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AIM: This study aimed to examine the accuracy of the Demirjian system in a sample of Western Australian children. MATERIALS AND METHODS: The data were collected from patients attending the Undergraduate Paedodontic Clinic (UGPAEDO) and receiving orthopantomographs (OPG) examination at the Oral Health Centre of Western Australia (OHCWA) in 2005. Three trained observers independently assessed the stages of tooth development of the seven left mandibular permanent teeth using the standard procedures suggested by Demirjian et al. RESULTS: Forty out of 406 patients ranging from 5 to 11 years-of-age (mean=8.08, SD=1.69) were eligible for the study, including 14 females (35.0%) and 26 males (65.0%) with an ethnic background of 20 Caucasians (50.0%) and 20 non-Caucasians (50.0%). Twenty-seven (65.7%) patients received OPG for orthodontic purposes whereas 13 (32.5%) received OPG for other clinical reasons. The accuracy of the Demirjian system was 42.5%. The difference between chronological age and the dental age based on the Demirjian system was significant ($t=3.575$, $df=39$, $p=0.001$). The accuracy of the Demirjian system was higher in the Caucasian ethnicity (chi square=5.013, $df=1$, $p=0.025$). The accuracy of the Demirjian system was not related to gender (chi square=0.496, $df=1$, $p=0.481$) and clinical reasons for assigning OPG (chi square=0.105, $df=1$, $p=0.746$). CONCLUSION: The use of the Demirjian system was more accurate in the Caucasian population. Due to the complex of the ethnic population in Western Australia, the application of the Demirjian system was limited. A new system for age estimation specific to a multiethnic population is indicated.

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