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Methodology Matters

Trust me, it is valid: Research validity in pharmacy education research

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Abstract

Research validity is a complex concept that is often used loosely or conflated with concepts in measurement validity in published quantitative pharmacy education literature. The problem begins with a lack of clarity of the distinction between four types of research validity including measurement, statistical conclusion, internal, and external validity (i.e., generalizability). In many cases published studies provide only incomplete discussions of measurement and external validity. The problem is exacerbated within the context of measurement validity where validation efforts are often reduced to statements about established levels of reliability. Ineffective discussions of research validity make it difficult to interpret study findings. After reading this article, the reader will be able to identify the different types research validity and discuss issues of research validity in quantitative pharmacy education research more completely.

Keywords: Validity; Internal validity; External validity; Measurement validity; Research methods

The issue

It is an exciting time to be a pharmacy education researcher. The pharmacy profession is experiencing an evolution toward a more expanded scope of practice; as a result, institutions of pharmacy education around the world are adapting to teach new sets of skills that require different ways of teaching. The continuing educational shifts have lead to important research questions that need to be studied. As an educational researcher, there is no better place to be to have a chance to make meaningful contributions.

However, with this tremendous opportunity comes a responsibility to ensure contributions are, in fact, meaningful so that study results can be readily interpreted to inform appropriate changes to educational practice and direction for future research. The question logically arises, then, of exactly how we go about doing that.

To start, findings are made meaningful by discussing them within a context of established practical and theoretical literature in order to provide a clear basis for identifying implications (how study findings inform understanding of theory) and applications (how study findings inform understanding of practice). More applicable to the present discussion, interpretations of study findings are given meaning when they are presented with a clear consideration of issues of research validity.

While the former is hard to comment on without being an expert in particular topics under study, issues with the quality of how research validity is discussed can be identified because an established framework of types of research validity that applies to all quantitative educational research exists.

Current descriptions of research validity identify four types that can be used to evaluate interpretations of research findings—measurement, statistical conclusion, internal, and external. A review of the pharmacy and health science education literature in general shows an apparent lack of clarity of the distinction between the different types of validity evidence. As a result, terminology and concepts of

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research validity tend to be used loosely or incorrectly in much of the quantitative educational literature making study findings difficult to interpret.

In a recent assessment of the articles published in American Journal of Pharmacy Education and Currents in Pharmacy Teaching and Learning from March to May 2015, two types of common problems were identified. First, there are multiple instances where the concept of measurement validity is misrepresented. For example, it is common for researchers to imply measurement validity is a characteristic of an instrument as opposed to a characteristic of an intended use. This is evidenced in broad statements about the use of "validated instruments" without explanations about how the cited validation supports the use in the context of the particular study. Similarly, it is common for researchers to claim measurement validity based on evidence of sufficient levels of reliability while ignoring the requirement for multiple types of evidence to justify validity claims.

Second, there are multiple instances where discussions of internal and external validity and the distinction between the two are absent from or only vaguely discussed in limitation sections. For example, it is common for researchers to focus on issues of generalizability due to sampling concerns despite the presence of additional important limitations on how study results can be interpreted. The presence of pre-existing differences between comparison groups and the resulting implications for how observed differences can be interpreted are rarely discussed despite obvious relevance.

Taken together, a lack of clarity about types of research validity is leading to some ineffective treatments of them in published studies making findings difficult to interpret. When findings are difficult to interpret they become hard to incorporate into current understandings of theory and practice. For the sake of making research results easier to process, there is a need to revisit the concept of research validity and discuss it in the context of quantitative pharmacy education research.

This article is written to (1) provide a brief and accessible overview of the different types of research validity in quantitative educational research, (2) identify common issues in how validity concepts are discussed or not discussed in the pharmacy education literature, and (3) suggest best practices for how to discuss research validity when writing up quantitative pharmacy education research.

Methodological literature review

Discussions of research validity in the pharmacy and health science education literature

Research validity is a general term for the process of bringing forward multiple sources of evidence to support the interpretation of study findings. Traditionally, there are four areas that serve as the basis to categorize the types of evidence that can be brought forward to validate interpretations of study findings—internal, external, statistical conclusion, and measurement.[1] While discussions of measurement validity are common in the pharmacy education literature, discussions of the other types are not.

With respect to measurement validity, most of the published literature focuses on validation of uses for specific instruments[2–6] or the process of measurement validation itself and how this requires the generation of multiple sources of evidence to support intended interpretations.[7] There is also a tendency for articles to be published about specific types of measurement validity evidence, including reliability evidence[8] or content validity evidence.[9]

A similar situation exists across other professional health science education literature where there are numerous studies describing validation efforts for specific tools[10–13] and many discussions of the measurement validation process and what constitutes measurement validity evidence.[14–21]

In contrast to the pharmacy education literature, however, discussions of the other types of research validity have started to emerge across other professions. For example, in the realm of nursing education, Higgins and Straub[20] describe a framework that differentiates measurement validity from internal, external, and statistical conclusion validity based on two types of error associated with interpreting study results. In medical education, Colliver and McGahie[22] discuss how medical education research is often criticized for its methodological flaws that give rise to uncertain interpretations. They advocate for generating research validity evidence as a way to rule out plausible threats to proposed interpretations. In addition, Kyuzon et al.[23] discuss common errors in statistical analysis that threaten statistical conclusion validity (e.g., failing to adjust for the impact of running multiple statistical tests on the likelihood of observing significant results).

In general, however, the discussion of research validity beyond measurement validity in the other health sciences focuses primarily on the concepts of internal and external valiity.[24–28] While there exists some consideration of the different types of research validity in the context of health science education literature more broadly, few provide an overarching account based on all four types of research validity.

This apparent gap in the literature is problematic given that quantitative educational research is often done under less than ideal conditions that make evaluation of the validity of study finding interpretations of particular importance. We now shift to explore brief definitions of research validity in general and the four types of research validity.

Discussing research validity in quantitative pharmacy education studies

This review has so far focused on articles that have discussed different types of research validity explicitly. The next section focuses on how each type of research validity is