

Sustaining Practice Improvement: Strategies to Organize Appraisal and Synthesis of the Evidence

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Objectives

- Objective 1: Identify strategies to organize a review of the literature related to a practice problem.
- Objective 2: Examine an approach to apply standardized evidence appraisal tools to evaluate the quality of the evidence.
- Objective 3: Discuss how to use a matrix table to synthesize the state of the evidence related to a practice problem.

Introduction

- Application of evidence to practice to improve patient and healthcare system outcomes is the hallmark of the DNP-prepared nurse.
- The first step in evidence application is appraisal and synthesis of the evidence.
- This presentation will share strategies to organize a literature search and evidence appraisal to create a synthesis that can be used to improve practice.

Introduction

- In order to create change and impact patient outcomes, the doctorally-prepared nurse must be able “to critically appraise existing literature and other evidence to determine practice”

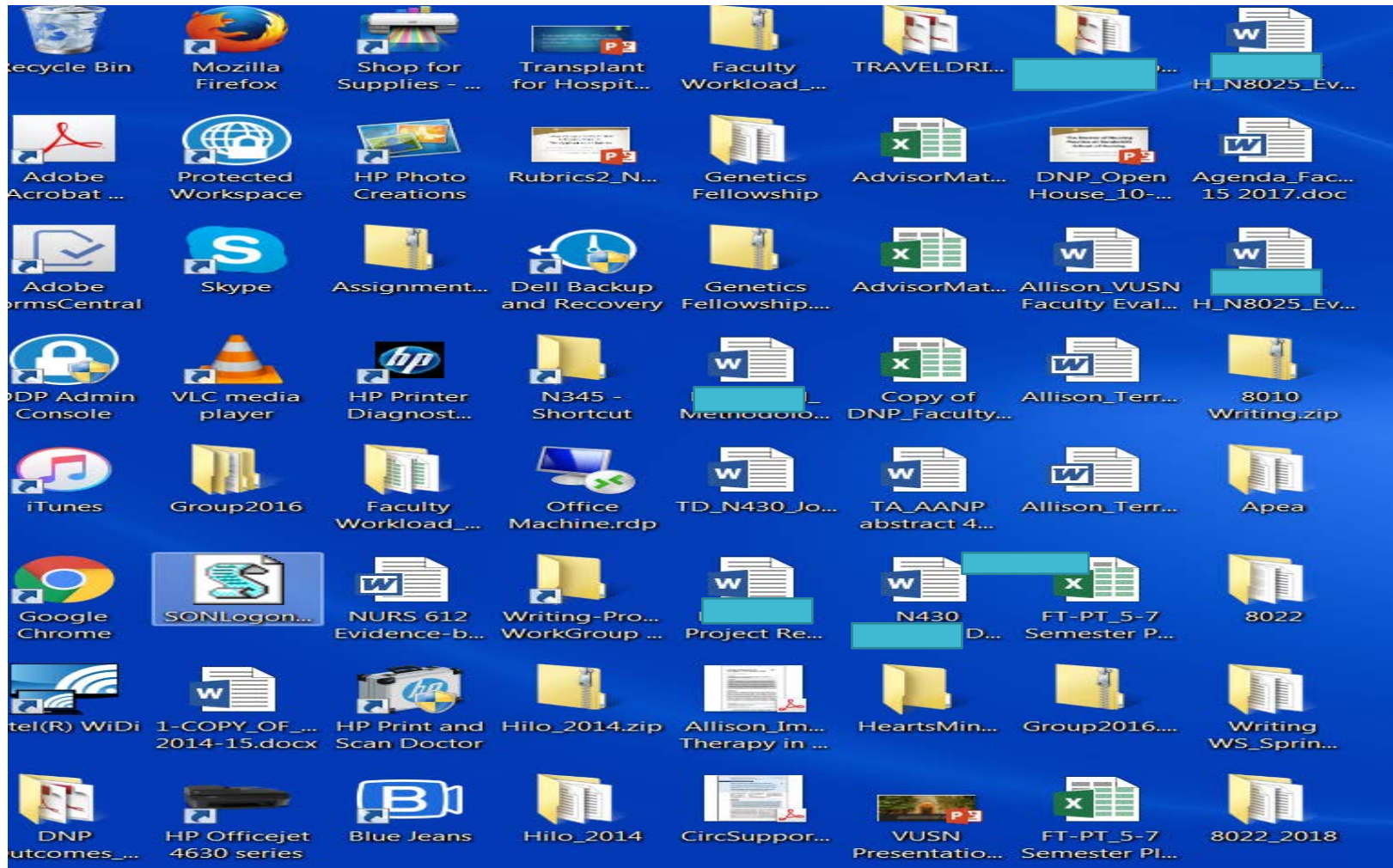
(American Association of Colleges of Nursing, 2006, p. 12).

Introduction

- A review of the literature is fundamental to understanding the state of the evidence related to a practice problem.
- DNP students are expected to develop effective skills to search, appraise and synthesize evidence to make recommendations for practice improvement.

Problem

- The ability to synthesize evidence to make recommendations for practice is integral to DNP education; however, students often struggle to appraise and provide a clear synthesis of the literature about their topic of interest.
- Students need a systematic approach to organize evidence, structure a critique, and synthesize the results.



Purpose

- A user-friendly review matrix was developed to assist DNP students to analyze essential elements of published research articles and apply standardized appraisal tools appropriate to the study design.

The Matrix Method

- Structure
 - Master folder containing all the notes and documentation accumulated as literature is reviewed
 1. Paper Trail Folder
 2. Documents Folder
 3. Review Matrix Folder
 4. Synthesis Folder
- Process
 - How to create and use the materials in each of the four folders

Structure – 1. Paper Trail Folder

- Documents search of the literature
- Five subfolders
 - Key Words
 - Controlled vocabulary: Medical Subject Headings (MeSH) <https://www.ncbi.nlm.nih.gov/mesh>
 - Resources
 - Store notes about the names of reference books, journals, government reports, and other materials reviewed
 - Record names of people who helped you, ie, reference librarian

Structure – Paper Trail Folder Cont.

- Bibliographic Databases
 - Electronic databases searched – create one Word document for each database
 - Date of search, key words used, search restrictions, time period,
- Internet Documents – record of internet documents examined
 - Date accessed, date restrictions, brief notes of information obtained
 - Copy URL of home page of useful sites to a Word document
 - Clarify incomplete citations – see Gerrard, page 101
 - PubMed home page → PubMed Tools → Single Citation Matcher
- Miscellaneous Notes – diary of things you need to remember

Structure – 2. Documents Folder

- Stores source documents for review
- Download PDFs of articles
- Use consistent naming convention
- Chronological order
 - 2017_Garrard_how to create a review matrix
 - Arranges articles in same order as on the Review Matrix
 - Quick index to find the articles
- Consider creating multiple source document folders by topic or subject

Documents Folder
Cont. –
Source Documents
Sub-Folder

- Primary sources
 - Original research paper written by scientists who conducted the study
- Secondary sources
 - Papers or other documents that summarize the original work of others
 - Based on information from primary source materials
 - Generally not acceptable source when writing the proposal
- Tertiary sources
 - Systematic analysis, meta-analysis or critical review of scientific papers
 - Often have a specific focus
 - Examples: critical review of RCTs on a specific subject i.e., Cochrane Review; meta-analysis; clinical practice guidelines

Structure – 3. Review Matrix Folder

Review Matrix Subfolders

- Review Matrix- CURRENT
 - 01-08-2018_Review Matrix
 - Rename with new date each time Review Matrix opened for work
- Review Matrix-PREVIOUS
 - Move version from previous work session
 - Keeps versions in case information is lost
- Review Matrix-Final
 - Final version used to write synthesis

Structure – 4. Synthesis Folder

- Synthesis CURRENT Subfolder
 - Most recent draft
 - Label with current date
 - Save a copy and change the date each time you work on the document
- Synthesis PREVIOUS Subfolder
 - Move previous version of document
 - Folder contains every previous version by date
- Synthesis FINAL Subfolder

Matrix Method Process

- Use the materials in each of the four folders
- Organize documents
 - Chronologically
 - By topic
- Abstract data from the documents and record in the matrix

Create the Review Matrix

- Spreadsheet or table – rectangular arrangement of rows and columns
 - Word
 - Excel
- Analyze documents
 - Use highlighter, underline, and sticky note features in PDF document to indicate relevant information

many practical resources have been created to facilitate ready access to high-quality research. We call these resources “pre-appraised” because they have undergone a filtering process to include only those studies that are of higher quality and they are regularly updated so that the evidence we access through these resources is current.

To facilitate use of the many pre-appraised resources, Haynes proposed a “4S” model,¹ which he then refined into a “5S” model.² The 5S model begins with original single studies at the foundation, and building up from these are syntheses (systematic reviews such as Cochrane reviews), synopses (succinct descriptions of selected individual studies or systematic reviews, such as those found in the evidence-based journals), summaries, which integrate best available evidence from the lower layers to develop practice guidelines based on a full range of evidence (eg, Clinical Evidence, National Guidelines Clearinghouse), and at

When we described the 5S model to colleagues at home and abroad, some queried the value of a single study and a synopsis of a systematic review as indicated by their single appearance in the hierarchy of evidence, a systematic review. We are adding a layer to the model to disseminate the model to dis

THE 6S MODEL

In the 6S model (Figure), we now have synopses of studies in the second layer from the bottom and synopses of syntheses in the fourth layer from the bottom, which more accurately depicts their rigour.

When using this model to guide clinical decision making, begin your search at the highest possible layer in the 6S model. In an ideal situation, this would be the *systems* layer. An evidence-based clinical information system integrates and

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Review Matrix

Author(s), Title, Journal	Year	Purpose	Method/ Level	# Subjects	Subject Charac	Sampling Design	Data Collection	Results/ Findings	Comments	Assessment of Quality
Carrel, A.	1910	Diversion of blood during operation, blood vessel anastomosis						Successful end-to-end anastomosis of descending aort		
Landsteiner, K & Levine, P.	1927	Determine differences in blood groups						Different properties in blood from different races and families		
Medawar, PB,	1957	Understand mechanism for rejection of skin grafts						Allograft rejection is immune mediated, ie, WBCs		
Hammonds, WD & Steinhaus, JE.	1993	Describe history of anesthesia						Crawford Long first used ether as anesthetic in 1842		

Methods Map

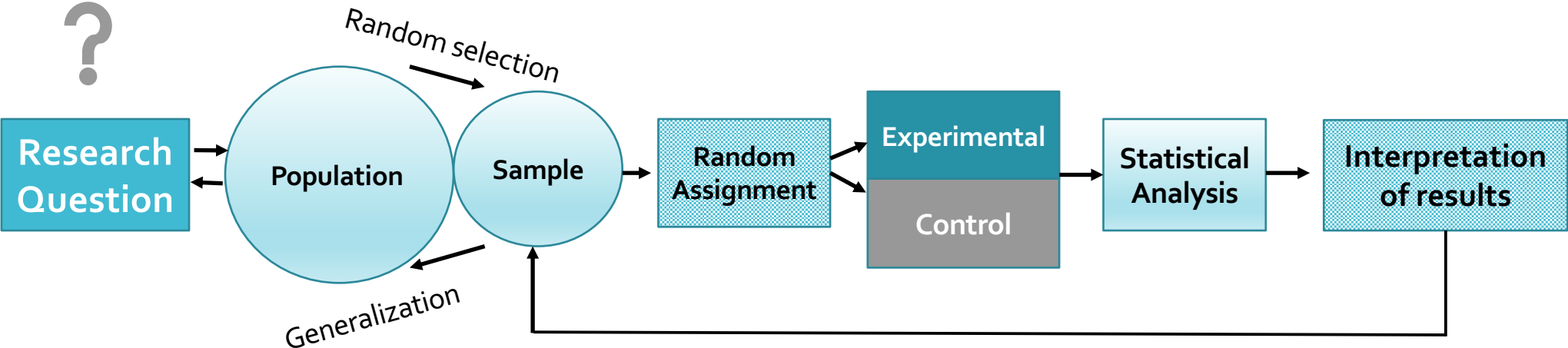
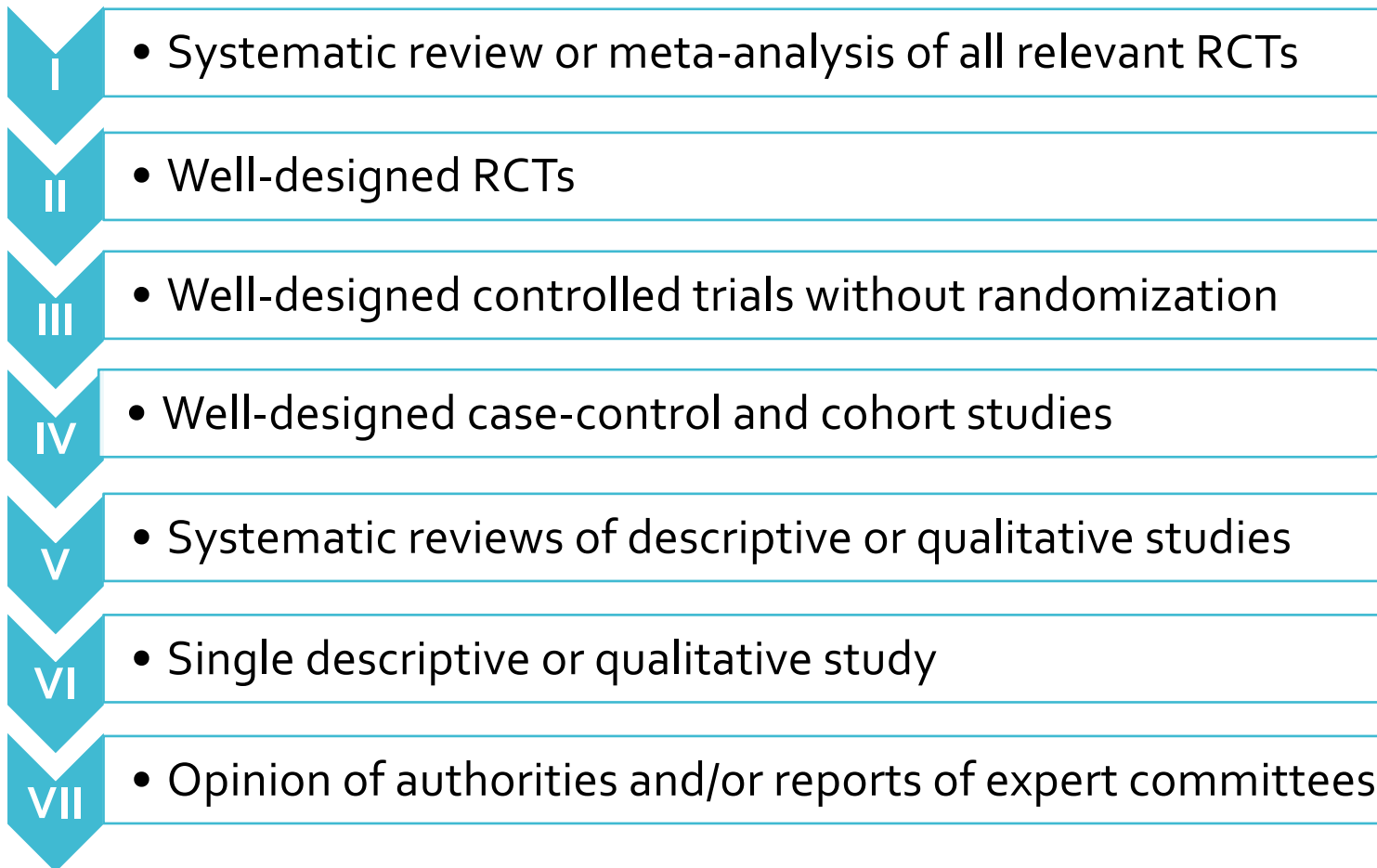


Figure 2-1, p. 58, Garrard (2017)

Analyzing a Source Document

- Introduction
- Methods
- Results
- Discussion
- References



(Melnyk & Fineout-Overholt, 2014)

Evaluation of the Quality of the Evidence

Appraisal Tools

- Meta-Analysis
PRISMA
- Clinical Practice Guideline
AGREE II
- Checklist for Reporting Results of Internet E-Surveys
CHERRIES
- Meta-analysis Of Observational Studies in Epidemiology
MOOSE
- Randomized Trials
CONSORT
- Quality Improvement
SQUIRE 2.0

Writing a Synthesis

- Review Matrix, most recent version
- Define purpose of the literature review → PICOT question and purpose of project
- Describe search strategy
- Integrate information down the columns of the Review Matrix

Application

- Students initiate the table in an evidence appraisal course and continue to add articles to the table as research related to the student's area of interest and DNP project are identified.
- Once a comprehensive review of the literature and appraisal of the evidence is conducted, students use the Review Matrix to synthesize the state of the evidence related to the practice problem.

Assignment 1

- Complete the Review Matrix with a minimum of 5 peer-reviewed research articles on your phenomenon of interest.
- In the final column, Assessment of Quality, document the tool you intend to use to assess the quality of the article.
- Highlight, underline, or use sticky note features in the PDF document to indicate relevant information included in the columns on the Review Matrix.
- Submit the Review Matrix and the Documents Folder containing abstracted PDF copies of the 5 articles used to complete the Review Matrix to Assessments.

Grading Assignment 1

- Faculty grade a random row of the version 1 Review Matrix.
- Students are responsible for completing the matrix with the minimum five research articles.
- Faculty provide guidance and feedback for the student to improve the Review Matrix for re-submission as Review Matrix version 2.

Review Matrix version 1	Weight	Comments
Purpose	15%	
Method & Level of Evidence	15%	
# Subjects	10%	
Subject Characteristics	10%	
Sampling Method	10%	
Data Collection/Instruments	10%	
Results/Findings	10%	
Comments	10%	
Assessment of Quality: Identification of evaluation tool to be used	10%	
Total	100%	

Assignment 2

- Use faculty feedback to refine and enhance all rows of the matrix.
- Complete a thorough evaluation of the quality of each article using the appropriate appraisal tool and record findings in the last column of the table, Assessment of Quality. Tools presented in this course (e.g. CHERRIES, MOOSE, CONSORT, PRISMA, AGREE II, SQUIRE 2.0, etc.), in addition to other scholarly tools/checklists found in the literature, may be used.
- If articles not included in version 1 are added to the matrix, upload a revised Documents Folder zipped with a PDF of each added article, along with the Review Matrix.

Grading Assignment 2

- Faculty grade a random row of the Review Matrix version 2 and provide feedback as needed.
- Students incorporate this feedback, as this Review Matrix will assist in writing a synthesis of the literature and state of the evidence in their project proposal.

Review Matrix version 2	Weight	Comments
Purpose	10%	
Method & Level of Evidence	10%	
# Subjects	5%	
Subject Characteristics	5%	
Sampling Method	5%	
Data Collection/Instruments	5%	
Results/Findings	5%	
Comments	5%	
Assessment of Quality	50%	
Total	100%	

Implications

- While the literature appraisal table was created to organize DNP students' evidence appraisal and synthesis, this approach has broader application to all DNP-prepared nurses engaged in review and appraisal of the evidence to address healthcare practice problems.

Questions?

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References

- American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced practice nursing*. Washington, DC: Author.
- Gerrard, J. (2017). *Health sciences literature review made easy: The matrix method* (5th ed.). Burlington, MA: Jones & Bartlett.