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Critiquing Nursing Research

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Nursing Leadership Scientific Day

Focus on Nursing Research

12 July 2012

Objectives

On completion of this session participants will be prepared to:

1. Discuss the guidelines for critiquing a research study
2. Critique a selected research study

Critiquing Nursing Research Defined

Critical evaluation/appraisal of research studies through using specific criteria in which the evaluator makes precise and objective judgments about the research study.

The word “critique” is often equated to the word “criticism.” This is unfortunate because the purpose of the research critique is to assess the strengths as well as the weakness of a research study.

Purpose

- Critiquing process aids in development of research skills
- As reader assesses the parts of a published research study, ideas come to mind for:
 - Development of future research studies
 - Improvements in research studies that have already been conducted or those that are in process
 - Improvements in clinical fields
 - Check EBP and systematic reviews

Nursing Research Articles

- Four major areas addressed in journal articles
 - Literature review
 - Research method used
 - Results or findings of the research study
 - Discussion
- Other areas discussed
 - Theoretical framework
 - Conclusion

Contents of Research to be Critiqued

1. Researcher qualifications
2. Title
3. Abstract
4. Introduction
5. Purpose
6. Problem statement
7. Review of the literature
8. Theoretical/conceptual framework
9. Assumptions
10. Limitations
11. Hypothesis (es)
12. Definition of terms
13. Research design
14. Setting
15. Population and sample
16. Data collections methods
17. Data collection instruments
18. Results /data analysis
19. Discussion of findings
20. Conclusion
21. Implications
22. Recommendations
23. Other considerations

Who Critiques Nursing Research?

- Research Committee or IRB for approval
- Journal reviewer before publishing the study
- Nursing conference ‘Scientific Committee’ before approval of a research abstract
- Nurse/student in order to get more information or to explore the experiences of others before conducting research
- Journal club members critique one or a group of articles
- EBP institutions or committees to appraise the research and its impact and its applicability on clinical fields

Strategy for Critiquing Research Articles

- Clear guidelines and framework for critiquing nursing research
- Research critique involves thorough examination of all parts of a research study and makes an initial evaluation report
- Then each part of the study should be subjected to an in-depth evaluation
- The critique checklist is helpful for the evaluation of each element in a systematic, structured way to determine:
 - Presence or absence of necessary elements
 - Good to poor elements
 - Comments about the various parts of the study should be written down as the reader evaluates the study

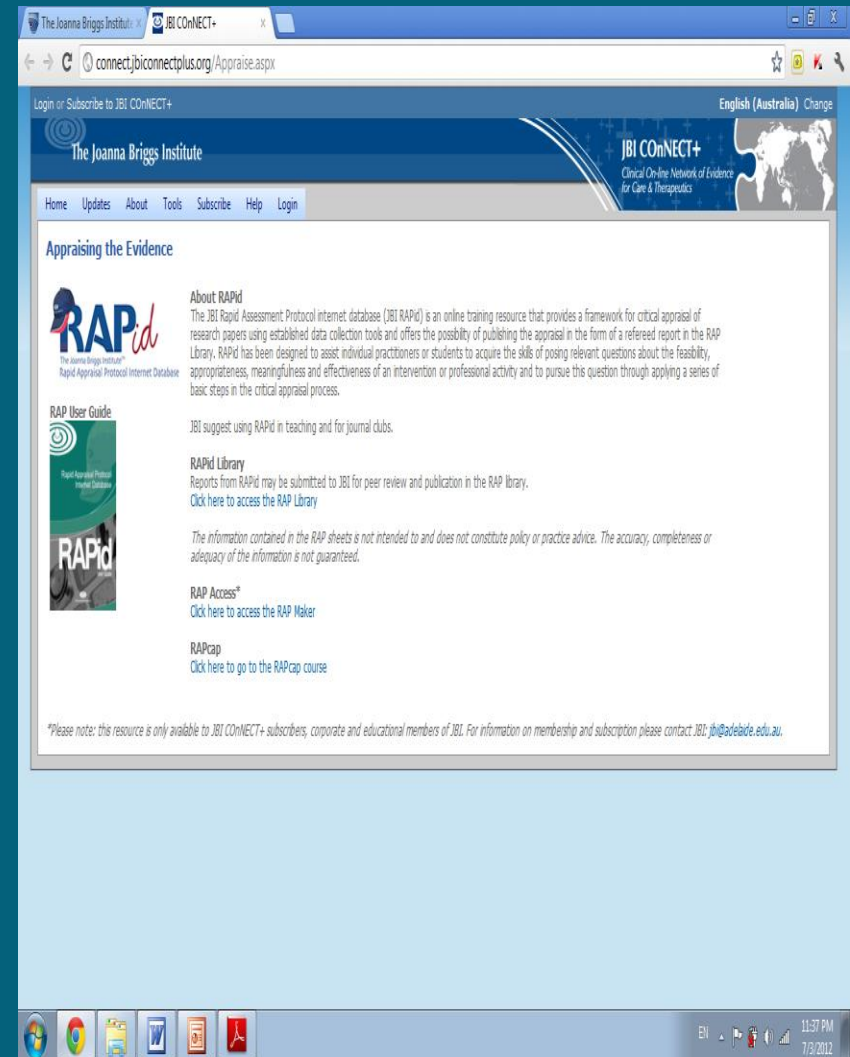
Critique Checklist/Guidelines for Research Articles

- Nieswiadomy, Rose Marie. 2012. *Foundations of Nursing Research*. Sixth edition
- Rebecca, I. 2008. A nurses' guide to the critical reading of research. *Australian Journal Of Advanced Nursing*. Volume 26 Number 1.
- Ryan, Francis. etal. 2007. Step-by-step guide to critiquing research: Part 1. qualitative research. *British Journal Of Nursing*. Volume 16 Number 11.
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- Russell, C. etal .How to develop successful journal club. International transplant nurse society.

Critique Checklist/Guidelines for Research Articles

Critical Appraisal in JBI

- Prognostic study
- Risk study
- Intervention study
- Cost study
- Experience study
- Diagnosis two-level and multi level studies
- Systematic review of interventions



The screenshot shows a web browser window with the URL connect.jbiconnectplus.org/Appraise.aspx. The page is titled "Appraising the Evidence" and features the RAPid logo (Rapid Assessment Protocol Internet Database). The content includes:

- About RAPid:** A description of the online training resource and its purpose for critical appraisal of research papers.
- RAP User Guide:** A link to a user guide for the database.
- RAPid Library:** Information about submitting reports for peer review and a link to access the library.
- RAP Access:** A link to access the RAP Maker tool.
- RAPcap:** A link to go to the RAPcap course.

A disclaimer at the bottom states: "Please note: this resource is only available to JBI CONNECT+ subscribers, corporate and educational members of JBI. For information on membership and subscription please contact: jbi@adelaide.edu.au."

Critiquing Contents of Research

Researcher Qualifications

- What are the researcher's qualifications regarding research study
 - Many nursing research studies in past years were conducted by non nurses.
- Authorities in subject areas are generally more qualified
- Brief biographical sketch that will assist the reader in evaluating the qualifications of the author or authors.
 - If this information is not provided, the initials after the name, such as M.S or Ph.D. will inform the reader of the educational background of the researcher
- If the research has been funded by some organization, such as American Nurses' Foundation, this information should be provided

Critiquing Contents of Research Title

- Clarity & conciseness of title are major considerations
- The focus of the research should be apparent in the title
- It should contain the population and the major variable(s)
- The title should be brief, containing no more than 15 words
- Extraneous words like “A study of...” “The relationship between...,” or “The effect of...” should be avoided
- It is very important that the title contain the critical word → help in searching process for the literature

Critiquing Contents of Research Abstract

- Usually the only section of article that is read
- Abstracts are typically 100 to 200 words in length
- The researcher should present the essential component of the research study in the abstract
 - Hypothesis(es) or research question(s)
 - Methods
 - Description of subjects
 - Major findings

Background → Objectives → Method → Result → Conclusion

Critiquing Contents of Research Introduction

- Should catch interest of reader & set stage for presentation of research study
- Should contain brief exploration of study area
 - Background information on the problem
 - Significance of this problem to nursing is presented
 - Study purpose may be included in this section

Critiquing Contents of Research Purpose

- Reason(s) for undertaking study should have been clearly formulated before research started
- **Broad** purpose of study may be made more specific in the form of objectives or goals

Critiquing Contents of Research Problem Statement

- Should be clearly identified
- Can be declarative or interrogative
 - Interrogative form preferable
- Should contain:
 - Population
 - Major variable(s)
- Ethical nature of study should be clear
- Feasibility & significance of study can be evaluated through the problem statement

Critiquing Contents of Research Literature Review

- Relevance to the study
- Comprehensiveness of the review
- Presents theory and research that both supports and opposes expected study results
- Indicates how present study contributes to existing knowledge

Critiquing Contents of Research

Theoretical/Conceptual Framework

- Framework may be found in the introductory section or the literature review section of the research article
- Is the framework
 - Identifiable?
 - Appropriate one for the study?
 - Based on a nursing theory or a theory from another discipline?

Critiquing Contents of Research Assumptions

- All research studies are based on assumptions
- Assumptions come from theory & previous research
- Explicit assumptions are those asserted by the researcher and are clearly identifiable by the reader
- Implicit assumptions are those made by researcher but are not clearly identified in research study

Critiquing Contents of Research Assumptions

Example

If study determines giving a back rub at bedtime decreases patient requests for sleeping medications, the researcher has made three assumptions:

- Adequate sleep is necessary for patients
- Sleeping medications are not the most healthful type of sleep enhancer
- One of the roles of nurses is to try to assist patients in obtaining adequate sleep

Critiquing Contents of Research

Limitations of the Study

- Limitations of the study must be clearly stated
 - Uncontrolled variables that affect study
 - Aspects of study where no control has been exercised
 - In experimental studies, internal and external threats to validity
 - Inappropriateness of instrument
 - Sample size

Critiquing Contents of Research Hypothesis(es)

- Hypothesis contain population and variables and reflect the problem statement.
- Research studies that examine relationships between variables should contain hypotheses
- When hypotheses are not appropriate for study, research questions may be used
- Hypotheses should be clearly and concisely stated in a declarative sentence and in the present tense
- Hypotheses should be based on theory or research findings

Critiquing Contents of Research

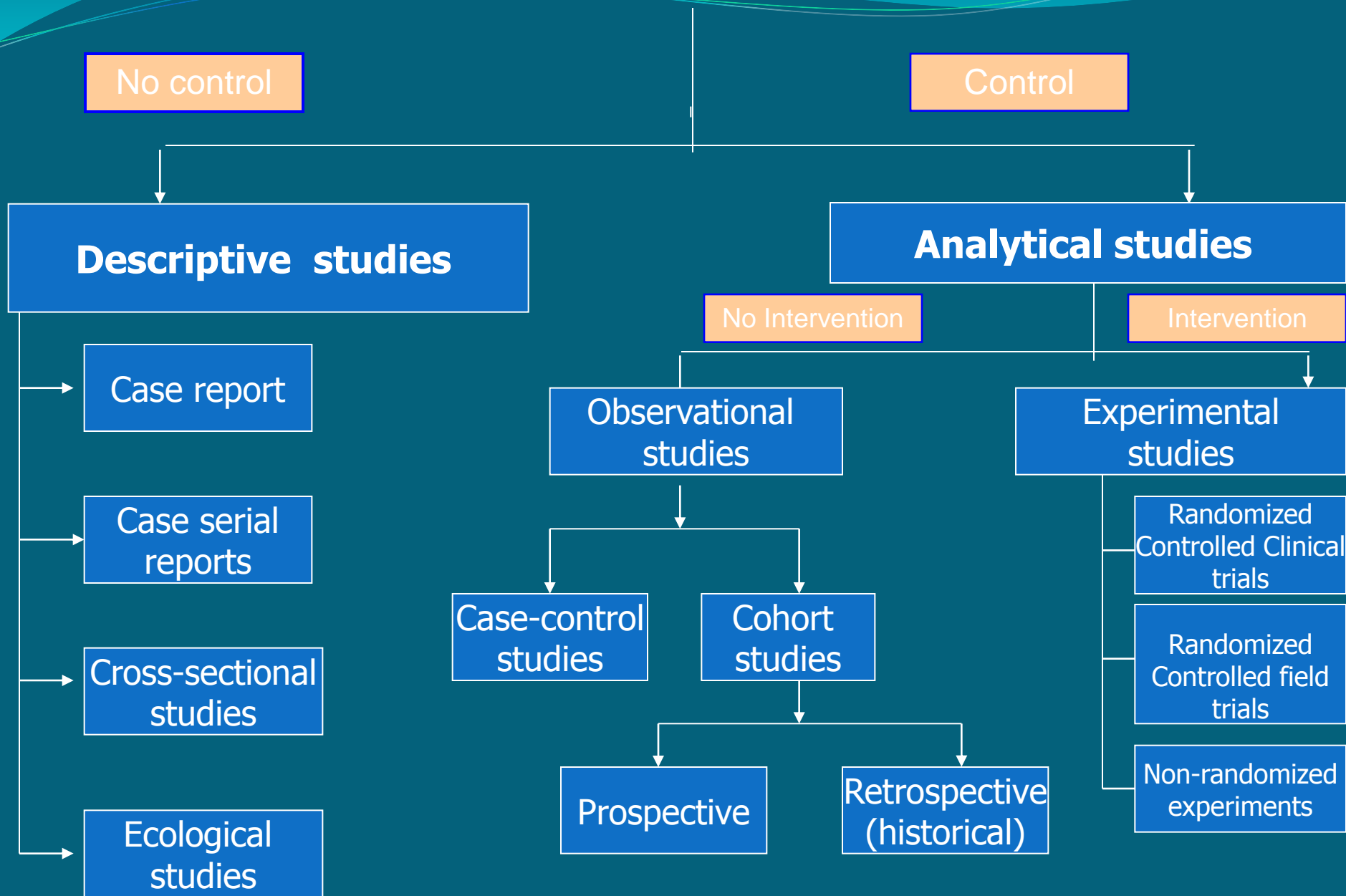
Definition of Terms

- May not be included in journal article because of space constraints
- May be derived from study framework
- Terms defined both conceptually & operationally
 - Conceptual = theoretical
 - Operational = from research instrument used to gather data

Critiquing Contents of Research Research Design

- Clearly identified and adequately described
- Appropriate design for the study under consideration
- Quantitative designs and qualitative designs are evaluated with different criteria
- In experimental studies
 - Is the treatment adequately described and appropriate for the study?
 - The method of assigning subjects to groups, if there is more than one group, should be discussed
 - Means to control threats to internal and external validity should be included in the section on research design

Study Design



Critiquing Contents of Research Setting

- The setting for research study needs to be described
- Many agencies do not want to be identified in research studies
- The description is general in nature
 - “A small, private psychiatric institution in the southeastern United States.”
 - “Tertiary teaching hospital.”

Critiquing Contents of Research Population and Sample

- Sample should be easily determined in research article
- Description of demographic characteristics of sample & sample size
- Percentage of population represented by sample
- Acknowledgment of subjects that drop out
- Protection of subjects' rights
- Include identification and description of sampling method
 - Describe specific type of probability or no-probability sampling method used
 - Determine appropriateness of sampling method

Reference & Study Population

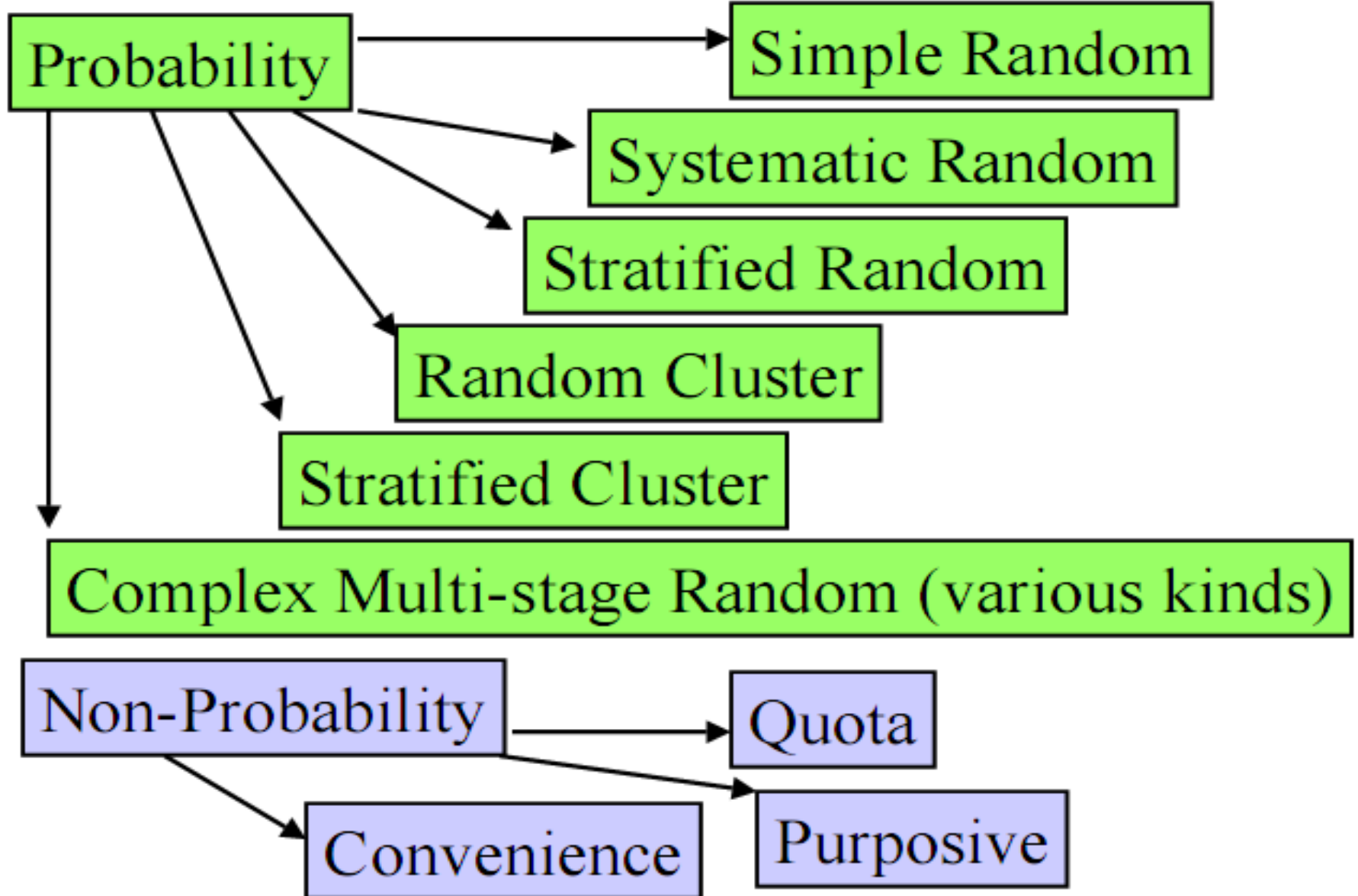


Reference
Population

Study
Population



Types of Samples



Critiquing Contents of Research

Data Collection Methods

- Description of data method should be extensive enough to allow exact replication of research study
- Five general questions asked in evaluating data collection - what, how, who, where, and when
 - What date will be collected?
 - How will the data be collected?
 - Who will collect the data?
 - Where will the data be collected?
 - When will the data be collected?

Critiquing Contents of Research

Data Collection Instruments

- All data collection instruments should be clearly identified and described
- Scoring procedures and range of possible scores on the instrument should be included
- Studies can make use of multiple data collection instruments
- The most important characteristics of an instrument is its reliability and validity

Critiquing Contents of Research

Data Analysis & Findings

- Decide if appropriate statistical tests were selected
- Decide if results are presented accurately and completely
- Was study hypothesis supported or not supported
- Findings should be clearly presented in both the text and the table

TABLE 19-10 Guide to Widely Used Bivariate Statistical Tests

TEST NAME	TEST STATISTIC	BETWEEN OR WITHIN	PURPOSE	MEASUREMENT LEVEL	
				IV*	DV*
Parametric Tests					
<i>t</i> -Test for independent groups	<i>t</i>	Between	To test the difference between two independent group means	Nominal	Interval, ratio
Paired <i>t</i> -test	<i>t</i>	Within	To test the difference between two related group means	Nominal	Interval, ratio
Analysis of variance (ANOVA)	<i>F</i>	Between	To test the difference among the means of 3+ independent groups, or of 2+ independent variables	Nominal	Interval, ratio
Repeated-measures ANOVA	<i>F</i>	Within	To test the difference among the means of 3 + related groups or sets of scores	Nominal	Interval, ratio
Pearson's product-moment correlation	<i>r</i>	Between, within	To test the existence of a relationship between two variables	Interval, ratio	Interval, ratio
Nonparametric Tests					
Mann-Whitney <i>U</i> -test	<i>U</i>	Between	To test the difference in ranks of scores of two independent groups	Nominal	Ordinal
Median test	χ^2	Between	To test the difference between the medians of two independent groups	Nominal	Ordinal
Kruskal-Wallis test	<i>H</i>	Between	To test the difference in ranks of scores of 3+ independent groups	Nominal	Ordinal

(continued)

TABLE 19-10 Guide to Widely Used Bivariate Statistical Tests (Continued)

TEST NAME	TEST STATISTIC	BETWEEN OR WITHIN	PURPOSE	MEASUREMENT LEVEL	
				IV*	DV*
<i>Nonparametric Tests</i>					
Wicoxon signed-rank test	Z	Within	To test the difference in ranks of scores of two related groups	Nominal	Ordinal
Friedman test	χ^2	Within	To test the difference in ranks of scores of 3+ related groups	Nominal	Ordinal
Chi-square test	χ^2	Between	To test the difference in proportions in 2+ independent groups	Nominal	Nominal
McNemar's test	χ^2	Within	To test the difference in proportions for paired samples (2×2)	Nominal	Nominal
Fisher's exact test	—	Between	To test the difference in proportions in a 2×2 contingency table when $N < 30$	Nominal	Nominal
Spearman's rho	ρ	Between, within	To test that a correlation is different from zero (that a relationship exists)	Ordinal	Ordinal
Kendall's tau	τ	Between, within	To test that a correlation is different from zero (that a relationship exists)	Ordinal	Ordinal
Phi coefficient	ϕ	Between	To examine the magnitude of a relationship between two dichotomous variables	Nominal	Nominal
Cramér's V	V	Between	To examine the magnitude of a relationship between variables in a contingency table (not restricted to 2×2)	Nominal	Nominal

*IV, independent variable; DV, dependent variable.

Positive Linear Correlation

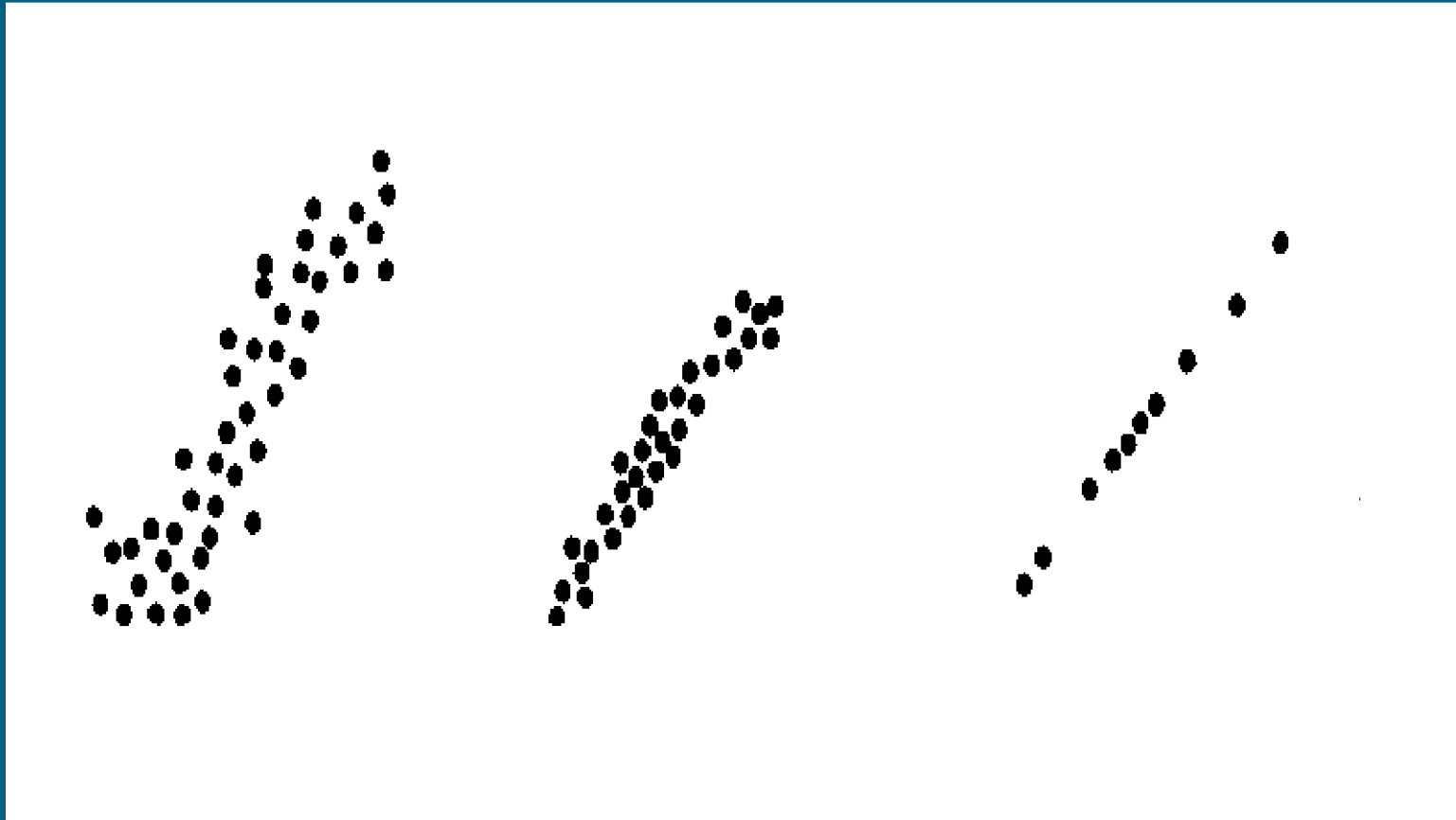


TABLE 20-7 Guide to Selected Multivariate Analyses

TEST NAME	PURPOSE	MEASUREMENT LEVEL OF VARIABLES*			NUMBER OF VARIABLES	
		IV	DV	Cov	IVs	DVs
Multiple regression/ correlation	To test the relationship between 2+ IVs and 1 DV; to predict a DV from 2+ IVs	N, I, R	I, R	—	2+	1
Analysis of covariance (ANCOVA)	To test the difference between the means of 2+ groups, while controlling for 1+ covariate	N	I, R	N, I, R	1+	1
Multivariate analysis of variance (MANOVA)	To test the difference between the means of 2+ groups for 2+ DVs simultaneously	N	I, R	—	1+	2+
Multivariate analysis of covariance (MANCOVA)	To test the difference between the means of 2+ groups for 2+ DVs simultaneously, while controlling for 1+ covariate	N	I, R	N, I, R	1+	2+
Discriminant analysis	To test the relationship between 2+ IVs and 1 DV; to predict group membership; to classify cases into groups	N, I, R	N	—	2+	1
Canonical correlation	To test the relationship between 2 sets of variables	N, I, R	N, I, R	—	2+	2+
Factor analysis	To determine the dimensionality and structure of a set of variables	—	—	—	—	—
Logistic regression	To test the relationship between 2+ IVs and 1 DV; to predict the probability of an event; to estimate relative risk	N, I, R	N	—	2+	1

*Variables: IV, independent variable; DV, dependent variable; Cov, covariate.

†Measurement levels: N, nominal; I, interval; R, ratio.

TABLE 20-8 Examples of Nursing Studies Using Multivariate Statistics

RESEARCH QUESTION	MULTIVARIATE PROCEDURE
What is the relationship between postural control among older adults and their ankle strength, knee strength, age, alertness, and mood? (Topp, Estes, Dayhoff, & Suhrheinrich, 1997)	Stepwise multiple regression
What is the effect of a self-management program for asthmatic adults on asthmatic symptoms and airway obstruction, controlling for initial levels of symptoms and obstruction? (Berg, Dunbar-Jacob, & Sereika, 1997)	Analysis of covariance
What is the structure of symptom distress in women living with advanced lung cancer? (Sarna & Brecht, 1997)	Factor analysis
To what extent do characteristics of percutaneous central venous catheter use in neonates (e.g., length of time catheters were in place) predict sepsis? (Trotter, 1996)	Discriminant analysis
What is the effect of a self-efficacy information intervention for men newly diagnosed with prostate cancer on the men's anxiety and depression levels? (Davison & Degner, 1997)	Multivariate analysis of variance
What is the relationship between the adjustment responses of mothers and the adjustment responses of their children with cancer? (Moore & Mosher, 1997)	Canonical correlation analysis
What is the relationship between self-rated social support network conflict and self-report measures of occupational stressors, job satisfaction, and health outcomes among professional firefighters and paramedics? (Beaton, Murphy, Pike, & Corneil, 1997)	Path analysis
How successful is the Price-Mueller model in explaining job satisfaction and organization attachment among doctorally prepared nurses? (Gurney, Mueller, & Price, 1997)	LISREL
What are the predictors of mortality among intensive care unit patients? (Kollef, 1995)	Logistic regression
What is the effect of chlorhexidine on days to onset of chemotherapy-induced oral mucositis? (Dodd et al., 1996)	Survival analysis

Critiquing Contents of Research Discussion of Findings

- Research reports vary in material presented in discussion of findings section:
 - Data analysis
 - Interpretation of findings
 - Conclusions
 - Implications
 - Recommendations
- Findings or facts of research study are presented in a completely objective fashion
- The author interprets the study results

Critiquing Contents of Research Discussion of Findings

- Author compares present findings with other research studies discussed in the literature review
- No new literature sources should be introduced in findings
- Author must make it clear that findings either supported or failed to support the framework of the study
- Both statistical and clinical significance should be discussed
- Study limitations need to be identified and discussed

Critiquing Contents of Research

Conclusions

- Conclusions answer the “so what?” questions that might be proposed to researcher at the end of a study
- Study conclusions are author’s attempt to make generalizations based on the study findings
- Personal experiences and opinions should not influence conclusions
- Findings are strictly data bound
 - Researcher has some freedom to go beyond data when presenting the conclusions

Critiquing Contents of Research Implications

- Implications need to be explicitly identify by researcher for nursing practice, nursing education, nursing research
- Implications section of a research report contains the “should” that result from the research findings
- For example:
 - Nurse Educator should include material in nursing curriculum on the topic of the study
 - Researchers should conduct more research in area of interest

Critiquing Contents of Research Recommendations

- A suggestion to:
 - Replicate the study
 - Develop a new instrument
 - Use a larger sample size
 - Take into consideration limitations of present study
- Consider findings of previous research studies

Critiquing Contents of Research

Other Considerations

- Grammar, sentence structure, punctuation
- Author's writing style and use of words
- Accuracy and completeness of reference list

References

- Nieswiadomy, Rose Marie. 2012. *Foundations of Nursing Research*. Sixth edition.
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Thank You