# Depression and Dementia in Older Adults: Associations in Oral Health

IADR Abstract # 3690

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## Abstract

Objective:
Psychological state and behavioral health have important implications for oral health behaviors. While there is a growing research effort addressing the connections between mental health status and oral health, there is a need to study such relations among older adults with dementia living in rural, low-income, and underserved areas. The present study explored the relations of oral health, general health, and depression among older adults with dementia in Appalachia.
Method: Participants were 67 older adults, ages 69-100 years (M= 86.0, SD=6.0), with mild to moderate dementia living in 12 different facilities in West Virginia. These older adults had a minimal of four teeth in their dentitions. These individuals reported overall general health and oral health on a scale of 1-5, with 1 representing better health. They also completed the Geriatric Depression Scale.
Results: participants with possible depression (Geriatric Depression Scale ≥5) reported significantly worse oral health (M=3.66, SD=0.86) than non-depressed participants (M=3.11, SD=1.0 t =2.31, p<0.05). Participants with depression also reported significantly worse overall general health (M=3.93. SD=1.17) than non-depressed counterparts (M=3.17, SD=0.97. t =2.91, p<0.005).
Conclusion: A relation exists between depression and report of oral health and general health among older adults with dementia. Given these findings, health care providers of older adults, including dentists, mental health professionals, physicians and nurses, should be aware of the impact of mental health on oral health. Such awareness will be particularly important as the number of older adults living in the United States and other industrialized nations increases in the future.

## Depression in Older Adults

- Depression is one of the most prevalent mental health issues in the United states of America. An estimated of 1 in 10 U.S. adults reported depression.[1] According to the US National Institute of Mental Health, depression is a mental disorder that is characterized by a low, sad mood, low self-esteem and a loss of interest in life, everyday activities and in those activities that once made them happy.[2]
- For the geriatric population, depression affects more than 6.5 million of the 35 million Americans aged 65 or older. Most people in this stage of life with depression have been experiencing episodes of the illness during much of their lives. Others may experience a first onset in late life—even in their 80s and 90s.
- Depression in older persons is closely associated with dependency and disability and causes great emotional and financial distress for the individual and the family.[3]

**Symptoms of Depression**

- **depressed mood (feelings of sadness or emptiness)**
- **lack of interest.**
- **significant decrease or increase in appetite**
- **insomnia or hypersomnia**
- **psycho-motor agitation or slow down (observable by others)**
- **fatigue or loss of energy**
- **feelings of worthlessness or inappropriate guilt**
- **diminished ability to concentrate or make decisions**
- **recurrent thoughts of death or suicidal ideation**

## Older Adult Oral Health

- Research has shown that community dwelling and institutionalized older adults with cognitive impairments have poorer oral health than older adults without cognitive impairment.
- Poor oral health appears to contribute to the decline of quality of life, and is closely related to functional, systemic and behavioral problems.
- Chalmers et al.[4] was the first to attempt complex modeling and prediction of risk factors for the onset and progression or oral disease in dementia population. Warren et al. [5] also showed significant differences in oral health of individuals with dementia compared with those without. The results showed that the condition is more related to the degree of cognitive impairment regardless of dementia diagnosis.

## Introduction

Oral health plays an important role in the health and well-being of elderly people and therefore quality of life.

- **Pain and difficulty with eating can lead to poor levels of nutrition**
- **Poor oral appearance, bad breath and dental incapacity can lead to social isolation**
- **Oral disease is now implicated in peptic ulcers, respiratory and cardiovascular illness**
- **Dental decay is the most costly diet related disease in Australia ahead of coronary disease, hypertension and diabetes**

Rural elderly population constitutes >25% of the total U.S. elderly population and has limited access to health care, particularly specialty health care, mental health services, and other resources necessary for appropriate chronic disease management.[6-7] While there is a growing research effort addressing the connections between mental health status and oral health, there is a need to study such relations among older adults with dementia living in rural, low-income, and underserved areas.

***The objectives of this study were to investigate:***

1. **The relationship between depression and subjective and objective oral health and general health evaluations**
2. **The relationship between depression, oral health related self-efficacy, and the patient's oral health related quality of life.**
3. **The relationship between objective oral health evaluation and self-efficacy, and the patient's oral health related quality of life.**

## Method and Materials

The study was approved by the Institutional Review Board (IRB) for Health Sciences at West Virginia University, Morgantown, WV. The criteria for participants in this study included those who live in one of the 55 counties in West Virginia, are 65 years or older, dentate ( have at least 4 remaining natural teeth), have been diagnosed with mild to moderate dementia, and are living independently in communities or in assisted living facilities. The participants must be able to care for themselves in daily activities except with some assistance if physical limitations exist or with some household chores.

•Each participant completed an oral evaluation by a licensed dentist which includes number of missing teeth, number and type of restorations, caries, plaque scores and gingival health conditions.
•Each participant completed a battery of neuropsychological tests to determine the cognitive status and memory.
•Each participant completed an interview pertaining to self-evaluation of oral health and general health conditions, oral health care efficacy/ behaviors and oral health related quality of life.
•Each participant completed a self-report oral health and general health question in a *scale of 1-5 ( excellent, very good, good, fair, poor)*, 7 questions about oral care efficacy/oral health behaviors and 12 questions about oral health related quality of life (GOHAI).[8]
• Each participant completed a 15 question Geriatric Depression Scale (GDS) questionnaire[9]. *A score of 5 and above suggests depression.*
•An informant for the participant also provided information on the participant's medical history, oral health practices, and cognitive and functional performances

## Results

***Relationship Between Objective Oral Health Evaluation and Geriatric Depression Scale***

| | Geriatric Depression Scale | N | Mean | Std Dev | Std Error Mean |
|---|---|---|---|---|---|
| Total Caries | Non-Depress (<5) | 37 | 2.35 | 3.39 | 0.56 |
| | Depress (≥5) | 30 | 4.13 | 6.87 | 1.26 |
| Total missing teeth | Non-Depress | 37 | 14.81 | 7.79 | 1.28 |
| | Depress | 30 | 17.13 | 7.89 | 1.44 |
| Caries/total remaining teeth | Non-Depress | 37 | 0.166 | 0.23 | 0.04 |
| | Depress | 30 | 0.323 | 0.48 | 0.09 |

◊ Depressed participants reported higher caries and increased number of missing teeth compared to the non-depressed participants, this difference, however, did not reach statistical significance.
◊ No significant correlations were found between depressed and non-depressed participants for total caries, total missing teeth or ratio caries/total remaining teeth.

***Relationship Between Participant's Subjective Oral and General Health Evaluations with Geriatric Depression Scale***

| | Geriatric Depression Scale | N | Mean | Std Dev | Std Error Mean |
|---|---|---|---|---|---|
| Subjective Oral Health | Non depress (<5) | 35 | 3.11 | 0.99 | 0.17 |
| | Depress (≥5) | 29 | 3.66 | 0.86 | 0.16 |
| Subjective general Health | Non depress | 36 | 3.17 | 0.97 | 0.16 |
| | Depress | 30 | 3.93 | 1.17 | 0.21 |
| | | t | df | Sig. | |
| Subjective Oral Health | | 2.31 | 62 | 0.024* | |
| Subjective general Health | | 2.91 | 64 | 0.005* | |

*P =0.05

◊ Participants with possible depression (Geriatric Depression Scale ≥5) reported significantly worse oral health than non-depressed participants.
◊ Participants with depression also reported significantly worse overall general health than non-depressed counterparts.
◊ Pearson's test reveals that participant's rating of condition of mouth was moderately and positively correlated with total number of missing teeth, $r$=0.45, $p$<0.001.

## Results

***Relationship Between Depression and Oral Health Related Quality of Life (GOHAI) and Oral Health Self efficacy/oral health behavior***

| Questions | GDS | N | Mean | SD | Sig. (2 tail) |
|---|---|---|---|---|---|
| ¤ Limit food type & amt | Non-depress (<5) | 36 | 4.67 | 0.68 | 0.025* |
| | Depress (>5) | 28 | 4.07 | 1.22 | |
| Eat with discomfort | Non-depress | 34 | 4.8 | 0.47 | 0.048* |
| | Depress | 26 | 4.5 | 0.65 | |
| Speaking properly | Non-depress | 36 | 4.75 | 0.65 | 0.023* |
| | Depress | 26 | 4.12 | 1.24 | |
| Self-conscious about dental problems | Non-depress | 36 | 4.14 | 1.02 | 0.050* |
| | Depress | 28 | 3.64 | 0.95 | |
| ¥Assistance with brushing | Non-depress | 34 | 4.00 | 0.00 | 0.017* |
| | Depress | 28 | 3.68 | 0.67 | |
| Assistance With flossing | Non-depress | 32 | 3.72 | 0.79 | 0.91 |
| | Depress | 23 | 3.70 | 0.88 | |
| «Mouthwash use | Non-depress | 30 | 3.07 | 1.23 | 0.025* |
| | Depress | 23 | 3.87 | 1.29 | |

*p≤0.5 ¤ GOHAI (1=very often, 5= never); ¥ (1=very often, 4=not at all; « (1=2X/day, 5= hardly ever)

◊ Geriatric Depression Scale and total GOHAI score did not show a significant difference except for specific question items.
◊ Geriatric Depression Scale and self efficacy/oral behavior evaluation did not show a significant difference except for specific question items.
◊ Pearson's test revealed a significant correlation between ratio of caries/remaining teeth and the oral health related quality of life (GOHAI). $r$ =-0.366, $p$=0.04

## Statistical Analysis

The data were analyzed with statistical software (SPSS version 17.0, SPSS Inc. Chicago, USA). Descriptive statistics were used to provide information about the frequency distributions of the responses and average responses as well as the variability of the responses. Student's t-test was used to relate depression and objective evaluation of oral health, subjective evaluation of oral and general health, oral health related self-efficacy/oral health behavior, and oral health related quality of life ($p$=0.05). Pearson's correlation coefficients were also calculated to test the various relationships at a significant level $p$=0.05.

## Conclusions

- The self-perceived oral health and general health in this population of non-institutionalized older adults with mild to moderate dementia showed positive correlation with their mental health status.
- Although clinical evaluations did not show significant differences with mental health status, self- report of the oral health conditions in this population can be reliable; they correlate with the number of missing teeth and selected oral behaviors.
- Mental state may interfere with the incidence and progression of oral diseases and results of dental treatments. Depressed patients tend to have poorer oral hygiene behavior and need more assistance in oral health care.
- Older adults with dementia who have higher caries incidences report poorer oral health related quality of life. Although our small sample size did not show correlations between quality of life and depression, it is important for the healthcare providers pay attention to the patients' self perceived evaluations even if they have mild to moderate cognitive impairment; and work together to improve these older adults' mental health, oral health and quality of life.

## Contact & Support

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