Introduction

Malocclusion is regarded as an irregularity of the teeth or a real relationship between the dental arches beyond the normal range that may affect the quality of life as well as their social interaction skills (1,2). There is an increased awareness of the close association and role of the primary occlusal relationship to the permanent tooth alignment and occlusal features (3). Previous studies have proven that the presence of malocclusion in primary dentition will lead eventually to malocclusion in its successor (4,5). Moreover, malocclusion in deciduous dentition is considered a risk factor indicating the necessity of orthodontic treatment in the future. Therefore, it is important to closely monitor occlusion in children and initiate immediate intervention at an appropriate time, when primary occlusion and deciduous features of primary occlusion have been well established in the literature by different authors, it is known that different population groups and ethnic backgrounds can influence the development of the occlusion (7). Genetic and environmental factors have also been strongly influenced to the development of either normal or abnormal occlusion (8).

Objective

No agreement on case definition of malocclusion was found in the literature, subsequently, no index is available to measure the prevalence of malocclusion in primary dentition. So, this study aimed to determine the prevalence of malocclusion in primary dentition and its associated risk indicators among a four-year-old Saudi children using a proposed definition that addresses the abnormal and not the norms of occlusion.

Materials and methods

A cross-sectional study was conducted on 3 to 5-year-old preschool children living in the capital of Saudi Arabia, Riyadh City. Ethical clearance was obtained from the Institutional Review Board of Princess Nourah bint Abdulrahman University (Reference number: IRB2014). A minimum required sample of 683 participants was calculated with an estimated 0.1 prevalence of malocclusion based on a previously published paper in Riyadh by Habib et al. in 1986 (9) with a 95% confidence interval and a 3% margin of error.

A convenient sample of kindergarten children from selected schools was used. Private and public schools from the five regions of Riyadh city were covered with a total number of 9 schools to ensure sample representation. A written permission from school authorities was obtained before school visits. The study sample included 709 Saudi children of both genders with complete primary dentition, whose parents agreed to participate in the study. Children with any kind of chronic disease, developmental tooth anomalies, extensive proclivity and/or occlusal caries, premature loss, or erupted permanent teeth were excluded from the study.

Data collection: The research consisted of a self-administered questionnaire to the child’s mother/caregiver, and a clinical examination to assess the occlusion of the child. A written informed consent along with the questionnaire was sent to the child’s mother/caregiver one week before the examination visit. The child with signed informed consent, answered the questionnaire, and who meet the inclusion criteria was examined.

The questionnaire was structured based on the one designed by Zhu et al. (10) and modified to meet the objectives of the study. It was divided into three main parts:

- Demographic data of the mother/caregiver: age, education level, and family income.
- Characteristics of the child: age, sex, racial and family history, as well as feeding methods.
- History of previous or persistent dental or oral problems such as other sucking habits, tongue thrusting, mouth breathing and or bruxism (11).

Training, and calibration of three examiners, one examiner, and GA, and HK were done under the guidance of an expert examiner to insure consistency and agreement on the diagnostic criteria. Inter- and intra-examiner reliability was calculated to assure the consistency of the diagnostic criteria among examiners using the Kappa statistics with a result of kappa statistics inter-rater = 0.80; kappa statistics intra-rater = 0.89.

A pilot study was conducted to ensure the smooth running of the study on ten children aged 3 to 5-year-old in the PNU dental clinic. Data from this pilot study were used to modify the questionnaire and examination.

Occlusal examination forms were made to record the following parameters in three spatial planes.