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Oral health education among Portuguese adolescents

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Abstract

Introduction: Oral health education is an important issue that should be given to children and adolescents, allowing the acquisition of correct oral health behaviours. The objective of this study was to determine the prevalence and assess the quality of oral health behaviours among a sample of portuguese adolescents and verify their association with socio-demographic variables. **Participants and methods:** A cross-sectional study was designed with a sample of 447 adolescents aged 12 to 19 years old, attending a public school in Sátão, Portugal. An interview was made questioning about socio-demographic factors and oral health behaviours to each adolescent in the classroom. Prevalence was expressed in proportions and crude odds ratio (OR) with 95% confidence intervals (CI) were used to measure the strength of association between oral health behaviours and socio-demographic factors. **Results:** The prevalence of toothbrushing (twice-a-day or more) was 90.6%. Five point eight percent of adolescents reported daily flossing, more frequent among female gender (female,OR=2.03 95%CI=1.35-3.05) and adolescents older than 15 years (>15years,OR=1.90 95%CI=1.24-2.92). Sixty-seven percent had at least one dental appointment in the previous twelve months. The prevalence of dental appointments was associated with socio-economic variables such as the father's professional situation (unemployed,OR=0.33 95%CI=0.17-0.65) and crowding index (>1,OR=0.4 95%CI=0.16-0.98). **Conclusion:** Considering the results of the present study, oral health community programs and primary preventive strategies, such as improvement of oral health education in schools should be considered in order to reduce the risk level of oral diseases and develop better oral health behaviours.

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Introduction

Oral health is defined by the World Health Organization (WHO) “*as being free of chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the mouth and oral cavity*”(WHO, 2003a).

Nowadays, dental caries and periodontal diseases are two of the most prevalent diseases worldwide, and, simultaneously, easily preventable with simple primary prevention methods. They are the main cause of dental loss and therefore are considered an important public health issue that affect children, adolescents, adults and the elder (Bastos *et al.*, 2007; WHO, 2003a).

Various studies demonstrate that socio-economic and cultural aspects may influence the oral hygiene habits. The lack of information and knowledge about oral health behaviours and limited access to dental healthcare explain the association between the higher risk of oral diseases and lower socio-economic status (Petersen *et al.*, 2008; Poutanen *et al.*, 2007, Schwarz, 2006; Timis and Danila, 2005).

Social and biological factors in very early life influence dental caries levels later in life. Studies confirm that low social class increases the risk of developing high levels of dental caries (Peres *et al.*, 2005).

In the previous years, WHO has dedicated special attention to health-promoting programs applied in schools. Oral health education is an important issue that should be developed among the population in order to decrease the prevalence of oral illnesses, namely dental caries and periodontal diseases, and, most recently, oral cancer. The necessity to develop primary prevention strategies is a reality in order to decrease oral cavity diseases (WHO, 2003b).

Oral health education is a major public health issue that must be taught to children and adolescents among their own family aggregate and school environment. Oral health promotion is very important in order to insure the application of primary prevention methods such as daily toothbrushing at least twice a day, daily use of dental floss and visiting a dentist regularly to prevent and detect oral diseases in a early stage. Oral health education is the first step in the prevention of oral diseases, in order to decrease socio-demographic differences and to give equal opportunities of oral health, promoting the measures necessary for the improvement of quality-of-life among the population (Qiu *et al.*, 2013; Yiu and King, 2011; Okullo *et al.*, 2004; Pereira, 2003; Honkala *et al.*, 2001).

Problem Statement

Even if there is an oral health enhancement among children and adolescents in Portugal, it is nevertheless disturbing and important to mention their poor oral condition, especially among those who live in suburban and rural areas, linked to a narrowed access to medical and dental care. This situation justifies the Portuguese

community irregular oral hygiene habits, when compared with other European countries.

Research Questions

What is the prevalence of oral health behaviors among Portuguese adolescents?

Which are the main determinants that may influence the oral health behaviors among a sample of Portuguese adolescents?

Purpose of the Study

The objective of this study was to determine the prevalence and assess the quality of oral health behaviours among a sample of Portuguese adolescents and verify their association with socio-demographic variables.

Research Methods

A non-probabilistic convenience sample of 447 adolescents aged from 12 to 19 years old, attending a public school in Sátão, Portugal, was enrolled in this epidemiological observational cross-sectional study that was carried out from September to December of 2012. An interview was developed questioning about socio-demographic variables, social and daily habits and oral health behaviours to each adolescent in the classroom. Socio-demographic variables such as gender, age, school grade at the moment of the study, residence area, parents' educational level (choosing the higher educational level between father and mother), father's professional situation (employed/unemployed), the number of people living in their home and the number of rooms in the house, in order to determine the crowding index were assessed. Oral health behaviours were assessed by questioning the adolescents about what they think about their own oral health, the frequency of toothbrushing per day, time spent toothbrushing (in minutes), period of the day that each adolescent toothbrushed, daily use of dental floss, having a dental appointment in the last 12 months and the reason of the last dental appointment, if he/she had experienced at least one episode of dental pain during their lives, if the adolescent feared the dentist, if they knew what was a fissure sealant and if their dentist had ever applied fissure sealants during a dental appointment and finally if they frequently consumed sugary beverages or soft drinks.

Data analysis was carried out using SPSS for Windows (version 18.0). Prevalence was expressed in proportions and crude odds ratio (OR) with 95% confidence intervals (CI) were used to measure the strength of association between oral health behaviours and socio-demographic factors. Proportions were compared by the Chi-square test and continuous variables by the Kruskal-Wallis and Mann-Whitney tests. The significance level established the inferential statistics was 5% ($p < 0.05$).

This research involving human data has been performed in accordance with the Declaration of Helsinki and

was submitted and approved by the Ethics Committee of the Health School and Research Centre for Education, Technology and Health Studies of the Polytechnic Institute of Viseu, Portugal (CI&DETS). The information collected by the questionnaires was provided voluntarily and confidentially, guaranteeing anonymity of the information collected by telling the adolescents not to sign their names or write down any other form of identification in any part of the questionnaire. Data collection was made only for adolescents whose parents signed an informed consent that explained the objectives of the study. After collection, the questionnaires were numbered, stored and processed by computer. The results do not refer to nominal adolescents or contain any information that may identify any of the participants.

Findings

In the studied sample, we verified that 13.3% of the adolescents consider having a very good oral health, 65.7% good oral health and 21.0% moderate/poor oral health. When assessing daily toothbrushing, 9.4% toothbrush only once a day, 67.3% twice a day and 23.3% toothbrush 3 or more times a day. From those who have the daily oral hygiene habit of toothbrushing, only 27.1% toothbrush during 3 or more minutes each time.

When the adolescents were asked if they brushed also their tongue during oral hygiene, 83.2% refer brushing their teeth, not forgetting to brush the tongue, which corresponds to a complete process of brushing. Adolescents were also questioned about their oral hygiene learning process, and in this situation we verified that 41.7% refer that their dentist never taught them how to toothbrush, while 58.3% say that their dentist have, at least once, talked about the basic measures of daily oral hygiene.

When assessing the use of dental floss, our study shows that only 5.8% use dental floss daily, while 33.9% refer using dental floss sometimes and 60.2% say that never use dental floss during their oral hygiene.

Dental appointments was another important variable analysed and our results demonstrate that 67.0% had a dental appointment in the last twelve months which demonstrates that a high prevalence of adolescents do not have a dental appointment at least twice a year. When assessing the main reason of the last dental appointment, 85% refer having a routine dental appointment, 35.8% visited a dentist in the presence of dental pain and had a dental appointment in an emergency situation and 58.2% for the treatment of dental caries. Adolescent's fear of the dental appointment was present in only 15.3% of the participants of the study.

When questions about the application of fissure sealants were addressed, only 28.9% referred knowing what fissure sealants are and only 15.5% knew if their dentist had applied them in a past dental appointment. The prevalence of dental fear presented by the adolescents was 15.3%, which can compromise the routine dental appointment that these adolescents should schedule at least twice a year. Finally, and after analysis of the variable referring to the consumption of sweet beverages and soft drinks, the prevalence among the adolescents was 92.5%.

When associating oral health behaviours and socio-demographic variables we can verify that toothbrushing at

least twice a day is more frequent among adolescents whose parent's have a higher level of education (>9th grade, OR=1.12 CI95%=0.54-2.32), with higher age (>15 years, OR=1.34 CI95%=0.68-2.65) and among the female gender (female, OR=3.65 CI95%=1.85-7.18). However, significant statistical differences were only found among female and male gender (94.9% vs 83.6%, $p<0.001$).

When associating the daily use of dental floss and socio-demographic variables we can verify that the use of dental floss is higher among adolescents whose parent's have a higher level of education (>9th grade, OR=1.07 CI95%=0.68-1.67), with higher age (>15 years, OR=1.90 CI95%=1.24-2.92), in female gender (female, OR=2.03 CI95%=1.35-3.05), live in urban areas (urban, OR=1.25 CI95%=0.81-1.92) and living in house with a higher crowding index (>1, OR=1.04 CI95%=0.41-2.60). Significant statistical differences were found among gender (46.0% vs 29.6%, $p<0.001$) and age of the adolescent (45.8% vs 32.9%, $p=0.001$).

Analyzing the association between socio-demographic variables and dental appointments in the last twelve months we verify significant statistical differences among dental appointments in the last twelve months and father's unemployment (41.5% vs 68.1%, $p<0.001$) and crowding index (55.0% vs 67.4%, $p=0.04$).

When associating dental pain in the last twelve months and socio-demographic variables we can verify that the prevalence of dental pain was higher among adolescents whose father was unemployed (unemployed, OR=1.27 CI95%=0.65-2.5) and the female gender (female, OR=2.21 CI95%=1.44-3.40), having only registered significant statistical differences between genders, verifying a higher prevalence among the female gender (39.5% vs 22.8%, $p<0.001$).

When associating the consumption of soft drinks and socio-demographic variables we observe that the prevalence of consumption of these kind of sweet beverages was higher among adolescents that registered a higher crowding index (>1, OR=1.43 CI95%=0.18-11.16) and lower among the other socio-demographic variables analyzed, having only registered significant statistical differences for age (≤ 15 years, 97.8% vs 86.7%, $p<0.001$) and residence area (rural, 93.8% vs 88.2%, $p=0.04$).

Conclusions

The present study demonstrates that measures must be taken in order to improve oral health behaviours among Portuguese adolescents. The daily routine of toothbrushing is continuously being well established, but there is still a lack of comprehension of the importance of completing oral hygiene with other methods such as the use of dental floss and including also the routine dental appointment. There is still the need to improve some aspects related with oral hygiene habits, namely the time spent on brushing that should be at least during approximately three minutes and brush not only the teeth but also other structures of the oral cavity such as tongue, gums and palate in order to remove plaque that accumulates in these areas (Daniel *et al.*, 2008; Harris and Garcia-Godoy, 2004).

Several studies also evidence that adolescents with lower socio-economic status have a higher risk of developing oral diseases, namely dental caries, which is also associated with worse oral hygiene habits and

less frequency of routine dental appointments (Pereira *et al.*, 2013; Sistani *et al.*, 2013; Julihn *et al.*, 2006; Nicolau *et al.*, 2005; Timis and Danila, 2005; Locker, 2000). Unfortunately, in many cases, a dental appointment is made only in an urgent/emergency situation, mostly because of dental pain as shown by the results presented in this study. This fact was demonstrated, in some studies, as being highly associated with socio-demographic variables such as level of education, residence area and financial and social income (Ravaghi *et al.*, 2013; Bastos *et al.*, 2012; Petersen *et al.*, 2008; Nicolau *et al.*, 2005).

In Portugal, the inequality access to oral healthcare among the population is evident. It is known the difficulty of access to oral healthcare by individuals socio-economically disadvantaged. This situation occurs due to the fact that the vast majority of oral healthcare is being provided by the private sector, involving funds that not all people are able to support (Almeida *et al.*, 2003). This is a major issue in Portugal and it is reflected in the results of this study that demonstrate this association as we can verify that adolescents whose father was unemployed in the moment of data collection and that registered a higher crowding index had a dental appointment less frequently and mostly visited a dentist only in a emergency situation of dental pain.

Considering the results obtained in the present study, community programs should be considered and developed in order to improve knowledge and behaviors related to the oral health of adolescents, giving special attention to the intervention of various health professionals, teachers and parents in the oral health education that should be transmitted to children and adolescents. Therefore, oral health education activities directed towards the prevention of risk factors for developing oral diseases should involve both parents and their children, because parental behavior is a significant predictor of children's oral health.

It is important to include in the oral health programs, not just children and adolescents, but also their parents in order to have the necessary knowledge on how to have good oral health habits and transmit that information and motivation to their children.

It is essential that, in a early stage, that children acquire adequate oral hygiene habits, particularly about brushing their teeth at least twice a day with toothpaste, daily use of dental floss and the need to have regular dental appointments at least twice a year in order to treat as soon as possible oral diseases and apply primary prevention measures. These are essential basic oral health determinants that should be taught in oral health education.

References

Almeida CM, Petersen PE, André SJ, Toscano A. (2003). Changing oral health status of 6- and 12-year-old schoolchildren in Portugal. *Community Dent Health*. 20, 211-16.

Bastos RS, Carvalho ES, Xavier A, Caldana ML, Bastos J, Lauris J. (2012). Dental caries related to quality of life in two Brazilian adolescente groups: a cross-sectional randomised study. *Int Dent J*. 62, 137-43.

- Bastos JL, Gigante DP, Peres KG, Nedel FB. (2007). Social determinants of odontalgia in epidemiological studies: theoretical review and proposed conceptual model. *Cien Saude Colet.* 12(6), 1611-21.
- Daniel SJ, Harfst SA, Wilder RS. (2008). *Mosby's Dental Hygiene: Concepts, Cases and Competencies*. 2nd ed. St. Louis: Mosby Elsevier.
- Harris NO, Garcia-Godoy F. (2004). *Primary Preventive Dentistry*. 6th ed. New Jersey: Prentice-Hall.
- Honkala E, Honkala S, Rimpela A, Rimpela M. (2001). The trend and risk factors of perceived toothache among Finnish adolescents from 1977 to 1997. *J Dent Res.* 80(9), 1823-7.
- Julihn A, Agholme M, Grindefjord M, Modéer T. (2006). Risk factors and risk indicators associated with high caries experience in Swedish 19-year-olds. *Acta Odontol Scand.* 64(5), 267-73.
- Locker D. Deprivation and oral health: a review. (2000). *Community Dent Oral Epidemiol.* 28, 161-9.
- Nicolau B, Marcenes W, Bartley M, Sheiham A. (2005). Associations between socio-economic circumstances at two stages of life and adolescents' oral health status. *J Public Health Dent.* 65(1), 14-20.
- Okullo I, Astrom AN, Haugejorden O. (2004). Influence of perceived provider performance on satisfaction with oral health care among adolescents. *Community Dent Oral Epidemiol.* 32(6), 447-55.
- Pereira C, Veiga N, Amaral O, Pereira J. (2013). Oral Health behaviours in a sample of Portuguese adolescents. *Rev Port Saude Publica.* 31(2), 158-165.
- Pereira AC. (2003). *Odontologia em Saúde Colectiva – Planejando acções e promovendo saúde*. 1st edition. Porto Alegre: Artmed Editora.
- Peres MA, Latorre MRDO, Sheiham A, Peres KGA, Barros FC, Hernandez PG, Maas AMN, Romano AR, Victora CG. (2005). Social and biological early life influences on severity of dental caries in children aged 6 years. *Community Dent Oral Epidemiol.* 33, 53–63.
- Petersen PE, Jiang H, Peng B, Tai BJ, Bian Z. (2008). Oral and general health behaviours among Chinese urban adolescents. *Community Dent Oral Epidemiol.* 36, 76-84.
- Poutanen R, Lahti S, Seppa L, Tolvanen M, Hausen H. (2007). Oral health-related knowledge, attitudes, behavior, and family characteristics among Finnish schoolchildren with and without active initial caries lesion. *Acta Odontol Scand.* 65, 87-96.

- Qiu RM, Wong MC, Lo EC, Lin HC. (2013). Relationship between children's oral health-related behaviors and their caregiver's sense of coherence. *BMC Public Health*.13, 239.
- Ravaghi V, Quinonez C, Allison PJ. (2013). Oral pain and its covariates: findings of a Canadian population-based study. *J Can Dent Assoc.* 79, d3.
- Schwarz E. (2006). Access to oral health care – an Australian perspective. *Community Dent Oral Epidemiol.* 34, 225-31.
- Sistani M, Yazdani R, Virtanen J, Pakdaman A, Murtomaa H. (2013). Determinants of oral health: does oral health literacy matter? *ISRN Dentistry*. Article ID 249591.
- Timis T, Danila I. (2005). Socioeconomic status and oral health. *J Prev Med.* 13, 116-21.
- World Health Organization. (2003b). WHO information series on School-health. Oral health promotion: An essential element of health-promoting schools. Document 11. Geneva: WHO.
- World Health Organization. (2003a). The World Oral Health Report 2003. Continuous improvement of oral health in the 21st century – the approach of the WHO global oral health programme. Geneva: WHO.
- Yiu C, King N. (2011). An overview of dental caries-preventive approaches for children. *Hong Kong Dent J.* 8, 29-39.