

## Review

# An Overview of Dentofacial Deformity and How It Affects the Quality of Life

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### Abstract

Quality of life is described as an individual's perception of well-being that is derived from contentment or discontentment with the aspects of life that are valuable to them. Health related quality of life is a performance indicator for studying individuals or populations as well as in public health surveillance. The increasing demand for scales to estimate oral health-related quality of life has resulted in the creation of multiple instruments. Oral Health Impact Profile is among the most frequently utilized tools to gauge individuals' perceptions of the psychosocial effect of dental conditions on their overall well-being. Dentofacial deformity are facial and dental disproportionalities major enough to substantially impact the person's quality of life. The condition is regarded as a handicap, due to its functional and social impact on the individual's life, stemming from aberrations in the dental and facial components that distinguish them enough to necessitate wide range of lifestyle adjustments. Also, individuals with such deformities encounter challenges due to poor self-esteem and reduced self-confidence levels along with physiological issues. Female patients are significantly more predisposed to temporomandibular joint pain, headache, dyspnea, and presence of detrimental habits. A perception of social stigma, abandonment and segregation, challenges in interrelationships including problems in starting and progressing companionship, restrictions in everyday tasks, and difficulties in professional life and joblessness have been linked with dentofacial deformities related depression, adversely impacting the quality of life of such persons. Although these individuals choose to undergo orthodontic and orthognathic rehabilitation for the enhancements in physical appearance and physiological functions, the expectation of the psychosocial advantages like personality transformation, improved interpersonal relationships, and self-esteem is a crucial driver for this treatment decision.

**Keywords:** *dentofacial deformity, quality of life, orthognathic surgery, well-being, orthodontic*

## Introduction

Quality of life (QOL) is described as an individual's perception of well-being that is derived from contentment or discontentment with the aspects of life that are valuable to them. According to the World Health Organization, QOL is based on "the context of the culture and value systems in which they (individuals) live and in relation to their goals, expectations, standards, and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationships to salient features of their environment (1)." Medical researchers typically target QOL domain linked particularly with the health of people, and this is domain is called health related quality of life (HRQL). HRQL has gained importance as an outcome measure in a wide variety of clinical research studies in the current times. It is also used as a performance indicator while studying individuals or populations as well as in public health surveillance (2). QOL is comparatively a novel concept in dental sciences. Reisine and colleagues introduced the concept in dental research by redesigning prior validated scales to assess the effect of numerous frequently occurring dental conditions on QOL. They found that many individuals suffered in their personal, social and professional lives due to their conditions (3). The increasing demand for scales to estimate oral health-related quality of life (OHRQL) has resulted in the creation of multiple instruments. Oral Health Impact Profile (OHIP) is among the most frequently utilized tools to gauge persons' perceptions of the psycho-social effect of dental conditions on their overall well-being (4).

Proffitt and colleagues described dentofacial deformity (DD) as facial and dental disproportionalities major enough to substantially impact the person's QOL (5). The condition is regarded as a handicap, due to its functional and social impact on the individual's life, stemming from aberrations in the dental and facial components that distinguish them enough to necessitate wide range of lifestyle adjustments (5). Such individuals often suffer embarrassment in performing daily activities such as dining publicly and are misjudged as incompetent, unfriendly or hostile when interacting with others due to their appearance. Additionally, individuals with such deformities encounter challenges due to poor self-esteem and reduced self-confidence levels along with physiological issues (6). Cunningham and colleagues observed that QOL reported in clinical studies and relating to individuals' health is a multidimensional

concept (1). They also evaluated QOL in another study and noticed that the social domain of a person's life is strongly correlated with the esthetic domain post-orthognathic rehabilitation (7).

## Methodology

No specific criteria were selected beforehand to determine which publications would be incorporated in this review. Google Scholar search engine was utilized to look for scientific publications containing "dentofacial deformities" and "quality of life". After a preliminary scanning of abstracts, full-lengths of relevant articles from peer-reviewed journals were acquired. The references sections of these articles were also screened for pertinent citations which were referred to for additional review.

## Discussion

HRQL is a multidimensional notion constituting a combination of absolute health, self-perception of health and/or disabilities (8). DD is a nuanced issue that impacts multiple aspects of individual's life (9). The intricacies also involve the interactions of QOL phenomenon with the variations among individual's condition and/or disorders (10). Studies exploring the impact of DD on QOL involve survey questionnaires covering a range of topics including general question regarding overall QOL, questions about OHRQL and questions targeting QOL related to the specific DD. These include the generic oral health-related Oral Health Impact Profile Questionnaire (OHIP-49), 36-component Short Health Form Survey (SF-36), and a 22-component dentofacial deformity-specific Orthognathic Quality of Life Questionnaire (OQLQ). All of these surveys consist of patient centric QOL related questions. The 36 components of SF-36 form addresses eight health aspects including functionality, physical aspect, pains, overall wellbeing, energy, social functioning, emotional and psychological wellbeing (11). These domains are segregated into physical and mental components and scored separately (12). The OHIP-14 form consists of seven such areas with a pair of components in each domain (13). These areas include functional restrictions, bodily pain, mental discomfort, physical disabilities, mental disabilities, social disabilities, and lastly handicaps. The responses are rated using a Likert scale. Many studies have found the "psychological or mental discomfort" to be the most impactful domain, noting the lowest means for questions targeting embarrassment or worry regarding their DD (14). The OQLQ form contains 22 components which address four major topic including facial aesthetics,

dental function, awareness of orofacial aesthetics, and the social elements concerning the DD (1, 7). In this survey, researchers have noted a predominance of facial aesthetics as the most impactful domain across studies, which is not surprising because the personality development and features such as self-perception of their body, self-concept, confidence in professional and personal settings is impacted by the skeletal abnormalities present in these patients (15). Deformities related to the orofacial complex, although not life-threatening, cause physical and psychosocial dysfunction (16). Untreated individuals have been observed to suffer from social restrictions due to projection of undesirable attitudes and behaviors toward them. These persons also tend to suffer from depression which also adversely impacts their QOL (16). One study evaluating different aspects morbidity related to facial deformities found that women were significantly more predisposed to temporomandibular joint pain, headache, dyspnea, and presence of detrimental habits (16). Although these individuals choose to undergo orthodontic and orthognathic rehabilitation for the enhancements in physical appearance and physiological functions, the anticipation of the psychosocial advantages is a crucial driver for this treatment decision. The advantages consist of personality transformation, improved interpersonal relationships, and self-esteem (17). Few research studies concluded that over a two-year course postoperatively, these patients' personalities undergo significant improvements. Motegi and colleagues studied the effect of mandibular advancement in individuals with class II skeletal malocclusion and found that their QOL significantly improved, both in general, and with regards to orthognathic health and psychosocial outcomes (17). The psychosocial aspects, linked with the person's social demeanor and presentation of emotion, were noted to considerably improve two years post-surgery. The QOL related to health assesses the impact that the disorders and their management have on the everyday life and individual contentment (7). The sense of social stigma, abandonment and segregation, challenges in interrelationships including problems in starting and progressing companionship, restrictions in everyday tasks, and difficulties in professional life and joblessness have been linked with DD related depression, adversely impacting the QOL of such persons (18). Psychological impact of living with DD is associated with a significant reduction in QOL, which includes impaired social capabilities (18). Plummeting spirit, concentration, and contentment can be seen in such individuals (19). In this

respect, it can be concluded that facial deformities result in individual dissatisfaction, that subsequently can be inferred from the individual's mental and emotional condition. DD linked depression has also shown to increase predisposition to headaches and temporomandibular joint pain. In fact, it has been recommended that individuals with DD assigned for orthognathic procedures must be assessed for depressive conditions preoperatively as they might have unrealistic aesthetic expectations that may worsen their mental state post-surgery if they experience dissatisfaction with the achieved results (20). Due to this risk, it is essential for the surgical team to prepare the patients prior to the surgery by imparting knowledge regarding the significance of a positive mental outlook as well as potential postsurgical sequelae like pain, swelling, nasal congestion, prolonged hospitalization, postsurgical depression, nausea, vomiting, dental problems and unnatural perception amid others (21). Psychological observation is a necessary component of presurgical groundwork (21). Depressive disorders cause direct impacts on person's QOL in various ways. In one study, out of eight domains evaluated in DD related QOL, three domains showed statistical significantly associations between them and depression. With respect to vitality, energy levels and willpower to do accomplish everyday chores are found to be significantly associated with being depression-free (16). In terms of social life, capacity for social engagement was significantly associated with not having depression. Further, Lovius and colleagues inferred that aesthetic rehabilitation positively affected social lives of patients with DD (22). Another such study noted significantly improved interpersonal engagements and found improved confidence levels during interactions (23). Analysis of psychological wellbeing data in patients undergoing surgical treatment found that patients became less socially anxious post-orthognathic surgery which they alluded to being due to improved self-perception of their facial features and body image (24). Along the same lines, researchers noted a psychologically damaging effect of DD which influenced the patient's overall personality and predisposed to depression (16). Detriment of both, overall health and well-being and specific domains pertaining to QOL such as vitality, social life, psychological well-being is seen in patients with orofacial deformities. Bortoluzzi and colleagues observed that overall female patients suffered more in personal and social life due to DD (25). Another Brazilian study, similarly, found that QOL in female patients was impacted more severely by their oral

condition irrespective of them undergoing orthodontic and/or orthognathic therapy (26). Age is also believed to be an important variable in DD related QOL. Using one commonly used scale, Orthognathic Quality of Life Questionnaire, researchers found that age was significantly and positively correlated with physical health restrictions, and complaints of pain and discomfort (25). Interestingly, a follow-up analysis showed that although, with age, the self-perception of DD related to physical appearance in females and physical restrictions in males, respectively, became poorer, the overall emotional health underwent improvement (25). Among postoperative variables, temporomandibular disorders were observed to lower QOL scores in patients (27). This reiterates the findings that improvement in oral function is an important marker of satisfaction postoperatively in DD patients, the lack of which can negatively impact overall improvement in HRQL. As noted earlier, an integrated approach involving orthodontic and orthognathic procedures is used to treat patients with orofacial disproportionalities. Selecting the correct treatment plan and procedure is indispensable for patient satisfaction. This involves consideration of aesthetic and functional factors as well as patient's perceived goals, anticipation, and requirements. Treatment dissatisfaction has been noted to be more associated with the failure of the favorable interrelationship between the doctor and the patient rather than the achieved technical results (28). This may be caused if the doctor fails to detect and manage adequately patients who develop displeasure with the surgical results even if they were clinically sound. Often challenges are encountered in such cases. The patient's dissatisfaction with the treatment may trigger an emotional reaction, medicolegal dispute, reproof aimed at the surgeon, withholding or denial of treatment charges payment, and in rare cases, violence aimed at the doctor (28). Thus, it is important to not only important for the treatment providers to consider their diagnostic criteria while designing the management plan for the DD, but also the patient's perceived needs and desires. It is also incumbent upon the surgical team to provide patients with preoperative care and assess them for personality features like psychosis, introversion/extroversion, self-awareness, and body image. They must also be educated about the potential postsurgical complications like pain, discomfort, shock, functional issues, and contentment (29). Adequate psychological preparation is vital for the patient's preparation for their postsurgical changes (30).

With regards to self-esteem in particular, a comparative study of literature assessing relationship between self-esteem indicators and DD related aspects is challenging due to the presence of many varied tools utilized in assessing the self-esteem levels (31). Researchers have observed a sophisticated host of components involved in the evaluation of self-esteem following diverse treatments. For instance, self-esteem at the outset can impact patient contentment with the management plan, with better psychological outcomes likely to be seen in individuals with lower self-esteem rating preoperatively (32). It is essential to conduct self-esteem assessment prior to the start of any orthodontic or surgical intervention to avoid recording biases (33). Cunningham and colleagues stressed on the importance of showing more attentiveness particularly to cases where the individuals are more anxious than usual and expect great outcomes (34).

## **Conclusion**

Individuals with DD have a poorer QOL compared to those without them. Psychological and aesthetic aspects have a strong quality of life influencing nature in patient with orofacial deformities, in addition to functional deficit. Therefore, treatment approaches like orthodontic treatment and orthognathic surgery which aim to restore the function and improve facial appearance enhance the patient's overall QOL as well. Patient satisfaction relates strongly with preoperative perceptions and expectations of the patients. Patient age also influences their perception of QOL with older patients having gathered more negative experiences due to their DD as well as more physical health restrictions. However, interactions between age and gender have been seen to create varying effects in DD patients. In case of women, although increasing ages increase the physical limitations and further effect on facial appearance, their emotional health is observed to undergo positive changes. In contrast, men, overall, experience a diminishing QOL with increasing age with reduced oral function and increased severity of social disabilities. There is a need for development of instruments that determine these measures accurately.

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Non applicable

**Data availability**

Data that support the findings of this study are embedded within the manuscript.

**Author contribution**

All authors contributed to conceptualizing, data drafting, collection, analysis, and final writing of the manuscript.

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