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The relationship between socioeconomic class and malocclusion or poor oral health, and the quality of life. A review

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ABSTRACT

The association between low socioeconomic class, poor oral hygiene and malocclusion has led to the increased demand for oral public health programs. At the same time, malocclusion and poor oral hygiene have a negative influence on the patients' quality of life (OHRQoL). It appears then that the socioeconomic class and quality of life are two sides of the same coin when the oral condition is considered. This two-way relation between the socioeconomic status and OHRQoL was worth shedding the light on as every aspect was usually discussed separately and their association was neither clearly, nor thoroughly explained before.

***Keywords*:** socioeconomic class, oral health related quality of life (OHRQoL), poor oral hygiene, malocclusion

Introduction

It has been pointed out that there is a relationship between the functional and psychological conditions of the population and oral health (Paula *et al.,* 2012). Many studies have demonstrated the presence of an association between low socioeconomic classes and poor oral condition (Newton *et al.,* 2005, Antunes *et al.,* 2002, Antunes *et al.,* 2004, Christopherson *et al.,* 2009, Locker *et al.,* 2004, Perira *et al.,* 2007, Petersen 2005, Vanobberge 2001). Children's oral health is usually connected to the parental education, income, family structure and parenting quality (Kumar *et al.,* 2014, Santhosh *et al.,* 2013). Such matters influence the psychosocial and psychological traits in children (Kumar et al 2014, Sanders and Spencer 2005).

This has led to an increasing demand for public health programs that involve preventive, interceptive and minor interventions in lower socioeconomic class areas and orphanages.

Another side of the same coin is the negative impact of poor oral hygiene on the patients' quality of life; whose importance has been increasingly recognized and investigated over the last decades (Piovesan 2010).

Several children and adolescent related studies have shown that malocclusion and poor oral health might have an impact on their quality of life (Barbosa and Gaviao 2008, Bendo and Pavia 2010, Brennan 2006, Gherungpong et al 2004, Jokovic et al 2006, Newton and Bower 2005, Wilson and Cleary 1995, Biazevic *et al.,* 2008, Do and Spencer 2007, Foster Page 2005, Marshman *et al.,* 2005, Robinson *et al.,* 2005, Agou *et al.,* 2005, Locker *et al.,* 2007, Marques *et al.,* 2005, O'Brien *et al.,* 2006). Instruments that evaluated the oral-health related quality of life (OHRQoL) were designed; they included the "Child perception questionnaire (CPQ)" (Paula et al 2012) which was developed in Canada (Piovesan 2010). Nevertheless, Locker in 2007; suggested that the impact on the quality of life could be arbitrated by personal, social and environmental variables, and accordingly the relationship between OHRQoL and clinical factors should be interpreted cautiously (Paula *et al.,* 2012).

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The World Health Organisation (WHO) has defined the Quality of Life as "an individual's perception of their position in life in the context of the cultural and value systems in which they live and in relation to their goals, expectations, standards and concerns" (Kumar *et al.,* 2014). Consequently; and as shown by several studies, parental socioeconomic status and the home environment impacted negatively children's OHRQoL (Kumar *et al.,* 2014).

This two-way relationship between the socioeconomic status and OHRQoL is worth highlighting, from what was discussed in the literature, as every aspect was usually discussed separately and their association was not clearly explained. In addition, only a few studies were conducted regarding this matter.

Influence of the socioeconomic status on children's malocclusion

Malocclusion is considered as a deviation from the normal evolution of the dento-maxillary apparatus which is affected by variable factors (Schapira 1973).

Currently, most of the available data comes from Brazilian studies. The influence of the socioeconomic status on malocclusion was a subject of interest as Brazil has an inconsistent socioeconomic distribution, which on the other hand increased the difficulty of conducting such studies. The more privileged group of the population usually refused to participate in such research (Normando *et al.,* 2015). When a study was conducted in Sao Paulo, which is a wealthy city, no influence on the malocclusion was found (Normando *et al.,* 2015). Contrarily, when higher socioeconomic class children in under developed areas were investigated it was found that they had higher prevalence of posterior crossbite (Moron *et al.,* 1997). Children of lower socioeconomic status, on the other hand, had significantly greater early primary teeth loss, which was similar to those of lower socioeconomic class in Venezuela; where they had higher risk of prevalent malocclusion (Normando *et al.,* 2015).

With respect to the fact that only a few studies have discussed the impact of socioeconomic status on the prevalence of malocclusion; their results are considered low evidence to rely on. However, it must be reported that it was found that in developed cities, similar to Sao Paulo, there was no influence of socioeconomic status on malocclusion (Calisti *et al.,* 1960, Popovich 1967).

The results of a study conducted on 14356 Urban Brazilian children conducted by Normando *et al.* (2015) showed that the prevalence of malocclusion varied with its classification. In the higher socioeconomic status group there was more prevalent Class II, increased overbite, overjet and posterior crossbite. While in the lower socioeconomic class group there was a more prevalent early loss of primary teeth.

These findings in turn elucidate the importance of implementing comprehensive preventive and interceptive treatment programs for the whole population regardless of the socioeconomic class.

A cross-sectional study on 960 children in the mining area in Romania was conducted. The study comprised of a majority of Romanian children and a minority of Roma children (different ethnic groups). The results of the study further showed that malocclusion was more prevalent in lower socioeconomic class. It was found that the prevalence of malocclusion was less in the Roma children despite the fact that they had lower socioeconomic status (Todor *et al.,* 2015).

Nonetheless, this paradoxical finding could not be considered as an indication of the effect of ethnic variation; because the Roma children were a minority in the study.

In addition, in England, Wales and Northern Ireland; data from a cross-sectional study of 4217 children showed that there was a clear relationship between socio- economic class and malocclusion. These results emphasize the necessity of taking a positive health action towards the less privileged groups regardless of the population or ethnic group involved (Ravaghi *et al.,* 2019).

The influence of socioeconomic status and clinical factors on how children perceive their OHRQoL

Despite the fact that the socioeconomic class could be related to OHRQoL, there is not much evidence to verify this association. Only one study by Locker et al showed that children with one adult and a low income family were affected negatively with regards to OHRQoL (Locker 2007). Considering this fact, some Brazilian studies were conducted to seek the evidence regarding this matter.

A cross-sectional survey was conducted on 792 Brazilian children from South Brazil. They investigated the impact of socioeconomic class and clinical factors on oral-health related quality of life through the use of CPQ and clinical examination. The children completed the questionnaire themselves, which provided information on age, gender, skin color and parental education (Piovesan et al 2010). Untreated dental caries and increased overjet were found to affect OHRQoL in children the most. In addition, poorer scores were reported by children who had lower household income and mothers who haven't completed their primary education (Piovesan *et al.,* 2010).

Here, it was very clear that the socioeconomic status not just affected the prevalence of malocclusion negatively or the presence of poor oral health, but it also; along with the dental condition, had a negative impact on the quality of life.

In another study conducted by Paula et al at the city of Juiz De For a in Brazil, 515 school children from both private and public schools; were investigated in a statistical regression model. In Brazil, those attending private schools represented the higher socioeconomic class, while those attending public schools represented the lower socioeconomic class (Normando *et al.,* 2015).

Clinical examination was performed utilizing DMFT and dmft indices together with the WHO categorization of treatment need to assess caries, and the dental aesthetic index (DAI) to assess malocclusion. The children were asked to complete CPQ and another questionnaire evaluating the presence of general diseases and self-perception of oral and general health, and home environment.

The results of the study emphasized previous ones that there was a negative impact of the clinical factors, socioeconomic status and home environment on the OHRQoL (Paula *et al.,* 2012). Hence, targeting the deprived populations should be a primary goal to oral health programs while applying subjective social features in planning and treatment.

When Kumar *et al.* (2014) conducted a systematic study, they concluded that their results could not be generalized because they were not representative of the whole world as they were mostly Brazilian studies. The presence of different study population, statistical tests, and methods made it difficult to draw accurate conclusions. Nevertheless, it seemed that, generally, children from families of higher socioeconomic status and parental education had better OHRQoL.

Using the modified index of Orthodontic treatment need (IOTN) in a recent cross-sectional analysis of children in England, Wales and Northern Ireland; OHRQoL was measured using the oral impacts on daily performance (Child-OIDP). The socioeconomic class, on the other hand, was estimated using the eligibility for free school meals. Malocclusion was reported to be associated with the socioeconomic status of the child as well as 15% increase in the negative impact on OHRQoL for 15 year old children (Ravaghi et al 2019). This research correlated the socioeconomic status indirectly to the OHRQoL and along with the scarcity of research regarding their correlation; the need for studies on different populations is accentuated to aid in the precise planning of targeted oral health programs.

Conclusion

1- The evidence in the literature is lacking regarding the effect of the socioeconomic status on malocclusion or socioeconomic status and oral health on oral-health related quality of life (OHRQoL).
2- The present studies in the literature are mostly Brazilian cross-sectional studies and their results cannot be generalized.
3- More studies are needed on different populations and ethnic backgrounds to provide reliable outcomes.
4- Longitudinal studies would be useful to provide a causal relationship between the socioeconomic status, malocclusion and OHRQoL.

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