

1. *Nurse Res.* 2025 Dec 10;33(4):32-39. doi: 10.7748/nr.2025.e1948. Epub 2025 Oct 30.

Qualitative data saturation in health sciences research

Background: Deciding when and where to stop gathering data is a significant challenge for novice and even seasoned qualitative researchers. Qualitative data saturation (QDS) is a well-known concept, but some researchers may struggle to identify explicit indications and stages of saturation.

Aim: To use the literature and the author's experiences to discuss possible benchmarks that researchers may find helpful when collecting qualitative data.

Discussion: This article considers how to operationalise data saturation, data saturation points, and quality and quantity of data in saturation, as well as some possible pitfalls.

Conclusion: The concept of saturation is most effectively contextualised within a study design when inductive reasoning is employed. Deductive reasoning may prove beneficial to qualitative researchers when predetermined averages of previous study samples in a similar context are used as a guide.

Implications for practice: The author proposes effective approaches to QDS as a guide for future qualitative research.

2. *BMC Med Res Methodol.* 2025 Dec 2;26(1):2. doi: 10.1186/s12874-025-02736-6.

The longitudinal qualitative research design in nursing, health, and social care research: philosophy, methodology, and methods

Background: The longitudinal qualitative research (LQR) approach is an emerging design in nursing research which focuses on examining changes in experiences over specified timepoints. While some authors have tied this approach to a specific qualitative tradition such as phenomenology and case study, other authors have associated it with two or more qualitative methodologies. Yet, others have also argued it is untied to a specific qualitative tradition. Thus, there is palpable confusion regarding whether it is a methodology or merely a method. Additionally, its guiding paradigm or philosophical/ theoretical foundations remain poorly articulated or loosely defined within the broader qualitative research tradition.

Objective: This methodological discussion paper sought to examine the guiding paradigm/ philosophical underpinning, methodology, and methods unique to LQR to ground it within the broader qualitative research tradition. A secondary goal, perhaps more nuanced, is to generate further scholarly discussions regarding LQR and its application to nursing, health, and social care research.

Design: Methodological discussion **FINDINGS:** When the term "longitudinal" is applied to a qualitative methodology, the emphasis is on repeated data collection informed by that methodology's theoretical perspective. However, when LQR is used, then it is to be considered as a methodology characterised by a focus on change, meaning, and time grounded in context, an emphasis on participants' own reflections of their subjective experiences and the researchers understanding of them. LQR emphasises reflective, second-order perspective (the world as experienced and perceived/ understood). With the need to uncover change across time, its dynamics, and mechanisms, LQR is argued to be potentially underpinned by the critical realist theoretical/ philosophical stance. Methodologically, LQR lends itself to methodical flexibility and pluralism. Despite its strengths, some challenges are noteworthy including attrition, time and resource demands, data management, ethical considerations, researcher bias, analytical complexity, contextual changes, and issues of transferability.

Conclusions: LQR is a methodology fit for uncovering meaning, dynamics, and mechanisms of change over time and bound to specific contexts albeit its conduct requires careful planning and availability of adequate resources.

3. *J Biomol Tech.* 2025 Dec 15;36(4):19-24. eCollection 2025.

Regional and National Shared Research Resources: Challenges and Opportunities

Shared Research Resources (SRRs), also known as Core Facilities or Research Service Centers are essential for advancing scientific research in academic, government, industry, and non-profit institutions since they provide access to advanced resources like innovative research technologies, latest equipment in variety of platforms, and expert personnel with skills to solve complex problems as well as providing training and pursue technology development. Traditionally, SRRs are thought of as confined to academic R1 universities and non-profit organizations. However, many regional centers and national laboratories also feature core facilities that cater to local, regional, national, and international users. Like traditional SRRs, these facilities provide user training, in-person access, and remote access to instruments and services. In this section, we will discuss some

of the opportunities these cores provide to scientists worldwide. We will also discuss some of the challenges these facilities face in running and maintaining such a large and continuous operation with many users.

4. *J Epidemiol Community Health.* 2025 Dec 10;80(1):55-61. doi: 10.1136/jech-2025-224437.

Framework and key considerations for designing and conducting critical mixed-methods research (cMMR)

Mixed-methods research leverages the strengths of qualitative and quantitative methodologies and methods to generate a comprehensive understanding of phenomena. There is ample guidance about traditional mixed-methods research, but limited discussion on critical mixed-methods research. To provide a conceptual framework and practical considerations for designing and conducting critical mixed-methods research. Contemporary and classical literature in critical research and mixed methods was used to guide the development of this framework. Critical mixed-methods research is informed by critical social theory, critical dialectical pluralism and transformative worldview. The seven core features of critical mixed-methods research are critique, insight, transformation, engagement, epistemic inclusion, critical reflexivity and intersectionality. Critical mixed methods is necessary and needed for studying social justice and equity-related research problems in health sciences and public health. Using the proposed framework and practical strategies can enable researchers to unravel complex social and healthcare phenomena through addressing power, oppression and social justice issues.

5. *Clin Spine Surg.* 2025 Dec 26. doi: 10.1097/BSD.0000000000002014. Online ahead of print.

Understanding Mendelian Randomization

Mendelian randomization (MR) is a statistical method that is rising in popularity. Although randomized controlled trials (RCTs) remain the gold standard in terms of inferring causality, they are not always feasible due to time, ethical, and resource constraints. Therefore, MR can be used to establish causality through observational and noninterventional data coupled with large and quickly growing genome-wide association studies (GWAS), thereby overcoming the confounding limitations of observational studies. This article aims to provide the reader with a better understanding of Mendelian randomization and expand on how this method investigates causal relationships and provides examples relevant to orthopedic surgery.

6. *Biochem Med (Zagreb).* 2026 Feb 15;36(1):010101. doi: 10.11613/BM.2026.010101. Epub 2025 Dec 15.

Effect sizes for nonparametric tests

Effect size measures are important complements to P values, providing information about the magnitude and practical relevance of research findings. While widely discussed in the context of parametric tests, effect size estimation for nonparametric tests remains less explored. This article reviews standardized effect size measures applicable to four common nonparametric tests: Mann-Whitney, Wilcoxon signed-rank, Kruskal-Wallis, and Friedman. Commonly suggested classifications for these effect sizes are also discussed. This article aims to support researchers in reporting and interpreting effect sizes more effectively in nonparametric contexts.

7. *Stat Med.* 2025 Dec;44(28-30):e70353. doi: 10.1002/sim.70353.

Effects Among the Affected

We propose a novel causal estimand that elucidates how response to an earlier treatment (e.g., treatment initiation) modifies the effect of a later treatment (e.g., treatment discontinuation), thus learning if there are effects among the (un)affected. Specifically, we consider a working marginal structural model summarizing how the average effect of a later treatment varies as a function of the (estimated) conditional average effect of an earlier treatment. We define the estimand to be a data-adaptive causal parameter, allowing for estimation of the conditional average treatment effect using machine learning without making strong smoothness assumptions. We show how a sequentially randomized design can be used to identify this causal estimand, and we describe a targeted maximum likelihood estimator for the resulting statistical estimand, with influence curve-based inference. We present simulation studies that evaluate the performance of this estimator under various finite-sample scenarios. Throughout, we use the "Adaptive Strategies for Preventing and Treating Lapses of Retention in HIV Care" trial (NCT02338739) as an illustrative example, showing that discontinuation of conditional cash transfers for HIV care adherence was most harmful among those who had an increase in benefit from them initially.

8. *MethodsX*. 2025 Nov 26;15:103739. doi: 10.1016/j.mex.2025.103739. eCollection 2025 Dec.

LOSARI: A novel R-based statistical software to facilitate students' self-regulated learning in statistics courses

This article presents the development of LOSARI, a novel R-based statistical software designed to facilitate students' self-regulated learning (SRL) in statistics courses. LOSARI can be accessed online without installation and allows students to perform statistical analyses through a point-and-click interface without coding. It integrates several innovative features: interactive video tutorials embedded in the analysis environment, real-time error notifications that guide students in correcting mistakes, and automatic interpretation of results to support independent learning. The software was validated through a student satisfaction survey using the End-User Computing Satisfaction (EUCS) model, which indicated that most users had positive perceptions of LOSARI and found it effective for learning statistics outside the classroom. Possible extensions and enhancements are also discussed. •A structured process for developing LOSARI as an R-based statistical learning tool. •Introduction of key features, including interactive video tutorials, real-time error notifications, and automatic interpretation. •Validation method through student satisfaction measurement and comparison with manual statistical coding.

9. *Am J Emerg Med*. 2026 Feb;100:182-186. doi: 10.1016/j.ajem.2025.12.003. Epub 2025 Dec 6.

The value of P-values in "Table 1"

A traditional "Table 1" describes the characteristics of patients in a study, split by intervention, exposure, or control, not by outcome. Comparing groups in Table 1 with use of P-values is common but is a misuse of hypothesis testing that leads readers astray, often calling attention to meaningless differences while masking important ones. This practice-intended to signal rigor-actually undermines study interpretation, confuses description with inference, and distracts from the clinical meaning of the data while perpetuating myths and misunderstandings about P-values. Consistent with best-practice guidelines for reporting both randomized trials and observational studies, the reporting of P-values in Table 1 should be eschewed. A holistic assessment of Table 1, placed in the unique clinical context of the study at hand along with basic descriptive statistics, offers readers and authors a superior method to compare study groups in order to assess the validity of the study.

10. *Front Neuroendocrinol*. 2025 Dec 8;80:101228. doi: 10.1016/j.yfrne.2025.101228. Online ahead of print.

From significant to meaningful: ATOMizing the study of sex differences and similarities

The sex differences field often relies on an implicit and flawed heuristic: defining a "difference" by any statistically significant gap between group averages. This practice yields findings that are often not useful, even counterproductive, for understanding sex-related variation and for advancing personalized healthcare. Following current statistical consensus, we argue that sex differences should be defined not by significance alone but by context-dependent criteria prioritizing informativeness. Drawing on the American Statistical Association's ATOM principles (Accept uncertainty, be Thoughtful, be Open, be Modest), we call for explicit, justified definitions and for a shift from group averages to meaningful individual variation. To illustrate this methodological and philosophical shift, we introduce Thresholded Probability of Superiority (TPS), a method that treats sex differences as probability distributions rather than overgeneralized, fixed abstractions. Thus, TPS allows for a more nuanced, relevant, and actionable understanding of sex-related variation, with greater potential to inform precision medicine.

11. *Stat Med*. 2025 Dec;44(28-30):e70314. doi: 10.1002/sim.70314.

A Review of Methods for Research Synthesis

Meta-analysis consists of a wide range of methods for summarizing existing research, often by aggregating summary statistics. The dominant methods are the fixed effect and the random effects models, which assume that all studies included in a meta-analysis are similar. In many scenarios, the available studies differ in important ways, for example, in terms of research design and sample population. To handle this heterogeneity, more advanced methods are required. In this article, we review some of these methods that have been proposed in the past decades: hierarchical models, bias adjustment and quality weighting methods, Bayesian methods, and decision-centered meta-analysis. We aim to describe the theoretical rationale behind the methods and to give examples of applications. Each method has advantages and limitations, and we consider ways of combining methods.

12. *J Korean Med Sci*. 2025 Dec 22;40(49):e342. doi: 10.3346/jkms.2025.40.e342.

Artificial Intelligence in Detecting Statistical Errors: Implications for Authors, Reviewers, and Editors

Choosing the right statistical tests is essential for reliable results, but errors, like picking the wrong test or misinterpreting data, can easily lead to incorrect conclusions. Research integrity implies presenting research that is honest, clear, and uses correct statistics. By identifying statistical errors, artificial intelligence (AI) systems such as Statcheck and GRIM-Test increase the reliability of research and assist reviewers. AI helps non-experts analyze data, but it can be unpredictable for experts dealing with complex data analysis. Still, its ease of use and growing abilities show promise. Recent studies show that AI is increasingly helpful in research, assisting in spotting errors in methodology, citations, and statistical analyses. Tools like LLMs, Black Spatula, YesNoError, and GRIM-Test improve accuracy, but they need good data and human checks. AI has moderate accuracy overall but performs better in controlled settings. The Statcheck and GRIM-Test are especially good at spotting statistical errors. As more studies are retracted, AI offers helpful, albeit imperfect, support. It can speed up peer review and reduce reviewer workload, but it still has limits, such as bias and a lack of expert judgment. AI also brings risks like misreading results, ethical issues, and privacy concerns, so editors must make final decisions. To use AI safely and effectively, large, well-labeled datasets, teamwork across fields, and secure systems are required. Human oversight is always necessary to review research processes and ensure their reliability; humans must make the final decision and utilize AI responsibly.

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