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Redefining Value in Nursing Research: Beyond Statistical Significance to Clinical Relevance

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Abstract

Background: In quantitative nursing research, a comprehensive reporting of results is crucial. Researchers should not only include traditional statistical significance with p-values but also effect size, confidence interval, observed statistical power, and clinical relevance to provide a more holistic understanding of their findings.

Objective: This article addresses key aspects of results reporting in nursing and clinical research. It delves into the importance and interplay of statistical significance, effect size, confidence interval, statistical power, and clinical relevance, and how these elements collectively contribute to a more meaningful interpretation of research outcomes.

Method: The article discusses the outcome measures in clinical research, emphasizing the need to consider their magnitude, precision, and clinical relevance. It offers guidelines for reporting effect size, confidence intervals, and observed statistical power in conjunction with statistical significance to enhance the quality and applicability of research findings.

Conclusion: Incorporating effect size, confidence interval, observed statistical power, and clinical relevance is essential for a complete and informative presentation of results in nursing research. These elements together provide a more nuanced and practically applicable understanding of research outcomes, thereby enhancing the impact of the research on clinical practice.

Keywords: Effect size; Statistical Power Confidence Interval; Clinical Relevance; Consistency; Healthcare applications

Introduction

In the field of nursing research, the traditional reliance on p-values for reporting findings is being reevaluated. The American Statistical Association [1,2] has underscored the limitations of null hypothesis significance testing and suggested alternative approaches that might supplement or replace p-values. While p-values provide a quantitative measure of results, they do not always equate to clinical relevance or practical impact, especially in healthcare research. This calls for a paradigm shift towards integrating additional statistical parameters-effect size, confidence intervals, and statistical power-to ensure research findings are not only statistically significant but also clinically relevant. Recently the use of other parameters such as 'false positive risk' are discussed in a review [3].

Effect Size

Effect size is crucial as it quantifies the magnitude of the difference, association, or prediction strength in a study. It provides a dimension beyond mere statistical significance, allowing for an understanding of the practical importance of the results. For instance, in comparing treatment outcomes, an effect size clarifies how much better one group fared over another, which is critical in clinical decision-making. By comparing effect sizes across studies, researchers can evaluate the consistency and generalizability of findings.

Confidence Interval

Confidence intervals (CIs) offer a range within which the true population parameter lies with a certain level of confidence (typically 95% or 99%). A narrower CI indicates greater precision and reliability of the estimate. In nursing research, where sample sizes can vary, CIs provide insight into the degree of uncertainty associated with the study's findings. For example, a wide CI in a study with a small sample size might suggest the need for caution in interpreting the results.

Statistical Power

Statistical power, or the probability of correctly rejecting a false null hypothesis, is another critical aspect. It is influenced by the

Type II error rate (β), sample size, effect size, and significance level. High statistical power reduces the risk of Type II errors, enhancing the reliability of the research findings. In nursing research, where studies often address vital health outcomes, ensuring adequate power is essential for drawing valid conclusions.

Clinical Relevance

Clinical relevance plays a pivotal role in both clinical and nursing research, serving as a crucial bridge between empirical findings and practical healthcare applications. In clinical research, the focus on clinical relevance ensures that the results of studies are not just statistically significant but also meaningful in real-world medical settings. This approach prioritizes patient-centered outcomes, such as improved quality of life, symptom relief, and enhanced healthcare experiences. In nursing research, clinical relevance translates research findings into practical strategies that can be implemented in nursing practice. It emphasizes the importance of evidence-based practice, where the findings directly inform patient care, nursing protocols, and health policy. By centering on clinical relevance, nursing research can address the unique needs of patients and healthcare systems, leading to more personalized, efficient, and effective care. Ultimately, the emphasis on clinical relevance in both domains ensures that research not only contributes to the body of scientific knowledge but also tangibly improves patient outcomes and healthcare practices.

Conclusion

Considering the American Statistical Association's recommendations, incorporating effect size, confidence intervals, and statistical power alongside p-values in nursing research is imperative. This integrated approach ensures that research findings are not only statistically sound but also hold clinical significance, thereby contributing more effectively to the body of knowledge and enhancing patient care practices.

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