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Review of: Rehabilitation Research Principles and Applications, 4th Edition

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INTRODUCTION

Rehabilitation Research Principles and Applications, 4th Edition, is written by a physical therapy professor and speech and language pathologist/therapist professor at Governors State University in University Park, Illinois. The textbook is intended as both a primary and secondary textbook for education instruction related to practical research in the field of rehabilitation. The authors provide relative research examples from physical and occupational therapists, speech-language pathologists, audiologists, physiatrists, athletic trainers, prosthetists, and orthotists. The practical language and numerous go-to charts, tables, and boxes make the textbook quite user friendly for both students and professionals in rehabilitative medicine.

REVIEW

While previous editions of Rehabilitation Research Principles and Applications maintained the foundational elements of evidence based research, this edition expands the previous concepts while yielding its language toward specifically addressing the requirements of student learning and practitioner application. The textbook is also on the cutting edge of imparting the importance of understanding the scholar/scientist-practitioner model now esteemed by numerous professions. The authors encourage both students and clinicians to ascribe to practical research knowledge and evaluation of clinical practices via several research designs, specifically single subject research.

ORGANIZATION

This textbook is divided into nine sections totaling 28 chapters and ends with appendices, a glossary, and index. Throughout the text, the authors employ bold headings, relative charts, tables, boxes, and figures to assist the reader with intellectual capacity. However, the chapter outlines appear a bit convoluted as there are different fonts, bolded letters, and scattered organization of the subheadings. The tables are utilized to provide definitions of a concept, demonstrate methods of discussion, or to explain data analysis. To the contrary, however, there are the well thought-out tables and graphs that specifically provide snapshots and illustrations of relative research elements in the rehabilitative domain.

Within the chapters, the bold headings along with a concise overview of the sections provide organization for the reader. Each chapter ends with a review specific to the chapter's topics and references denoted in AMA style using numeric citations with superscripts numbered in the order they are cited. The textbook ends with useful appendices, such as Table of Random Units, Questions for Narrative Evaluation of a Research Article, Basic Guidelines for Preparing a Journal Article Manuscript, an AMA and an APA style manuscript, A sample platform presentation perfect for students while ending with a comprehensive glossary and index. However in the glossary there is no correlated page number to the chapter for quick referencing.

Section 1

This section consists of five chapters all pertaining to “Research Fundamentals” in rehabilitation research.

Chapter one entitled “Rehabilitation Research” consists of one box and one table. The table is quite helpful to the reader as it lists the most current journals in rehabilitation research. There is an excellent section in chapter one that speaks to the significance of developing rehabilitation research and the need for the role of clinician-researcher.

Chapter two entitled “Theory in Rehabilitation Research” contains five figures and two tables and provides an in-depth review of the role, characteristics, and concepts of theory and rehabilitation research in an example about hemiplegia; this fictitious diagnosis and patient is developed throughout this chapter to illustrate the definitions and purpose of utilizing theory in research. Figure 2.2 provides a well-illustrated diagram of the theory of gait in individuals with hemiplegia. There is a brief mention of the World Health Organizations-International Classification of Functioning, Disability, and Health (ICF). Particularly beneficial in Chapter two is the section on putting theory into practice. The authors discuss the significance of developing answerable research questions, topics, and problem identification, as well as theoretical and research selections. Here the authors speak to the rigor needed to develop reproducible research.

Chapter three entitled “Evidence Based Practice” provides three tables and two boxes. All aide in illustrating levels of evidence and the steps needed to implement evidence based practice and research. There is also an excellent table that assists in evaluating every element of research. Chapter three provides an updated overview for determining levels of evidence and evaluating pre-existing research. Box 3.2 follows with criteria for determining an intervention study’s validity, impact, and clinical applicability. Overall, the boxes and tables are easy to follow allowing even novice rehabilitation researchers to understand the concepts.

Chapter four entitled “Finding Research Literature” covers strategies to finding appropriate research literature; the chapter provides one table and one figure and provides a brief overview of how to begin a literature review. This chapter also gives step-by-step instruction for Boolean Operations, search limits and common databases used in rehabilitative medicine.

Chapter five entitled “Research Ethics” covers research ethics and addresses the more uniform principles of ethics including beneficence, non-maleficence, utility and autonomy, and HIPPA. Informed consent is also discussed at length within one box and is illustrated by coverage of the Tuskegee Syphilis Study. This chapter also speaks to the need for publication integrity.

Section 2

This section consists of chapters six through nine and discusses “Research Design.”

Chapter six entitled “Research Paradigms” provides an in-depth discussion of three research paradigms. There are two boxes and two tables that illustrate the epistemological foundations and methods of quantitative, qualitative, and single subject paradigms. Analyses of all three paradigms are provided in the chapter.

Variables are the emphasis for chapter seven entitled “Variables.” The chapter emphasizes quantitative and single subject related variables to emphasize cause and effect relationships. Chapter seven contains six figures and three tables that reinforce the functional relationships among variables. The authors particularly emphasize the need to use graphs that help to illustrate and comprehend functional relationships among variables. Chapter eight entitled “Research Validity” contains three figures appropriately utilized to enhance the readers understanding of validity-related concepts. Concise operational definitions for terms internal validity, construct validity, and external validity are provided.

Chapter nine, “Selection and Assignment of Participants,” provides a brief discussion on how, and by what means, to select research participants, and the potential pitfall of a poor selection.

Section 3

Section three contains chapters ten through eleven and discusses ‘Experimental Design’ as it relates to group designs and single subject designs with the latter being synthesized in great detail.

Chapter ten entitled “Group Design” contains five figures that are easily utilized to enhance the readers understanding of the concepts presented. In chapter ten, an operational definition for experiment is used to focus the discussion.

Chapter eleven entitled “Single Subject Design” is the cornerstone chapter of the entire book in that it thoroughly details the design most often used by scientist-practitioners in rehabilitation. Carter and Lubinsky provide a brief history of single subject designs, an explanation on when to use single subject designs, problems with single subject designs and how they are often confused with clinical case reports, and limitations of this design. The authors also provide an extensive discussion on the characteristics of single subject designs while using nine figures and eight tables. Carter and Lubinsky do an outstanding job in communicating to the reader the essentials of five basic design variations including A-B designs, Withdrawal Designs, Multiple Baseline Designs, Alternating Treatment Designs, Interaction Designs, and Changing Criterion designs. Definition and Application for each research design is thoroughly illustrated while utilizing physical therapy clinically based research scenarios. This chapter should be insightful for students and novice practitioners. The authors provide an extremely useful discussion of graphing and illustrating single subject data.

Section 4

Section four includes “Non-Experimental Research for Rehabilitation” and contains chapters twelve and thirteen.

Chapter twelve entitled “Overview of Non-experimental Research” is a relatively short chapter as it provides only an overview of retrospective descriptive research. This was unexpected as this is a burgeoning research design especially as it relates to wellness and rehabilitation outcomes. In this chapter the authors provide one figure and one table including the types of non-experimental research.

Chapter thirteen entitled, “Clinical Case Reports” covers the development of clinical case reports. The authors provide a brief discussion on the contributions of case reports to theory in practice and this message is undergirded by two figures showing the purpose of various scholarly communications.

Section 5

Section five entitled “Research Beyond the Everyday” continues the discussion, in part, on qualitative research and contains chapters fourteen through seventeen.

The chapter fourteen entitled “Qualitative Research” contains a modest discussion on qualitative designs including case study ethnography, phenomenon, and grounded theory. There is an extensive discussion on relational skills needed to perform competent interviews. They also speak to appropriate techniques for survey development and how to generate meaning from the data. One figure is used to illustrate these concepts in a fictitious physical therapy clinically-based research scenario.

Chapter fifteen entitled “Epidemiology” provides an overview of fundamental epidemiology functions and terms and its relation to rehabilitative research. The text provides a brief overview of ratios, proportions, and other fundamentals. Also discussed is a cross section of studies, case control studies, and cohort studies. Prevalence is also discussed in this chapter, while the authors provide eight figures of which one specifically speaks to sensitivity and specificity in three tables. Lastly, one box provides an overview of an actual epidemiological study.

Chapter sixteen entitled “Outcomes Research” discusses outcomes research and the frameworks used in outcomes research. There is an extensive discussion on the Nagi model and the ICFDP and its application and research. The text provides the reader resources to conduct outcomes research. This chapter also contains three figures that helped to explore relevant case scenarios in rehabilitation settings.

Chapter seventeen “Survey Research” discusses survey research and is a chapter of particular interest in that the authors provide an extensive protocol on how to develop survey instruments. However, there could have been a more significant discussion for both Likert development and multiple choice items. Also included is a discussion on sample size and sampling. The authors provide an excellent step-by-step protocol on determining sample sizes. Lastly, the authors provide examples of informed consent, questionnaire design, and a questionnaire cover letter. There is also a brief but extremely useful discussion on internet surveys.

Section 6

Section six entitled “Measurement” contains chapters eighteen and nineteen and provides a throughout discussion on measurement.

Chapter eighteen “Measurement Theory” begins with defining levels of measurement and foundations of measurement theory. Thereafter is an extensive discussion on the measurement reliability and validity, again using clinical scenarios. This chapter

provides three tables and four figures. Table 18.3 provides an overview of correlational measurements. Figure 18.4 provides an extensive graphic of normal distribution.

Chapter nineteen “Methodological Research” covers methodological research and provides a brief discussion on levels of standardization.

Section 7

Section seven covers “Data Analysis” and comprises chapters 20 through 24.

Chapter 20, “Statistical Reasoning,” continues to reinforce the research process discussed in earlier chapters. While using specific clinical case scenarios to illustrate difficult concepts, the authors utilize nine tables and seven figures. There is an overview on frequency distribution, central tendency, and normal distribution. There is also a substantial discussion on the importance of “Power” in data analysis.

Chapter 21, “Statistical Analysis of Differences: The Basics,” discusses basic functions in statistical analysis and provides an in depth discussion on distribution throughout the chapter. Twelve tables are used to illustrate statistical analysis using several clinical scenarios. There is also one figure used to convey normal distribution and degrees of freedom.

Chapter 22, “Statistical Analysis of Differences: Advanced,” is an in depth discussion on statistical analysis of difference. The chapter discusses advanced ANOVA techniques. To help explain more difficult concepts the authors utilize eleven figures and tables.

Chapter 23, “Statistical Analysis of Relationship; The Basics,” begins with the basic discussion of statistical analysis of relationship followed by Chapter 24, “Statistical Analysis of Relationship: Advanced,” which speaks to a more advanced statistical analysis of relationship, including a discussion on multiple regression and factor analysis. Seven tables and five figures help to undergird the discussion.

Section 8

Section eight focuses on the topic of “Being a Consumer of Research.” This section contains Chapters 25 and 26 and provides an in depth discussion on procedural techniques on evaluating evidence and synthesizing bodies of evidence.

Chapter 25, “Evaluating Evidence One Article at a Time,” is an excellent tool for the both novice researchers/ scientist – practitioners and the expert. It is a how-to guide that quickly and accurately demonstrates how to evaluate literature. There is a review of a published original research study and an evaluation of an unpublished research study. In this chapter, the illustrations will be very helpful to practitioners who are new to the field. Table 25.1 provides an overview of elements of a research article. Box 25.1 provides appropriate questions developed to evaluate articles. Table 25.3 provides an overview of the levels of evidence developed by Sackett, and box 25.2 provides structured questions for articles within the patient management model. Table 25.4 provides a scale for scoring the quality of randomized controlled trials and table 25.5 illustrates PEDro scoring of randomized controlled trials and rehabilitation.

Chapter 26, “Synthesizing Bodies of Evidence,” has three figures and three tables that discuss synthesizing bodies of evidence, and this chapter helps the reader to identify important characteristics of individual studies.

Section 9

Section nine provides a detailed discussion on “Implementing Research.” Section nine contains Chapters 27 and 28. Chapter 27, “Implementing a Research Project,” reviews the elements of a research proposal. It discusses protection of human participants, appropriate recruiting procedures, data collection, and analysis. In summary, Table 27.1 provides a work plan for a research project and Figure 27.1 gives an example “Letter of Consent.” To help highlight the points of the chapter, there are two figures, three tables, and three boxes. Box 27.3 provides a partial list of U.S. Federal government funding sources for health research.

Chapter 28, “Publishing and Presenting Research,” provides a how-to manual on publishing and presenting research. The chapter speaks to the types of publications and the process for platform presentations.

SUMMARY

Rehabilitation Research Principles and Application is a superb resource for students and practitioners in the field of rehabilitation research. This text is comprehensive, detailed, and timely for scientist-practitioners in the field of rehabilitative research. The figures, tables, and boxes help to illustrate complex concepts while the chapters are concise. This text is highly recommended for use in clinical and academic settings, particularly as rehabilitation practitioner continues to develop, review, and practice evidence based rehabilitative medicine.