

Psychosocial impact of malocclusion in the school performance. A Hierarchical Analysis.

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Objective: To identify any association between the psychosocial impact of malocclusion and academic performance in adolescents. **Methods:** Cross-sectional study in a sample of 297 adolescents aged 10 to 14 years old enrolled in public schools. A self-complete questionnaire enquiring about socioeconomic, demographic, and psychological characteristics and the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) was administered in classrooms. The school provided documents related to School Performance (average grade in the Portuguese subject and absences). A conceptual structure was built, and independent variables were inserted hierarchically into logistic models for school performance (outcome). Independent variables were: Gender, age, caries status (DMFT), orthodontic treatment need (IOTN-DHC), psychological impact (PIDAQ) and school commitment (class absences and missed classes). **Results:** Boys (OR = 3.56; 95% CI: 1.54-8.21) with caries experience (OR = 2.77; 95% CI: 1.23-6.23), need for orthodontic treatment (OR = 0.40; 95% CI: 0.18-0.91) and adolescents who reported a psychological impact (OR = 2.70; 95% CI: 1.16-6.30) had worse school performance. **Conclusion:** Boys with caries and malocclusion experience who reported the psychological impact of the need for orthodontic treatment are more likely to have worse school performance.

Keywords: Malocclusion, Psychosocial impact, Academic performance

Introduction

Oral health conditions can negatively impact school performance, as individuals with poor oral health are more likely to have worse academic performance. (De Paula *et al.*, 2015; Maharani *et al.*, 2017; Gopalan *et al.*, 2018; Naavaal and Kelekar, 2018; Rebelo *et al.*, 2018; Ruff *et al.*, 2018; Karki *et al.*, 2019; Lehtinen *et al.*, 2020). Dental caries is a risk factor for poor school performance (Piosevan *et al.*, 2012; Gopalan *et al.*, 2018; Ribeiro *et al.*, 2018) since it may cause pain and discomfort, influencing sleep, reducing the ability to learn and, consequently, affecting performance in the school environment (Naavaal and Kelekar, 2018; Ribeiro *et al.*, 2018). Dental trauma and periodontal problems also negatively influence the school context (Piovesan *et al.*, 2012; Kaewkamnerdpong and Krisdapong, 2018).

Malocclusion is a prevalent condition among adolescents (Marques *et al.*, 2005; Freitas *et al.*, 2015; Martins *et al.*, 2019) with a direct influence on health-related quality of life (OHRQoL) and family life (Sun *et al.*, 2017; Sun *et al.*, 2018; Alrashed and Algerban, 2021). However, the literature is inconclusive about its impact on the academic performance of adolescents (Basha *et al.*, 2016; Rebelo *et al.*, 2019; Ribeiro *et al.*, 2018).

Nor does the literature provide information on how Gender can modulate the impact of malocclusion on school performance. Girls report greater impact of dental esthetics (Iranzo-Cortés *et al.*, 2020; Ilijazi-Shahigi *et al.*, 2021). Thus, social activities may be affected in this context, negatively reflecting on school performance (Basha *et al.*, 2016).

The impact of malocclusion on quality of life is related to the intensity and complexity of the social, emotional, and behavioral relationships experienced in adolescence (Almeida *et al.*, 2019) and, therefore, its consideration in health care is important. This study aimed to identify any association between the psychosocial impact of malocclusion and academic performance in adolescents. We hypothesized that the psychosocial impact of poor dental aesthetics is associated with poor academic performance.

Methods

A cross-sectional study was conducted with 297 adolescents between 10 and 14 years of age enrolled in 4 public schools in Araras (São Paulo, Brazil). The municipality has an estimated population of 118,843 inhabitants at data collection, with a Human Development Index (HDI) of 0.78 (Atlas of Human Development in Brazil). The study was approved by the Human Research Ethics Committee (No.14414519.1.00000.5385) and carried out following the STROBE guidelines. Adolescents and their legal guardians were informed that participation in the study was entirely voluntary, the study's objectives were clarified, and the confidentiality of the collected data was guaranteed. After agreeing to participate, the guardians signed the free and informed consent terms, and the adolescents signed the assent term.

According to the Brazilian educational system, the adolescents included in the study were enrolled in public school and attended elementary school (between the 5th and 9th grades). Classrooms and participants were randomly selected