Du et al. INPLASY protocol 2026110096. doi:10.37766/inplasy2026.11.0096 Downloaded from https://inplasy.com/inplasy-2026-11-0096/

INPLASY

Comfort and Acceptance of Digital Versus Conventional Dental Impressions in Paediatric Patients: A Systematic Review and Meta-Analysis

INPLASY2026110096
doi: 10.37766/inplasy2026.11.0096
Received: 24 November 2026
Published: 24 November 2026

Du, J; Xing, Y; Yin, W.

Corresponding author:
Jing Du

dujing_d67@163.com

Author Affiliation:
Shanghai Jiangong Hospital.

ADMINISTRATIVE INFORMATION

Support - Shanghai Jiangong Hospital.

Review stage at the time of initial registration - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026110096

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 November 2026 and was last updated on 24 November 2026.

INTRODUCTION

Review question / Objective To systematically evaluate the comfort and acceptance of digital intraoral scanning versus conventional impression techniques in paediatric patients.

Condition being studied Dental impressions are a fundamental and critical procedure in paediatric dentistry and orthodontic treatment. Conventional impressions typically use alginate or elastomeric impression materials via impression trays to capture dentition data. In recent years, digital intraoral scanning technology has been increasingly applied in dental clinics.

METHODS

Participant or population Participants were healthy children under 18 years of age, regardless of gender and race, whose treatment plans involved the making of dental impressions.

Intervention The experimental group utilised digital intraoral scanning technology to acquire patients' three-dimensional oral data.

Comparator The control group used commonly applied clinical conventional impression techniques, including but not limited to alginate, polyvinyl siloxane or polyether impression materials.

Study designs to be included Study selection was performed independently by two researchers based on the inclusion and exclusion criteria. Initial screening was conducted by reading the titles and abstracts of the literature, followed by a full-text review of studies that potentially met the inclusion criteria. In the event of a disagreement between the two researchers, a consensus was reached through discussion or by consulting a third researcher. After the completion of study selection, data extraction was conducted independently by the two researchers using a standardised data extraction form. The extracted information.

Eligibility criteria Four electronic databases, namely PubMed, Web of Science, Cochrane Library and Embase, were systematically searched between their inception and 10 June 2026. The literature search keywords included: 'pediatric', 'children', 'digital impression', 'intraoral scanning', 'conventional impression', 'alginate', 'patient comfort', 'patient satisfaction' and 'Visual Analog Scale'. The detailed literature search strategy is presented in the supplementary file. In addition, target literature was obtained by reviewing the reference lists of the included studies.

Information sources Four electronic databases, namely PubMed, Web of Science, Cochrane Library and Embase, were systematically searched between their inception and 10 June 2026. The literature search keywords included: 'pediatric', 'children', 'digital impression', 'intraoral scanning', 'conventional impression', 'alginate', 'patient comfort', 'patient satisfaction' and 'Visual Analog Scale'. The detailed literature search strategy is presented in the supplementary file. In addition, target literature was obtained by reviewing the reference lists of the included studies.

Main outcome(s) The primary outcomes were patient-reported comfort, specifically quantitatively assessed using standard scales such as the Visual Analog Scale (VAS) or the Likert scale.

Quality assessment / Risk of bias analysis This study employed the Cochrane Risk of Bias 2.0 (RoB 2) tool to assess the methodological quality of the literature[11]. This tool evaluates the risk of bias across five specific domains: bias arising from the randomisation process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in measurement of the outcome and bias in selection of the reported result. Based on the answers to the signalling questions, the risk of bias for each domain and the overall study was judged as 'low risk' (if all specific domains were rated as low risk), 'some concerns' (if at least one domain was evaluated as having some concerns but no domain was at high risk) or 'high risk' (if any single domain was rated as high risk).

Strategy of data synthesis Statistical analysis was performed using Stata 16.0 software. The primary outcomes were patient-reported comfort, specifically quantitatively assessed using standard scales such as the Visual Analog Scale (VAS) or the Likert scale. Because comfort might be assessed using scales with different dimensions across studies, the standardised mean difference (SMD) and its 95% confidence interval (CI) were used as the effect size; if data heterogeneity was low and the measurement units were consistent, the mean difference was used for pooling. For crossover studies, researchers accounted for the paired nature of the observations following the Cochrane Handbook guidelines by incorporating within-participant correlations to derive adjusted variance and standard error estimates, thereby ensuring appropriate precision and study weighting in the meta-analysis. Additionally, for studies that evaluated two digital impression systems against a single conventional impression group, the sample size of the shared control group was halved in each comparison while retaining the original means and standard deviations to avoid double-counting participants.

Subgroup analysis Heterogeneity was assessed using the I^2 statistic and Cochran's Q test. If I^2 0.1, the included literature was considered homogeneous, and a fixed-effects model was utilised for analysis; if $I^2 > 50\%$ or $P \leq 0.1$, indicating poor homogeneity among the included studies, a random-effects model was used for analysis. Leave-one-out sensitivity analysis was conducted to evaluate whether the direction and statistical significance of the pooled results were influenced by any single study. Because fewer than 10 studies contributed to each outcome indicator and traditional funnel plots are susceptible to subjective visual interpretation when study numbers are small, exploratory Begg's and Egger's tests were conducted for the two core outcomes with the largest number of studies (general discomfort and gag reflex) to evaluate potential small-study effects. Unless otherwise specified, the statistical significance level for this study was set at $P < 0.05$.

Sensitivity analysis Heterogeneity was assessed using the I^2 statistic and Cochran's Q test. If I^2 0.1, the included literature was considered homogeneous, and a fixed-effects model was utilised for analysis; if $I^2 > 50\%$ or $P \leq 0.1$, indicating poor homogeneity among the included studies, a random-effects model was used for analysis. Leave-one-out sensitivity analysis was conducted to evaluate whether the direction and statistical significance of the pooled results were influenced by any single study. Because fewer than 10 studies contributed to each outcome indicator and traditional funnel plots are susceptible to subjective visual interpretation when study numbers are small, exploratory Begg's and Egger's tests were conducted for the two core outcomes with the largest number of studies (general discomfort and gag reflex) to evaluate potential small-study effects. Unless otherwise specified,

Du et al. INPLASY protocol 2026110096. doi:10.37766/inplasy2026.11.0096 Downloaded from https://inplasy.com/inplasy-2026-11-0096/

the statistical significance level for this study was set at $P < 0.05$.

Country(ies) involved Multiple countries in Europe and the Middle East.

Keywords paediatric, dental impression, digital, comfort.

Contributions of each author
Author 1 - Jing Du
Author 2 - Yaqin Xing
Author 3 - Weijiao Yin

Du et al. INPLASY protocol 2026110096. doi:10.37766/inplasy2026.11.0096 Downloaded from https://inplasy.com/inplasy-2026-11-0096/