

01 / Statistical review

Fictional scenario - not a client study or a publication claim

Brief: A retrospective dental study compares two restorative materials. Several observations come from the same patient. The draft methods section treats every observation as independent.

Priority 1 - Define the unit of analysis

Teeth from the same patient may be correlated. Confirm whether treatment is assigned by patient or tooth and whether patients contribute to one or both material groups. Select a model that represents this structure before interpreting a group comparison.

Priority 2 - Explain exclusions and missingness

Request the number of patients, teeth and excluded observations, with reasons. Report missing values by variable and group. Agree a defensible handling strategy; do not silently remove incomplete records.

Priority 3 - Separate association from causation

In a retrospective comparison, treatment selection may be related to prognosis. Describe the result as an association, identify plausible confounders and distinguish planned adjustment from exploratory work.

What the researcher receives

An annotated review, a prioritised correction list and an agreed reanalysis plan. Additional modelling is a separate task once the data structure and scope are confirmed.

This sample demonstrates the review process. No dataset was analysed and no clinical result is claimed.

02 / Sample-size planning

Hypothetical assumptions - not a completed G*Power calculation

Brief: Plan a two-group comparison of an independent continuous outcome with equal allocation. The assumed standardised difference is 0.50, two-sided alpha is 0.05 and target power is 80%.

Transparent planning calculation

Using a normal approximation:

$$n \text{ per group} = 2 \times (1.960 + 0.842)^2 / 0.50^2$$

Unrounded result: 62.79; round up to 63 evaluable participants per group. With 15% anticipated loss, recruit $\text{ceil}(63/0.85) = 75$ per group, or 150 in total.

What changes the answer?

An exact two-sample t-test calculation can require a slightly different sample size. Pairing, unequal allocation, clustering, multiple primary outcomes, unequal variances and a different clinically meaningful effect change the design requirements.

Before a final recommendation

Confirm the primary outcome, effect-size justification, intended test, expected variability and attrition with the investigator. Sensitivity analyses should show how the required sample changes across credible assumptions.

Deliverable

A short planning memo showing the source of every assumption, software and settings actually used, required evaluable sample, recruitment target and design limitations.

Normal quantiles were calculated programmatically for this demonstration. This page is not labelled as SPSS or G*Power output.

03 / Reviewer response

Fictional reviewer comment and proposed response structure

Reviewer comment: “Please explain how the analysis accounts for multiple measurements from the same participant and provide effect estimates with confidence intervals.”

Our first step

Check participant identifiers, time points, missing visits and the original model. Determine whether the concern is an incomplete methods description or a model that must be changed.

Response plan

1. State the unit of analysis and correlation structure.
2. Explain the model selected and why it fits the design.
3. Report the estimated contrast, units, confidence interval and analysis population.
4. Identify the revised table and manuscript location.
5. Explain any remaining limitations.

Illustrative wording after verification

“Thank you for highlighting the dependence between repeated observations. We have clarified how the analysis accounts for measurements within participants and expanded the reporting of effect estimates and confidence intervals. The revised methods and results identify the model specification, analysis population and missing-data approach.”

What is checked before delivery?

Every statement must match the model actually fitted and the revised manuscript. Model assumptions, denominators and table-text consistency are checked. A request for unsupported claims or a particular significance result is not an analysis objective.

This is a response template, not a claim that a revision, model fit or journal acceptance has occurred.