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Assess impact of oral health on the psychological health of adults

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ABSTRACT

Background: As the global population ages, adults over 65 are increasingly retaining natural teeth, highlighting the need for tailored oral healthcare to meet the unique needs of older adults. Oral health plays a crucial role in the physical, emotional, and social well-being of this population, as poor oral health can exacerbate conditions like diabetes, cardiovascular disease, and nutritional deficits, which can impact self-confidence, social interaction, and potentially lead to social isolation and decreased well-being.

Methods: This study utilized data from a longitudinal study on healthy aging, focusing on individuals aged 79 and older who live independently. A total of 201 participants were assessed through structured, in-home interviews and self-completed questionnaires. Variables collected included demographics, general health, social activity, and detailed oral health metrics such as dentition, dental pain, denture use, and dental appearance concerns. Psychological well-being (PW) and depressive symptoms were measured using validated scales, including the Philadelphia Geriatric Center Affect Scale. Data were analyzed with Chi-square, one-way ANOVA, and Pearson's correlation tests, followed by multivariate linear regression to identify predictors of well-being.

Results: Participants, with an average age of 83.9 years, exhibited varied dental statuses, with 65.1% partially dentate and 31.3% edentulous. Positive affect scores were linked to minimal dental appearance concerns, meal enjoyment, social activity, and general health. Negative affect and depressive symptoms were more frequent among participants with dental appearance concerns, frequent dental issues, or who avoided specific foods due to oral health problems. Dental appearance, general health, social activity, and physical limitations were significant predictors of psychological well-being and depressive symptoms, explaining a substantial portion of score variance in each outcome.

Conclusion: This study underscores the significant role of oral health in the well-being of older adults, particularly the influence of dental appearance and function on psychological health. The findings support the need for targeted oral health programs and policies to enhance quality of life and mental well-being in the aging population. Future research should integrate longitudinal designs and clinical assessments to further clarify the relationship between oral health and well-being in older adults.

Keywords: oral, health, mental, life

INTRODUCTION

As in many parts of the world, adults aged 65 years and older are becoming an increasingly significant segment of the population. Currently, they make up around 15% of the population in several countries, and this figure is expected to reach 22% by 2056, with the oldest age group (85+ years) growing the fastest (1, 2). Many countries are also undergoing an epidemiological shift, with larger numbers of older adults retaining their natural teeth.

This shift emphasizes the importance of continuous research and advancements in oral health care to meet the unique needs of this aging population (3).

There is substantial evidence that independence and well-being in older age can be supported by physical activity, social involvement, healthy eating, and other personal and social behaviors (4). Poor oral health, however, is a risk factor for increased frailty and may worsen other health conditions, such as pneumonia, diabetes, cardiovascular disease, and nutritional deficiencies (5, 6). Oral health is a crucial component of physical, emotional, and social well-being in older adults (7–13). Oral diseases and related conditions not only affect physical health by increasing the risk of systemic diseases and causing pain (14, 15), but also influence appearance, eating, speaking, sleep, work, social roles, and psychological well-being (16, 17). These factors, in turn, can affect self-confidence, social interaction, and intimacy, potentially leading to social isolation and a decline in social well-being (10, 14, 15).

Improving oral health in older adults can be achieved through primary, secondary, and tertiary prevention strategies (5). Advances in medicine and dentistry have contributed to lower rates of complete tooth loss (edentulism) and higher rates of natural tooth retention among the elderly (19–23). Despite this, older adults often experience higher rates of tooth loss and denture use than younger individuals and are more likely to report discomfort with their appearance and avoid certain foods due to dental issues (14, 24).

While oral diseases are largely preventable, maintaining oral health in older populations, especially among the oldest adults, presents unique challenges for both healthcare providers and society. The growing diversity within this age group reflects a range of oral health needs (25). Thus, demographic and epidemiological shifts highlight the importance of research into the oral health factors that influence well-being in older adults (19–21). By investigating these factors, we can increase our understanding of how oral health impacts quality of life and provide evidence to support targeted health policies and interventions.

This study aims to examine the oral health factors affecting psychological well-being (PW) and depressive symptoms in independently living individuals aged 79 years and older. An improved understanding of these factors will contribute to existing research and help inform health policies and interventions that specifically address the oral health of the elderly population. This analysis will provide insight into the oral health experiences of older adults and the relationship between oral health and PW, identifying areas for improvement and supporting initiatives that enhance quality of life and overall well-being for this age group.

METHODS

This study utilized data from a wave of a longitudinal study on healthy aging that included oral health-related questions. A total of 201 older adults living independently participated in this data collection wave. Initial ethical clearance was obtained from a primary institution, with further ethics approval granted for this study, and written consent was collected from participants at each wave.

The study's first wave collected data on a sample of 1,000 independently living older adults, chosen from an electoral roll and aged 65 and over. Methodological details of the initial study have been documented previously. Data collection was performed through in-home, face-to-face interviews, conducted by trained interviewers using structured questionnaires, with proxy respondents included if necessary. Data gathered encompassed health, health behaviors (nutrition, exercise, and social activity), well-being, and service usage (health, community, and residential services). Additionally, a self-completed questionnaire addressed attitudes and life histories, and a clinical examination assessed health measures such as weight, height, eyesight, and hearing. Nonrespondents were tracked, and mortality records updated across each wave.

For the current analysis, five sociodemographic variables were included: age, sex, income, education, and marital status. Education was categorized into four levels, and marital status into four groups. Participants were asked about having a health benefits card and private insurance. Oral health variables included self-perception of dentition status, dental pain frequency, denture usage, concerns about dental appearance, and frequency of oral health issues. Service use was measured by time since the last dental visit.

General health assessments included self-rated health status on a 5-point scale and a medical history score based on the presence of 24 conditions (e.g., diabetes, arthritis, and heart disease). Social activity levels were self-rated as "Not enough," "Right," or "Too much."

Psychological well-being (PW) was assessed using validated instruments for affect and depression, chosen for their reliability with older populations. The Philadelphia Geriatric Center Affect Scale, with items on positive and negative affect, and a Depression Scale from the Psychogeriatric Assessment Scales were employed.

Data Analysis

Analysis compared PW and depressive symptom scores with sociodemographic, self-reported oral, and general health variables. Nominal and ordinal variables were analyzed with Chi-squared tests, while interval-scale variables were tested with one-way ANOVA, followed by Tukey’s post hoc tests for significant results. Pearson’s correlation was applied to continuous variables and PW scores. Multivariate linear regression with a stepwise approach identified predictors of well-being, factoring in physical disabilities, social activity, illnesses,

and oral health conditions. After controlling for sociodemographic influences, semipartial regression coefficients isolated the unique contributions of oral health outcomes. Prior to analysis, assumptions of multivariate methods were checked, and only valid responses were included. Data analysis was conducted using IBM SPSS.

RESULTS

The study's participants had a mean age of 83.9 years (SD = 3.6 years) and ranged from 79 to 96 years. The largest age group (61.7%) was 79-84 years old, and 52% of participants were male. In terms of marital status, 53.5% were married or in a de facto partnership, while 36.9% were widowed. Regarding educational levels, over half (51%) had no formal qualifications, with 38% having some higher education, including 9% with a Bachelor's degree or higher. Most participants (70.4%) self-assessed their general health as "Good" to "Excellent," while only 5.6% rated their health as "Poor." Most participants (70.4%) were also beneficiaries of a health card.

In terms of dental status, 65.1% reported being partially dentate, 31.3% were edentulous, and only 3.6% retained all their natural teeth. Most respondents (69.3%) reported no significant issues with teeth, mouth, or dentures in the past year, with only 8.8% experiencing frequent dental issues. Eating difficulties due to dental issues were reported by 17.2% of participants, while 82.8% had no eating challenges. Additionally, 74.7% were unconcerned about their dental appearance, with a small fraction (8.5%) frequently feeling concerned. Furthermore, 92.4% reported "Never" or "Hardly ever" experiencing toothaches over the past year, while only 0.8% reported frequent pain.

Close to half (47.7%) of the respondents had visited a dentist within the last year, while 32.1% had not visited a dentist in more than five years. In contrast, all participants reported visiting a medical practitioner within the past year.

Regarding health conditions, 6.6% reported no medical conditions, 10.9% had one condition, and the rest reported multiple conditions, with 30.8% reporting between five and fourteen. Common conditions included high blood pressure (51.7%), osteoarthritis (30.7%), and diabetes (15.6%). Cancer was reported by 22% of participants, and among men, 29.3% reported prostate issues.

Analysis revealed that positive affect scores ranged from 11 to 25, with a mean score of 19.7 (SD = 2.7). Dental appearance concern, frequent dental problems, and avoiding certain foods due to dental issues were all significantly associated with reduced positive affect scores and higher levels of depressive symptoms. Participants who expressed minimal concern about dental appearance and who reported excellent general health had the highest positive affect scores and the lowest negative affect and depressive symptoms scores. Additionally, self-rated poor health was linked to higher negative affect and depressive scores.

Through multiple linear regression, self-assessment of dental appearance, meal enjoyment, social activity, and general health were found to significantly predict positive affect scores, accounting for 17.8% of its variance. Negative affect scores were similarly influenced by dental appearance concerns, food avoidance, income, and gender, with these factors explaining 20.1% of the score variance. Depressive symptoms were primarily associated with dental appearance concerns, increasing health conditions, and walking difficulties, accounting for 24.6% of variance in depressive scores.

Table 1. Distribution of Sociodemographic Variables, Self-assessed General Health, Oral Health-care Visits Pattern, Use of Dental Prosthetics, and Means and Standard Deviations PW Scores

	% (*n* = 201)	**Positive affect score**	**Negative affect score**	**Depressive symptoms score**
Sex			*	*
Male	52.0	19.8 (2.8)	12.7 (3.3)	1.6 (2.2)
Female	48.0	19.5 (2.6)	11.6 (2.9)	1.0 (1.4)
Age				
75-84 years	61.7	19.5 (2.6)	12.3 (3.3)	1.2 (2.0)
85 years or more	38.3	19.9 (2.8)	11.9 (2.9)	1.3 (1.7)
Education				
Left school at age 14 or less years	28.5	19.5 (2.5)	12.1 (3.2)	1.4 (2.4)
Left school at age 15 or more years	23.0	19.6 (2.9)	12.3 (3.5)	1.0 (1.4)
Trade/apprenticeship	10.5	20.0 (2.7)	11.8 (2.8)	1.2 (1.8)
Certificate/diploma	29.0	19.7 (2.8)	12.3 (3.3)	1.3 (1.7)
Bachelor's degree or higher	9.0	19.6 (2.8)	12.1 (3.2)	1.3 (1.5)
Self-assessed general health		***	*	***
Excellent	9.2	22.1 (2.4)	10.8 (2.9)	0.4 (0.7)

Very good	27.5	20.2 (2.2)	11.6 (2.7)	0.8 (1.2)
Good	33.7	19.3 (2.7)	12.3 (3.3)	1.3 (2.2)
Fair/Poor	29.6	18.4 (2.7)	13.2 (3.3)	2.3 (2.1)
Time since last visit to dentist				
Within a month	8.3	19.7 (2.4)	12.1 (2.1)	1.7 (2.2)
1-5 months ago	19.2	19.9 (2.8)	12.1 (3.3)	1.1 (1.7)
6-11 months ago	20.2	20.1 (2.7)	11.7 (2.9)	0.7 (1.2)
1-2 years ago	12.4	19.3 (2.6)	11.8 (2.6)	1.3 (1.7)
3-4 years ago	7.8	19.7 (1.8)	13.0 (2.7)	1.3 (2.9)
5 or more years ago	29.0	19.4 (2.9)	12.4 (3.5)	1.7 (2.0)
Never	3.1	20.2 (3.0)	11.3 (4.7)	1.2 (1.5)
Dental prosthetics				
Wearers	75.0	19.7 (2.7)	12.1 (3.2)	1.3 (2.1)
Nonwearers	25.0	19.7 (2.7)	12.1 (2.9)	1.1 (1.2)

* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

Table 2. Oral Health-Related Variables and Means and Standard Deviations PW Scores Among Participants

	% (*n* = 201)	**Positive affect score**	**Negative affect score**	**Depressive symptoms score**
Natural teeth missing				
No natural teeth missing	3.6	19.4 (2.6)	12.4 (3.5)	1.7 (2.4)
Some natural teeth missing	65.1	19.7 (2.8)	11.9 (2.9)	1.1 (1.6)
All natural teeth missing	31.3	19.4 (3.5)	12.1 (2.6)	0.7 (1.0)
Difficulty eating due to problems with mouth or teeth		*		***
Yes	17.2	18.6 (3.0)	12.9 (3.0)	2.3 (2.6)
No	82.8	20.0 (2.6)	11.9 (3.1)	1.1 (1.6)
Toothache (frequency past 12 months) dentate only				
Never	80.3	19.8 (2.5)	11.9 (2.8)	1.2 (1.7)
Hardly ever	12.1	19.9 (2.5)	12.3 (2.8)	1.0 (1.8)
Sometimes/Often/Very often	7.6	19.0 (3.8)	11.3 (4.1)	1.2 (1.7)
Problem with mouth or denture (frequency past 12 months)		**		***
Never	69.3	20.1 (2.5)	11.7 (3.0)	1.0 (1.6)
Hardly ever	11.5	19.6 (2.9)	12.6 (2.6)	1.2 (2.1)
Sometimes	10.4	18.1 (2.7)	12.4 (2.8)	1.5 (1.7)
Often/	3.6	20.1 (2.0)	13.7 (2.4)	1.9 (1.6)
Very often	5.2	18.0 (3.4)	14.1 (5.0)	3.6 (3.4)
Concern about dental appearance (frequency past 12 months)		***	**	***
Never	74.7	20.2 (2.4)	11.5 (2.8)	0.9 (1.4)
Hardly ever	8.9	19.9 (2.6)	12.9 (3.4)	1.5 (2.2)
Sometimes	7.9	17.9 (2.7)	14.1 (3.7)	2.2 (2.5)
Often	5.8	16.7 (2.7)	14.3 (3.3)	2.8 (3.2)
Very often	2.6	18.0 (3.1)	14.2 (4.4)	2.4 (2.5)
Avoiding certain foods due to dental problems (frequency past 12 months)		*	**	***
Never	71.4	20.0 (2.5)	11.6 (2.8)	1.1 (1.6)
Hardly ever	9.4	20.0 (2.9)	12.6 (2.8)	0.7 (1.3)
Sometimes	11.4	19.0 (3.1)	12.9 (3.6)	1.5 (1.9)
Often	5.2	17.6 (3.1)	13.8 (3.0)	2.8 (2.6)
Very often	2.6	18.0 (2.2)	15.2 (5.1)	4.6 (4.1)

* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

Table 3. Predictors of PW (Positive Affect) Score in Participants

	B	r^2	***P*-value**
Concerns about appearance of their mouth and teeth	−1.45	0.87	0.001
Would you say you enjoy your main meal of the day? (A lot)	1.15	0.054	0.02
Self-assessment of general health	1.00	0.035	0.05
Social activity “About right”	1.00	0.021	0.05
Constant	17.61		

Adjusted r^2 = 0. 178.

Table 4. Predictors of PW (Negative Affect) Score in Participants

	B	r^2	***P*-value**
Concerns about appearance of their mouth and teeth	1.33	0.090	0.02
Social activity “About right”	−2.01	0.027	0.001
Sex (Male = 1)	−1.48	−0.055	0.01
Income	0.28	0.030	0.01
Avoid eating some foods due to problems with your teeth, mouth	1.12	0.027	0.05
Constant	12.47		

Adjusted r^2 = 0.201.

Table 5. Predictors of Depressive Symptoms Score in Participants

	B	r^2	***P*-value**
Walking difficulties	−1.43	0.090	0.0001
Concerns about appearance of their mouth and teeth	0.93	0.027	0.001
Dentate (1 = Yes)	−0.64	0.055	0.02
Number of health conditions	0.11	0.030	0.03
Constant	3.48		

Adjusted r^2 = 0.246.

DISCUSSION

The analysis of MELSHA data demonstrates that in this cohort of older Melbournians, oral health aspects, particularly those concerning mouth and dental appearance, significantly correlate with positive well-being (PW) and depressive symptoms. This is consistent with Australia's National Oral Health Plan, which considers oral health as essential to overall health and a foundation for quality of life and well-being (16, 31). These findings underscore that older adults remain cognizant of dental aesthetics, suggesting that interventions targeting oral health improvements—especially enhancing dental or denture appearance—could positively impact their well-being.

The data also revealed that over 80% of participants had multiple health conditions, with 31% managing five or more, highlighting a significant health burden in older populations. Common conditions included osteoarthritis and mobility issues affecting feet and legs, which could hinder their ability to maintain oral hygiene or access dental care. Furthermore, more than half of the participants reported high blood pressure (51.7%), which is often managed with medications that can reduce salivary function and lead to dry mouth (32). Diabetes and cancer were also prevalent, with cancer treatments like chemotherapy further reducing salivary production, exacerbating dry mouth complications (33). These issues illustrate that dry mouth, or xerostomia, is not a trivial problem, as it can lead to increased risks of dental caries, periodontal disease, tooth loss, and decreased quality of life (34).

Additionally, the data showed a reduced frequency of dental visits among participants (47.7%), which highlights the need to promote regular dental care for health maintenance and oral hygiene education as essential components for improving the well-being of older adults (35). Oral health professionals must also consider older adults' past dental experiences and potential biases, encouraging better engagement and openness to oral health interventions (36).

Although the findings offer valuable insights, several limitations were identified, including the cross-sectional design, reliance on self-reported data, and a sample skewed towards relatively healthy, independent, English-speaking individuals. There was also a lack of clinical data to verify self-reported oral health issues, though the self-assessed data remained consistent with national health statistics for people aged 75 years and over (37).

Overall, the study extends current understanding of how oral health contributes to the well-being of older adults, supporting the need for targeted interventions and oral health programs. These findings provide useful information to develop effective oral health services and programs designed to improve the oral health and PW of older adults (16, 38, 39). Future research should use longitudinal and qualitative approaches, incorporating

detailed oral health behaviors and clinical assessments, to improve understanding of oral health needs in older adults. This would facilitate designing interventions that enhance appearance and ultimately support well-being in this growing demographic (14, 40).

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