

Clinical Psychology of Oral Health: The Link Between Teeth and Emotions

SAGE Open
 July-September 2017: 1–7
 © The Author(s) 2017
 DOI: 10.1177/2158244017728319
journals.sagepub.com/home/sgo


Salvatore Settineri¹, Amelia Rizzo¹, Marco Liotta¹,
 and Carmela Mento¹

Abstract

The effects of oral health conditions on physical and psychosocial dimensions have been a matter of interest for several authors over the last decades. Nevertheless, literature lacks studies that address the relationship between the oral health–related quality of life (OHRQoL) and emotions. The present study aimed to investigate the psychological impact of oral disorders on people’s emotional well-being, with a particular attention to gender and age differences. Two hundred twenty-nine dental patients in care at private dental clinics were individually tested. One hundred thirty of them were females (56.8%) and 99 males (43.2%), aged between 18 and 83 years ($M = 38.11$; $SD = 16.7$). For the evaluation, the Profile of Mood States (POMS) and the Oral Health Impact Profile (OHIP-14) were used. Data were analyzed using Pearson’s correlations, the ANOVA, and the Kruskal–Wallis test. OHRQoL showed several correlations with all the emotions explored, overcoming the well-known relationship with anxiety and depression ($p < .05$). The degree of OHRQoL produced differences on mood states, which could appear normal, moderately altered, or psychopathological ($p < .03$). Furthermore, in different life stages, patients showed specific OHRQoL and emotions.

Keywords

OHRQoL, emotions, psychological well-being

Introduction

According to the World Health Organization (WHO; 2012),

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing.

As the above-mentioned definition suggests, a number of psychological factors seem to be implicated. At first, it is well known that the concept of quality of life (QoL) is “multidimensional and may be categorized within five dimensions: physical wellbeing, material wellbeing, social wellbeing, emotional wellbeing, and development and activity” (Felce & Perry, 1995, p. 51).

As oral health–related quality of life (OHRQoL) is “an integral part of general health and well-being,” it can be hypothesized that oral disorders may impair at least three of the QoL dimensions: the physical, emotional, and social well-being (Åström, Haugejorden, Skaret, Trovik, & Klock, 2005; Sischo & Broder, 2011).

Studies have demonstrated the impact of oral health conditions on physical and psychosocial dimensions (John et al.,

2004; Locker & Allen, 2007; Settineri, Rizzo, Liotta, & Mento, 2014), while there is a lack of scientific evidence about the link between OHRQoL and emotions. The majority of existing studies have focused exclusively on the relationship with dental anxiety (Kurer, Watts, Weinman, & Gower, 1995; McGrath & Bedi, 2004) and/or depression (Marques-Vidal & Milagre, 2006).

From a psychological point of view, all emotions play a fundamental regulatory role in human behavior (Gross, 1998), as they intervene in stressful situations, such as facing illness. Positive or negative feelings toward health problems may produce different outcomes (Bowman, 2001), suggesting a strict link between health and emotions. According to Kressin, Reisine, Spiro, and Jones (2001), the personality trait of “negative affectivity,” compared with the “positive affectivity” trait, is associated not only with a worse general physical health and worse health-related quality of life (HRQoL) but also with specific aspects of OHRQoL. On the

¹University of Messina, Italy

Corresponding Author:

Carmela Mento, Department of Cognitive Sciences, Psychology, Educational and Cultural Studies COSPECS, via Concezione 6/8, 98100 Messina, Italy.
 Email: cmento@unime.it



contrary, an active coping and the trait of optimism seem to be related to dental health behavior, suggesting that the trait of optimism could be a determinant for both oral and general health (Ylöstalo, EK, & Knuuttila, 2003).

OHRQoL—as a part of a broad range of QoL domains—could have relationships with a wider emotional spectrum, from a functional affect expression to a psychopathological condition. In fact, emotions in clinical situations may become pathological, for example, when “there is a lack of balance between real and perceived danger” (Settineri, Mallamace, Muscatello, Zoccali, & Mento, 2013, p. 168).

Furthermore, as individuals during life span vary in their ability to regulate emotions and cope with stress (Wang & Saudino, 2011), it can be hypothesized that even the relationship between OHRQoL and emotions may differ across age, even if the existing literature seems to have neglected this point.

On the basis of these premises, the main aim of this study was to investigate the relationship between all emotions (Tension, Depression, Anger, Fatigue, Vigor, and Confusion) and the patient’s OHRQoL, with a particular attention for different life stages.

The hypotheses are the following:

Hypothesis 1: Poor OHRQoL is linked not only to anxiety and depression but also to other mood states.

Hypothesis 2: In different life stages, there are different OHRQoL degrees and different emotions.

Hypothesis 3: Different OHRQoL degrees produce different expression of emotions, until psychopathology.

Method

Instruments

For the evaluation, two questionnaires were used.

The POMS is a self-assessment mood scale consisting of 58 items (McNair, Lorr, & Droppleman, 1992). The participant has to indicate on a Likert-type scale from 0 (*not at all*) to 4 (*very much*) as the last week has experienced the moods listed. The instrument consists of six subscales: (a) *Tension–Anxiety*, (b) *Depression–Dejection*, (c) *Aggression–Anger*, (d) *Vigor–Activity*, (e) *Fatigue–Indolence*, and (f) *Confusion–Bewilderment*. The participant obtains a score for each subscale, which can be transformed into standard scores (*T* points). Being a standardized instrument, on both clinical and nonclinical samples, it allows to discriminate between normal range (40–60 *T* points) and psychopathology (over 61 *T* points).

The Oral Health Impact Profile (OHIP-14)—Italian version edited by Franchignoni et al. (2010)—consists of 14 items (Slade, 1997). As described by Meredith, Strong, Ford, and Branjerdporn (2016), each pair of item captures a specific dimension of the perception of the state of oral health: (a) *Functional Limitation* (e.g., difficulty chewing), (b) *Physical*

Pain (e.g., sensitivity of teeth), (c) *Psychological Discomfort* (e.g., self-consciousness), (d) *Physical Disability* (e.g., changes to diet), (e) *Psychological Disability* (e.g., reduced ability to concentrate), (f) *Social Disability* (e.g., avoiding social interaction), and (g) *Handicap* (e.g., being unable to work productively). Respondents were asked to indicate how frequently they experienced each problem within a reference period of 12 months on a 5-point Likert-type scale—*never* (score 0), *hardly ever* (score 1), *occasionally* (score 2), *fairly often* (score 3), and *very often* (score 4). Highest valor corresponds to greater discomfort related to oral health; a non-pathological condition is instead closer to zero.

Procedure

The study was in conformity with ethical principles of research as it was conducted according to the Declaration of Helsinki. Each participant was informed in advance about methods and study aims and answered to the issued questionnaires only after signing informed consent. Data were collected in the period from January to May 2013. The administration was conducted by operators who had a brief training for the administration of psychological tests. The completion of the questionnaires required from 15 to 30 min, being two self-report measures. Data were analyzed using the Statistical Package for the Social Sciences (SPSS 17.0). To verify our hypothesis, we performed Pearson’s correlations, the ANOVA, and the Kruskal–Wallis test. The reliability of questionnaire used obtained a Cronbach’s alpha value of .93 for the OHIP-14 and .80 for the POMS.

Results

Sample

The whole sample consisted of 263 dental patients, all belonging to private dental surgeries of the center of Messina, Sicily (240,000 habitants). We included all participants with mild or moderate dental problems (gingivitis, cavities, plaque, sensitive teeth, halitosis, denture discomfort, etc.) according to the judgment of the dentist. For the analysis, we considered only the valid cases: 130 of them were females (56.8%) and 99 males (43.2%), for a total of 229 participants (see Table 1).

To verify any difference between life stages, patients aged between 18 and 83 years ($M = 38.11 \pm 16.7$) were split into three age groups, based on age classes: (a) young patients, from 18 to 30 years; (b) adult patients, from 31 to 50 years; and (c) old age patients, from 51 to 83 years. The chi-square values according to age and gender were not significant, indicating that groups were well balanced. The measure of sampling adequacy met the criteria for statistical analysis (Kaiser–Meyer–Olkin [KMO] = .92, $p < .001$). Table 2 shows descriptive statistics of the scores obtained by dental patients on the OHIP-14 and POMS.

Table 1. Descriptive Statistics of OHIP-14 and POMS.

| OHIP-14 | M | SD |
|--------------------------|-------|-------|
| Functional Limitation | 1.29 | 1.84 |
| Physical Pain | 3.07 | 2.19 |
| Psychological Discomfort | 2.52 | 2.41 |
| Physical Disability | 1.75 | 1.97 |
| Psychological Disability | 2.07 | 2.15 |
| Social Disability | 1.73 | 2.11 |
| Handicap | 1.06 | 1.79 |
| POMS | M | SD |
| Tension–Anxiety | 54.85 | 11.39 |
| Depression–Dejection | 53.08 | 11.94 |
| Aggression–Anger | 56.45 | 13.07 |
| Vigor–Activity | 53.59 | 11.00 |
| Fatigue–Indolence | 57.01 | 12.55 |
| Confusion–Bewilderment | 51.15 | 9.93 |

Note. OHIP-14 = Oral Health Impact Profile; POMS = Profile of Mood States.

Each dimension of OHIP-14 was referred to a pair of items (e.g., *Functional Limitation*, Items 1 and 2; *Physical Pain*, Items 3 and 4, etc.); subsequently, scores range from a minimum of 0 to a maximum of 8. As regards the POMS from raw scores, we obtained *T* points: Scores ranging from 40 to 60 are conventionally considered normal. In our dental patients sample, each subscale scores exceed the norm (minimum 6, maximum 98), even if the mean is contained in the conventional range.

Hypothesis 1: Poor OHRQoL is linked not only to anxiety and depression but also to other mood states. To verify our first hypothesis, we performed Pearson's correlation (see Table 3). All the POMS subscales were positively related to OHIP-14 items. Oral health dimensions were significantly related not only to the well-known constructs of *Anxiety* and *Depression* but also with *Aggression*, *Fatigue*, and *Confusion*, with the exception for *Vigor* subscales. The higher the level of emotional psychopathology, the worse the OHRQoL. Furthermore, both physical and psychological aspects of oral health were significantly linked to mood states.

Hypothesis 2: In different life stages, there are different OHRQoL degrees and different emotions. Second, we excluded any possible significant effect of gender by performing the Student *t* test for independent samples. On the contrary, the ANOVA revealed significant difference in the OHIP between age classes, as shown in Table 4.

Adult patients aged from 31 to 50 years had the higher scores and hence the worse oral health profile in almost all subscales, with the exception of *Functional Limitation* in which old age patients were more compromised.

As regards POMS, there were no differences between males and females and between age classes. In the whole

sample, 66 patients showed a level of *Tension* upper normal, 58 for *Depression*, 75 for *Aggression*, 86 for *Fatigue*, and 44 for *Confusion*.

Hypothesis 3: Different OHRQoL degrees produce different expression of emotions, until psychopathology. According to the classification of the total score of OHIP-14, one hundred forty-four patients obtained a score lower than 14, which indicates the absence of oral health problems; 79 patients obtained a total score between 15 and 41, on the average; and only six patients obtained a score higher than 42, showing oral health problems. To verify our third hypothesis, we perform the nonparametric Kruskal–Wallis test (Table 4).

Patients who obtained a total score on the average (from 15 to 41) reported increased feelings of *Depression* and *Confusion*. Instead, patients who obtained OHIP-14 total scores higher than 42 reported more *Aggression* and *Fatigue*.

Discussion and Conclusions

At first, as general result, all mood states subscales resulted positively related to oral health dimensions, with the exception for the *Vigor*, the unique positive mood state. Oral health dimensions were strictly linked not only to the well-known constructs of *Anxiety* and *Depression* but also with *Aggression*, *Anger*, and *Confusion*. This result clearly confirmed our hypothesis: The perception of the patient's OHRQoL was connected to an emotional spectrum, broader than known, ranging from adequately modulated mood, until emotional dysregulation. In fact, in 19% to 37% of cases, the patients tested showed mood alterations in association with OHRQoL problems. Specifically, we observed that patients who obtained a total oral health score on the average reported increased feelings of *Depression* and *Confusion*. Instead, patients who scored lower in the oral health profile, suggesting a poor OHRQoL, reported more *Aggression* and *Fatigue*. Different degrees of perceived severity of the OHRQoL conditions were connected to different emotional shades. A possible explanation is that mood states may also depend on cognitive evaluation of oral health impairment (i.e., having coping abilities, self-efficacy, danger perceived, etc.), but this pathway has not yet been investigated in detail. One of the few attempts to draw the association between oral health and mood states is the *Meridian Tooth Chart* developed by Wilson and Williams (2011) (see Figure 1). The authors have compiled a list of the associations between teeth, organs, and positive or negative mood states. Although fascinating, this theory borrowed from oriental medicine had never been the subject of empirical studies: The psychometric investigation of the relationship between teeth and emotions may even serve as a first scientific evidence to support this intuitive association.

Regarding the issue of age differences, we observed that the most significantly impaired oral health dimension for elderly patients is *Functional Limitation* which was in

Table 2. Correlations Between POMS and OHIP-14.

| | Tension–Anxiety | Depression–Dejection | Aggression–Anger | Vigor–Activity | Fatigue–Indolence | Confusion–Bewilderment |
|--------------------------------|-----------------|----------------------|------------------|----------------|-------------------|------------------------|
| 1. Difficult pronounce words | .115 | .111 | .127* | –.043 | .099 | .145* |
| 2. Worsened taste | .097 | .143* | .133* | –.176** | .160** | .154* |
| 3. Pain | .200** | .138* | .152* | –.025 | .187** | .132* |
| 4. Uncomfortable to eat | .128* | .077 | .089 | –.092 | .155* | .113 |
| 5. Self-conscious | .202** | .214** | .209** | –.091 | .206** | .258** |
| 6. Feel tensed | .244** | .217** | .257** | –.113 | .274** | .237** |
| 7. Diet unsatisfactory | .175** | .259** | .186** | –.087 | .225** | .174** |
| 8. Interrupted meals | .245** | .238** | .259** | –.050 | .257** | .230** |
| 9. Difficult to relax | .238** | .232** | .226** | –.072 | .280** | .295** |
| 10. Embarrassed | .209** | .221** | .187** | –.036 | .229** | .255** |
| 11. Irritable | .262** | .280** | .293** | –.101 | .305** | .319** |
| 12. Difficult to do jobs | .247** | .342** | .284** | –.085 | .273** | .300** |
| 13. Life less satisfying | .270** | .319** | .226** | –.150* | .262** | .303** |
| 14. Totally unable to function | .274** | .322** | .272** | –.113 | .221** | .305** |
| OHIP-A | .279** | .296** | .278** | –.116 | .302** | .309** |

Note. POMS = Profile of Mood States; OHIP-14 = Oral Health Impact Profile; OHIP-A = Total Oral Health Impact Profile.
*Correlation is significant at the .05 level (2-tailed). **Correlation is significant at the .01 level (2-tailed).

Table 3. Differences in Oral Health Impact Profile Between Age Classes (OHIP-14).

| | 18-30 years | | 31-50 years | | 51-83 years | | ANOVA | |
|--------------------------|-------------|------|-------------|------|-------------|------|-------|--------------|
| | M | SD | M | SD | M | SD | F | Significance |
| Functional Limitation | 0.97 | 1.64 | 1.43 | 1.71 | 1.69 | 2.25 | 2.99 | .050 |
| Physical Pain | 2.57 | 2.03 | 3.58 | 2.29 | 3.24 | 2.17 | 4.97 | .008 |
| Psychological Discomfort | 2.20 | 2.43 | 3.00 | 2.46 | 2.41 | 2.24 | 2.46 | .087 |
| Physical Disability | 1.44 | 1.85 | 2.19 | 2.11 | 1.67 | 1.90 | 3.28 | .039 |
| Psychological Disability | 1.71 | 2.15 | 2.48 | 2.04 | 2.13 | 2.23 | 2.79 | .063 |
| Social Disability | 1.34 | 1.88 | 2.30 | 2.26 | 1.61 | 2.13 | 4.68 | .010 |
| Handicap | 0.57 | 1.35 | 1.53 | 2.07 | 1.28 | 1.87 | 7.04 | .001 |

Note. In bold are statistically significant values. OHIP-14 = Oral Health Impact Profile.

Table 4. Differences in Mood States Based on OH Classification.

| | OH classification | | Kruskal–Wallis test | | |
|---------------------|--------------------|-------------------------------|---------------------|--------------------------------------|-------------------------|
| | Low 0-14 (n = 144) | On the average 15141 (n = 79) | High 42-56 (n = 6) | Grouping variable: OH classification | |
| | Mean rank | Mean rank | Mean rank | Chi-square | Asymptotic significance |
| Level of Tension | 109.83 | 121.99 | 147.08 | 4.516 | .105 |
| Level of Depression | 104.11 | 134.12*** | 124.50 | 18.430 | .000 |
| Level of Aggression | 103.5 | 134.65 | 138.25*** | 16.589 | .000 |
| Level of Vigor | 114.6 | 116.82 | 99.17 | 0.517 | .772 |
| Level of Fatigue | 107.8 | 125.35 | 149.67* | 6.912 | .032 |
| Level of Confusion | 107.5 | 129.94** | 109.17 | 9.024 | .011 |

Note. OH = oral health.
*In bold are statistically significant values (p < .05; p < .01).

association with specific mood states: *Depression*, low *Vigor* and *Confusion*. These results are consistent with the findings of similar studies conducted by Friedlander, Friedlander, Gallas, and Velasco (2003). The authors found an association between oral health and late life depression (LLD): Old age patients with LLD seem to develop behavioral patterns characterized by “compromised social function and impaired

self-maintenance skills (e.g., bathing, dressing, hygiene).” The depressed, who lose pleasure and interest for daily life activities, lose even the interest in personal oral hygiene. Similarly, Macentee, Hole, and Stolar (1997) found, through a structured interview, that in older adults, mouth has a particular significance related to three interacting themes: comfort, hygiene, and health. An amount of studies, coherent

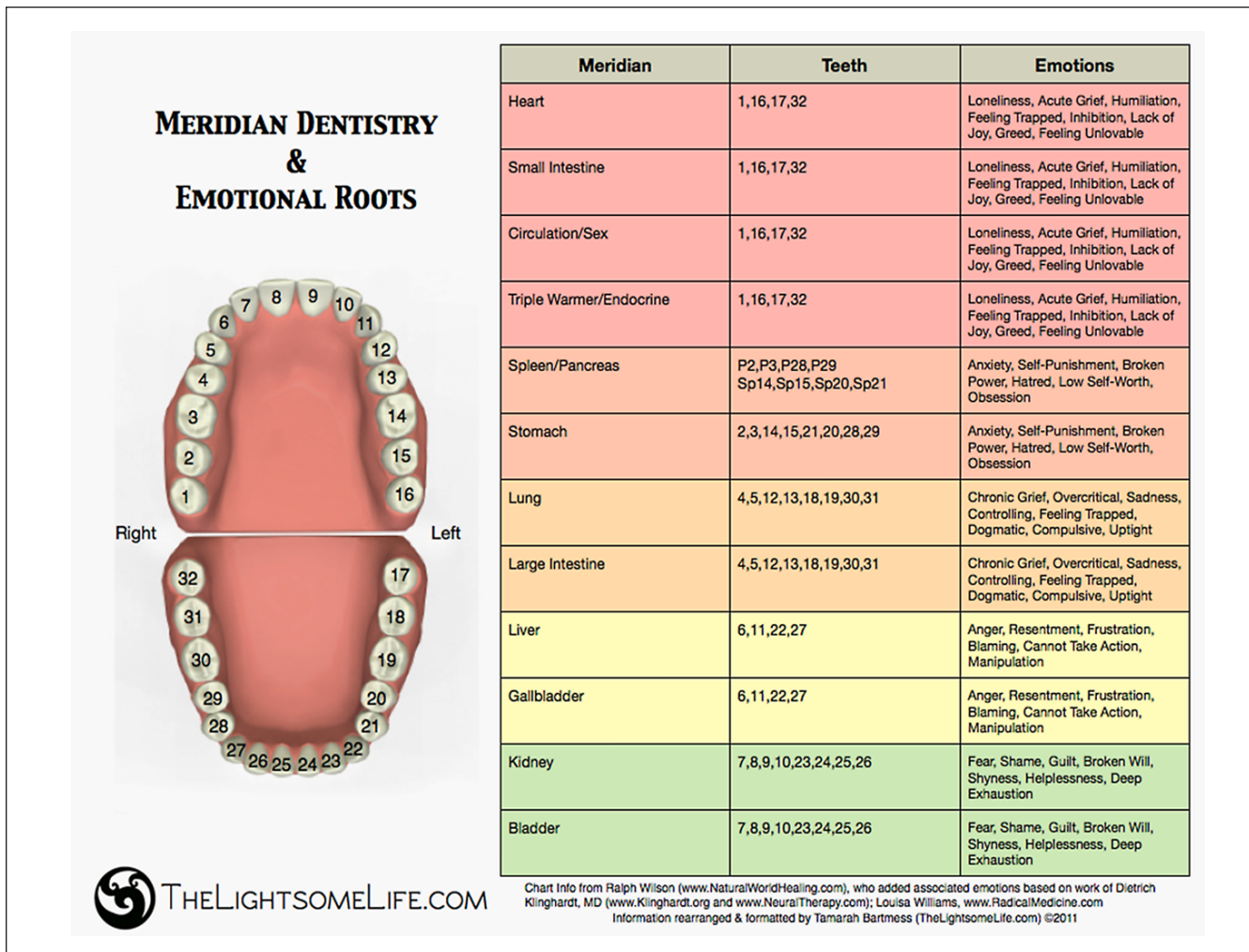


Figure 1. Meridian Tooth Chart.
Source: Wilson and Williams (2011).

with our results, have demonstrated that “many older adults have chewing problems, pain, difficulties in eating, and problems in social relationships because of oral disorders” (Zainab, Ismail, Norbanee, & Ismail, 2008, p. 19). Even Locker, Clarke, and Payne (2000) found that poor self-perceived oral health and relatively poor QoL in older adults coexist. On the contrary, adult patients of our sample aged from 31 to 50 years scored worse oral health profile, in almost all subscales. These results can be explained by the epidemiological distribution of oral health-related problems and its impact on the specified age range. According to Nuttall, Steele, Pine, White, and Pitts (2001), “over half (51%) of dentate adults said they had been affected in some way by their oral health, and in 8% of cases the impact was sufficient to have reduced their quality of life” (p. 121). Locker and Miller (1994) comparing different age groups of dental patients on self-reported oral health status obtained that the initial hypothesis that younger participants would report lower problems on oral health indicators has been not

supported. On all measures except ability to chew, younger participants were as likely to be compromised by oral conditions as older participants. On the contrary, in the present study, younger patients showed the lower levels of oral health impairment and adequate emotional regulation. Nevertheless, we have reason to think that the oral compromise of adolescents and young adults could be tied not so much for the physical aspects, such as pain or discomfort, assessed in this study, but above to other oral health aspects belonging to the general health QoL such as dental aesthetics perceptions and dysmorphic levels, as suggested by literature (Settineri, Mento, et al., 2013; Settineri et al., 2014; Settineri, Rizzo, Ottanà, Liotta, & Mento, 2015).

It is also necessary to discuss issues surrounding the gender. Both in OHIP-14 and in the POMS, gender differences were not found. On the contrary, several studies have shown that males and females have a different perception of oral health status and oral health behavior in favor of females. Young woman “had better oral health

behaviour and more factors associated with their oral health in comparison with young men” (Tada & Hanada, 2004, p. 104). At the same time, women perceived oral health as having a greater impact than men on their QoL in general, having both a greater negative or positive impact (McGrath & Bedi, 1999). Nevertheless, good general health habits correlate with higher oral health behaviors in males as well. For this reason, Fukai, Takaesu, and Maki (1998) hypothesized that “gender specificities in oral health depend on individual attitudes to oral health and dental utilization” (p. 187).

Although the findings have offered a first level of study of the psychopathology of emotions in dental patients, we must point out some limitations of the study. First, the sample showed the limits of generalizability, having been sourced in the same geographic region, because there are some evidence that oral health is influenced also by cultural background. For example, in Australia, those aged between 30 and 49 years showed the worst oral health profile scores; in the United Kingdom, instead, patients below 30 years showed the highest scores, reporting the worse oral health quality (Steele et al., 2004).

It would also be interesting to verify, both from the psychological and the dental point of view, whether the discomfort felt by the patient is congruent with the severity attributed by the dentist or whether there are differences attributable to the degree of invasiveness of the treatment.

In conclusion, the results of this study showed a significant relationship between the perception of the patient’s oral health and the mood states experienced. This knowledge may help to better understand the psychological mechanisms involved in the treatment compliance. The attention about the role of emotions in oral health life involves both psychologists and dentists, who have to safeguard the psychosocial, physical, and emotional well-being of dental patients. The teeth moreover have a symbolic value in the emotional life. The mouth, the main organ of our ability to express, can be read scientifically as an organ to cure, or symbolically as part of the body capable of recording and expressing our psychoemotional experience.

Acknowledgments

The authors are grateful to the dental students of the University of Messina for the data collection which was carried out as a clinical psychology exercise to deeper understand the psychological aspects that influence dental patients’ behavior.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- Åström, A. N., Haugejorden, O., Skaret, E., Trovik, T. A., & Klock, K. S. (2005). Oral impacts on daily performance in Norwegian adults: Validity, reliability and prevalence estimates. *European Journal of Oral Sciences, 113*, 289-296.
- Bowman, G. S. (2001). Emotions and illness. *Journal of Advanced Nursing, 34*, 256-263.
- Felce, D., & Perry, J. (1995). Quality of life: Its definition and measurement. *Research in Developmental Disabilities, 16*(1), 51-74.
- Franchignoni, M., Giordano, A., Brigatti, E., Migliario, M., Levrini, L., & Ferriero, G. (2009). Psychometric properties of the Italian version of the reduced form of the Oral Health Impact Profile (OHIP-14). *Giornale Italiano Di Medicina Del Lavoro Ed Ergonomia, 32*(3, Suppl. B), B71-78.
- Friedlander, A. H., Friedlander, I. K., Gallas, M., & Velasco, E. (2003). Late-life depression: Its oral health significance. *International Dental Journal, 53*, 41-50.
- Fukai, K., Takaesu, Y., & Maki, Y. (1999). Gender differences in oral health behavior and general health habits in an adult population. *The Bulletin of Tokyo Dental College, 40*, 187-193.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271-279.
- John, M. T., Hujoel, P., Miglioretti, D. L., LeResche, L., Koepsell, T. D., & Micheelis, W. (2004). Dimensions of oral-health-related quality of life. *Journal of dental research, 83*, 956-960.
- Kressin, N. R., Reisine, S., Spiro, A., & Jones, J. A. (2001). Is negative affectivity associated with oral quality of life? *Community Dentistry and Oral Epidemiology, 29*, 412-423.
- Kurer, J. R. B., Watts, T. L. P., Weinman, J., & Gower, D. B. (1995). Psychological mood of regular dental attenders in relation to oral hygiene behaviour and gingival health. *Journal of Clinical Periodontology, 22*, 52-55.
- Locker, D., & Allen, F. (2007). What do measures of “oral health-related quality of life” measure? *Community Dentistry and Oral Epidemiology, 35*, 401-411.
- Locker, D., Clarke, M., & Payne, B. (2000). Self-perceived oral health status, psychological well-being, and life satisfaction in an older adult population. *Journal of Dental Research, 79*, 970-975.
- Locker, D., & Miller, Y. (1994). Subjectively reported oral health status in an adult population. *Community Dentistry and Oral Epidemiology, 22*, 425-430.
- Macentee, M. I., Hole, R., & Stolar, E. (1997). The significance of the mouth in old age. *Social Science & Medicine, 45*, 1449-1458.
- Marques-Vidal, P., & Milagre, V. (2006). Are oral health status and care associated with anxiety and depression? A study of Portuguese health science students. *Journal of Public Health Dentistry, 66*, 64-66.
- McGrath, C., & Bedi, R. (1999). Gender variations in the social impact of oral health. *Journal of the Irish Dental Association, 46*, 87-91.
- McGrath, C., & Bedi, R. (2004). The association between dental anxiety and oral health-related quality of life in Britain. *Community Dentistry and Oral Epidemiology, 32*, 67-72.
- McNair, D. M., Lorr, M., & Droppleman, L. F. (1992). *POMS: Profile of mood states*. North Tonawanda, NY: Multi-Health Systems.

- Meredith, P., Strong, J., Ford, P., & Branjerdporn, G. (2016). Associations between adult attachment and oral health-related quality of life, oral health behaviour, and self-rated oral health. *Quality of Life Research, 25*, 423-433.
- Nuttall, N. M., Steele, J. G., Pine, C. M., White, D., & Pitts, N. B. (2001). Adult dental health survey: The impact of oral health on people in the UK in 1998. *British Dental Journal, 190*, 121-126.
- Settineri, S., Mallamace, D., Muscatello, M. R. A., Zoccali, R., & Mento, C. (2013). Dental anxiety, psychiatry and dental treatment: How are they linked? *Open Journal of Psychiatry, 3*, 168-172.
- Settineri, S., Mento, C., Rizzo, A., Liotta, M., Militi, A., & Terranova, A. (2013). Dysmorphic level and impact of dental aesthetics among adolescents. *Paripex-Indian Journal of Research, 2*, 210-214.
- Settineri, S., Rizzo, A., Liotta, M., & Mento, C. (2014). Italian validation of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ). *Health, 6*, 2100-2108.
- Settineri, S., Rizzo, A., Ottanà, A., Liotta, M., & Mento, C. (2015). Dental aesthetics perception and eating behavior in adolescence. *International Journal of Adolescent Medicine and Health, 27*, 311-317.
- Sischo, L., & Broder, H. L. (2011). Oral health-related quality of life: what, why, how, and future implications. *Journal of Dental Research, 90*, 1264-1270.
- Slade, G. D. (1997). Derivation and validation of a short-form oral health impact profile. *Community Dentistry and Oral Epidemiology, 25*, 284-290.
- Steele, J. G., Sanders, A. E., Slade, G. D., Allen, P. F., Lahti, S., Nuttall, N., & Spencer, A. J. (2004). How do age and tooth loss affect oral health impacts and quality of life? A study comparing two national samples. *Community Dentistry and Oral Epidemiology, 32*, 107-114.
- Tada, A., & Hanada, N. (2004). Sexual differences in oral health behaviour and factors associated with oral health behaviour in Japanese young adults. *Public Health, 118*, 104-109.
- Wang, M., & Saudino, K. J. (2011). Emotion regulation and stress. *Journal of Adult Development, 18*, 95-103.
- Wilson, R., & Williams, L. (2011). *Meridian Tooth Chart*. Available from TheLighsomeLife.com
- World Health Organization. (2012). Oral health. *Fact Sheet, N°318*. Retrieved from http://www.who.int/oral_health/en/
- Ylöstalo, P., Ek, E., & Knuutila, M. (2003). Coping and optimism in relation to dental health behaviour—A study among Finnish young adults. *European Journal of Oral Sciences, 111*, 477-482.
- Zainab, S., Ismail, N. M., Norbanee, T. H., & Ismail, A. R. (2008). The prevalence of denture wearing and the impact on the oral health related quality of life among elderly in Kota Bharu, Kelantan. *Archives of Orofacial Sciences, 3*, 17-22.

Author Biographies

Salvatore Settineri is an associate professor of clinical psychology at the University of Messina, Italy. He teaches in university courses in clinical psychological, health psychology, and psychodynamics.

Amelia Rizzo received her PhD in psychological sciences at the University of Messina, Italy. She deals with clinical psychology research, psychopathology of emotions, and psychological well-being.

Marco Liotta received his PhD in psychological sciences at the University of Messina, Italy. He is interested in research topics on the psychopathology of emotions in the clinical field.

Carmela Mento is an assistant professor of clinical psychology at the University of Messina, Italy. She teaches in psychology courses at the university and deals with psychopathology and clinic.