these characteristics; particularly age group, gender, and employment status is crucial for providing a complete contextual foundation for interpreting subsequent analytical results. These demographic variables are theoretically associated with oral health conditions, behavioral tendencies, and decision-making patterns related to denture use. Understanding these characteristics allows researchers to identify potential sociodemographic determinants that may influence oral health behaviors among older adults.

Data on elderly respondents were obtained through a combination of brief structured interviews and direct observation involving 60 individuals who met the study's inclusion criteria. This dual approach ensured that the information collected was both accurate and reflective of the respondents' actual conditions. The mapping of these characteristics serves several important purposes. First, it verifies that the sample is sufficiently representative of the elderly population enrolled in the Tangguh Elderly School (Selantang) in RW 12 Mojo Village. Representativeness

Table 1. Distribution of demographic characteristics of elderly family in Tangguh Elderly Schools in 2026

Demographic characteristics of elderly family	Category	Frequency	Percentage
Age	30-39	18	30
	40-49	12	20
	50-59	0	0
	60-69	19	31.7
	70-74	11	18.3
Gender	Male	10	16.7
	Female	50	83.3
Jobs	Housewife	32	53.3
	Merchant	5	8.3
	Framework	7	11.7
	Teacher	2	3.3
	Driver	1	1.7
	Civil servant	3	5
	Not working	10	16.7

is a critical methodological requirement, as it strengthens the validity of the study's findings and enhances the generalizability of the conclusions drawn. Second, the demographic profile provides a foundational basis for interpreting the results of the statistical analyses conducted in later sections, particularly those examining the relationship between family support and denture use.

Age distribution among the elderly is an important indicator of functional capacity, health status, and the likelihood of experiencing tooth loss. Gender distribution may influence oral health-seeking behavior, as previous studies have shown that women often demonstrate higher health awareness but may also face greater socioeconomic barriers. Employment status, meanwhile, reflects socioeconomic conditions that can affect access to dental care, affordability of dentures, and reliance on family support. By documenting these variables, the study acknowledges the multifaceted nature of oral health behavior among older adults.

Overall, the demographic characteristics of the elderly respondents provide essential context for understanding the dynamics of denture use within this community. These characteristics also help identify potential disparities or patterns that may influence oral health outcomes. A detailed distribution of the demographic characteristics of elderly respondents is presented in the Table 2, offering a clearer visualization of the population profile examined in this study.

Of the total 60 elderly respondents, most were in the age group of 60-69 years (75%), with the remaining respondents aged 70-74 years (25%). The gender composition showed the dominance of women (83.3%), while men represented 16.7% of the total sample. Regarding employment status, the majority of the elderly are housewives (73.3%), followed by non-working groups (20%), retirees (5%), and a small percentage are still running a trading business (1.7%). These findings reflect a common characteristic of the elderly population in urban areas, where the role of the economy has decreased significantly with age.

Family support answer distribution

To obtain a more comprehensive understanding of the pattern of family support received by the elderly, it is essential to conduct a detailed analysis of the distribution of respondents' answers for each item in the questionnaire. The questionnaire was developed based on four core dimensions of family support; emotional, appraisal, instrumental, and informational support each of which reflects a distinct aspect of the assistance provided by family members. Respondents were asked to select one of four tiered answer choices ranging from "very often" to "never," allowing for a nuanced assessment of the frequency and consistency of support behaviors exhibited by families.

Table 3. Distribution of family support answers to elderly families at *Tangguh Elderly Schools* in 2026

No.	Statement	Respondent's answer							
		Very often		Frequent		Sometimes		Never	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Emotional support									
1.	I remind you to use dentures.	2	3.3	7	11.7	26	43.3	25	41.7
2.	I accompany you to health services for treatment/making dentures at the dentist.	4	6.7	2	3.3	14	23.3	40	66.7
3.	I listened to your complaints when I had trouble chewing food.	2	3.3	12	20	25	41.7	21	35
Award support									
1.	I agree if you go to a dental health service for a dental checkup.	3	5	10	16.7	26	43.3	21	35
2.	I give praise to you when they have used and cared for dentures properly.	4	6.7	2	3.3	5	8.3	49	81.7
3.	My reaction is happy if I see that you can chew food easily.	7	11.7	16	26.7	22	36.7	15	25
4.	I support you to wear dentures at all times	18	30	23	38.3	8	13.3	11	18.3
Instrumental support									
1.	I provide supporting facilities for denture hygiene tools such as glasses, brushes, and toothpaste.	24	40	32	53.3	1	1.7	3	5

Table 2. Distribution of demographic characteristics of elderly in *Tangguh Elderly Schools* in 2026

Demographic characteristics of elderly family	Category	Frequency	Percentage
Age	60-69	45	75
	70-74	15	25
Gender	Male	10	16.7
	Female	50	83.3
Jobs	Housewife	44	73.3
	Merchant	1	1.7
	Retires	3	5
	Not working	12	20

No.	Statement	Respondent's answer							
		Very often		Frequent		Sometimes		Never	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
2.	I am willing to pay for the treatment/manufacture of dentures.	12	20	14	23.3	19	31.7	15	25
3.	I am willing to provide special time for you when you are going to do the treatment/making of dentures.	6	10	16	26.7	20	33.3	18	30
Informational support									
1.	I provide information to you regarding the importance of using dentures.	6	10	9	15	25	41.7	21	35
2.	I tell you the impact when you don't use dentures.	1	1.7	18	30	26	43.3	15	25
3.	I provide information to you regarding the place of fast service/making dentures at the dentist.	19	31.7	14	23.3	16	26.7	11	18.3
4.	I am looking for information about treatment efforts when you have difficulty chewing.	6	10	14	23.3	20	33.3	20	33.3
5.	I provide information so that you wear dentures at all times.	19	31.7	22	36.7	12	20	7	11.7

Analyzing the distribution of responses at the item level provides a more granular and meaningful picture than relying solely on total scores or overall category classifications. While total scores offer a general overview of the level of family support, item-level analysis reveals which specific forms of support are already functioning effectively and which areas require further strengthening. For example, high frequencies of "very often" or "often" responses in emotional support items may indicate strong affective engagement from families, whereas lower frequencies in instrumental or informational support items may highlight gaps in practical assistance or knowledge provision that need to be addressed.

This detailed mapping is particularly important because each dimension of support contributes differently to the elderly's readiness and ability to use dentures. Emotional support may influence confidence and willingness to adapt to new health behaviors, while instrumental support directly affects the elderly's capacity to maintain denture hygiene and attend dental appointments. Informational support ensures that the elderly understand the benefits and proper use of dentures, and appraisal support reinforces positive behaviors through encouragement and validation. Therefore, identifying strengths and weaknesses within each dimension allows researchers and policymakers to design more targeted and effective interventions.

Furthermore, item-level analysis enhances the interpretive depth of the study by illustrating behavioral patterns within families that may not be visible through aggregate scores. It also provides empirical evidence for developing tailored health promotion strategies that align with the specific needs of the elderly population in the study area. Such strategies may include family-centered education programs, skill-building workshops, or community-based initiatives aimed at strengthening weaker dimensions of support. A detailed presentation of the distribution of respondents' answers for each questionnaire item is provided in the Table 3, offering a clearer and more structured visualization of the patterns of family support observed in this study.

An analysis of emotional support revealed that family involvement in reminding the elderly to use dentures is still limited, with most respondents answering "sometimes" (43.3%) and even "never" (41.7%). In the dimension of assistance to dental health facilities, the condition is more worrying with 66.7% of families stating that they have never accompanied the elderly. However, in terms of listening to elderly complaints related to the difficulty of chewing, the response was quite more positive although it still showed limitations with 41.7% answering "sometimes" and 35% "never". Appreciation or appreciation support also showed a low rate, with most families (81.7%) never giving praise when the elderly successfully used and cared for dentures. Instrumental support presents a more positive picture, especially in the provision of hygiene facilities (53.3% answered "very often"), but for the financing aspect of making dentures, there are still 25% of families who are not willing to provide financial support. On informational support, the emerging pattern showed that the majority of families provided information about the importance of dentures only "occasionally" (41.7%), with information about the impact of not using dentures also at the same frequency (43.3%).

Categories family support levels

After obtaining an overview of the distribution of answers at the statement item level, the total scores of the four dimensions of family support are then converted into percentages and categorized into three levels, namely high, medium, and low support, as described in the operational definition section. This categorization process aims to simplify *continuous* data into *ordinal* data that is easier to interpret and relevant for the purpose of further statistical analysis, especially in testing the relationship with the variables of denture use. This categorization refers to references that have been used in previous studies, so that the results can be compared with findings in the context of other similar studies. Further details on the results of the categorization of family support levels in the study respondents are presented in the Table 4.

The results of the categorization showed that more than half of the family respondents (53.3%) provided relatively low support (score $\leq 50\%$), followed by the group with moderate support (28.3%), and only 18.3% of families provided high support (score $> 75\%$). This distribution indicates that the majority of elderly families at the study site do not have a sufficiently in-depth understanding of their crucial role in encouraging the use of dentures as an oral health rehabilitation effort.

Use of dentures in the elderly

As a bound variable in this study, the status of denture use in the elderly was obtained through direct observation of the respondents' oral cavity which was carried out at the same time as the process of filling out a questionnaire by family members. This direct observation method was chosen to minimize the *subjectivity* bias that may arise if data is only obtained through *self-reports* from the elderly and their families. Each elderly person who was observed was then classified into two categories, namely "using dentures" or "not using dentures", according to the results of the examination that had been recorded on the *checklist sheet*. The data from this observation is the main basis for determining the *prevalence* of denture use as well as material for analyzing the relationship with family support variables. Further details on the results of observations on the use of dentures in the elderly are presented in the Table 5.

The findings of the study showed that of the 60 elderly people examined, only 7 people (11.7%) used dentures, while 53 people (88.3%) did not use dentures at all. This figure is very much in line with national *epidemiological* data which shows a large gap between the prevalence of tooth loss and the use of dentures in the elderly population of Indonesia. This condition reflects the various obstacles faced by the elderly, both in terms of economy, knowledge, comfort, and family social support.

The relationship of family support to the use of dentures

As the core of this study, the analysis of the relationship between family support and the use of dentures in the elderly was carried out using the Chi-Square statistical test, considering that both variables are categorical with ordinal and nominal scales. This test was chosen because it was able to identify whether there is a statistically significant relationship between two categorical variables without assuming a specific data distribution. Through a cross-contingency table between the three categories of family support (high, medium, low) and the status of using dentures (using and not using), an overview of the relationship pattern as well as the p-value as the basis for decision-making on the research hypothesis can be obtained. The results of this analysis are the main answer to the research objectives that have been formulated previously. More details on the results of the Chi-Square test are presented in the Table 6.

The results of the Chi-Square test resulted in an Asymptotic Significance (p-value) value of 0.000, well below the set significance level ($\alpha = 0.05$). These findings show that alternative hypotheses are accepted and zero hypotheses are rejected, proving the existence of a meaningful relationship between family support and denture use in the elderly. More specifically, of the 11 elderly who received high family support, 5 people (45.5%) used dentures. In the moderately supportive group, only 2 out of 17 elderly people (11.8%) used dentures. In contrast, none of the elderly in the low-support group used dentures. This pattern consistently demonstrates that the higher the level of family support received, the more likely older adults are to adopt and maintain the use of dentures as part of their oral health care.

DISCUSSION

Family support on the use of dentures

The findings revealed that the majority of elderly families (53.3%) provided relatively low support, while 28.3% offered moderate support, and only 18.3% demonstrated high support. This distribution clearly indicates that a substantial proportion of elderly individuals have not yet received optimal family assistance in adopting dentures as a rehabilitative strategy to address tooth loss. The significant impact of low family support on the awareness, readiness, and motivation of the elderly to use dentures cannot be overlooked, particularly considering that the family serves as the primary support system responsible for maintaining the health and well-being of its members [19,27]. When family members lack adequate understanding of the benefits, functions, and long-term implications of denture use, they are less capable of providing encouragement, relevant information, or practical assistance to elderly individuals who require oral rehabilitation. This insufficient support often manifests in limited guidance, minimal emotional reinforcement, and inadequate facilitation of access to dental services.

One of the underlying causes of low family support is the limited knowledge possessed by families regarding the importance of denture use. Knowledge constitutes a fundamental determinant in shaping health attitudes and behaviors within individuals and family units [27]. Families who are not well informed about oral health risks associated with tooth loss; such as impaired mastication, nutritional deficiencies, reduced social confidence, and diminished quality of life tend to underestimate the urgency of denture adoption. Insufficient education directed toward families

Table 4. Results of categorization of family support for elderly families in *Tangguh Elderly Schools* in 2026

Family support	Frequency	Percentage
High	11	18.3
Medium	17	28.3
Low	32	53.3

Table 5. Observation results of the use of dentures in the elderly in *Tangguh Elderly Schools* in 2026

Use of dentures	Frequency	Percentage
Using	7	11.3
Not using	53	88.3

Table 6. The relationship of family support with the use of dentures in the Elderly in *Tangguh Elderly Schools* in 2026

Use of dentures	Family support			Total	p-value
	High	Medium	Low		
Using	5	2	0	7	0,000
Not using	6	15	32	53	

therefore emerges as a key factor contributing to the low level of support observed in this study. Research conducted by Zhao and Kim as well as Yun et al. further confirms that external determinants, particularly family support and access to dental health services, strongly influence the decision-making process of elderly individuals regarding denture use. Without adequate social support, the elderly are more likely to disregard the need for dental rehabilitation, even when clear clinical indications are present [28,29].

The absence of sufficient social support, including family support, has been shown to correlate with poorer dental and oral health outcomes among elderly populations. Elderly individuals experiencing social isolation tend to exhibit lower oral health status and reduced utilization of dental health services. This phenomenon underscores the crucial role of social support in shaping health behaviors among the elderly, particularly in relation to denture use as a component of oral rehabilitation. Many elderly individuals face limitations in knowledge, physical function, and mobility, making it difficult for them to maintain oral health independently. Consequently, they require family support in the form of motivation, supervision, and assistance in accessing dental care. Bolukbasi and Dundar emphasize that the aging process is accompanied by a decline in physical and oral functions, necessitating increased attention and support from the surrounding environment, especially family members [30]. Without such support, elderly individuals may experience heightened vulnerability to oral diseases, discomfort, and functional impairment.

A study by Wulansari, Larissa, and Mursid found that dental and oral health knowledge is significantly associated with the needs and demands for denture use among the elderly [31]. Various forms of family support; including emotional, appraisal, informational, and instrumental support play distinct yet complementary roles in encouraging denture use. Emotional support fosters confidence and reduces anxiety related to dental procedures; appraisal support reinforces positive attitudes toward oral rehabilitation; informational support provides guidance on denture care and benefits; and instrumental support ensures practical assistance, such as accompanying the elderly to dental appointments. Elderly individuals who receive comprehensive assistance from their families demonstrate higher success rates in adapting to and consistently using dentures compared to those who lack such support.

Research by Perić et al. and Shen et al. further confirms that the success of denture use is influenced not only by technical and clinical factors but also by psychological readiness and social conditions. The involvement of family members or caregivers in providing continuous support through home-based care (domiciliary care) is therefore essential in ensuring optimal denture adaptation and maintenance [32,33]. Consistent support helps elderly individuals overcome initial discomfort, adhere to denture hygiene routines, and maintain long-term use, which ultimately contributes to improved oral function and quality of life.

Elderly individuals who receive strong family support consistently show a greater tendency to use dentures. Studies by Tang, Sun, and Sun as well as Zhao and Kim demonstrate that denture use is influenced not only by clinical conditions but also by psychosocial factors, including family support in the form of motivation, supervision, information, and assistance in accessing dental health services [28,34]. Thus, efforts to improve dental and oral health among the elderly should not focus solely on individual-level interventions but must also incorporate family-centered approaches. Family-based interventions—such as structured education, counseling, and health promotion programs—represent effective strategies for increasing awareness, motivation, and participation among elderly individuals in adopting dentures as part of their oral rehabilitation. Strengthening family involvement may therefore serve as a pivotal component in enhancing denture utilization and improving overall oral health outcomes among the elderly.

Use of dentures in the elderly

The observational results indicated that only 11.7% of the elderly were using dentures, whereas a striking 88.3% did not use dentures at all. This extremely low utilization rate aligns with national epidemiological data, which consistently demonstrate a substantial gap between the prevalence of tooth loss and the adoption of dentures among elderly populations in Indonesia. The low rate of denture use can be attributed to multiple interrelated factors, including limited family knowledge, financial constraints, temporary or situational barriers, and insufficient educational outreach from dental health facilities. Studies by Nikolovska et al. and Fadriyanti, Afriza, and Salsabila emphasize that inadequate public understanding of the benefits, functions, and importance of dentures remains one of the primary determinants of low denture utilization among older adults [35,36].

Tooth loss is a highly prevalent condition among the elderly and has direct consequences for chewing function, verbal communication, and facial aesthetics. Batmomin et al. highlight that the elderly represent an age group undergoing complex biological, psychological, and social changes, all of which may influence their overall quality of life. As individuals age, progressive declines in physical function, adaptability, and oral health capacity become more pronounced, making it increasingly difficult for them to meet their health needs independently. In this stage of dependency, the role of the family becomes critically important, as family members are expected to provide practical assistance, emotional support, and sustained attention to ensure that elderly individuals receive appropriate oral rehabilitation.

Psychological and social dimensions also play a significant role in determining whether elderly individuals choose to use dentures. A recent study by Perez et al. (2024) demonstrates that denture use is associated with increased confidence and improved social interaction among older adults. Conversely, elderly individuals who do not use dentures often experience reduced self-esteem due to changes in facial appearance, impaired speech clarity, and discomfort during social engagement. Thus, the low rate of denture use affects not only physical health but also psychosocial well-being, contributing to social withdrawal and diminished quality of life.

From a health perspective, the absence of dentures can lead to adverse outcomes such as reduced chewing ability, which subsequently impairs nutritional intake. Mohamed et al. found that elderly individuals without dentures exhibit significantly lower chewing efficiency, increasing their risk of nutritional deficiencies and broader systemic health problems. Untreated tooth loss has also been linked to declines in cognitive function among the elderly, as impaired mastication may reduce sensory stimulation and cerebral blood flow [37]. Dentures therefore play an essential role in enhancing holistic well-being among older adults, making the low utilization rate a public health concern that warrants serious attention. A systematic review by Linn et al. further demonstrates that denture use significantly improves Oral Health-Related Quality of Life (OHRQoL), including enhanced chewing function, comfort, and social capability [38].

Research by Hongini and Aditiawarman revealed that elderly individuals using dentures; particularly implant-supported overdentures show better chewing ability and higher quality of life compared to those who do not use dentures or rely solely on conventional prostheses [13]. This finding reinforces the notion that denture use is closely associated with improved mastication, which directly influences nutritional adequacy among older adults. However, several factors such as discomfort, insufficient education, and low motivation continue to hinder optimal denture use. Techapiroontong and Limpuangthip argue that the persistently low rate of denture utilization underscores the need for comprehensive interventions, particularly those involving family support. Dentures serve not only as replacements for missing teeth but also as instruments that

enhance physical, psychological, and social aspects of elderly well-being. Therefore, family involvement is essential in encouraging elderly individuals to adopt and maintain denture use as part of their daily oral health practices [39].

The relationship between family support and the use of dentures in the elderly

The results of the analysis demonstrated that the alternative hypothesis was accepted while the null hypothesis was rejected, indicating a statistically significant relationship between family support and denture use among the elderly. This finding suggests that the higher the level of support provided by the family, the greater the likelihood that elderly individuals will adopt and consistently use dentures. Family support encompasses several dimensions; emotional, appraisal, informational, and instrumental which collectively assist the elderly in making informed decisions regarding denture use. As a primary support system, the family plays a crucial role in shaping the elderly's perceptions, motivation, and adherence to oral health care practices. Kurniawati and Sunarti emphasize that families who actively provide encouragement, relevant information, and practical assistance significantly increase the probability that elderly individuals will utilize dentures as part of their efforts to improve oral function and overall quality of life [40].

Salputra and Keumala further highlight that external factors, particularly social support; including family involvement have a substantial influence on denture-use behavior and can enhance the utilization of dental health services among older adults [41]. The persistently low rate of denture use in the elderly is often associated with insufficient family support and limited attention to oral health needs. Elderly individuals who lack family support tend to exhibit low motivation and reduced awareness regarding dental and oral health maintenance. Idaryati et al. reported that the low interest in denture use is strongly influenced by inadequate awareness, limited motivation, and minimal support from the surrounding environment, especially the family, which serves as the closest and most influential social unit for the elderly [42].

Falatehan et al. demonstrated that dental health education programs targeting elderly populations lead to improved understanding, attitudes, and habits related to denture care following educational interventions [43]. These findings align with the conclusions of Suprpti and Budiarti, who argue that social environmental factors; including family support serve as reinforcing elements that significantly influence individual actions aimed at maintaining health [44]. Family support not only affects the initial decision to use dentures but also plays a vital role in ensuring the continuity and sustainability of denture use. This is particularly important because consistent denture use is closely associated with improved chewing function, enhanced comfort, better nutritional intake, and overall improvements in the quality of life of elderly individuals.

According to the PRECEDE–PROCEED model described by Rachmawati, health status is influenced by behavioral and environmental factors, which are shaped by predisposing, reinforcing, and enabling components [25]. The findings of this study underscore the importance of strengthening the role of families in providing comprehensive support to elderly individuals across these domains, especially in the context of dental health care. Predisposing factors such as knowledge and attitudes must be improved through structured education; reinforcing factors such as family encouragement and social support must be strengthened; and enabling factors such as access to dental services and availability of dentures must be facilitated. Family-based promotive and preventive efforts are therefore expected to increase denture utilization rates and contribute to enhancing the overall quality of life of the elderly population [45].

Research limitations

This research, like observational studies in general, is inseparable from several methodological limitations that must be acknowledged transparently to ensure that the interpretation of the findings remains proportional and scientifically grounded. First, the use of a cross-sectional design carries inherent consequences for the nature of the relationships that can be identified. This design captures the association between family support and denture use at a single point in time, thereby limiting the ability to infer temporal sequences or causal pathways. Although the statistical analysis revealed a significant relationship between the two variables, the study cannot confirm whether family support directly leads to increased denture use or whether denture use itself may influence the level of support provided by families. Cross-sectional studies are fundamentally restricted to identifying correlations rather than causation, and therefore the findings must be interpreted within this methodological boundary [25].

Second, the sample size and geographical scope of the study present additional limitations. The research involved only 60 respondents, all drawn from a single community setting; the *Tangguh* Elderly School in Mojo RW 12 Village, Surabaya. This narrow sampling frame restricts the generalizability of the findings to broader elderly populations at the city, provincial, or national levels. Sociocultural, economic, and demographic characteristics vary widely across regions in Indonesia, and these contextual differences may influence patterns of family support and denture-use behavior. Consequently, the relationships observed in this study may not fully represent conditions in elderly communities with different sociodemographic profiles, limiting the external validity of the findings [25].

Third, the data collection instruments used in this study introduce potential measurement biases. The family support questionnaire relied on self-reported perceptions from family members accompanying the elderly. Self-report instruments are susceptible to social desirability bias, wherein respondents may provide answers that align with perceived social norms or expectations rather than accurately reflecting actual conditions. This bias may lead to overestimation of family support or underreporting of negative experiences. Additionally, the assessment of denture use was conducted through visual observation and brief interviews. Although standardized checklist sheets were employed, the evaluation process still carries the possibility of subjective interpretation by enumerators, particularly in borderline cases where denture use or condition may not be immediately apparent. Such subjectivity may affect the reliability of the measurements and introduce non-systematic error into the dataset [25].

Fourth, the study did not fully control for confounding variables that theoretically influence denture use among the elderly. Factors such as educational attainment, socioeconomic status, access to dental health services, cultural beliefs, and the general health conditions of the elderly were not included in the analysis. Without controlling for these variables through multivariate statistical techniques, it is possible that the observed relationship between family support and denture use is partially or substantially influenced by other unmeasured factors. For example, elderly individuals with higher socioeconomic status may have better access to dentures regardless of family support, or those with chronic illnesses may be less able to use dentures even with strong family encouragement. The absence of confounder control limits the internal validity of the study and reduces the precision of the conclusions drawn [25].

Fifth, the limited time frame of the study; from August 2025 to January 2026 restricts the ability to observe changes in family support dynamics and denture-use behavior over time. Family support is not a static construct; it may fluctuate due to life events, changes in health status, economic conditions, or evolving family relationships. Similarly, the decision to use dentures is often a gradual process influenced by adaptation, comfort, and ongoing motivation. A longer observation period would allow researchers to capture these dynamic processes and provide a more

comprehensive understanding of how family support interacts with denture-use behavior across different phases of aging. The short duration of the study therefore limits the ability to identify trends, transitions, or long-term behavioral patterns [25].

Collectively, these limitations highlight the need for future research to adopt more robust methodological approaches. Follow-up studies should consider expanding the geographical scope, increasing sample size, and employing longitudinal designs to capture temporal changes in behavior and support systems. Incorporating multivariate analyses would allow for more rigorous control of confounding variables, thereby strengthening causal inferences. Additionally, the development of more objective measurement tools; such as validated family support scales or clinical assessments of denture use would enhance data accuracy. By addressing these methodological constraints, future research can produce more comprehensive and generalizable insights into the role of family support in promoting denture use among the elderly [25].

Implications

The findings of this study provide several important implications at theoretical, practical, and policy levels, serving as a foundation for stakeholders seeking to improve the oral health of elderly populations in a holistic and sustainable manner. Theoretically, the results reinforce the conceptual framework of the PRECEDE–PROCEED model, particularly the role of family support as a reinforcing factor that encourages positive health behaviors among older adults. This study contributes to the existing body of literature by offering empirical evidence that the multidimensional nature of family support; encompassing emotional, instrumental, informational, and appraisal components plays a significant role in shaping specific health behaviors such as denture use at the community level. Previous studies have often focused on general health behaviors, but this research highlights the nuanced ways in which family support influences oral rehabilitation practices, thereby enriching theoretical discussions on behavioral determinants in geriatric health [25].

At the practical level, the findings underscore the need for health professionals, especially those working in dental and oral health services, to adopt a more integrative approach that goes beyond direct interventions aimed solely at elderly individuals. Instead, families should be actively engaged as partners in the education, counseling, and mentoring processes. Dental health education programs that incorporate family involvement have the potential to be more effective in increasing awareness, motivation, and adherence to denture use compared to interventions that target the elderly as isolated individuals. Family members often serve as decision-making partners, caregivers, and sources of emotional and instrumental support; therefore, empowering them with adequate knowledge and skills can significantly enhance the success of denture rehabilitation. This approach aligns with community-based health promotion principles, which emphasize the importance of social support systems in sustaining behavioral change among vulnerable populations [25].

From a policy perspective, the results of this study offer valuable insights for stakeholders, including community health centers, local health offices, and policymakers, in designing family-based and community-oriented intervention programs. Policies that aim to increase family understanding of the importance of denture rehabilitation can be integrated into existing community health platforms such as elderly posyandu and Tangguh Elderly School programs, which are already established in various regions. Embedding family-centered oral health education within these routine activities can optimize the reach and sustainability of interventions without requiring substantial additional resources. Such policy initiatives can also support the development of standardized modules for family education, ensuring that information delivered across regions is consistent, evidence-based, and culturally appropriate. Strengthening family involvement in oral health promotion aligns with broader public health goals of improving functional independence, nutritional adequacy, and quality of life among elderly populations [25].

Furthermore, the findings of this study open opportunities for more advanced and in-depth follow-up research. Future studies could experimentally test the effectiveness of family-based intervention models to generate stronger scientific evidence regarding the causal relationship between family support and denture-use behavior among the elderly. Longitudinal studies would be particularly valuable in capturing changes in family support dynamics and denture-use patterns over time, offering deeper insights into how behavioral reinforcement evolves in response to health conditions, family interactions, and environmental factors. Additionally, multivariate analyses could be employed to control for confounding variables such as socioeconomic status, access to dental services, and general health conditions, thereby producing more precise and generalizable findings. Such research would not only strengthen theoretical frameworks but also provide practical guidance for designing targeted interventions that address the complex determinants of denture use among older adults [25].

CONCLUSION

This study demonstrates that family support is a central determinant influencing denture-use behavior among older adults, as reflected in the predominance of limited support and the correspondingly low adoption of dentures despite clear clinical need. The analysis confirms a strong association between the quality of family support and the likelihood that elderly individuals will adopt and maintain denture use, with higher levels of emotional, instrumental, informational, and appraisal support consistently linked to greater motivation, readiness, and sustained engagement in oral rehabilitation. Collectively, these findings underscore that family support functions synergistically across multiple dimensions to shape decision-making and adherence to denture use, positioning the family as an indispensable component in improving oral health outcomes among the elderly.

The implications of these findings highlight the need for structured, continuous, and family-centered education to strengthen understanding of the importance of denture rehabilitation for elderly well-being. Health workers should actively involve families as partners in counseling and mentoring, ensuring that emotional encouragement, practical assistance, accurate information, and positive reinforcement are consistently provided. Integrating family-based interventions into community programs; such as elderly posyandu or Tangguh Elderly School activities can enhance awareness, motivation, and adherence to denture use, ultimately improving the physical, psychological, and social quality of life of older adults.

Ethical consideration, competing interest and source of funding

- The ethical approval: This study had obtained ethical approval from the Health Research Ethics Commission of Poltekkes Kemenkes Surabaya, number: EA/2198/KEPK-Poltekkes_sby/II/2023.
- There is no conflict of interest related to this publication.
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