



Received: April 10, 2025
Revised: August 13, 2025
Accepted: December 25, 2025

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The Interplay of Loneliness, Oral Health and Quality of Life: A Study of Thai Older Adults

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Abstract

Objectives: This study aimed to examine the association between oral health, oral health-related quality of life (OHRQoL) and loneliness among Thai older adults.

Methods: A cross-sectional study was conducted among 421 adults aged 60 and older in Ang Thong Province, Thailand. Data were collected through structured interviews and oral examinations. Loneliness and OHRQoL were assessed using the Thai version of the 6-item Revised UCLA Loneliness Scale (RULS-6), and the Thai version of The Oral Health Impact Profile 14 (OHIP-14), respectively. Statistical analyses included correlation, univariate, and multivariate linear regression.

Results: The average (standard deviation) loneliness score was 7.76 (3.46). All OHIP-14 domains were significantly associated with loneliness. The strongest correlation was observed in the psychological discomfort domain ($r=0.31$), followed by the handicap domain. In the multivariate analysis, significant predictors of increased loneliness included greater age, living alone, smoking history, semi-dependence, and psychological discomfort. Interestingly, psychological disability was found to be inversely associated with loneliness.

Conclusions: Certain domains of OHRQoL, especially psychological discomfort, were positively associated with loneliness among older Thai adults. Factors such as age, living status, smoking history, and functional ability also played significant roles.

Keywords: aging, loneliness, oral health, oral health-related quality of life

Introduction

Like much of the world, Thailand is experiencing a growing elderly population and is approaching a “completed aged” society in which at least 20% are over the age of 60. Currently, 12.6 million (nearly 19%) of Thailand’s 66.7 million people are aged 60 or older.⁽¹⁾ The elderly often face loneliness, an emotional state characterized by a perceived gap between the social relationships that individuals desire and the relationships that they have, and it can undermine overall well-being.⁽²⁾ Loneliness has become a significant public health issue. In 2023, the World Health Organization (WHO) declared loneliness a global public health concern.⁽³⁾ Loneliness worsens various health outcomes, most notably affecting mental health and overall well-being.⁽⁴⁾ It has been associated with depression and other mental health problems^(4,5), physical disability^(6,7), reduced quality of life (QoL)^(4,8), and risky behaviors such as smoking.^(9–11) Many studies have addressed the impact of loneliness on general health and behavior. However, research on its relationship with oral health and oral health-related quality of life (OHRQoL) remains limited, especially among older adults. OHRQoL reflects how oral conditions affect daily life and overall well-being. It considers the severity, frequency, or duration of impacts that are significant enough to influence one’s perception of life quality.⁽¹²⁾ OHRQoL encompasses four dimensions: oral function, orofacial pain, orofacial appearance, and psychosocial impact.⁽¹³⁾ The psychosocial dimension considers the emotional and social consequences of oral health problems. Poor oral health and low OHRQoL have been associated with feelings of loneliness.^(14–16) However, studies exploring this association are limited, notably among older Thai adults, whose cultural context may differ from that of other populations. In Thailand, loneliness in older adults is often related to living arrangement and lack of family engagement. Individuals living alone report greater loneliness, and older adults who do not participate in family activities tend to feel more isolated.⁽¹⁷⁾ Therefore, examining loneliness in Thai older adults provides important insight for culturally appropriate interventions. This study aims to examine the association between oral health, OHRQoL and loneliness among Thai older adults.

Material and Methods

Study design and ethical approval

This cross-sectional study was approved by the Ethical Review Board of the Ang Thong Provincial Public Health Office (ATGEC 23/2567).

Setting and sample

The study was conducted from March to May 2024 among community-dwelling older adults aged 60 years and older in Ang Thong Province, Thailand. A quota sampling method was used to recruit 421 participants. Individuals with cognitive impairment (as assessed by the Mini-Cog test) or communication difficulties were excluded. The sample size was determined using G*Power for linear multiple regression (fixed model) with a priori analysis, which considered an effect size of 0.09, a significance level of 0.05, a power of 0.90, and included 30 predictors.⁽¹⁸⁾

Data collection

Structured interviews were conducted at the village town hall or the community health center during community activities. These interviews collected data on demographics, health conditions and behaviors, oral health behaviors, and overall oral health status and function, including group eating avoidance and eating problems. Oral examinations assessed the number of remaining teeth and occluding tooth pairs.

Loneliness was measured using the Thai version of the 6-item Revised UCLA Loneliness Scale (RULS-6).⁽¹⁹⁾ This unidimensional scale has demonstrated good reliability, with Cronbach’s $\alpha=0.83$.⁽¹⁹⁾ Each item began with a question stem, ‘How much of the time do you feel..’, and used a four-point response scale: 1 (often), 2 (sometimes), 3 (rarely), and 4 (never).⁽¹⁹⁾ Scores range from 6 to 24, with higher scores indicating greater levels of loneliness.⁽¹⁹⁾

Oral health-related quality of life (OHRQoL) was measured using the Thai version of the Oral Health Impact Profile 14 (OHIP-14).^(20,21) This tool evaluates seven domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Participants reported the frequency of oral health impacts experienced

over the past four weeks using a 5-point response scale ranging from 0=never to 4=very often. Higher scores indicate poorer OHRQoL.^(20,21)

Data analysis

Statistical analyses were performed using IBM SPSS version 29.0. Descriptive statistics, including means and standard deviations, were used to summarize demographic, behavioral, and oral health data. Independent t-tests and one-way ANOVA were employed to assess factors related to loneliness. Pearson correlation was used to assess the relationship between loneliness and OHRQoL. Both univariable and multivariate regression analyses were conducted to explore the associations between oral health, OHRQoL, and loneliness. A *p*-value below 0.05 was considered statistically significant.

Results

A total of 421 older adults participated in the study. Their average age was 70.38 years (standard deviation, SD: 7.18), with most participants aged between 60 and 69 years. Additionally, 51.1% of the participants were female. The majority were married (70.3%), lived with family members (54.9%), and had completed only elementary education (72.2%). In terms of health conditions, 75.1% had systemic diseases, with a median of two diseases (Interquartile range: 0.5-2). Regarding oral health, 66.7% had 20 or more remaining teeth, while 77.2% had between 0 and 3 natural occluding tooth pairs. Furthermore, 44.7% reported experiencing difficulties with eating or chewing (Table 1).

Significant differences in RULS-6 scores were observed based on demographic, health, and oral health factors. Loneliness scores increased with age, with the following averages (SD): 7.20 (2.65) for ages 60-69 years, 7.90 (3.73) for ages 70-79 years, and 9.41 (4.61) for those aged 80 years and older ($p<0.001$). Higher loneliness scores were found among individuals living alone (9.31 (4.72)), those with lower education levels ($p=0.005$), non-exercisers ($p<0.001$), and smokers ($p=0.025$). Participants who were semi-dependent or dependent had significantly higher loneliness scores (15.33 (5.64)) compared to independent individuals (7.59 (3.21)) ($p<0.001$). Additionally, participants with 20 or more teeth reported higher loneliness scores (8.02 (3.72)) than those with fewer than 20 teeth (7.23 (2.80)) ($p=0.026$). Those who avoided group eating (8.94 (4.69)) and those with eating

or chewing difficulties (8.17 (3.97)) also exhibited higher loneliness scores ($p<0.05$) (Table 1).

The average (SD) loneliness scores, using the Thai RULS-6, ranged from 1.19 (0.60) for item 4, "How often do you feel left out?" to 1.40 (0.79) for item 6, "How often do you feel people are around you but not with you?" (Table 2).

The study also found that participants had an average (SD) overall OHIP-14 score of 5.46 (7.84). Among the assessed domains, the physical pain domain had the highest mean (SD) score of 1.58 (1.92). The item most affected in this domain was "Discomfort when eating," which scored an average (SD) of 0.94 (1.24). In contrast, the lowest mean scores (SD) were noted in the social disability domain 0.30 (0.90). There were also low scores for the items "Difficulty relaxing" in the psychological disability domain and "Irritability with others people" in the social disability domain, both with a mean (SD) score of 0.17 (0.53) (Table 3).

Univariate analysis of loneliness using simple regression revealed several factors significantly associated with loneliness ($p<0.05$). These factors included age, marital status (previously married), living alone, number of systemic diseases, lack of exercise, smoking (ex-smokers), and self-ability (semi-dependent or dependent). Oral health factors that were significantly associated with loneliness included having more than 20 remaining teeth, avoiding group eating, and experiencing eating problems. OHIP-14 factors significantly associated with loneliness were functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap ($p<0.05$) (Table 4).

Multivariable analysis adjusting for confounders showed that age, living alone, smoking (ex-smokers), and self-ability (semi-dependent or dependent) remained significant predictors of loneliness. Among OHIP-14 factors, psychological discomfort was positively associated with loneliness, whereas psychological disability was negatively associated (Table 5).

Discussion

This study examined the association between loneliness, oral health, and OHRQoL among Thai older adults, revealing a significant relationship among these factors. The relationships presented mixed outcomes. A poorer OHRQoL was significantly associated with

Table 1: Demographic characteristics, health conditions, oral health behavior, and loneliness scores of Thai older adults (N=421).

	N	%	Loneliness (RULS-6)		F or t	p
			Mean	SD		
Demographics						
Age (years)						
60-69 years	215	51.1	7.20	2.65	10.375	<0.001 ^b
70-79 years	145	34.4	7.90	3.73		
More than 80 years	61	14.5	9.41	4.61		
Gender						
Male	125	29.7	8.14	3.74	1.492	0.136 ^a
Female	296	70.3	7.59	3.32		
Marital status						
Single	55	13.1	7.93	3.58	2.373	0.094 ^b
Married	231	54.9	7.44	3.17		
Previously married	135	32.1	8.24	3.83		
Living arrangements						
Alone	48	11.4	9.31	4.72	6.072	0.003 ^b
Spouse	69	16.4	7.91	3.11		
Family	304	72.2	7.48	3.24		
Highest education level						
None	9	2.1	8.67	5.32	5.377	0.005 ^b
Elementary or less	310	73.6	8.05	3.64		
Secondary or higher	102	24.2	6.80	2.37		
Health conditions and behavior						
Presence of systemic disease						
No	105	24.9	7.40	2.98	1.225	0.221 ^a
Yes	316	75.1	7.88	3.60		
Regularly exercises						
No	94	22.3	8.97	4.70	3.918	<0.001 ^a
Yes	327	77.7	7.41	2.92		
Smoking						
Non-smokers	366	86.9	7.58	3.29	3.708	0.025 ^b
Ex-smokers	36	8.6	8.83	4.21		
Current smokers	19	4.5	9.11	4.52		
Self-ability						
Independent	412	97.9	7.59	3.21	7.018	<0.001 ^a
Semi or Dependent	9	2.1	15.33	5.64		
Oral health behaviors						
Brushing						
No	23	5.5	7.91	3.30	0.221	0.825 ^a
Yes	398	94.5	7.75	3.47		
Use of extra cleaning instruments						
No	307	72.9	7.85	3.67	0.932	0.352 ^a
Yes	114	27.1	7.50	2.79		
Wearing dentures						
No	311	73.9	7.74	3.35	0.639	0.528 ^b
Yes, good denture	86	20.4	8.01	3.94		
Yes, poor-fitting denture	24	5.7	7.13	2.94		
Dental visit within the past year						
No	275	65.3	7.96	3.69	1.622	0.106 ^a
Yes	146	34.7	7.38	2.95		

	N	%	Loneliness (RULS-6)		F or t	p
			Mean	SD		
Oral health status and function						
Number of remaining teeth						
0-19 teeth	140	33.3	7.23	2.80	2.228	0.026 ^a
20 or more teeth	281	66.7	8.02	3.72		
Number of natural occluding tooth pairs (pairs)						
0-3	325	77.2	7.89	3.64	1.404	0.161 ^a
4 or more	96	22.8	7.32	2.73		
Total occluding pairs (pairs)						
0-3	266	63.2	7.85	3.54	0.744	0.458 ^a
4 or more	155	36.8	7.59	3.32		
Avoid group eating						
No	372	88.4	7.60	3.24	2.561	0.011 ^a
Yes	49	11.6	8.94	4.69		
Eating problems						
No	233	55.3	7.42	2.94	2.210	0.028 ^a
Yes	188	44.7	8.17	3.97		

^aIndependent samples t-test, ^bOne-way ANOVA.

Table 2: Frequency of responses to items in 6-Item Revised UCLA Loneliness Scale (RULS-6) in Thai older adults (N=421).

Item	Mean	SD	Never		Hardly ever		Sometimes		Regularly	
			n	%	n	%	n	%	n	%
1. How often do you feel that you lack companionship?	1.33	0.76	347	82.4	18	4.3	47	11.2	9	2.1
2. How often do you feel alone?	1.31	0.76	359	85.3	6	1.4	45	10.7	11	2.6
3. How often do you feel that you are no longer close to anyone?	1.22	0.62	369	87.6	15	3.6	33	7.8	4	1.0
4. How often do you feel left out?	1.19	0.60	379	90.0	7	1.7	31	7.4	4	1.0
5. How often do you feel that no one really knows you well?	1.30	0.72	348	82.7	26	6.2	39	9.3	8	1.9
6. How often do you feel that people are around you but not with you?	1.40	0.79	325	77.2	27	6.4	64	15.2	5	1.2
RULS-6 total score	7.76	3.46								

RULS-6: 6-Item Revised UCLA Loneliness Scale

increased feelings of loneliness, aligning with previous studies.⁽¹⁴⁻¹⁶⁾ Specifically, the psychological discomfort domain, which is characterized by feeling of self-consciousness and tension related to oral health issues, showed the strongest positive correlation with loneliness. Notably, the psychological disability domain exhibited an inverse relationship, indicating that individuals who found it difficult to relax and experienced feelings of embarrassment may feel less lonely. This unexpected finding could reflect social coping mechanisms or cultural factors that warrant further investigation.

Although oral health factors were excluded from the final model in the multivariate analysis, some factors were significantly related to loneliness in the bivariate analy-

sis. However, in this study, participants with 20 or more remaining teeth had significantly higher loneliness scores compared with those who had fewer than 20 teeth. This finding was unexpected and inconsistent with previous studies⁽²²⁾, which reported that fewer remaining teeth were associated with higher levels of social isolation and loneliness. One possible explanation is that older adults with more teeth might have higher expectations of their oral and social functioning, such as eating together with family in Thai culture. When such expectations are unmet, they may perceive greater loneliness. Furthermore, older individuals who experienced eating problems or avoided group meals were more likely to feel lonely. Previous studies have shown that limited social interaction during

Table 3: Mean, SD and frequency of responses to items in the Oral Health Impact Profile 14 (OHIP-14) in Thai older adults (N=421).

Domain/Item	Mean	SD	Never		Hardly ever		Occasionally		Fairly often		Very often	
			n	%	n	%	n	%	n	%	n	%
Functional limitation	1.16	1.87										
Difficulty pronouncing words	0.54	1.03	306	72.7	44	10.5	41	9.7	17	4.0	13	3.1
Decreased sense of taste	0.62	1.08	297	70.5	36	8.6	54	12.8	21	5.0	13	3.1
Physical pain	1.58	1.92										
Painful aching in the mouth	0.65	1.02	278	66.0	46	10.9	76	18.1	10	2.4	11	2.6
Discomfort when eating	0.94	1.24	241	57.2	37	8.8	95	22.6	25	5.9	23	5.5
Psychological discomfort	0.78	1.54										
Self-consciousness	0.48	0.98	322	76.5	36	8.6	36	8.6	16	3.8	11	2.6
Feeling tense	0.31	0.76	349	82.9	30	7.1	30	7.1	9	2.1	3	0.7
Physical disabilities	0.80	1.47										
Unsatisfactory diet	0.46	0.88	316	75.1	37	8.8	52	12.4	12	2.9	4	1.0
Interrupting during meals	0.34	0.77	338	80.3	35	8.3	37	8.8	9	2.1	2	0.5
Psychological disabilities	0.43	1.05										
Difficulty relaxing	0.17	0.53	374	88.8	27	6.4	17	4.0	2	0.5	1	0.2
Feeling of embarrassment	0.27	0.74	363	86.2	20	4.8	27	6.4	6	1.4	5	1.2
Social disabilities	0.30	0.90										
Irritability with others	0.17	0.53	371	88.1	34	8.1	11	2.6	4	1.0	1	0.2
Difficulty performing usual tasks	0.13	0.45	383	91.0	27	6.4	8	1.9	2	0.5	1	0.2
Handicap	0.40	1.07										
Decreased life satisfaction	0.21	0.59	364	86.5	31	7.4	22	5.2	3	0.7	1	0.2
Inability to function effectively	0.19	0.61	372	88.4	27	6.4	15	3.6	4	1.0	3	0.7
OHIP-14 total score	5.46	7.84										

OHIP-14: Oral Health Impact Profile 14

Table 4: Correlation between oral health-related quality of life (OHIP-14) and loneliness (RULS-6) in Thai older adults (N=421).

Domain	r	95% CI
Functional limitation	0.22	0.13, 0.31
Physical pain	0.18	0.08, 0.27
Psychological discomfort	0.31	0.22, 0.39
Physical disabilities	0.20	0.11, 0.29
Psychological disabilities	0.16	0.06, 0.25
Social disabilities	0.20	0.10, 0.29
Handicap	0.25	0.15, 0.33
OHIP-14 total score	0.27	0.18, 0.36

OHIP-14: Oral Health Impact Profile 14, r: Pearson correlation coefficient, CI: confidence interval

meals can contribute to feeling of loneliness and increase the risk of depressive mood.^(23,24)

In terms of OHRQoL, both correlation analysis and bivariate analysis shown that all domains were significantly associated with loneliness, with poorer OHRQoL leading to heightened feelings of loneliness.^(14,15) Oral health and function influence OHRQoL by affecting key aspects such as eating, speaking, smiling, and engaging

in social interactions.⁽²⁵⁾ These findings imply that compromised oral function may contribute to social isolation, potentially due to feelings of embarrassment, difficulties with chewing, or avoidance of social dining situations.

After adjusting for confounding factors in the multivariate model, significant predictors of loneliness included age, living alone, ex-smoking status, self-ability, psychological discomfort, and psychological disability.

Table 5: Relationship between oral health, oral health-related quality of life and loneliness in Thai older adults (N=421).

Variables	Univariate analysis			Multivariate analysis		
	B	95% CI	p	B	95% CI	p
<i>Demographic data</i>						
Age (years)	0.102	0.057, 0.147	<0.001	0.047	0.002, 0.092	0.041
<i>Gender</i>						
Male	0.549	-0.174, 1.273	0.136			
<i>Marital status</i>						
Single	0.490	-0.526, 1.506	0.344	0.425	-0.532, 1.383	0.383
Previously married	0.800	0.066, 1.533	0.033	0.670	-0.041, 1.381	0.065
<i>Living arrangement</i>						
Alone	1.836	0.793, 2.878	0.001	1.539	0.566, 2.512	0.002
Spouse	0.436	-0.459, 1.331	0.339	0.438	-0.415, 1.290	0.313
<i>Highest education level</i>						
Elementary or less	-0.622	-2.895, 1.652	0.591			
Secondary or higher	-1.863	-4.201, 0.475	0.118			
Health conditions and behavior						
<i>Presence of systemic disease</i>						
Yes	0.477	-0.288, 1.241	0.221			
Number of systemic diseases	0.352	0.069, 0.635	0.015	0.158	-0.106, 0.422	0.239
<i>Regularly exercises</i>						
Yes	-1.558	-2.340, -0.776	<0.001	-0.683	-1.420, 0.054	0.069
<i>Smoking</i>						
Ex-smokers	1.251	0.072, 2.430	0.038	1.520	0.448, 2.591	0.006
Current smokers	1.523	-0.065, 3.112	0.060	0.852	-0.602, 2.306	0.250
<i>Self-ability</i>						
Semi- or Dependent	7.741	5.573, 9.909	<0.001	5.863	3.659, 8.067	<0.001
Oral health behaviors						
<i>Brushing</i>						
Yes	-0.164	-1.623, 1.294	0.825			
<i>Use of extra cleaning instruments</i>						
Yes	-0.353	-1.099, 0.392	0.352			
<i>Wearing denture</i>						
Yes, good denture	0.275	-0.553, 1.104	0.514			
Yes, poor-fitting denture	-0.611	-2.052, 0.829	0.405			
<i>Dental visit within the past year</i>						
Yes	-0.573	-1.267, 0.122	0.106			
Oral health status and function						
<i>Number of remaining teeth</i>						
20 or more teeth	0.793	0.093, 1.492	0.026	0.112	-0.545, 0.769	0.738
<i>Number of natural occluding tooth pairs (pairs)</i>						
4 or more	-0.563	-1.352, 0.225	0.161			
<i>Total occluding pairs (pairs)</i>						
4 or more	-0.260	-0.947, 0.427	0.458			
<i>Avoids group eating</i>						
Yes	1.337	0.311, 2.362	0.011	0.102	-0.881, 1.085	0.838
<i>Eating problems</i>						
Yes	0.745	0.082, 1.408	0.028	0.421	-0.257, 1.099	0.223
Oral Health Related-Quality of Life (OHIP-14)						
Functional limitation	0.411	0.238, 0.584	<0.001	0.020	-0.203, 0.244	0.859
Physical pain	0.319	0.149, 0.489	<0.001	-0.023	-0.250, 0.205	0.845
Psychological discomfort	0.694	0.489, 0.900	<0.001	0.668	0.327, 1.008	<0.001
Physical disabilities	0.476	0.254, 0.697	<0.001	-0.197	-0.539, 0.146	0.260
Psychological disabilities	0.518	0.207, 0.830	0.001	-0.544	-1.023, -0.065	0.026
Social disabilities	0.754	0.392, 1.116	<0.001	0.450	-0.037, 0.937	0.070
Handicap	0.788	0.488, 1.088	<0.001	0.232	-0.151, 0.615	0.234

B: Regression coefficient

This study found that loneliness increased with age. However, several previous studies reported that age was not directly linked to loneliness, suggesting that other factors such as income, health, or social self-efficacy may play a stronger role.⁽²⁶⁻²⁸⁾ The discrepancy in findings may be explained by the focus of our study on older adults only, whereas many prior studies examined a broader age range. We consider that in the Thai context, older adults may face greater social withdrawal with increasing age, especially if physical limitations or loss of social roles occur, which could explain the higher loneliness scores in this group. While some studies have shown different trajectories of loneliness across the life course⁽²⁸⁾, our findings highlight that interventions for loneliness in Thailand should particularly address the needs of the oldest age groups.

Moreover, this current study found that older adults living alone experience greater loneliness, which aligns with previous studies.^(17,29) A study in Thailand reported that older adults living alone exhibited higher levels of loneliness, emphasizing the importance of family activities as a key factor.⁽¹⁷⁾ Another Thai study reached similar conclusions, highlighting the crucial role of family caregivers as the primary source of support in preventing social isolation among older adults.⁽²⁹⁾

Additionally, the study found that former smokers tend to experience greater loneliness. Although no study has explicitly confirmed this association, it can be hypothesized that individuals who previously smoked may have already been encountering feelings of loneliness. After quitting, their loneliness may not have diminished, possibly due to increased health awareness or social changes. Research involving older Chinese adults revealed that former smokers had higher odds of reporting depression, while current smokers were more likely to experience a loss of interest, both of which are associated with loneliness.⁽⁹⁾ Furthermore, smoking is often viewed as highly antisocial.⁽³⁰⁾ A longitudinal study indicated that, after a 12-year follow-up, smoking was associated with increasing social isolation and loneliness in older adults.⁽¹⁰⁾ Wootton *et al.*,⁽¹¹⁾ provide tentative evidence of a causal, bidirectional relationship between loneliness and smoking, particularly suggesting that the initiation of smoking may contribute to increased feelings of loneliness.

The results indicated that participants who were semi-dependent or dependent reported higher levels of loneliness. This findings aligns with previous research

and confirms the association between self-ability and loneliness.^(6,7) Furthermore, Shamlou *et al.*,⁽⁷⁾ found a significant negative relationship between self-care ability with loneliness, as well as social isolation. This suggests that older adults experiencing greater loneliness and more severe social isolation tend to have poorer self-care ability. Limitations in self-care and daily functioning may contribute to social withdrawal and increased in feelings of loneliness. These findings highlight the need for interventions aimed at oral health, enhancing social support, and promoting self-care abilities to help reduce loneliness in older adults.

A key strength of this study is its comprehensive assessment of both oral health and loneliness among participants, providing a multidimensional understanding of their interrelationships. Among the limitations, this study is cross-sectional, which restricts the ability to establish causal relationships between OHRQoL and loneliness. Longitudinal studies would be useful to clarify causality and explore potential influencing factors. Additionally, the participants in this study were community-dwelling older Thai adults actively engaged in community activities, which may have contributed to the relatively low levels of reported loneliness.

Conclusions

A lower OHRQoL was associated with heightened feeling of loneliness, particularly due to psychological discomfort. Additionally, psychological disability showed an inverse association with loneliness. Other significant factors contributing to loneliness included living alone, having a history of smoking, and experiencing semi-dependence.

Acknowledgments

The authors would like to thank Assoc. Prof. Dr. Pagaporn Pantuwadee Pisarnurakit from the Department of Community Dentistry, and Assoc. Prof. Dr. Nareudee Limpuangthip from the Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Thailand, for their valuable guidance and support throughout the study.

Funding

This research did not receive any specific grant or funding from funding agencies in the public, commercial,

or not-for-profit sectors.

Conflicts of Interest

The authors declare no conflict of interest.

References

1. National Statistical Office. Demography population and housing statistics [Internet]. Thailand;2021 [updated 2021 Dec 1; cited 2024 March 1]. Available from:<http://statbi.nso.go.th/staticreport/page/sector/th/01.aspx>.
2. Spithoven AWM, Bijttebier P, Goossens L. It is all in their mind: a review on information processing bias in lonely individuals. *Clin Psychol Rev*. 2017;58:97-114.
3. World Health Organization. WHO launches commission to foster social connection [Internet]. Geneva: World Health Organization; 2023 Nov 15 [updated 2023 Nov 15; cited 2024 March 1]. Available from: <https://www.who.int/news/item/15-11-2023-who-launches-commission-to-foster-social-connection>.
4. Park C, Majeed A, Gill H, Tamura J, Ho RC, Mansur RB, *et al*. The effect of loneliness on distinct health outcomes: a comprehensive review and meta-analysis. *Psychiatry Res*. 2020;294:113514.
5. Wang J, Mann F, Lloyd-Evans B, Ma R, Johnson S. Associations between loneliness and perceived social support and outcomes of mental health problems: a systematic review. *BMC Psychiatry*. 2018;18(1):156.
6. Nieboer AP, Hajema K, Cramm JM. Relationships of self-management abilities to loneliness among older people: a cross-sectional study. *BMC Geriatrics*. 2020;20(1):184.
7. Shamlou R, Nikpeyma N, Pashaeipour S, Sahebi L, Mehrgou Z. Relationship of loneliness and social isolation with self-care ability among older adults. *J Psychosoc Nurs Ment Health Serv*. 2021;59(1):15-20.
8. Kang HW, Park M, Wallace Hernandez JP. The impact of perceived social support, loneliness, and physical activity on quality of life in South Korean older adults. *J Sport Health Sci*. 2018;7(2):237-44.
9. Chang YC, Lee YH, Chiang T, Liu CT. Associations of smoking and alcohol consumption with loneliness, depression, and loss of interest among Chinese older males and females. *Int J Ment Health Addict*. 2022;1-16.
10. Philip KE, Bu F, Polkey MI, Brown J, Steptoe A, Hopkinson NS, *et al*. Relationship of smoking with current and future social isolation and loneliness: 12-year follow-up of older adults in England. *Lancet Reg Health Eur*. 2022;14:100302.
11. Wootton RE, Greenstone HSR, Abdellaoui A, Denys D, Verweij KJH, Munafò MR, *et al*. Bidirectional effects between loneliness, smoking and alcohol use: evidence from a Mendelian randomization study. *Addiction*. 2021;116(2):400-6.
12. Locker D, Allen F. What do measures of 'oral health-related quality of life' measure?. *Community Dent Oral Epidemiol*. 2007;35(6):401-11.
13. John MT. Foundations of oral health-related quality of life. *J Oral Rehabil*. 2021;48(3):355-9.
14. Abdullah A, König HH, Hajek A. Oral health-related quality of life and loneliness: results based on a cross-sectional survey. *Arch Pub Health*. 2024;82(1):114.
15. Rouxel P, Heilmann A, Demakakos P, Aida J, Tsakos G, Watt RG. Oral health-related quality of life and loneliness among older adults. *Eur J Ageing*. 2017;14(2):101-9.
16. Finlayson TL, Moss KL, Jones JA, Preisser JS, Weintraub JA. Loneliness and low life satisfaction associated with older adults' poor oral health. *Front Public Health*. 2024;12:1428699.
17. Phuangcharoen C, Thayansin S. The loneliness of older adults associated with various types of Thai families. *JPSS*. 2022;30:207-21.
18. Korkmaz Aslan G, Kulakci Altinta SH, Ozen Cinar I, Veren F. Attitudes to ageing and their relationship with quality of life in older adults in Turkey. *Psychogeriatrics*. 2019;19(2):157-64.
19. Wongpakaran N, Wongpakaran T, Pinyopornpanish M, Simcharoen S, Suradom C, Varnado P, *et al*. Development and validation of a 6-item Revised UCLA Loneliness Scale (RULS-6) using Rasch analysis. *Br J Health Psychol*. 2020;25(2):233-56.
20. Suksudaj S. The Thai social capital as a social determinant of oral health [dissertation on the Internet]. Adelaide: The University of Adelaide, School of Dentistry; 2010. [cited 2024 March 1]. Available from: <https://digital.library.adelaide.edu.au/server/api/core/bitstreams/3e021a1f-3e20-4d11-b018-b9ddb8fd703/content>.
21. Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol*. 1997;25(4):284-90.
22. Koyama S, Saito M, Cable N, Ikeda T, Tsuji T, Noguchi T, *et al*. Examining the associations between oral health and social isolation: a cross-national comparative study between Japan and England. *Soc Sci Med*. 2021;277:113895.
23. Kuroda A, Tanaka T, Hirano H, Ohara Y, Kikutani T, Furuya H, *et al*. Eating alone as social disengagement is strongly associated with depressive symptoms in Japanese community-dwelling older adults. *J Am Med Dir Assoc*. 2015;16(7):578-85.
24. Kimura Y, Wada T, Okumiya K, Ishimoto Y, Fukutomi E, Kasahara Y, *et al*. Eating alone among community-dwelling Japanese elderly: association with depression and food diversity. *J Nutr Health Aging*. 2012;16(7):728-31.
25. Aguiar AD de, Oliveira ERA de, Miotto MHM de B. Tooth Loss, sociodemographic conditions and oral health-related quality of life in the elderly. *Pesqui Bras Odontopediatria Clin Integr*. 2022;22:e200189.
26. Hawkey LC, Buecker S, Kaiser T, Luhmann M. Loneliness

- from young adulthood to old age: explaining age differences in loneliness. *Int J Behav Dev.* 2022;46(1):39-49.
27. Nguyen TT, Lee EE, Daly RE, Wu TC, Tang Y, Tu X, *et al.* Predictors of loneliness by age decade: study of psychological and environmental factors in 2,843 community-dwelling Americans aged 20–69 years. *J Clin Psychiatry.* 2020; 81(6):20m13378.
28. Barreto M, Victor C, Hammond C, Eccles A, Richins MT, Qualter P. Loneliness around the world: age, gender, and cultural differences in loneliness. *Pers Individ Dif.* 2021;169:110066.
29. Iamtrakul P, Chayphong S. Exploring the influencing factors on living alone and social isolation among older adults in rural areas of Thailand. *Int J Environ Res Public Health.* 2022; 19(21):14572.
30. Cummings KM, Proctor RN. The changing public image of smoking in the United States: 1964–2014. *Cancer Epidemiol Biomarkers Prev.* 2014;23(1):32-6.