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PSYCHOLOGICAL IMPACT OF DENTAL AND JAW MALFORMATIONS ON SELF-PERCEPTION IN ADOLESCENTS

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| ARTICLE INFO | ABSTRACT |
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| Received 15 th March 2024 Received in revised form 27 th March, 2024 Accepted 16 th April, 2025 Published online 28 th April, 2025 | Especially in teenagers, dental abnormalities and jaw defects have significant clinical, psychological, and social consequences. The complex link between malocclusions and self-perception is investigated in this paper, therefore stressing the psychological influence of dental abnormalities. One hundred twenty teenagers between 13 and 17 were assessed for malocclusion degree, oral health indices, and psychological well-being using standardised dental exams and psychometric evaluations using a cross-sectional research design. The findings show a clear relationship between lower self-esteem and higher social anxiety as well as between malocclusion degree and more psychological discomfort. Additionally noted were gender variations in self-perception; female teenagers felt more emotional discomfort over oral appearance. The results highlight the need for early orthodontic treatments aiming at psychological and clinical elements to enhance general well-being. This research supports more insurance coverage for orthodontic treatment to reduce the psychological load related to dental anomalies. |
| Key words: | |
| Malocclusion, Self-perception, Psychological distress, Adolescents Orthodontic intervention | |
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INTRODUCTION

Dental malformations and jaw deformities do not only have clinical but also profound psychological and social implications for the affected individuals, especially adolescents (Adil, 2024). Physical appearance plays a significant role in developing self-perception and identity, and dental aesthetics is an important issue. Peer interactions, social standards, and media portrayals determine how self-image and how we think those around us perceive us are educated during adolescence (Dinkel and Foltin, 2023). An underlying association between malocclusions and other jaw abnormalities and feelings of embarrassment, social anxiety, and reduced self-esteem can result in a negative effect on your mental health and quality of life.

The Sixth German Oral Health Study (DMS 6) is a study that offers comprehensive data on the prevalence of malocclusions in children and adolescents and its far-reaching consequences (Holt-Lunstad, Robles, and Sbarra, 2017). The study also outlined that a large percentage of young people have some form of crooked or misaligned teeth, and many of them need orthodontic help. The findings also point not only to the physical consequences of untreated malocclusion but also to

psychosocial ones. The malocclusions beyond functional loss, like difficulty chewing, speech, articulation, and increased risk of dental diseases, adversely affect interpersonal relationships and self-worth. This report investigates the intricate relationship between dental malformations and self-perception of each other and discusses the psychological impact that they have. The study seeks to identify the need for early intervention and comprehensive treatment approaches covering both clinical and psychological dimensions based on what the existing research and empirical data have shown.

Heredity, injuries and environmental exposure (Foltin, 2020) are some of the risk factors that may lead to these deformations.

MATERIALS AND METHODS

Study Design and Participants

A cross-sectional study was undertaken to evaluate the psychological and social effects of malformations of dental and jaw in the adolescent population. One hundred twenty male and female adolescents between 13 and 17 years of age were recruited from orthodontic clinics and school health programs. Participants were divided into five levels of severity of malocclusion based on the Orthodontic Indication Group (KIG), a systematic method of assessing orthodontic conditions (summarized in Table 1). Once it is classified, it is possible to differentiate a minor, moderate, or severe malocclusion upon comparing environmental, social or psychological variables.

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Table 1. Definition of the severity of the orthodontic indication groups (KIG) (based on the german original of Source: DMS 6, 2021, p. 34.)

| Degree of severity | Definition |
|--------------------|---|
| Grade 1 | Slight misalignment of teeth, the treatment of which may be desirable for aesthetic reasons, but is not covered by health insurance |
| Grade 2 | Misaligned teeth of minor severity that require correction for medical reasons but whose costs are not covered by health insurance |
| Grade 3 | Pronounced malocclusions of minor severity that require treatment for medical reasons |
| Grade 4 | Severe misaligned teeth that require urgent treatment for medical reasons |
| Grade 5 | Extremely pronounced misaligned teeth that absolutely require treatment for medical reasons |

All this was attempted to minimise confusion. It excluded those who had had orthodontic treatment as adolescents and, in this case, dealt with untreated malocclusions. Participants were finally omitted if they had medical or neuropsychological disorders (found through a self-report paper and exam before testing) that could influence psychological assessments. Informed consent for the medical treatment and participation in this research was given before all the participants and their authorised legal guardians participated in the study.

Dental Examination

It was used to standardise data collection for standardised comparability over time, by reasons of oral health conditions and malocclusions (Cimeli et al., 2013). Two primary measurable indices of oral health status were Decayed, Missing and Filled Teeth (DMFT) and Gingival Index (GI). Among the most popular indices for assessing decayed, missing teeth due to caries and filled (DMFT) teeth of a person (Dinkel et al., 2024). This index reveals the participant's oral health history and dental care needs. The DMFT score is high; there is a higher burden of dental decay and restorations, which can lead to functional and aesthetic problems in adolescents.

The Gingival Index (GI) was also used, in addition to the DMFT index, to assess periodontal health. Gingival inflammation is measured by the GI, which measures the degree of redness, swelling, and bleeding during probing (Eddin Omar Al Ostwani, 2019). Additionally, since periodontal health has a bearing on the general condition and the aesthetics of one's teeth, this enhancement in measures provided a further vision of how dental health conditions affect one's self-perception (Hidalgo-Moara et al., 2024). As a corollary, all examinations were conducted by trained orthodontists under standardised settings with standardised instruments (dental mirror, probe and intra-oral scoopers). The condition and severity of the malocclusion were objectively recorded in the intraoral region by photographs of each participant, and his teeth were cast. Through these processes, each participant's dental health was

assessed with complete thoroughness, and the ability to do what it could to affect their psychological well-being was also evaluated.

Psychological Assessment

Participants were asked to fill in the Operationalized Psychodynamic Diagnosis (OPD) questionnaire to investigate the psychological effects of these dental and jaw malformations. In this specific case, searching for this psychometric tool was selected by researchers just to test how the person perceives himself, how the person controls their emotions and how the person acts in front of others (Arias, Saxena, and Verguet, 2022). The OPD questionnaire that includes self-image, social competence and perceived stigmatisation on the psychosocial effect of malocclusion is very relevant to use.

The evaluation was carried out in a controlled place to be accurate and reliable. Training psychologists were ready to answer questions and instructed the participants on how to do the questionnaires. The OPD assessment offered a method to measure one's self-esteem, embarrassment of appearance and a tendency to withdraw socially (Brown et al., 2019). Given this, it was expected that in a worse state regarding negative self-perception and social distress scales, adults would have more severe malocclusions and that dental irregularities should have a relatively limited impact on one's mental condition.

Moreover, participants also answered questions regarding the nature of interactions with peers, bullying, and whether they believed they needed orthodontic treatment. The self-reported experiences yielded qualitative data, which complemented the quantitative data to present a complete picture of how malocclusions affect adolescent psychology.

Statistical Analysis

The correlation between malocclusion severity and levels of psychological stress was investigated using a comprehensive statistical analysis (Dörfer et al., 2017). ANOVA was used to compare psychological distress scores across five malocclusion levels. This statistical method is commonly used to determine whether or not there are significant differences between multiple groups.

Finally, post hoc Turkey tests were carried out to examine specific group differences. By doing these tests, which severity levels have statistically significant variations on psychological outcomes identified precisely? Furthermore, Pearson correlation coefficients were calculated to evaluate the degree of strength and direction of relationships between self-perception scores and dental health indices (DMFT and GI). All findings were statistically significant at $p < 0.05$ for robust and reliable interpretation. SPSS statistical software is used to analyse all data and is widely accepted in medical and psychological research. The results were then interpreted based on existing literature on self-perception of adolescence and plastic dentistry and how such a disease and psychological health were interconnected.

RESULTS

Psychological Impact

A comparison of psychological distress scores in adolescents (KIG 4/5) with severe malocclusions with peers who had mild

or even no malocclusions demonstrated significantly higher scores in the former. Its most evident psychological effects were decreased self-esteem, heightened social anxiety, and raised susceptibility to bullying. Most adolescent patients with disclosable dental irregularities often feel embarrassed and affected by their dental appearance, decreasing their willingness to participate in social activities (Kirchhoff et al., 2022). Others had mentioned avoiding all social situations where they might need to converse, smile, or be close to others because they were afraid of being judged or made fun of.

In school settings, especially, these were obvious psychological challenges, given that social development is heavily dependent on peer interactions. Both participants and dentists agreed that participants' dental appearance made them a target of negative social experiences, such as exclusion and verbal bullying. The consequences of such experiences often extend beyond those circumstances to become emotional burdens, further withdrawal, and increased social but also academic and general well-being (Al Sagob et al., 2022). The findings support the early orthodontic intervention as more than serving a functional or aesthetic purpose but to lessen long-term psychological consequences. If addressed early, malocclusions may even help improve adolescents' self-perception and reduce their social experience in more positive ways, resulting in better mental health outcomes.

Gender Differences

Men and women also showed distinct gender bases within the self-perception and psychological responses to malocclusion. There was a significant difference in dissatisfaction with a person's dental appearance between men and women. This is consistent with the previous research suggesting that adolescent girls are more self-critical about their physical appearance than boys, which should be considered in terms of pressures and beauty standards distributed by society via media. Anxiety associated with the dental aesthetics of females with severe malocclusion was common, and they often linked their self-worth with their appearance (Alhammadi et al., 2018). Despite their milder malocclusions, they usually had an expressed desire to undergo orthodontic treatment. However, unlike that of male participants, the distress levels associated with male participants' concern with their dental irregularities were also significantly lower. Males placed less on aesthetics and were less likely to link their self-esteem with their dental appearance (Greenfield et al., 2020).

This suggests considering the gender involved when performing orthodontic and psychological interventions. As such, healthcare providers should also consider the prominent psychological effect that malocclusions have on female adolescents and adapt the given counselling and treatment procedures. The knowledge of self-acceptance and support groups can lessen the distress associated with dental malformations, especially for females.

Oral Health Findings

The study also sought to determine the relationship between oral health and malocclusion. The results showed that the adolescents with severe malocclusions had significantly higher scores in DMFT and GI, thus confirming our hypothesis that malocclusions are associated with poorer oral health outcomes.

There was a greater prevalence of dental decay and periodontal problems in those of the KIG 4-5 category, presumably because of the difficulty in maintaining oral hygiene, as the teeth are misaligned (Fardouly and Vartanian, 2016). Irregular spacing, overcrowding, and misalignment often result in severe malocclusions that cause hard-to-reach areas with plaque accumulation, thus making it easy for cavities and gum disease to occur. The psychological and physical burden of poor oral health compounded by poor oral health makes for an additional psychological burden as well as increases prior discomfort. It reduces the already low level of self-confidence and social interaction (De Oliveira Meira et al., 2020). Those with impaired oral health were more likely to respond that the mouth pain, the bad breath, and an aversion to smiling all contribute to a negative perception of self.

These findings imply that comprehensive orthodontic care should concentrate on conserving overall dental health and achieving good aesthetic alignment. Early orthodontic screenings and patient education about good oral hygiene could also help prevent the long-term adverse side effects of malocclusions on physical and psychological states of being.

Hypothesis Testing

- **H1:** Confirmed – higher malocclusion severity associated with higher psychological distress.
- **H2:** Partially confirmed – Adolescents recognised the dental malformations as a health problem but reported an inability to report psychological consequences.
- **H3:** Parents were more emotionally regulated when making decisions in treatment.
- **H4:** Supported yes—We validated H4 that greater severity of malocclusion was associated with a higher risk of caries and periodontal disease.

DISCUSSION

Interpretation of Findings

Based on the findings of this study (summarized in Table 2), it is clear how significant dental deformities are in affecting adolescent self-perception. Research linking facial appearance, social acceptability, and self-esteem in previous studies showed that adolescents with moderate to severe malocclusion have increased levels of psychological distress (Jarman et al., 2022). Dental aesthetics plays a vital role in the self-image of the young people studied and determines their confidence level, willingness to mix with others, and general health (Angel et al., 2018). Malocclusions often negatively hinder self-perception, forcing persons to withdraw socially, become bullied, and endure higher amounts of anxiety.

It is apparent that at a higher level of malocclusion severity, there is a greater likelihood of adolescents developing emotional distress, thus indicating that adolescents with apparent dental irregularities are more prone to psychological distress (James, Puranik, and Sowmya, 2022). As this shows, the psychological burden is another reason early orthodontic intervention is favoured, as it can improve dental function and reduce burdens (Ehrenthal et al., 2023). Thus, different from the situation with children, when corrected, adolescents with malocclusions often report improvement in self-confidence and willingness to be with others, attesting to the importance

of orthodontic treatment in medical and psychological terms (Jordan et al., 2022).

Table 2. Findings of the study

| ResultCategory | Aspects Investigated | Findings |
|----------------------|---|--|
| Psychological Impact | Self-esteem, social anxiety, and bullying risk in adolescents with malocclusions | Significantly lower self-esteem, increased social anxiety, and higher bullying risk in KIG 4/5 compared to KIG 0-3 |
| Gender Differences | Differences in perception of dental aesthetics and treatment desire between male and female adolescents | Girls are more critical of their dental appearance and more likely to seek treatment, even for milder malocclusions |
| Oral Health Findings | Association between malocclusion severity (KIG Index) and oral health (DMFT Index, Gingival Index) | Adolescents with KIG 4/5 exhibit poorer oral health, with increased caries risk (higher DMFT values) and greater gum inflammation (higher GI values) |

Clinical and Public Health Implications

This study concludes with results (summarized in Table 3) advocating that orthodontic interventions be considered more than traditional corrective dental function interventions. However, these tools should instead be acknowledged as an integral component of improving adolescent self-perception and psychological well-being. The connection between dental appearance and mental health emphasises that care should be broader and more comprehensive, with psychological reviews included in the treatment process (Kaisler et al., 2023).

Table 3. Expanding the Scope of Orthodontic Care – Psychological and Public Health Implications

| Core Argument | Supporting evidence |
|--|--|
| Orthodontic care improves adolescent self-perception and psychological well-being, not just dental function. | KIG 4/5 adolescents show higher social anxiety, lower self-esteem, and increased bullying risk. |
| Insurance should cover moderate malocclusions (KIG 1/2) due to their psychosocial burden. | Many adolescents with moderate malocclusions lack insurance despite clear psychosocial distress. |
| Limited access to orthodontic treatment negatively impacts adolescent mental health and quality of life. | Untreated malocclusions contribute to emotional distress and social withdrawal. |

The main implication of this study is that insurance coverage

of orthodontic treatments should be broadened, especially for those with moderate malocclusions, which may not be functionally disabling but do produce significant psychosocial burdens (Jiotsa et al., 2021). Many adolescents have no access to treatment that can positively impact their emotional well-being due to many public and private insurance providers only covering orthodontic procedures when deemed medically necessary (Blöte et al., 2019). Expanding coverage policies to include orthodontic services that address psychosocial concerns would significantly improve the quality of life of teenage patients with Class III malocclusion (Jankowiak et al., 2021).

Limitations and Future Research

Although this study explains the relationship between malocclusions and adolescent self-perception, some limitations exist. The main constraining factor of this study is its cross-sectional design, which allows for data to be seen at a certain point in time. This approach is unable to establish causal relationships between malocclusion severity and psychological distress. Additional conclusions could have been obtained from future longitudinal studies that would monitor the psychological effects of malocclusions and orthodontic interventions over time. Additionally, the study utilises self-reported psychological evaluations, which may induce response bias. Social desirability or personal perceptions of emotions tend to make adolescents under or over-report emotional distress.

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