

Simple Steps: Identifying Valid Research Instruments

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16th Annual Research Day Conference
Organization of Nurse Leaders, NJ



Agenda

Key Definitions

Locating Instruments

Copyrights and Permissions

Research Instruments - AKA

Questionnaires

Surveys

Instruments

Measurement Scale

Measurement Instrument

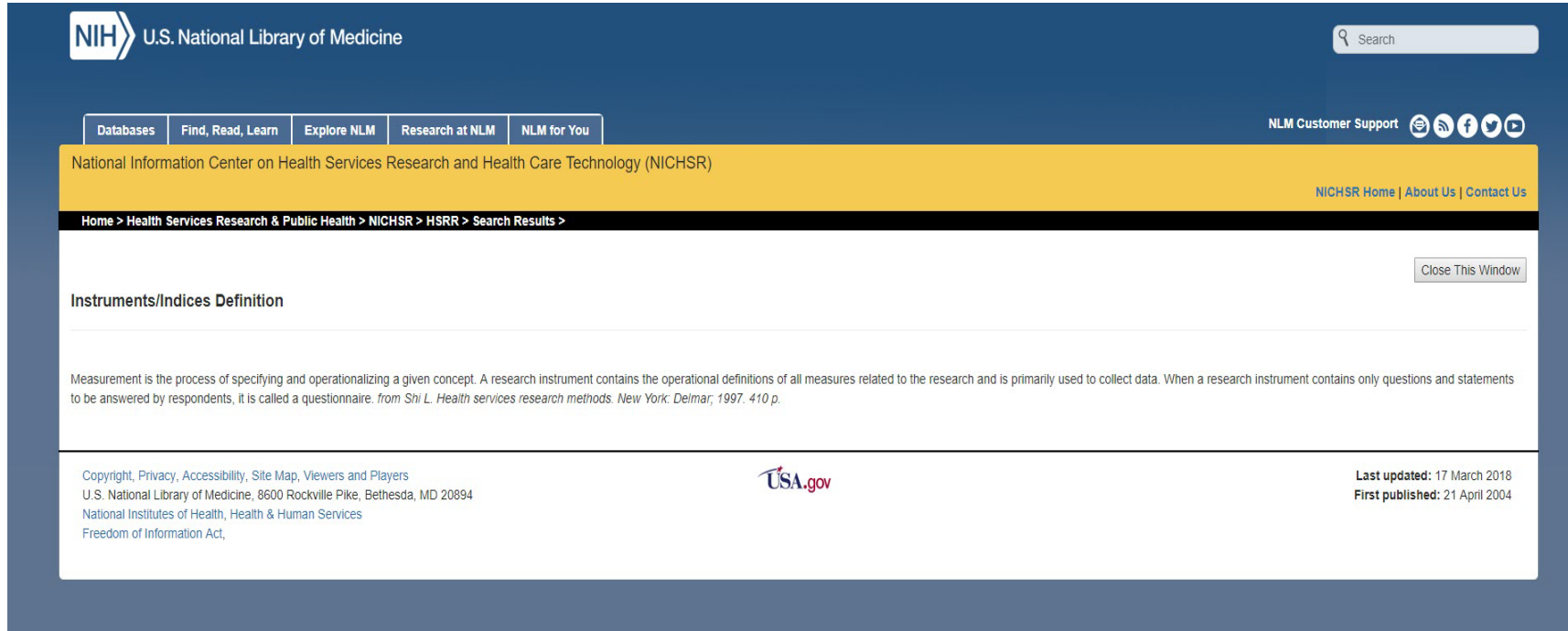




Definitions

Measurement and Research Instrument

“Measurement is the process of specifying and operationalizing a given concept. A research instrument contains the operational definitions of all measures related to the research and is primarily used to collect data.”
(Shi, 1997, p.410). https://hsrr.nlm.nih.gov/hsrr_search/sample_design



The screenshot shows the National Library of Medicine (NLM) website. The header includes the NIH logo and the text "U.S. National Library of Medicine". A search bar is located in the top right. Below the header, there are navigation tabs: "Databases", "Find, Read, Learn", "Explore NLM", "Research at NLM", and "NLM for You". To the right of these tabs is "NLM Customer Support" with icons for email, RSS, Facebook, and Twitter. A yellow banner below the navigation tabs reads "National Information Center on Health Services Research and Health Care Technology (NICHSR)". Below this banner is a breadcrumb trail: "Home > Health Services Research & Public Health > NICHSR > HSRR > Search Results >". The main content area is titled "Instruments/Indices Definition" and contains the following text: "Measurement is the process of specifying and operationalizing a given concept. A research instrument contains the operational definitions of all measures related to the research and is primarily used to collect data. When a research instrument contains only questions and statements to be answered by respondents, it is called a questionnaire. from Shi L. Health services research methods. New York: Delmar; 1997. 410 p." At the bottom of the page, there is a footer with copyright information, the USA.gov logo, and the dates "Last updated: 17 March 2018" and "First published: 21 April 2004".

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Instruments/Indices Definition

Measurement is the process of specifying and operationalizing a given concept. A research instrument contains the operational definitions of all measures related to the research and is primarily used to collect data. When a research instrument contains only questions and statements to be answered by respondents, it is called a questionnaire. from Shi L. Health services research methods. New York: Delmar; 1997. 410 p.

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First published: 21 April 2004



Source: Boynton, P.M. Boynton & Greenhalgh, T. (2004). Selecting, designing, and developing your questionnaire. *BMJ*, 328, p.1312.

Standardized Instruments

Provides confidence in the instrument's validity and reliability.

A valid instrument is reliable.

A prudent researcher has confidence that the instrument measures what it claims to measure, and that the empirical evidence can be trusted.

Instrument Validity

The degree to which an instrument measures what it is supposed to measure (Polit & Beck 2017).

***Importantly:** Validity is not proven or disproven but supported by the degree to which an instrument measures the construct of interest (Burns & Grove 1997).*

Construct Validity

Questions:

- What is this instrument really measuring?
- Does it adequately measure the construct of interest?

Examples: Hypothesis-testing validity

Pilot testing of instruments

Correlation Coefficients

Pearson Correlation Coefficient indicate direction and magnitude of relationships between variables.

Pearson's r Varies Between +1 and -1	
- 1.00	perfect negative correlation
0.00	no correlation
+ 1.00	perfect positive correlation

Three-Types: Theory-based Validity

1. **Face validity** - participants are asked, “if *on face value*” is the instrument measuring what it is supposed to measure.
2. **Content validity** - degree to which an instrument has an appropriate sample of items for the construct being measured.
3. **Construct validity** - use of factor analysis to assess how well items in an instrument relate to each other.



Defining Empirical-evidence Validity

Criterion-related Validity - degree to which the empirical evidence is supported to a greater or lesser extent, as measured by the instrument.

Example: Validity of an instrument for depression is greater if it was found to predict suicide.

Two Types: Criterion-related Validity

1. Concurrent Validity - comparing empirical data from a new instrument that correlates well with an established instrument measuring the same construct.

Example: Compare a new 9-item instrument with the old 50-item version.

2. Predictive Validity - most powerful evidence of an instrument's predictive strength of a future outcome (high correlation between the instrument's data results and a future event).

Example: Apgar score and failure to thrive.

Validity Generalization

The extent to which evidence obtained in one study setting can be generalized to other settings, typically predictive validity (Waltz, Strickland, & Lenz 2010).

***Meta-analysis:** a statistical integration of results to examine a sufficient database of findings from a large set of studies about the same variable.

Reliability

The extent to which the instrument yields the same results repeatedly.

Homogeneity or internal consistency indicates the degree that items on a multi-item scale are measuring the same construct; known as *Cronbach's alpha*.

Reliability Coefficient (R)

.70 at least;
.80 preferred.

Improved by making instrument longer
(adding items).

Are lower in homogeneous than in
heterogeneous samples.



Considerations: Existing Instruments

Is it standardized (valid and reliable)...

Number of items...

How long will it take to complete...

Potential cost...

Are questions safe to administer...



Locating Valid Instruments



[illegible]

Credible Nursing Databases...



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*Key Databases

*CINAHL (Cumulative Index to Nursing and Allied Health Literature) - biomedical and nursing

*(Medline (Medical Literature on-Line) - clinical research

Cochrane Collaboration - primarily research in health care

PsycINFO (including PsycARTICLES) - behavioral sciences, mental health and more...

CINAHL Complete

Specific database of health related research instruments and more...

<https://www.ebsco.com/products/research-databases/cinahl-complete>

Health and Psychosocial Instruments (HaPI)

<https://www.ebsco.com/products/research-databases/health-and-psychosocial-instruments-hapi>

Evidence-Based Databases



ProQuest

- ▶ <https://www.proquest.com/libraries/academic/databases/>

U.S. National Library of Medicine

- ▶ [NICHSR: National Information Center on Health Services Research and Health Care Technology](https://www.nlm.nih.gov/pubs/tech/tech.html)
- ▶ <https://www.ncbi.nlm.nih.gov/pubmed/>

Source: U.S. Department of Health & Human Services, May 24, 2018.

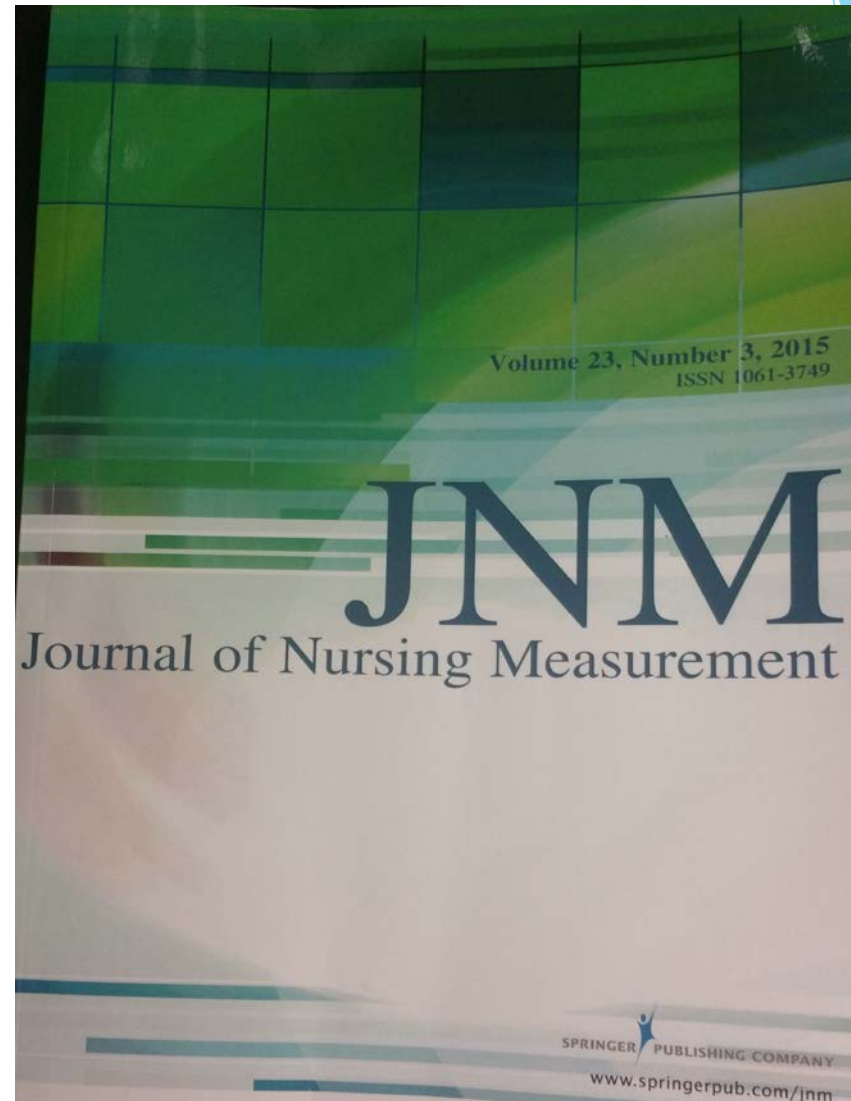
Important Sources...

- ✓ Literature Review
- ✓ Author
- ✓ Contact other researchers
- ✓ Google
- ✓ ProQuest
- ✓ Ask A Librarian

Journal of Nursing Measurement

Focus: Instrument's

- evidence of reliability, validity, sensitivity, and specificity.
- procedures designed or used for measuring variables in nursing research, practice, and education.



<http://www.springerpub.com/journal-of-nursing-measurement.html>

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- Architectural works: buildings.
- Sound recordings: musical, lyrical or spoken-word performances, in any form, podcasts or other interactive medium.
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- Audiovisual: motion pictures, multimedia presentations, demonstrations & slideshows (analog or digital).
- Dramatic: plays & screenplays.
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Implications for Nursing

- ✓ Education
- ✓ Practice
- ✓ Research

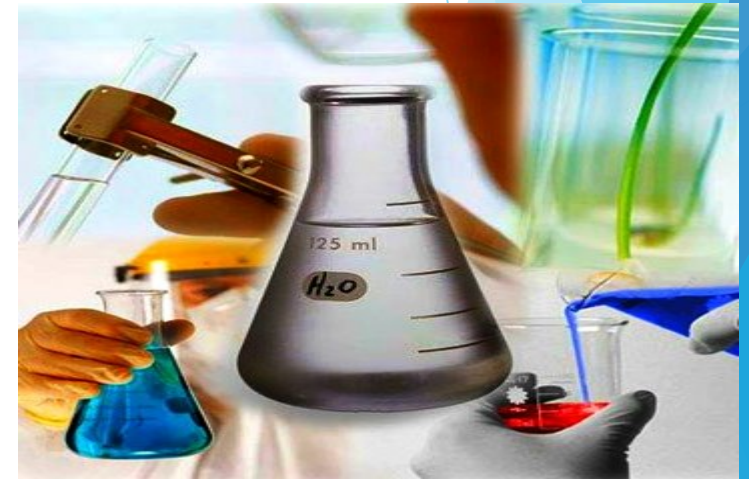


Nursing Education

Academia



Bio-Medical/Nursing



Nursing Practice

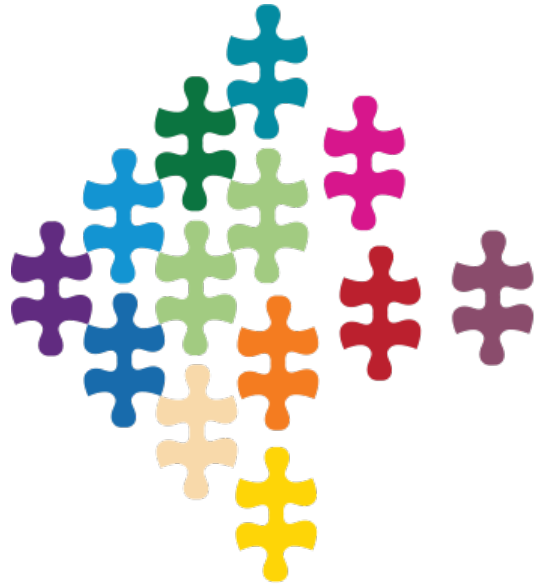
Acute Care



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Nursing Research



NATIONAL INSTITUTE OF NURSING RESEARCH

- Build the scientific foundation for clinical practice
- Prevent disease and disability
- Manage and eliminate symptoms caused by illness
- Enhance end-of-life and palliative care

<http://ninr.nih.gov/ninr/>

TAKEAWAY

- ✓ Gained knowledge and skill in identifying valid research instruments ...

Questions...



Select References

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A photograph of a beach with waves crashing onto the shore. The words "THANK YOU" are written in the sand in the foreground. The water is a mix of blue and green, and the sand is a light tan color. The waves are white and foamy as they break on the beach.

THANK YOU