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Investigating the perspectives of older adults in residential aged care on oral health-related quality of life

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Objective: The objective of the study was to explore how older people living in a residential aged care facility perceived that their oral health influenced their food preferences and attitudes towards food, their social interactions and their self-esteem.

Background: Poor oral health can have biological, behavioural and social impacts on quality of life among older adults (aged 65+ years). In terms of biological impacts, oral health impairments may cause older adults to avoid many types of foods. This shift in dietary pattern can lead to malnutrition among older people, undermine general health and negatively impact quality of life (QOL).

Materials and Methods: Using a mixed methods approach, quantitative data from the General Oral Health Assessment Index (GOHAI) were explored and supported by data from semi-structured interviews with 10 older adults from a residential aged care facility in Perth, (Australia) to provide insights into their oral health-related quality of life. Thematic analysis of qualitative data was guided by the conceptual framework informed by Locker.

Results: The average GOHAI score was 32.9 ±3.6, which indicated that participants had an average oral health-related quality of life. Participants coped with oral functional problems by adopting personal strategies and seeking organisational assistance. Some participants appeared to have accepted associated changes to their physical appearance, while others reported significant dissatisfaction and low self-esteem. Perceptions differed on their social interactions at the facility, from being self-conscious about their own oral health problems, to distaste at others' eating behaviours.

Conclusions: Poor oral health had negative biological, behavioural and social impacts on daily activities and quality of life among some participants. However, changes at the organisation level may help to support participant QOL.

KEYWORDS
aged care, older adults, oral health, oral health-related quality of life

1 | INTRODUCTION

Diet plays an important role in the prevention and management of age-related disease.[1] Dietary intake among older adults is impacted by many factors, including living circumstances, socio-economic status, psychological well-being, medication use, physical and mental health and poor oral health.[2,3] Oral health issues can influence health through multiple pathways, such as affecting the functional ability to eat, chew, swallow and speak.[4] In particular, compromised oral function can lead to food avoidance[5] and result in older adults changing their food selection and eating behaviours.[3] For example, tooth loss can lead to older adults avoiding particular foods,[5] such as raw fruits, vegetables, meat and hard breads, because they are hard to chew or swallow.[6] The extent of this issue is evident in the most recent national study of oral health and dental care in Australia, which found that 27% of adults aged 65 years and older reported avoiding eating some foods due to oral health issues; this was an increase from 24% in 2013.[7]

Compromised food intake due to poor oral health has a significant influence on morbidity and mortality among older people.[8] For example, Soini et al.[9] identified that older people who had lost all their teeth and did not wear dentures had a substantially lower mean body mass index (BMI) than older adults who wore dentures, suggesting that tooth loss reduces an older person's capacity to consume foods that supply the protein, vitamins and minerals necessary to maintain a healthy BMI. Poor oral health can be a particularly serious problem for frail older people residing in residential aged care facilities (RACF), because they are dependent on the facility for their daily meals. Research has identified that residents may refuse to eat and return their meals uneaten to the kitchen if they are unable to eat due to oral health issues and inappropriate consistency of food offered in RACFs.[10] Notably, a recent Royal Commission into aged care in Australia found that 68% of residents in RACF were malnourished or at risk of malnutrition due to poor oral health, poor food quality, or a lack of assistance to eat.[11]

As well as substantial impacts on nutritional status, there are links between oral health and quality of life.[12,13] These are captured in the concept of oral health-related quality of life (OHRQoL). OHRQoL was defined by Gift[14] as a subjective concept related to oral health and the functional, social and psychological impacts of poor oral health on an individual's quality of life. Hernandez et al. added further insights to this concept by defining OHRQoL as reflecting "people's comfort when eating, sleeping and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health."[15]

Previous studies that have evaluated the physiological and psychological impacts of oral health conditions on older adults have typically used quantitative methods.[16] By contrast, relatively few studies have employed qualitative methods to investigate how older adults perceive that their oral health impacts their quality of life, and even less has involved frail older people in RACF.[17] This study aimed to address this gap, by investigating how older adults (65+ years) living in RACF perceive that the oral health conditions they experience influence their eating behaviours and food preferences, their social interactions with other people and their self-esteem.

2 | METHODS

This study is philosophically grounded in the reconciliation of postpositivist and constructionist epistemologies. Postpositivism views reality as a single objective truth that "exists 'out there' in the world."[18] Constructionism is assumes that there are multiple realities, and people construct different subjective meanings "even in relation to the same phenomenon," and that knowledge is constructed by humans, partly through social interactions.[18] A combination of these was seen as the most appropriate approach because they help corroborate, refine or refute plausible explanations of older adults' perspectives on their oral health, but with qualitative and quantitative methods undertaking different tasks in the same research design. The theoretical framework used in this study is a conceptual framework developed by Locker.[19] This model is based on the World Health Organization's international classification of impairment, disability and handicap.[20,21] Locker provides a holistic conceptual model of the consequences of oral impacts on an individual's everyday life experience. This model captures three broad dimensions associated with OHRQoL—from a biological to a behavioural and then social level of consequences—that highlight the complex pathways through which oral health influences quality of life.[15]

3 | STUDY DESIGN AND PARTICIPANTS

This research adopted a mixed methods design, with qualitative and quantitative data collected at one time point in July 2018. This design enabled the collection of rich qualitative data about oral health and its association with food, eating and quality of life that helped to provide important context to the quantitative data. Individual interviews with older adults living in a RACF were used to collect quantitative and qualitative data on residents' self-perceived OHRQoL. Quantitative data were collected through the General Oral Health Assessment Index (GOHAI).[22] The GOHAI is used to assess links between participants' oral health status and their quality of life and is relevant to this research because it focuses on functional impacts, such as eating and speaking, as well as different impacts of oral status on quality of life, including psychosocial factors and pain or discomfort which may be more evident in an older sample. Originally developed by Atchison and Dolan[22] for use with older population groups, the GOHAI has been translated and validated in a variety of languages.[23] Many researchers have applied it to various samples of different ages and ethnic backgrounds, and in different settings,[24,25] and it has acceptable reliability.[15] The GOHAI comprises 12 items (Table 1). The items are classified into three categories associated with oral health-related quality of life, including (a) functional problems such as eating, chewing, speaking and swallowing (Items 1, 2, 3 and 4); (b) psychosocial impacts

TABLE 1 GOHAI questionnaire

In the past three months …	Always	Sometimes	Never
1. How often did you limit the kinds or amounts of food you eat because of problems with your teeth or dentures?			
2. How often did you have trouble biting or chewing any kinds of food, such as firm meat or apples?			
3. How often were you able to swallow comfortably?			
4. How often have your teeth or dentures prevented you from speaking the way you wanted?			
5. How often were you able to eat anything without feeling discomfort?			
6. How often did you limit contacts with people because of the condition of your teeth or dentures?			
7. How often were you pleased or happy with the looks of your teeth and gums, or dentures?			
8. How often did you use medication to relieve pain or discomfort from around your mouth?			
9. How often were you worried or concerned about the problems with your teeth, gums, or dentures?			
10. How often did you feel nervous or self-conscious because of problems with your teeth, gums, or dentures?			
11. How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?			
12. How often were your teeth or gums sensitive to hot, cold or sweets?			

Note: 3 Point Likert scale: 1 = Always, 2 = Sometimes, 3 = Never.

TABLE 2 Semi-structured interview questions

1. I would like you to tell me about the food you normally eat.
   - Please start by telling me about the time before you moved to the aged care facility—for example, the sort of food/meals you normally had on a daily basis.
   - And what about when you moved to the residential aged care facility—please tell me about your meals/diet now.
2. Please tell me about particular foods/meals you like to eat?
   - Are there any foods/meals that you do not eat, or are not able to eat—can you tell me about them,
   - And why you do not or cannot eat them?
3. Please tell me about any issues you have with your mouth and/or teeth (e.g. chewing, swallowing and taste). What sort of problems does this cause you?
4. How do you feel about the appearance of your teeth when you are in public?
   - How do you feel about speaking with other people, or eating your meals with other people?
5. Have you experienced any pain or discomfort in your mouth? Can you tell me more about that?
   - How did you cope with that?
6. In your opinion, what are some of the issues that older adults experience in terms of oral health?

including concern about oral health, discomfort with social interactions, and dissatisfaction with appearance, and self-awareness in relation with oral health (Items 6, 7, 9, 10 and 11); (c) pain and discomfort due to oral impairments, which incorporates the use of medication (Items 5, 8 and 12).[15] Three items refer to positive status (numbers 3, 5, 7) and nine refer to negative items (numbers 1, 2, 4, 6, 8, 9, 10, 11, 12), with responses scored on a three-point Likert scale. To calculate the final score, the positive items are recoded,[22] so that a lower final score indicates poorer OHRQoL. The reference period is the previous three months.

Qualitative data were collected through semi-structured interviews, which were conducted with participants after the GOHAI assessment. The interview guide included open-ended questions related to the three categories associated with oral health-related quality of life, as covered in the GOHAI (i.e. functional, psychosocial and pain and discomfort. Information collected through the interviews helped to contextualise participants' GOHAI responses, and to facilitate a deeper understanding of how participants perceived their oral health influenced factors relevant to their quality of life (Table 2).

Participants were recruited from a RACF managed by a not-for-profit organisation in Perth, Western Australia. This RACF provides social care and accommodation to older adults who can no longer live independently and need ongoing help with day-to-day tasks, personal care and clinical care.[11] Typically, RACF residents in Australia experience multi-morbidity are frail and require a high level of care,[26] but residents are free to leave their facility when they choose, for activities such as shopping, social functions and family events. In this particular facility, residents' oral health was assessed annually by registered nurses, using the icare Oral and Dental Care Management Plan and by their own dentist as required. Most residents in this RACF also participate in a free annual dental screening examination offered by the Western Australian Department of Health.

The RACF manager identified a sample of residents with a range of oral health, who could understand English, and who had the cognitive capability to complete the study, as determined through routine assessments using the Montreal Cognitive Assessment (MoCA), or Mini-Mental State Examination (MMSE). Only 15 residents met the inclusion criteria, and they were asked to participate.

Approval was gained from the not-for-profit organisation's research centre to conduct the study, and the RACF manager provided permission to distribute information letters to eligible participants. Ethics approval was obtained from the university's Human Research Ethics Committee.

4 | DATA COLLECTION AND ANALYSIS

The interviews took place at the facility and lasted from 17 to 97 minutes (mean 33 minutes). The interviews commenced with a short general introduction to the data collection process. The researcher read aloud to the participant the socio-demographic questions and items from the GOHAI questionnaire (Table 1), and participant responses were recorded. The researcher then followed up by asking questions from the semi-structured interview guide (Table 2). Prompts were used to engage participants in conversations about the foods they normally ate before and since they moved to the aged care facility and to investigate their perspectives on issues related to biological, behavioural and social impacts of their oral health.

The final GOHAI scores were calculated by summing responses to the 12 GOHAI items. The final scores were then categorised as high (34–36), average (31–33) and low (30 or less) quality of life.[25] Digital files of the semi-structured interviews were transcribed verbatim by the first author. The names of the facility and participants were removed from all documents, and all data were de-identified to maintain confidentiality.

The qualitative data were analysed using reflexive thematic analysis (TA), as outlined by Braun and Clarke.[32,33] In the initial stage, the first author followed a process of inductive analysis as described by Percy et al.,[34] to interpret individual pieces of information within the transcripts.[35] This involved listening to the interview recordings and reading the transcripts several times to ensure familiarity with the data, and through this process, identifying any words or phrases that related in some way to the research aim, and which best reflected "meaning as communicated by the participants."[35] These words or phrases were labelled with codes that were descriptive (semantic codes) and/or interpretive (latent codes).[35] This process was repeated several times, such that codes were revised and refined through iteration. It was important at this stage of data analysis that key issues reported by the participants were accurately represented, rather than trying to fit their words "into any preexisting categories."[34] Therefore, our analysis was "data-driven" rather than "theory-driven."[34]

The next stage in the process of analysis involved, as Byrne described, interpreting the "aggregated meaning and meaningfulness across the data set."[35] Here, codes that appeared to reflect a shared meaning or underlying concept, and which addressed the research aim, were collated into preliminary themes. These preliminary themes were an interpretation of participants' reported experiences and perceptions, represented through abstract concepts. At this point, consideration was given to ensuring homogeneity across codes within a theme and heterogeneity between themes.[35] This confirmed that items of data and associated codes were relevant to a theme, and that final themes reflected an appropriate "interpretation of the data set."[35] Lastly, the first author used deductive analysis to interpret the themes through the theoretical "lens" of Locker's conceptual framework, with themes subsequently categorised into biological, behavioural and social dimensions.[29]

Throughout data collection and qualitative data analysis, the first author reflected on how her subjectivity as a researcher and dental health professional influenced her interactions with the participants and her interpretation of the data.[33] This is an important feature of reflexive thematic analysis and is based on an assumption in qualitative research that "meaning and knowledge are understood as situated and contextual, and researcher subjectivity is conceptualised as a resource for knowledge production."[33]

5 | VALIDITY AND RELIABILITY

The use of mixed methods and multiple instruments allowed for data triangulation of qualitative and quantitative data and helped to establish validity.[30] Validity was also addressed through the authors discussing the discrepant perspectives of participants and reporting this evidence in different themes.[31] Reliability in this study was addressed through comparing the transcripts with the codes throughout the process of coding to ensure that individual codes were assigned to items of data in a consistent way.[27]

6 | FINDINGS

Of the 15 residents who met the inclusion criteria and were asked to participate, 10 agreed to participate and completed an individual interview. An equal number of women (five) and men (five) took part in this study. Participants' ages ranged from 68 to 95 years, with a mean (SD) age of 78.2 ± 8.3 years. Four participants had lived in the facility for 1–12 months, and five had lived in the facility for >1 year. There was one participant who had lived in the facility for only 10 days. Two participants had no formal education beyond lower secondary school, four had finished high school, two had undergraduate qualifications, and two had masters or above. Seven participants were married, two were widowed and one was divorced.

The average GOHAI score was 32.9 ± 3.6, reflecting an average OHRQoL. Six participants were classified as high (34–36) OHRQoL, three as average (31–33) and one as low (30 or less).[25]

Analysis of the qualitative data identified eight themes. These themes were subsequently mapped to the dimensions of OHRQoL depicted in Locker's conceptual framework. (Figure 1) The following section draws on this analysis, as well as findings from participants' GOHAI responses and scores, to provide a detailed discussion on how the biological, behavioural and social dimensions of oral health appeared to influence participants' quality of life. The discussion of each dimension includes a detailed review of associated themes, with salient participant quotes used to demonstrate meaning and context.

7 | BIOLOGICAL DIMENSION

The GOHAI data and the qualitative interviews indicated that participants experienced a range of physical impacts such as difficulty chewing, and minor pain and discomfort when eating particular foods, due to partial or complete tooth loss and difficulties with dentures. The physical impacts were also demonstrated through dysphagia (difficulty in swallowing) in some participants that affected their normal oral functioning and led to dietary limitations. These physical impacts are explored through the themes of "personal adaptation to oral health issues" and "organisational responses to oral health issues."

7.1 | Personal adaptations to oral health issues

This theme reflects how participants adapted their eating habits or diet in response to oral health issues such as illness, missing teeth, wearing dentures or minor pain. For example, an interview with a male participant helped to "tease out" how missing some of his molars affected his quality of life. Brian reported that he had experienced difficulty chewing meat more so since moving to the RACF, because of the texture of meat in meals at the facility. However, while missing some molars did not cause him to avoid particular food, he did have difficulty with meat getting stuck in his teeth and described a relatively simple solution he had adopted:

> I carry toothpicks, hahahaha. Because… just… some of them get, shredded often, get stuck here and here and here, so I get the toothpick and dig it all out.
>
> (Brian)

Brian further explained that he did not experience this difficulty with meat when he ate outside the facility. The difficulties Brian experienced when eating meat at the RACF may result from cooking methods used in the facility to tenderise meat to better suit many residents' compromised chewing and swallowing ability. By contrast, traditional cooking methods such as grilling and barbequing likely to be more familiar to older people, result in meat that is more easily cut into smaller pieces and is less likely to shred.

In contrast to Brian, two female participants described how they preferred soft meat that was tender and easy to chew. For Robyn, her dissatisfaction with the texture of meat in the facility meals appeared to relate to her use of dentures. As she noted, "sometimes it's impossible to eat it [meat]. It's so tough, and just pulls your denture out."

Difficulties that denture wearers may experience when eating meat was also explored in a study by Veyrune and Mioche.[28] They found that the masticatory pattern of a group with natural teeth was more adapted to different samples of meat than for a group of people with dentures. Another study also reported that the perception of texture is poorer in older people who wear dentures than in dentate older adults.[36] These studies suggest that for people who wear dentures, such as Robyn, meals need to be prepared so that the meat component is soft enough for them to comfortably chew. Doing this, though, may have unintended consequences for residents such as Brian, who experience difficulties with meat shredding and becoming stuck in their teeth. This draws attention to the diverse needs and preferences of residents in aged care, and the challenges this may present to the organisation.

Some participants talked about how they managed oral-related discomfort and pain. For example, Helen described drawing on her faith:

> When I get pain I pray to the lord, that he will help me to get through the pain.
>
> (Helen)

By contrast, Brian relied upon more practical strategies to manage pain from sensitive teeth and described relying on a particular toothpaste:

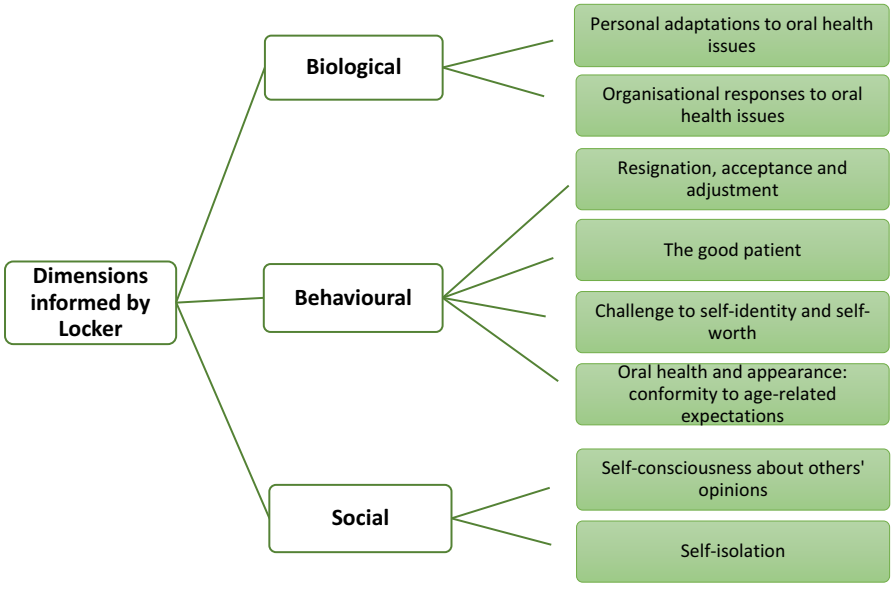

FIGURE 1 Themes relating to the biological, behavioural and social dimensions of oral health

> I've got miracle Sensodyne [toothpaste] in there. If I have a pain or twinge or whatever, I just put a little on the finger and rub on the tooth, it fixes [it].
>
> (Brian)

One issue highlighted in the literature that can impact OHRQoL is discomfort associated with wearing dentures.[37] In the current research, although a number of participants wore either full or partial dentures, few reported denture-related pain. However, as an interview with one female participant highlighted, adjusting to wearing complete dentures can take some time. Robyn had worn full upper and lower dentures for 10 years and reported feeling comfortable with them, explaining that she was "used to" them. In reflecting on when she first started wearing dentures, she explained:

> Oh it was sort of painful and uncomfortable when you first put the denture in your mouth, then you get used to it.
>
> (Robyn)

As well as the initial discomfort, Robyn also referred to difficulties with speaking when she was first fitted with her dentures:

> You know by the time you get used to a new denture it is a bit hard, you know the words come upside down, but now it's ok, it doesn't worry me at all … It's not always easy but we get through.
>
> (Robyn)

Robyn's observation is borne out by a recent study that used the GOHAI questionnaire among complete denture wearers before the dentures were fitted and then at 6 and 12 months after denture insertion.[38] There were improvement in participants' OHRQoL over the 12 months, with an increase in all item scores, reflecting reductions in pain and discomfort and improvement in eating and speaking.[38]

7.2 | Organisational responses to oral health issues

Organisational assistance played an important role in helping participants more easily cope with their impaired oral health-related physical function. Interviews with participants who reported difficulty chewing or swallowing highlighted how the facility staff modified foods and meals to suit their needs. For example, Helen and Robyn noted how they could easily ask someone in the kitchen to grate any apples or carrots they might buy, to make it easier for them to chew. Robyn also noted that she did not like the texture of cooked vegetables, preferring instead fresh salad. Building a personal relationship with a staff member who worked in the facility kitchen had helped in addressing her needs:

> Well I ask for salad, and most of the time I get it, but it depends who is in the kitchen. But there is lady in the kitchen. She knows I like salad, she gives me salad.
>
> (Robyn)

Helen and Robyn's experiences relate to the relatively new concept of "oral comfort when eating food," described by Vandenberghe-Descamps et al,[39] who identified this as a multidimensional concept that encompasses "food oral processing (ability to form and swallow a food bolus), food sensory properties (texture and taste) and to a lesser extent pain sensations."[39] They also noted that this is an important consideration when preparing food for older people, and the need for regular review of change in the resident clinical profile.

As well as the difficulty with texture, our findings also highlighted the impact of more serious conditions such as dysphagia for two male participants. Paul explained that, before moving to the RACF, he had been able to eat soft food, including rice, but his condition had deteriorated and he could no longer swallow rice without coughing. This meant that he was now restricted to food that had been pureed, because whole foods were a "battle to swallow." This interview suggested that his condition had at least some influence on his OHRQoL. Although Paul reported being satisfied with the facility's food service, he also seemed to hint at a level of dissatisfaction at the dietary restrictions related to his physical condition that may influence his quality of life:

> [Fruit] comes out of a machine, it's like you know baby food, that's like baby food. Grated or sticky mustard, they are puree, but we don't have too many fruits because it's difficult to puree fruit, but I do have juice, fresh orange juice.
>
> (Paul)

The challenges for residents such as Paul were demonstrated findings from a large-scale study in 36 Australian RACF that found limited food product options available to accommodate oral problems, resulting in restricted food choices for residents.[40]

8 | BEHAVIOURAL DIMENSION

Issues related to the behavioural dimension of the Locker's conceptual framework were coded into four themes: resignation, acceptance and adjustment; the "good patient"; challenge to self-identity and self-worth; and conformity to age-related expectations.

8.1 | Resignation, acceptance and adjustment

Several participants (including Paul and Stephen, who both had dysphagia) appeared to have accepted medically imposed dietary limitations with a degree of stoicism and perhaps resignation. Stephen required a percutaneous endoscopic gastrostomy (PEG), a procedure

in which a flexible feeding tube is placed through the abdominal wall and into the stomach to absorb nutrition and fluids, bypassing the mouth and oesophagus.[41] As Stephen observed, "the other option is to die." Stephen scored low on GOHAI physical functions items and had an average GOHAI score (31). Paul, whose diet was limited to pureed food, also appeared to have accepted his restricted diet, albeit with a degree of resignation. Paul also had an average GOHAI score (31). Aware of the risk of choking if he attempted to eat solid food and cognisant of limited capacity in the facility to meet every resident's individual needs, Paul was reluctant to initiate any change in the way his meals were prepared. Interviews with several other participants also highlighted a level of resignation and acceptance about the facility's willingness and/or capacity to meet personal preferences and needs relating to oral health, such as providing food suitable for older adults with dentures. This was evident in Robyn's response, when asked what she did when she could not eat the meat provided in her meals: "Nothing … You can't eat that, you don't eat." Moreover, Robyn seemed to suggest there was limited organisational capacity or desire to learn about individual residents' dietary requirements:

> You know you just have to have what everybody else has. You know, they don't ask if you'll be able to chew that or not. Just like all, it's a big place here.
>
> (Robyn)

8.2 | The "good patient"

Some participants did not want to be perceived as complaining or "making a fuss" about their oral health and oral comfort needs. Previous research has identified that residents in aged care facilities may be conditioned to behave like a "good patient" as a result of subtle pressure not to be "difficult."[42(p130)] This may create an environment where aged care residents are subtly encouraged to adopt passive behaviour and "do as they are told."[42] Reflecting elements of the "good patient" dynamic, there was evidence in our study that some participants accepted a lack of preferred and familiar meals because they did not feel comfortable "rocking the boat." For example, Helen liked meat to be softer so that she could eat it, but, despite this, she reported having declined to ask for any change in the texture of meat or the way of cooking. Instead, she limited her meals to those she could eat and which she felt were healthy. Helen explained that she did not like to complain and felt uncomfortable asking for food she liked and could eat more easily. This reluctance to complain about the food also extended to talking about this with her family. She seemed to value her image as a happy and grateful wife and mother, and the following comment suggests that an unconscious desire not to be seen as a nuisance or "difficult" prevented her from expressing her needs:

> I worry about smiling, because I am a happy person, I'm very happy, … and I try not to complain because I think why should I sit down and say to my family the food here is not what I'm used to. That's tough rough.
>
> (Helen)

Other research[43] has suggested that residents in RACF may not express their real feelings about food because they are embarrassed, or think that their request will not be fulfilled.

8.3 | Challenge to self-identity and self-worth

While some participants physically adapted to their deteriorating oral condition, an interview with one female participant identified how unwelcome changes to dental appearance can lead to important changes in confidence, social interactions and self-worth and fundamentally challenge an individual's sense of identity. During Helen's interview, she expressed substantial dissatisfaction with her deteriorating oral condition because it affected her appearance; this was evident in her low GOHAI score (24). Helen appeared to be particularly concerned about how missing teeth affected her appearance, and her comments suggested that "looking good" was an integral part of her identity as a wife and mother and was important to achieving a self-image she deemed as acceptable to society:

> I said to him [husband] I went out to dinner and I didn't have my two teeth in and he said, I know. I said why didn't you tell me, and he said because you would have been embarrassed. I said, were you embarrassed? And he said NOO. I said, but you know that I like to go out dressed up and looking good, and … I do that because I love you, and I don't want you to think that I don't.
>
> (Helen)

Christiansen[44] defined identity as "the person we think we are," with identity comprising the three different concepts of "self," "self-concept" and "self-esteem." The word "self" is frequently used in daily life and refers to our feelings about our thoughts. "Self-concept" encompasses inferences about ourselves, and "self-esteem" is about how we evaluate ourselves in the context of our relationships and everyday activities. Self-esteem, defined as self-perception of one's worthiness, is vital for an individual's development in life. Identity can be influenced by our ideas about who we were before, who we are now, and who we will be in the future.[44–46] Helen's statements suggest that age-related physical changes to her dental appearance had influenced her perception of "who she is now." Moreover, she appeared to be concerned about her social identity, and her worry about how she might be viewed in the eyes of others served to diminish her self-esteem.

Christiansen[44] demonstrated that identity maintenance is an important psychological construct for positive mental health among older people, because it contributes to higher self-esteem, better feelings about ageing[47] and a longer lifespan.[48] Christiansen concluded

that ageing and disability may result in functional changes that limit older people's capacity and opportunities, and which can consequently lead to changes in identity and self. In particular, and as Huff et al. observed, "the face is the very core of human identity,"[49(p245)] and changes to the facial profile and dissatisfaction with the appearance of teeth can threaten an individual's identity and challenge self-esteem and psychological well-being.[49]

Impairments in Helen's dental appearance disrupted her identity as a competent person. She pointed to her reality that her dental appearance was an important element through which she could communicate her identity as an "attractive" woman. Disruptions to identity such as these can result in mental health problems, particularly if they are connected to high neurotic self-reflection (such as anxiety, panic, aggression, negativity and depression) and low self-esteem.[50] However, despite being very concerned about the condition of her mouth and self-conscious about her visibly missing teeth, Helen was reluctant to make an appointment with her dentist. In part, this seemed to be motivated by embarrassment about what the dentist may think. In discussing her last visit to the dentist:

> *Interviewer*: How about the gap from the other missing teeth? Didn't she [dentist] do anything for them? Helen: No … .Because I didn't want to ask … it labels me as a vain person, and I admit I am vain, I like to dress properly.

Even brushing her teeth was an anxiety-provoking experience in Helen's everyday life:

> I clean my teeth morning and night and I feel very sad - Because I know that the dentist is going to say they all have to come out. Your upper and your lower dentures are not in good condition and that is not healthy.
>
> (Helen)

8.4 | Oral health and appearance: Conformity to age-related expectations

While participants such as Helen found changes to their physical appearance due to oral health issues confronting and a challenge to their self-esteem or sense of identity, others viewed them as part of the natural ageing process and so appeared to more readily accept them. For example, Brian expressed his feeling about his oral health condition in the context of it not being as important any more. Although he subsequently stated that he did not like the appearance of his teeth (due to having a lot of plaque and staining), he did not feel that it had impacted on his level of social engagement and interaction:

> [With] most of the visitors I get, same as you ladies … I talk, therefore… Hahahaha … [for a] few minutes people can sit there and have a conversation.
>
> (Brian)

The interview with Mary, a 95-year-old woman who had difficulty breathing and was using an oxygen concentrator, also suggested acceptance of changes associated with "growing old" and a lower focus on physical appearance. When asked whether she would like to wear a denture, she promptly responded: "No, I am 95." She gave the same answer when asked if she felt happy with the appearance of her mouth: "Look, I am 95," suggesting that, at her advanced age, issues of appearance were no longer a priority.

9 | SOCIAL DIMENSION

Residents had different perceptions about how their oral health influenced their willingness to socially engage, from being self-conscious about their own oral health problems and how they might look to others, to avoiding eating meals in the communal dining room because of distaste at others' eating behaviours. Data were coded into two themes: *self-consciousness about other's opinions*; and *self-isolation*.

9.1 | Self-consciousness about other's opinions

People with dental problems may be embarrassed by their appearance and feel uncomfortable interacting socially with other people. This was summed up by Helen's response to item 7 in the GOHAI questionnaire, relating to how often she was pleased or happy with the look of her teeth, gums or dentures: "I don't enjoy going out… Because when I smile you can see the gap".

Paul, who suffered from a degenerative disorder that resulted in facial muscle weakness, had difficulties smiling or showing his emotions through facial expressions. Paul's response to the same item suggests a level of concern at his situation because he could not show his teeth properly when he smiled:

> Yeah I'm happy, what worries me is that the muscles in my mouth are gone, and I can't smile, I can't, Yeah, because I want to smile or for photographs, I can get teeth … [my lips] just sort of hangs …
>
> (Paul)

Changes to facial appearance that are affected by dental impairments can strongly influence an individual's level of social engagement.[51] Kiyak et al.[52] found that even minor facial and dental impairments can negatively influence body image; after implant treatment, they found that participants' body image had improved in relation not only to teeth but also to the face, mouth and overall body image. In the current research, the potential for oral health impairments to influence older people's level of social interaction and engagement was explored through item 11 of the GOHIA ("how often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?"). As was evident from Paul's response, older adults suffering from dysphagia may be reluctant to eat in front of others in the aged care setting:

> I mean it's my throat, you know I was uncomfortable because I've gotta spit something out.
>
> (Paul)

Although Robyn was now used to wearing dentures, she recalled how daunting it had been for her to eat in front of others when she first started wearing dentures 10 years earlier. Her concern seemed to reflect a mix of embarrassment at her appearance if the dentures should move when she was talking or eating, and the more practical problem of physical discomfort when eating food:

> Well, I feel embarrassed, you know if one of the dentures starts moving or fall out or something, that's embarrassing ... You just look one way and what if they saw that, and then you take them out and put them in your pocket.
>
> (Robyn)

Despite the embarrassment Robyn experienced at times because of her dentures, this did not cause her to avoid eating with others, since she believed it to be a common problem among older adults.

9.2 | Self-isolation

For participants such as Helen, embarrassment with their appearance appeared to impair their enjoyment in interacting with others:

> I think all the time. Because if I smile and I do smile a lot, and if I smile I'm conscious of gaps in my mouth and I don't want that.
>
> (Helen)

An important feature of most RACF is the communal dining room. These provide an opportunity for social interaction among residents, and the "social facilitation of eating" in these settings can promote appetite and a desire to eat, as people tend to eat more in the presence of others.[53(p61)] However, communal mealtimes were not enjoyed by all of our participants. Interviews with two male participants highlighted how other residents' behaviours at mealtimes (such as spitting out food or taking dentures out and placing them on the table in front of others) were viewed as distasteful and led these participants to prefer having their meals alone in their room:

> I cannot stand people when they take out the false teeth and put it in front of me ... I don't eat with everybody down there [communal dining room].
>
> (Andrew)

Research with aged care residents in Sweden identified similar concerns, finding that particular eating behaviours among other residents were viewed by their participants as distasteful and decreased their appetite.[54] However, all participants in that study described the importance of sharing mealtimes and experiencing "meal fellowship," and rather than eating alone, they preferred to eat in smaller groups.[54(p124)] Their participants explained that the communal environment increased their appetite because they enjoyed communicating with others from different backgrounds and with differing opinions and felt that eating alone decreased their appetites and/or willingness to eat.[54]

Our findings therefore provide valuable new insights into how oral health problems among older adults in RACF can increase social isolation, either through residents choosing to avoid others because of embarrassment over their oral health-related appearance, or through withdrawing to their room to eat, so as to avoid what they perceive as poor eating "etiquette" among other residents. Regardless of the specific cause for this self-isolation, the implications are important in light of evidence that communal eating environments can increase appetite and thereby reduce the relatively high rates of malnutrition in Australian RACF.[11]

10 | STRENGTHS AND LIMITATIONS

The use of a mixed methods approach in this research enabled us to complement quantitative data from the GOHAI questionnaire with rich, thick qualitative data from in-depth interviews. Through this approach, there were new insights into how older adults in RACF perceive that their oral health status influences their quality of life. Many residents experience significant physical and cognitive impairments that exclude them participating in research. For our research, this meant a limited recruitment pool, which ultimately precluded wider inferences being drawn from the limited quantitative data. However, the inclusion of qualitative interviews helped to "tease out" the quantitative data, providing valuable information to complement the existing literature.

This research also has several limitations. First, participants were recruited from one facility within a single organisation, and the findings may not reflect the experiences of older adults in other RACF, or those living in the community. Second, this study had a small sample (10 participants). Some eligible residents declined to take part in the interview after the researcher commenced the data collection, so the Deputy Service Manager approached other residents and recruited new participants. The sample size was also impacted by the difficulty in recruiting residents with sufficient cognitive ability, as determined by the RACF Manager, to be able to discuss their oral health condition. However, while the sample was relatively small, the goal of data collection in qualitative research is to obtain extensive, rich information, and this can be achieved with a small sample.[55]

11 | CONCLUSIONS

This mixed methods study has highlighted the diverse ways in which older adults in RACF perceive how their oral health influences their quality of life. While some participants observed that oral health

impairments impacted their physical function, the psychological impact of poor oral health featured most prominently in this study. In particular, functional limitations and changes to physical appearance had significant psychological consequences that negatively influenced some participants' self-esteem, and also disturbed their social interactions. These findings have important implications for aged care providers, allied health professionals and policymakers and provide new insights for strategies that can enhance residents' ability to enjoy a healthy diet and enhance quality of life.

AUTHOR CONTRIBUTION

Parisa Malekpour conceived of the presented idea, contributed to the design of the study, performed data collection, analysis and interpretation of data and drafted the manuscript. Amanda Devine, Julie Dare and Leesa Costello provided critical feedback and helped shape the research, analysis and interpretation of data, contributed to drafting the manuscript and revised it critically for important intellectual content. All authors read and approved the final version of the manuscript.

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CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

DATA AVAILABILITY STATEMENT

The de-identified data that support the findings of this study are available from the corresponding author upon reasonable request.

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