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Original Article

A Cross-sectional Assessment of Oral Health-related Quality of Life in Institutionalized Older People

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SUMMARY

Background: This study focused on institutionalized older people's self-perceived oral status to investigate factors influencing their Taiwanese Short-form of the Oral Health Impact Profile (OHIP-7T) scores.
Methods: Subjects were 536 institutionalized residents in central Taiwan. Information concerning self-perceived ability to chew food, self-perceived mouth dryness, sociodemographic characteristics, health risk behaviors, oral health status, a number of types of commonly used oral healthcare tools served and OHIP-7T was collected via face-to-face interview questionnaires. Linear regression analysis was conducted to determine the best masticatory factor that could serve as a predictor of OHIP-7T scores.
Results: The average OHIP-7T score was 4.85 (standard deviation: 5.50). Through regression analysis, five factors influencing the OHIP-7T score were determined, namely, age (B = 0.023, t = –2.257, 95% CI = -0.007 to -0.096), chewed/did not chew betel quid (B = 0.855, t = 2.58, 95% CI = 0.532 to 3.883), mouth-wash use (B = 0.155, t = –2.38, 95% CI = -0.066 to -0.672), self-perceived ability to chew food (B = 0.027, t = –4.70, 95% CI = -0.074 to -0.179), and self-perceived mouth dryness (B = 0.041, t = 7.21, 95% CI = 0.217 to 0.379). In mean tests comparing two groups with high and low OHIP-7T, three variables achieved statistical significance, namely body mass index (BMI), activities of daily living (ADL), and using a toothbrush as an oral cleaning tool.
Conclusion: The results confirmed that institutionalized older people's self-perceived oral status is an effective factor influencing OHIP scores.

1. Introduction

The oral health status in the older people is unsatisfactory. Older people tend to score negatively on the physical, mental, and social aspects of oral health-related quality of life (OHRQoL).[1] Patients' OHRQoL results can serve as supplementary means of evaluation for patients' clinical treatment requirements, and thus also represent a key factor in medical care decision-making.[2]

Studies on the OHRQoL of institutionalized older people have confirmed that oral disease symptoms (e.g., mouth dryness, tooth caries, inappropriate dentures, or gum pain), sociodemographic characteristics,[3] health risk behaviors,[4] oral health behaviors,[5] saliva flow rate, and the ability to chew food[6] are all correlated with OHRQoL. Most studies have used clinical examinations to determine the relationship between patients' oral disease symptoms and OHRQoL. However, this approach is difficult to implement in long-term care (LTC) institutions where oral healthcare services are limited.[7]

Self-perceived mouth dryness and deterioration of the self-perceived ability to chew food are generally the main factors that cause patients to assess their oral condition as being abnormal and prompt them to seek treatment.[8] Therefore, this study by assessing the OHRQoL of institutionalized older people in Taiwan and exploring whether it varied according to their sociodemographic characteristics, health risk behaviors, oral health behaviors, self-perceived mouth dryness, and self-perceived ability to chew food. This study determined the key predictors of institutionalized older people's OHRQoL.

2. Methods

2.1. Participants

This study employed purposive sampling to select 27 legally registered LTC institutions from Changhua County and Taichung City. After providing the LTC institutions with written information explaining the research purpose and content, 15 LTC institutions agreed to participate in the study. The inclusion criteria were older people who (1) had clear cognitive function and were willing to sign an informed consent form and (2) had lived in the given LTC institution for at least 1 month. Potentially eligible participants were recommended by the LTC institutions and contacted by the research staff. After those willing to participate had signed their informed consent form, trained interviewers conducted face-to-face interviews with them. This study collected data from August 2014 to March 2015. A total of 577 eligible institution-dwelling older people were identified, 568 of whom were willing to participate in this

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study. In total, 568 questionnaires were distributed, and 536 valid questionnaires were returned. Subsequently, power analysis was conducted on the 536 valid samples. After using G*Power software to conduct post hoc calculations, the power analysis of the two-tailed test revealed an effect size index of 0.3, a power of 0.99, and an α level of 0.05. This study was approved by the Institutional Review Board of Cheng Ching General Hospital (HP140026). All research procedures adhered to the Declaration of Helsinki.

2.2. Measurements

This study employed a structured questionnaire to collect data and construct the measurement tools. During questionnaire development, this study referenced previously developed reliable and valid scales and conducted a literature review to investigate factors that influenced oral health-related quality of life,[9–16] on the basis of which the sociodemographic characteristics of institutionalized older adults and self-perceived mouth dryness among older adults were obtained. Furthermore, the content validity of the questionnaire was evaluated to determine the research validity. Three professionals with over 3 years of oral-care experience in LTC institutions were invited to evaluate the questionnaire items to determine their suitability and content inclusiveness. After the professionals examined the questionnaire and considered their requirements and integrity, the researchers revised the questionnaire content based on the professionals' suggestions to produce the final questionnaire.

2.2.1. Taiwanese Short-form of the Oral Health Impact Profile (OHIP-7T)

Translation and verification of OHIP-7 was developed and verified in 2013. The OHIP-7T developed by Kuo et al. (2013) exhibits favorable reliability, validity, and sensitivity.[17] Because of the item selection process, the total OHIP-7T score can only be regarded as a reflection of the overall OHIP concept, but cannot measure OHIP statuses in multiple facets.[17]

Table 1 shows the seven OHIP items. The items were scored from 0 (never) to 4 (usually), with a maximum score of 28. Low scores indicated more satisfactory quality of life in terms of oral health. Studies have found that the Cronbach's α of the OHIP-7T scores among community-dwelling adults in Taiwan aged over 40 years old, over 65 years old, and undergoing prosthesis treatment were 0.94,[18] 0.83,[17] and 0.79,[17,18] respectively. In the present study, the Cronbach's alpha of the participants' OHIP-T7 scores was 0.91.

2.2.2. Self-perceived ability to chew food

Because studies have already indicated significant correlation between older adults' ability to chew and the OHRQoL,[13] this study developed a scale based on foods commonly available in Taiwanese buffet restaurants. Foods that older people frequently ate were selected to aid in assessing their self-perceived ability to chew food. Twenty-four foods were grouped into four categories. Category 1 featured hardness (eight types of fruit that were not marinated, not overly ripe or soft, or not made into juice), category 2 featured chewiness (four types of fresh food and meat), category 3 featured fracturability (eight types of cooked vegetables, mainly stir-fried and stewed), and category 4 featured viscosity (four types of viscous food).[19] The highest score in each category was 8, with a maximum total score of 32. A high score indicated favorable chewing ability. The Cronbach's alpha for this scale was 0.93.

2.2.3. Self-perceived mouth dryness

Self-perceived mouth dryness is a critical factor in low OHRQoL scores.[16] The questionnaire in this part of the study was formulated with reference to other mouth dryness–related studies or scales.[20,21] This scale comprised of nine items, which were scored from 1 (never) to 5 (usually), with a maximum score of 45. A high score indicated severe self-perceived mouth dryness in institutionalized older people. Table 2 shows the institutionalized older people's self-perceived mouth dryness symptoms. Cronbach's α revealed that the questionnaire had good internal consistency and reliability (α = 0.80).

The sociodemographic characteristics of institutionalized older people were examined in this study (Table 3). The Barthel Activities of Daily Living Index (ADL) scale with a maximum score of 100 was adopted. Participants with scores greater than 81 can care for themselves. By contrast, participants with scores ranging from 61–80, 31–60, and < 30 are defined as having mild, moderate, and severe disabilities, respectively.[22]

Sociodemographic characteristics also included body mass index (BMI) in the previous month, number of diseases diagnosed by physicians within the last half-year, and health risk behaviors. Institutionalized older people's oral health behavior and the types of oral healthcare tools they commonly used were also examined.[9–11]

2.3. Statistical analyses

The OHIP-7T results were calculated in three steps: (1) calculating the total score of the OHIP-7T responses from items 1 to 7 to obtain the overall score; (2) dividing OHIP-7T responses into three categories by severity, namely, "never/rarely," "occasionally," and "often/usually," to determine their distribution; and (3) dividing the participants into two groups by the median total OHIP-7T score, which was 2. Institutionalized older people scoring 0–2 had a high quality of life, and were therefore referred to as the high OHIP-7T group; those scoring 3–28 had a low quality of life, and were therefore referred to as the low OHIP-7T group. First, descriptive analysis was adopted to determine the conditions of institutionalized older people. This study employed the residents' ADL scores to reveal the

Table 1
Institutionalized older people's total scores on and responses to the OHIP-7T.

Items	Never/hardly ever N (%)	Occasionally N (%)	Fairly ofen/very often N (%)	Mean	SD
Q1. Sensed that something is wrong with the teeth or dentures	420 (78.40)	53 (9.90)	63 (11.80)	1.33	0.68
Q2. Have to stop during a meal	444 (82.83)	38 (7.10)	54 (10.10)	1.27	0.63
Q3. Uncomfortable during eating	447 (83.40)	35 (6.52)	54 (10.07)	1.27	0.63
Q4. Cannot concentrate	467 (87.13)	33 (6.16)	36 (6.72)	1.20	0.54
Q5. Difficulty pronouncing words	476 (88.81)	25 (4.70)	35 (6.53)	1.18	0.53
Q6. Difficulty dealing with daily work or activities	481 (89.74)	21 (3.92)	34 (6.34)	1.17	0.52
Q7. Not satisfied with life in general	236 (44.03)	234 (43.66)	66 (12.31)	1.68	0.68
OHIP-7T total	236 (44.0)	234 (43.70)	66 (12.3)	4.85	5.50

Note: OHIP-7T: Taiwanese Short-form of the Oral Health Impact Profile; N = 536.

Table 2
Self-perceived mouth dryness.

Items	All N = 536	High OHIP-7T group N = 273	Low OHIP-7T group N = 263	Significant
	Mean (SD)	Mean (SD)	Mean (SD)	
1. I feel dryness in my mouth	2.08 (1.07)	1.86 (1.01)	2.31 (1.08)	0.000[M]
2. I feel dryness in my lips	1.98 (1.01)	1.74 (0.91)	2.24 (1.03)	0.000[M]
3. I feel my gums are swollen, hurt, and hot and dry	1.30 (0.72)	1.12 (0.40)	1.49 (0.91)	0.000[M]
4. I need moisture such as soup or water to help me swallow my food	1.92 (1.15)	1.73 (1.08)	2.12 (1.19)	0.000[M]
5. I need to get up to drink water at night	2.07 (1.19)	1.90 (1.16)	2.25 (1.20)	0.001[M]
6. I often feel dryness in my mouth after finishing a meal	1.73 (0.94)	1.53 (0.83)	1.94 (1.00)	0.000[M]
7. I have difficulty eating dry food	1.93 (1.12)	1.73 (1.04)	2.15 (1.17)	0.000[M]
8. I feel dryness in my nose	1.35 (0.73)	1.23 (0.62)	1.48 (0.81)	0.000[M]
9. I feel dryness in my eyes	1.63 (0.88)	1.47 (0.81)	1.80 (0.92)	0.000[M]
Total score	16.01 (5.48)	14.30 (4.70)	17.78 (5.67)	0.000[M]

Note. NS not statistically significant at 0.05 level. [M] p-value was differences between hight/lowe OHIP-7T were tested by Mann-Whitney test.

Table 3
Sociodemographic characteristics of institutionalized older people.

Variable	All N = 536	High OHIP-7T group N = 273	Low OHIP-7T group N = 263	Significant
	N (% or SD)	N	N	
Age	77.13 (SD: 10.71)	77.61 (SD: 10.76)	76.62 (SD: 10.65)	0.26 (NS)[M]
Average time of LTC institution stay	3.35 (SD: 3.24)	3.11 (SD: 3.14)	3.60 (SD: 3.32)	0.07 (NS)[M]
Average number of diseases diagnosed	2.09 (SD: 1.43)	1.99 (SD: 1.38)	2.19 (SD: 1.48)	0.12 (NS)[M]
BMI	22.91 (SD: 3.86)	23.27 (SD: 4.07)	22.53 (SD: 3.59)	0.03[M]
ADL				
Severe disabilities (0–30)	89 (16.6%)	38	51	
Moderate disabilities (31–60)	121 (22.6%)	56	65	
Mild disabilities (61–80)	95 (17.7%)	52	43	
Self-care (≥ 81)	231 (43.1%)	127	104	
Total score	68.11 (SD: 29.32)	71.90 (SD: 27.97)	64.16 (SD: 30.20)	0.002[M]
Gender				
Male	236 (44.0%)	112	124	0.15 (NS)[C]
Female	300 (56.0%)	161	139	
Type of LTC institution				
LTC institutions	15 (2.8%)	8	7	0.64 (NS)[C]
Domiciliary care institutions	346 (64.6%)	181	165	
Nursing homes	175 (32.6%)	84	91	
Education				
Illiterate	213 (39.70%)	112	101	0.57 (NS)[C]
Elementary school	214 (39.90%)	103	111	
Junior high school and above	109 (20.3%)	58	51	
Do you have a smoking?				
No	395 (73.70%)	212	183	0.06 (NS)[C]
Have smoked, no more than 5 packs	8 (1.50%)	5	3	
Have smoked, over than 5 packs	133 (24.8%)	56	77	
Do you have chewed/did not chew betel quid				
No	494 (92.2%)	262	232	0.001[C]
Yes	42 (7.8%)	11	31	
Have you been drinking in the past year?				
No	474(88.4%)	247	227	0.13 (NS)[C]
Yes	62 (11.6%)	26	36	

Note: NS not statistically significant at 0.05 level. Activities of daily living was ADL; body mass index was BMI.
[C] p-value was differences between hight/lowe OHIP-7T were tested by Chi-square test.
[M] p-value was differences between hight/lowe OHIP-7T were tested by Mann-Whitney test.

relationship between disability and oral health behavior. Second, differences between the high and low OHIP-7T groups were determined for all variables. χ^2 tests were adopted for categorical variables. Because the coefficient of variation (CV) for numerous items was abnormally high, the Mann–Whitney test was adopted to evaluate the consecutive variables. Third, after examining the OHIP-related literature, the five main factors (17 variables) were revealed as crucial influence factors for OHIP.[9–16] The thereby setting the total OHIP-7T score as a dependent variable and the five main factors as independent variables. Furthermore, the forced entry method was adopted to evaluate the influence of each factor on OHIP.

3. Results

The total average OHIP-7T score was 4.85 (standard deviation [SD]: 5.50). Most institutionalized older people answered “never/rarely” on the OHIP-7T, with the proportion of such answers ranging from 44% to 89.8% by item. Institutionalized older people who answered “occasionally” were the second largest group, with the proportion of such answers ranging from 3.9% to 43.6% by item.

Institutionalized older people who answered "often/usually" were the fewest, with the proportion of such answers ranging from 6.3% to 12.31% by item (Table 1).

The institutionalized older people in this study had an average age of 77.13 years (SD: 10.71 years), have stayed in LTC institutions for an average of 3.35 years, had been diagnosed with an average of 2.09 diseases within the last 6 months, an average BMI of 22.91 (kg/m^2). Among the institutionalized older people, 236 were male and 300 were female. Most of the institutionalized older people, specifically 39.7% and 39.9%, were illiterate or had elementary school education, respectively. In the institutionalized older peoples' health-risk behaviors dimension, most residents (73.7%) did not smoke. 92.2% and 88.4% of the institutionalized older peoples had not chewed betel nuts or consumed alcohol in the past year, respectively. The average ADL score of the institutionalized older peoples in this study was 68.11.

The institutionalized older peoples' average tooth-brushing frequency was 1.69 times/day and their average frequency of mouthwash use was 1.14 times/day. In this study, 60.8% of the institutionalized older peoples exhibited a total ADL score greater than 61, thereby demonstrating the ability to conduct oral health care. The participants with total ADL scores ranging from 31–60 could conduct oral health care with the assistance of caregivers. By contrast, participants with severe disabilities (total ADL < 30) were entirely reliant on caregivers to conduct oral health care. More than 90% of the participants had not received dental cleaning within the last 6 months. The average number of oral healthcare tools they frequently used was one, namely, toothbrushes (81.5%). Their average self-perceived ability to chew food was 20.37. Of all the food items assessed, participants had the most unsatisfactory performance for chewing, and the most satisfactory performance for fracturability (Table 4).

Table 5 shows the relative analysis between the 10 ADL items and oral health behaviors. Within the table, the "tooth-brushing item" of the "toothbrush daily oral cleaning times" category in the "oral healthcare tools" was positively correlated with the 10 ADL items. The correlation between the tooth-brushing item and the 10 ADL items ranged from 0.09–0.224, signifying a slight correlation.[23] The correlation coefficients between sponge toothbrush usage and the other functions were between -0.1 and -0.3, demonstrating a fair degree of correlation.[23]

The average total score of self-perceived mouth dryness was 16.01, with mouth dryness and getting up at night to drink water being scored with relative severity (Table 2).

The variables with significant differences were BMI, ADL, chewed/did not chew betel quid, type of tooth-brushing tools, self-perceived ability to chew food, and self-perceived mouth dryness (Tables 3–5). The results indicated that, compared with the low OHIP-7 group, the high OHIP-7 group had slightly higher BMI, more favorable ADL, did not chew betel quid, used mouthwash rinsing more frequently, and had more satisfactory self-perceived ability to chew food and self-perceived mouth dryness.

Table 4
Oral health behavior and self-perceived ability to chew food of institutionalized older people.

Variable	All N = 536	High OHIP-7T group N = 273	Low OHIP-7T group N = 263	Significant
	N (% or SD)	N	N	
Oral health behavior				
Had received dental cleaning within the last half-year				
No	488 (91.04%)	247	241	0.64(NS)[C]
Yes	48 (8.96%)	26	22	
Oral healthcare tools				
Toothbrush				
No	99 (18.5%)	41	58	0.04[C]
Yes	437 (81.5%)	232	205	
Mouthwash				
No	495 (92.4%)	255	240	0.35(NS)[C]
Yes	41 (7.6%)	18	23	
Dental floss				
No	496 (92.5%)	251	245	0.59(NS)[C]
Yes	40 (7.5%)	22	18	
Sponge toothbrush				
No	523 (97.6%)	269	254	0.14(NS)[C]
Yes	13 (2.4%)	4	9	
Gauze				
No	534 (99.6%)	273	261	0.14(NS)[C]
Yes	2 (0.4%)	0	2	
Average number of oral healthcare tools	1.00 (SD: 0.54)	1.01 (SD: 0.52)	0.98 (SD: 0.55)	0.44(NS)[M]
Daily oral cleaning times				
Number of tooth brushing	1.69 (SD: 1.32)	1.79 (SD: 1.14)	1.59 (SD: 1.13)	0.03[M]
Number of mouthwash	1.138 (SD: 1.44)	1.359 (SD: 1.49)	1.27 (SD: 1.39)	0.65(NS)[M]
Self-perceived ability to chew food				
Dardness	5.28 (SD: 2.21)	5.67 (SD: 2.17)	4.81 (SD: 2.24)	0.000[M]
Fracturability	5.93 (SD: 0.42)	6.31 (SD: 2.36)	5.44 (SD: 2.50)	0.000[M]
Chewiness	4.41 (SD: 2.59)	4.76 (SD: 2.72)	3.91 (SD: 2.45)	0.000[M]
Viscosity	4.78 (SD: 3.27)	5.19 (SD: 3.15)	4.30 (SD: 3.35)	0.001[M]
Total score	20.37 (SD: 9.00)	21.36 (SD: 9.46)	18.33 (SD: 9.16)	0.000[M]

Note: NS not statistically significant at 0.05 level.
[C] p-value was differences between hight/lowe OHIP-7T were tested by Chi-square test.
[M] p-value was differences between hight/lowe OHIP-7T were tested by Mann-Whitney test.

Table 5
The Pearson's correlation coefficients of analysis between the 10 ADL items and oral health behaviors.

Oral health behavior	Activities of daily living (ADL)										Total score
	Feeding	Tansfers	Toilet use	Bathing	Mobility	Dressing	Grooming	Stairs	Bowels	Bladder	
1. Had received dental cleaning within the last half-year	0.05	0.08	0.06	0.07	0.03	0.00	0.04	0.06	0.04	0.04	0.06
2. Oral healthcare tools: toothbrush	0.24**	0.15**	0.21**	0.09*	0.13**	0.18**	0.17**	0.14**	0.12**	0.16**	0.20**
3. Oral healthcare tools: mouthwash	0.02	-0.08	-0.06	-0.02	0.01	-0.08*	-0.05	-0.06	0.01	0.02	-0.04
4. Oral healthcare tools: dental floss	0.05	0.09*	0.07	0.03	0.08*	0.02	0.03	0.05	0.07	0.08	0.08
5. Oral healthcare tools: sponge toothbrush	-0.31**	-0.16**	-0.14**	-0.07	-0.14**	-0.15**	-0.19**	-0.07	-0.20**	-0.20**	-0.20**
6. Oral healthcare tools: gauze	-0.05	-0.11**	-0.11**	-0.04	-.08*	-0.08	-0.03	-0.06	-0.05	-0.05	-0.09*
7. Number of tooth brushing	0.13**	0.18**	0.22**	0.14**	0.18**	0.19**	0.21**	0.13**	0.15**	0.20**	0.22**
8. Number of mouthwash	-0.01	0.00	-0.02	0.03	-0.01	0.00	0.02	0.01	0.05	0.06	0.01

Note: * Significant at p < 0.05; ** Significant at p < 0.01.

In linear regression analysis, the total OHIP-7T score served as the dependent variable, whereas sociodemographic characteristics, health risk behaviors, and total scores for self-perceived ability to chew food and self-perceived mouth dryness served as independent variables. Forced-entry regression analysis was adopted. For adjust variables mutually and elimination confounding. The R^2 was 0.21 (F = 6.99, p = .000). The independent variables were then subjected to separate post hoc tests, in which five of the independent variables achieved significance: age (B = 0.023, t = –2.257, 95% CI = -0.007 to -0.096), chewed/did not chew betel quid (B = 0.855, t = 2.58, 95% CI = 0.532 to 3.883), mouthwash use (B = 0.155, t = –2.38, 95% CI = -0.066 to -0.672), self-perceived ability to chew food (B = 0.027, t = –4.70, 95% CI = -0.074 to -0.179), and self-perceived mouth dryness (B = 0.041, t = 7.21, 95% CI = 0.217 to 0.379) (Table 6).

4. Discussion

This study confirmed that institutionalized older people's age, frequency of mouthwash use, self-perceived ability to chew food, chewed/did not chew betel quid, and self-perceived mouth dryness affected their OHIP-7T scores.

The finding that institutionalized older people's OHIP decreased with age was consistent with that of other studies.[24] In Taiwan, betel quid chewing is a common health risk behavior.[25] Measures to prevent middle-aged people from engaging in betel quid chewing have been discussed and developed on the basis of sociocultural factors.[26] This study found that institutionalized older people who chewed betel quid also had relatively unsatisfactory OHIP scores. Preventive or corrective measures should be implemented to reduce health risk behavior in these older people.

Research has indicated that mouthwash is effective in mitigating bad breath, preventing dental caries, and alleviating mouth dryness.[27] This study also determined that frequency of using mouthwash was a key factor influencing oral health; the higher the frequency of using mouthwash, the more satisfactory OHIP became. Therefore, encouraging institutionalized older people to increase their mouth rinsing frequency can improve their OHRQoL.

Other reports on institutionalized older people's oral status have also revealed that mouth dryness can impede eating or lead to burning-mouth sensations or difficulty in chewing, which can further deteriorate their OHRQoL.[28,29] This supports the finding that institutionalized older people's self-perceived ability to chew food and self-perceived mouth dryness were critical factors influencing their OHRQoL.[30]

Regarding the mean tests between the high and low OHIP-7T groups, BMI, ADL, and using toothbrushes as oral cleaning tools achieved statistical significance. The BMIs of both groups indicated that their members were not overweight, with the BMI of the low OHIP-7T group being slightly less than that of the high OHIP-7T group. Several studies have claimed that underweight status is related to dental status and malnutrition due to inadequate food intake.[31] However, other studies have found no relationship between BMI values and OHIP scores.[32] Future studies should pursue this question by investigating the causes of the difference between OHRQoL and ADL.

The high OHIP-7T group had a higher frequency of using toothbrush use than the low OHIP-7T group did. Empirical research has indicated that regular tooth-brushing interventions in LTC institutions is conducive to maintaining the oral health of institutionalized older people.[33,34] This result further highlighted the necessity of toothbrush use to maintain institutionalized older people's OHRQoL.

The analysis results have several limitations. First, this was a cross-sectional study, no causal relationships could be determined. In addition, the participants in this study were limited to residents from central Taiwan who were willing to participate in the experiment. Therefore, the results cannot be representative of the overall OHRQoL of all institutionalized older people in Taiwan. The results of this study should be generalized with caution. Second, this study did not investigate the residents' medicine usage conditions. Research has indicated that complexity of the medicine types and dosages used by institutionalized residents.[35] Future studies should include physician and pharmacist teams to confirm the correlation between resident medicine conditions and OHRQoL. Third, this study has two self-developed questionnaires. While this study employed numerous methods to ensure the scale's validity and reliability, the study did not include other implicit factors related to OHRQoL. Therefore,

Table 6
Linear regression analysis of factors influencing institutionalized older people's OHIP-7T.

Variable	*B*	*SE B*	β	T	95% CI
Age	-0.051	0.023	-0.100	-2.257	-0.007 to -0.096
Chew betel quid	2.207	0.855	0.108	2.582	0.532 to 3.883
Mouthwash	-0.369	0.155	-0.096	-2.386	-0.066 to -0.672
Self-perceived ability to chew food	-0.126	0.027	-0.216	-4.701	-0.074 to -0.179
Self-perceived mouth dryness	0.298	0.041	0.297	7.207	0.217 to 0.379

Note: R^2 = 0.21, F = 6.99, p = 0.000. CI = confidence interval.

the results of this study may deviate from real-world scenarios and should be applied with caution.

5. Conclusions

The results of this study indicated that institutionalized older people's age, frequency of using mouthwash, the self-perceived ability to chew food, betel quid chewing, and self-perceived mouth dryness affected their OHIP-7T results. The results also indicated that the high and low OHIP-7T groups exhibited differences in BMI, ADL, and toothbrush use for oral cleaning, thus suggesting that these may be critical indicators.

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