

TRIANGULATION: A METHOD TO INCREASE VALIDITY, RELIABILITY, AND LEGITIMATION IN CLINICAL RESEARCH



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CE Earn Up to 7.5 Hours. See page 113.

Research strives to understand truths about particular phenomena, whether it be the pathophysiology of a disease process or how nursing care affects the outcomes of patients. Our knowledge is always evolving over time. To ensure that the information we derive from research data accurately reflects the truth about phenomena under investigation, different research methods are used. Triangulation is one method that helps increase the validity, reliability, and legitimation, which encompasses credibility, dependability, confirmability, and transferability, of research findings.¹⁻⁴

Triangulation is a research methods strategy that uses multiple data sources, researchers, theories, or research methods to ensure that the data, analysis, and conclusions of a research study are as comprehensive and accurate as possible. It also assists in identifying areas that need further study.²⁻⁷ Clinical researchers can use 4 types of triangulation when planning and implementing a clinical research study: (1) method triangulation; (2) investigator triangulation; (3) theory triangulation; and (4) data source triangulation.^{1,3,5,6}

Method triangulation incorporates multiple research methods to collection data. An example of this type of triangulation might involve using patient chart data, direct patient observations, and patient interviews to allow the clinical researcher to compare data, thereby providing a more complete picture than just using one method such as patient chart data.⁸

Investigator triangulation uses more than one researcher to collect and analyze data. Using multiple researchers helps

ensure that individual bias is better controlled in the research process.

Theory triangulation uses more than one theory to help guide the research design, research study implementation, and interpretation of data. For example, a researcher might consider using Benner's Stages of Clinical Competence (novice to expert) theory,⁹ Kübler-Ross's Five Stages of Grief theory,¹⁰ and Leininger's Theory of Culture Care Diversity and Universality¹¹ to examine the role of new emergency nurses in caring for Native American families who experience the death of a loved one in the emergency department.

Data source triangulation is similar to methods triangulation but focuses more on obtaining data from multiple sources within a single data collection method to ensure that a more complete perspective is obtained. For instance, a nurse researcher who is conducting focus groups to examine perceived self-competency levels in caring for psychiatric patients in acute crisis would want to ensure that the focus group included participants who were representative of staff experience levels, gender, ethnicity, and assigned shifts.

Each of these triangulation types can be used alone or in combination. The research question and design of the study are the driving factors influencing which type(s) of triangulation should be incorporated into a research study. Clinical researchers should clearly articulate the research question(s), because the research question(s) dictate the study design, which in turn provides direction regarding the methods that should be used. The importance of this planning process cannot be overemphasized. Triangulation in qualitative research establishes legitimation, particularly credibility, in qualitative studies. However, triangulation also can be used with quantitative research to increase reliability and validity. Renz, Carrington, and Badger,¹ Foster,² Patton,³ and Tonkin-Crine et al⁶ highlight the importance that triangulation plays in both qualitative and quantitative research studies to obtain a more robust and complete picture of the phenomena under investigation.

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TABLE

Definitions of research approaches

Approach	Definition
Positivist	Belief that there is a single truth that can be measured and studied
Post-positivist	Belief that there is a single reality with hidden variables that prevents us from fully understanding phenomena and there are no absolutes in nature
Constructivist	Belief that multiple realities exist and these realities are dependent on the individuals involved with a specific phenomenon; in short, individuals construct knowledge through their lived and shared experiences

Adapted from Varpio L, Ajjawi R, Monroe LV, O'Brien BC, Rees CE. Shedding the cobra effect: problematising thematic emergence, triangulation, saturation, and member checking. *Med Educ*. 2017;51:40-50.

Although triangulation is a commonly accepted research method, it is not without some controversy. Varpio et al⁴ provide a succinct overview of the 3 main concerns that clinical researchers should consider when incorporating triangulation methods into their research studies. The first 2 concerns focus on the researcher's approach to research. Positivist and post-positivist approaches (Table) believe in a single truth and typically use triangulation to support the credibility of a study.⁴ On the other hand, a constructivist approach (Table) believes that knowledge is constructed through our lived and shared experiences, and thus triangulation is used to capture the richness and diversity of phenomenon perspectives.⁴

Regardless of how clinical researchers plan to implement triangulation methods in research, the type(s) of triangulation methodology must be identified along with a plan for how data will be used in triangulation and how this triangulated data will be used in the final data analysis.⁴ Excluding this type of information from a study interferes with the reader's ability to decide the quality of the study's outcomes. Walsh⁷ cautions clinical researchers against assuming that utilizing triangulation prevents errors in data collection and/or analysis. First, if the collected data are incorrect, no amount of triangulation will correct this problem.⁷ Second, clinical researchers need to be aware that data and triangulation findings can both be wrong for different reasons.⁷ For instance, incorrectly collected data that appear to triangulate with an inappropriate methodology is still not accurate data. Therefore, a critical eye must be maintained when examining data and triangulation findings.

Triangulation also plays an important role in helping to alleviate a chief concern of clinical researchers: identifying data that do not fit the expected outcomes. These unexpected findings often times help identify other aspects that were not previously considered regarding a clinical question. For instance, consider a clinical researcher who has been examining why patients frequently return to the emergency department for chronic illnesses. Medical records reveal that a lack of primary care providers and insurance are contributors to this phenomenon. However, during focus group interviews, it was discovered that reading illiteracy was another contributing factor. The inability to read affected how these patients managed their illnesses, which in turn influenced their decisions about when to utilize the emergency department. Excluding a triangulation method from this study may have led the clinical researcher to fail in identifying this unexpected finding. Developing a broader and deeper understanding of the clinical question provides a better understanding of phenomena, requiring researchers to further probe why these variations have occurred and what is contributing to their occurrence. Clinicians practice on the basis of current information that is available at any given moment in time. It would be naive to believe that no changes occur to practice when further research is conducted despite believing that what we were doing for years was the best thing for our patients.

The method of triangulation provides a more complete picture of study variables, thus helping researchers better understand the truths about particular phenomena. A variety of triangulation methods can be incorporated into the research process. Triangulation benefits research because it enhances a study's rigor through the collection of data from multiple sources. These multiple sources are triangulated, allowing truths in multiple sources to emerge into study data.⁴ With an average delay of 17 years in implementing research into practice,¹² research data must be as rigorous and unbiased as possible to provide the foundations for evidence-based practice changes. Clinicians stay current in practice by utilizing the best evidence possible to provide the highest quality and safest care to patients. By improving a study's rigor and thus improving evidence quality and strength, triangulation methods will positively affect patient care.

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