Original Research Article

Periodontal status in 18-year-old Lithuanian adolescents: An epidemiological study

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A B S T R A C T

Objective: The aim of this study was to investigate the periodontal and oral hygiene status of 18-year-old Lithuanian adolescents.

Materials and methods: Cross-sectional data were collected by a multistage sampling approach that was used to draw a representative sample of 1063 adolescents attending schools. In total, 20 schools from the alphabetical list of educational institutions in Lithuania agreed to participate. Periodontal status was evaluated using the Periodontal Screening and Recording (PSR) index. The oral hygiene status was assessed using the Silness-Löe plaque index.

Results: The analysis of the PSR index showed that 77.1% of the study population exhibited gum bleeding on probing, had supragingival and/or subgingival calculus, and shallow pockets. Analysis of the composition of the PSR index revealed that in children whose parents had low education levels (18.6%), gum bleeding was more common than in those whose parents had medium education levels (9.5%) ($P < 0.05$). Our data showed that in 40.0% of the study participants, oral hygiene status was satisfactory, with a statistically significant difference between boys (46.9%) and girls (35.3%) ($P < 0.001$).

Conclusions: The results of our study showed that the periodontal and oral hygiene status of 18-year-old Lithuanian population could be characterized as poor. In total, 77.1% of the study participants were found to have periodontal conditions such as gum bleeding, dental calculus, and shallow pockets. The anterior teeth of the mandible were most frequently affected.

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1. Introduction

Chronic diseases have the most important risk to human health [1]. Dental caries and periodontal diseases are common chronic oral diseases causing multiple health issues [2,3]. Oral health promotion programs traditionally focus on dental caries. However, in Lithuania periodontal diseases are widespread too, but still there is a lack of comprehensive population studies in this field, especially of those which are suitable for comparison with epidemiological studies conducted in other countries [4–6]. Few epidemiological studies carried out in Lithuania showed that the prevalence of periodontal disease among 12-year-old children was 47.4% [4], while among 17–30-year olds, 97.2% [6]. Periodontal conditions such as gum bleeding on probing, supragingival or subgingival calculus, and periodontal pockets of 4–5 mm depth were documented in 29.2%, 18.2%, and 0.3% of 12-year-old Lithuanian children, respectively [4].

In adolescence the prevalence of periodontal diseases may increase due to physiological hormonal changes [7] as well as contributing environmental and behavioral factors [8]. Clinical signs of early stages of periodontal diseases are reversible if adequate oral hygiene is implemented and maintained [9]. However, there is part of the population in which early periodontal conditions might develop into severe and progressive stages in the future [10]. The 5-year longitudinal study carried out in the United Kingdom reported that the loss of periodontal tissue attachment increased from 3.0% in 14-year olds to 37.0% in 16-year olds and 77.0% in 19-year olds [11].

The diagnosis of periodontal diseases and evaluation of risk factors in adolescence are both crucial because the initial forms of these diseases may progress to severe or even irreversible complications. High-risk individuals could be included in special prevention or treatment programs, recognizing that the initial forms of periodontal diseases are simply and effectively prevented and treated.

The aim of the study was to evaluate the periodontal and oral hygiene status among 18-year-old Lithuanian adolescents.

2. Materials and methods

2.1. Study population

This cross-sectional study on the periodontal and oral hygiene status was carried out among 18-year-old Lithuanian adolescents in 2014. The method of multistage cluster sampling was used. Lithuania is divided into 10 counties. In the first stage, each county was divided into smaller urban and rural administrative units (clusters). During the second stage, in each cluster, schools (sub-clusters) from the alphabetic list of all the schools based on the data from the education management information system of the Centre of Information Technologies in Education were selected (the first and the last school from the list were chosen). If the selected school refused to participate, the following one from the list was approached. In total, 27 schools were approached in the study, and 20 of them were enrolled in the final study sample. In the

third stage, 3rd gymnasium classes (a block) were selected. One hundred adolescents from each selected block were asked to complete the questionnaire about their birth date, gender, oral hygiene skills, and parental education level. Totally, 2000 adolescents from all over the country were interviewed. The study was voluntary; the inclusion criteria were age of 17.5–18.5 years and agreement to be enrolled in the study by signing written informed consent. A total of 1063 adolescents met the inclusion criteria. Adolescents were informed about the fact that they could withdraw from the study at any time. The flow chart of the study sample is presented in Fig. 1.

2.2. Final sample

The sample size was calculated using the Paniott's formula with the error of 0.05% based on the 18-year-old population in 2012, which was 37 036 according to the Lithuanian Department of Statistics (Statistics Lithuania). By using this formula, it was determined that not less than 396 18-year-old adolescents had to be included in the study. Permission to examine the subjects was granted by the Kaunas Regional Biomedical Research Ethics Committee on 27 November 2012 (No. BE-2-47). The aims and procedures of the study were explained to the children's parents, and written informed consent was obtained from each adolescent.

2.3. Clinical examination and interview

Participants were asked about their parent's education level, which was classified into low education (unfinished or graduated secondary school), medium education (higher education – college) and high education (higher education – university).

Periodontal examinations were performed under standardized conditions using a comfortable chair with a head support and portable dental units equipped with a halogen light source, compressed air, and suction device. All periodontal status measurements were performed by four researchers (J.Z., K.S., N.B., and V.A.) who were trained and calibrated. Training and calibration was performed on 35 18-year-old subjects with some extent of periodontal conditions who were not included in the final sample. The examiners were trained to assess indicators of the periodontal conditions such as gingival bleeding, supragingival and/or subgingival calculus, and periodontal pockets. The process included theoretical activities with discussions regarding the diagnostic criteria for all conditions. Inter-examiner agreement among the examiners and intra-examiner agreement was evaluated and was shown to be good with the kappa value ranging from 0.83 to 0.87. The examination was carried out using portable equipment. The severity and prevalence of periodontal conditions as well as the oral hygiene status of the subjects were evaluated.

Periodontal status was evaluated using the Periodontal Screening and Recording (PSR) index [12]. The examination involved gentle insertion of the periodontal probe into the gingival sulcus of each tooth until light resistance was met and then "walking" the probe around the tooth circumference. After examination of each tooth in the sextant, only the highest code obtained was recorded and only one score was recorded for each sextant.