

INPLASY PROTOCOL

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Support: Najran University.

Review Stage at time of this submission: Preliminary searches.

Conflicts of interest:
None declared.

The reliability of Demirjian method when determining dental age in children from Saudi Arabia

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Review question / Objective: Is Demirjian method applicable for children from Saudi Arabia when when determining dental age?

Condition being studied: The dental age has been widely accepted to be part of the assessment in age disputed cases and in forensic science to determine the chronological age. It is important to assess dental age using a reliable and suitable method as incorrectly assessing a child as an adult leaves the child with limited access to education, healthcare and other support provided to children. This systematic review aims to provide a better understanding of the applicability of the Demirjian method to children and adolescents from Saudi Arabia who are of a different population from the original standard.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 March 2022 and was last updated on 27 March 2022 (registration number INPLASY202230153).

INTRODUCTION

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an adult leaves the child with limited access to education, healthcare and other support provided to children. This systematic review aims to provide a better understanding of the applicability of the Demirjian method to children and adolescents from Saudi Arabia who are of a different population from the original standard.

METHODS

Search strategy: A systematic search using the Medline database is conducted to include studies published between 1st January 2000 and 1st May 2022 (keywords "Demirjian"; "dental age"). Each study's title and abstract are screened to determine whether it presented data related to dental age assessed by Demirjian's method. The full text will be retrieved when the reviewer cannot decide on the study's eligibility by examining the title and abstract. "demirjian"[All Fields] OR "demirjian s"[All Fields]) AND ("demirjian"[All Fields] OR "demirjian s"[All Fields])) OR (("dental health services"[MeSH Terms] OR ("dental"[All Fields] AND "health"[All Fields] AND "services"[All Fields]) OR "dental health services"[All Fields] OR "dental"[All Fields] OR "dentally"[All Fields] OR "dentals"[All Fields]) AND ("age"[Journal] OR "age omaha"[Journal] OR "age dordr"[Journal] OR "adv genet eng"[Journal] OR "age"[All Fields])) AND ("saudi arabia"[MeSH Terms] OR ("saudi"[All Fields] AND "arabia"[All Fields]) OR "saudi arabia"[All Fields])) AND (2000:2022[pdat]).

Participant or population: Children and adolescent Age between 14- 19 years old.

Intervention: Assessing dental age.

Comparator: Dental age established by the reference standard.

Study designs to be included: diagnostic accuracy studies.

Eligibility criteria: 1. Research articles that used Demirjian's method 2. Research papers that included only healthy

population 3. The result should be in form of mean differences and standard deviation 4. Limited to Saudi population in which the article should clearly illustrate it.

Information sources: The Web of Science, PubMed, The Cochrane Library, EMBASE dataset.

Main outcome(s): This systematic review is more focused to a specific population (Saudi Arabians) in which at least one factor is more likely to reduce the heterogeneity between the different studies. Several measurement errors can arise when determining dental age from a radiograph including the subjective interpretation of the images against Demirjian standard.

Data management: The reviewer has developed a spreadsheet to record and compare the following data between studies; how the study was conducted, sample size, participant sex and age, the area of Saudi in which the study was carried out, mean difference between dental age and chronological age (DA-CA) and conclusions.

Quality assessment / Risk of bias analysis: The methodological quality of the included studies is assessed using QUADAS-2 18. This is a checklist to assess the applicability and risk of systematic bias in studies of diagnostic tests studies. We consider that the QUAD-2 is the checklist quality assessment that is best for this systematic review. The QUAD-2 checklist has four domains as following: selection of participants; index test; reference test; flow and time aspect.

Strategy of data synthesis: In this part of the analysis, the effect size is calculated based on the mean differences between dental age and chronological age. Nevertheless, the standard deviation will be calculated for those studies that report the (SD) based on yearly interval using normal assumption. For the meta-analysis, we are interested in describing how the difference between the chronological age and dental age (DA-CA) distributed. Looking at the

literature that used the Demirjian method, some studies calculated SD of the differences between DA-CA difference directly (based on differences individual level), while other studies reported SD of chronological age and dental age and reconnection the relationship between these two variables. For the latter studies, we will estimate the SD for difference between chronological age and dental age (for given chronological age categories).

Subgroup analysis: Males and females will be analysed separately.

Sensitivity analysis: To assess statistical heterogeneity between studies, the p-value of heterogeneity test (based on "Cochran's Q" test statistic) will be used, and percentage of total variation can be explained by heterogeneity I². If the p-value of the test is low (eg. <0.1), this indicates that the observed difference between the studies is greater than the difference one would expect by random variation between the results in the studies.

Language: English.

Country(ies) involved: Saudi Arabia.

Keywords: dental age, chronological age, Demirjian.

Contributions of each author:

Author 1 - Khalaf Alshamrani - Drafted the manuscript.

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Author 2 - Hassan Alshamrani - Methodology.