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Short Communication

Guidelines for professional practice in reporting information about measurement instruments in health research



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The goal of this article is to propose a set of guidelines aimed at changing professional practice with respect to how investigators report information about the measurement instruments used in their research, in order to enhance the replicability and utility of research in the health sciences. Based on a combined century of work in the field of measurement, we have identified several commonly used reporting practices that undermine the replicability and utility of health research. These unsound reporting practices make it difficult or impossible for other researchers to replicate the instruments and measurement procedures of prior investigators, and thereby impede scientific progress. As a consequence of these suboptimal reporting practices, if a new study fails to replicate earlier findings, one cannot know whether this failure to replicate is because the earlier findings are spurious or because the new study has used different measures compared to earlier researchers. If investigators in a particular field of research cannot repeat the methods of measurement used in previous studies, then this field is not practicing science.

The problems we have identified involve current practices in reporting the development of new instruments and the modification of pre-existing instruments in peer-reviewed health journals. Unfortunately, these problematic reporting practices are all too common in the health sciences. The fact that these issues are ignored in current published guidelines for research practice and reporting—for example, in public health,¹ epidemiology,² medicine,³ clinical trials,⁴ and psychology⁵—underscores the need for additional reporting guidelines concerning measurement methods and instrumentation. Below we highlight these problematic reporting practices, presenting them in terms of a set of basic questions that published health research articles too often fail to address concerning the development and modification of measurement instruments. Finally, we present a set of guidelines for reporting measurement in health research.

Problems with reporting the development of new instruments

A. What is the new instrument intended to measure?

One of the most serious problems in measurement reporting in health research is the frequent failure of developers of new instruments to explain the purpose of their instrument. This serious oversight makes it impossible to know exactly what a given instrument is intended to measure. Without a clear, precise definition of the target construct that an instrument is designed to measure, there is no way for

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subsequent researchers to know what it is that the instrument assesses.⁶ Yet, health researchers often use a measurement instrument whose purpose they are unable to explain. Clearly, this lack of clarity and specificity in defining the focal constructs being measured compromises the validity and value of scientific research. If readers of an article reporting a newly developed instrument are unable to determine precisely what it is that the new instrument is meant to measure, then the article is not science. As Ziegler⁶ has argued, the definition of a construct should not only include an explanation of its conceptual components and behavioural manifestations, but should also explain its relation to other constructs.

Every health researcher who reports the development of a new measurement instrument should be required to explain clearly and precisely the exact concept or concepts that their instrument is designed to assess. Peer-reviewed health journals should not publish an article reporting the development of a new measurement instrument unless the authors have met this essential requirement. And yet, every year countless health research articles are published reporting the development of a new instrument whose exact purpose is never explicitly specified. This reporting problem must be corrected, if we are to increase the conceptual precision of research measurement and optimise progress in the health sciences.

B. What is the name of the new measurement instrument?

A second problem in measurement reporting in health research is the widespread failure of originators of new measures to title their instruments. Not titling an instrument makes it impossible to track its use and to manage information about it. The lack of a formal title for an instrument also makes it difficult or impossible for other researchers to be sure that they are using the same measures as prior investigators.

How does one find and keep track of other research studies that have used a particular instrument, if the instrument in question has no name or title? Imagine physicians trying to prescribe the proper medication for a particular medical condition, when the medication they are seeking has no official name. How could physicians ever be sure their patients receive the correct drug rather than some other medication that seems similar or identical? Clearly, untitled measurement instruments impair the ability of future scientists both to replicate research using these measures, as well as to conduct meta-analyses of the psychometric properties of these instruments.

Problems with reporting the adaptation of pre-existing instruments

- A. When researchers report using an ‘adapted’ version of a pre-existing measurement instrument, which specific instrument have they modified, who is the author of this original instrument, and what is its original citation?

Clearly, when health researchers have modified a pre-existing measure, they should specify the name and author(s) of the original instrument and provide its original

citation. All too often, however, researchers either fail to report all of this information or report inaccurate information. This problematic reporting practice makes it difficult or impossible for later researchers to determine the origins of the ‘adapted’ instrument or to compare the ‘adapted’ and original forms of the measurement instrument.

- B. When researchers report using an ‘adapted’ version of a pre-existing measurement instrument, what specific changes have they made in ‘adapting’ the instrument?

It is common practice in many health journals for researchers to modify a pre-existing instrument to suit the needs of their research, without reporting the specific nature of these modifications. In their research articles, investigators often simply state that they ‘adapted,’ ‘revised,’ or ‘modified’ an instrument for use in their study—but they do not always explain the precise ways in which they altered the pre-existing measure. This problematic reporting practice leaves unspecified the specific measurements employed, making it impossible for future researchers to replicate the measures used in such studies. As noted earlier, if the methods of research cannot be replicated, then the research is not science. Unfortunately, this unsound reporting practice is rampant in peer-reviewed health research journals. Researchers who modify a pre-existing instrument should explicitly clarify the changes they have made to the instrument, and why these changes were deemed necessary.

- C. When researchers report using ‘selected items’ from a pre-existing measurement instrument, what specific items did these researchers administer and analyse?

In their research articles, health researchers often report using only a subset of the full battery of items from a larger, pre-existing instrument. However, these researchers do not always report the specific items that they used. Clearly, this reporting practice makes it impossible for future researchers to put in place or analyse the same measures used in the earlier study. Once more we note that any field of empirical inquiry that uses non-reproducible methods is not science. Investigators who report using ‘selected items’ from a pre-existing instrument in a research study should explicitly clarify the specific items they administered and analysed, in order to enhance the ability of future health researchers to replicate their measurements.

- D. When researchers report using ‘selected items’ from a pre-existing instrument, on what basis did they decide to administer or analyse only a subset of the original items?

When a health researcher reports using ‘selected items’ from a larger, pre-existing instrument in a research article, it is important for future researchers who wish to replicate this earlier study to know whether the original researcher: (a) selected a subset of items *a priori* at the outset of the study and administered only these selected items to the sample; or (b) administered the full battery of items from the pre-existing instrument and then selected a subset of items to analyse a

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