Making sense of the literature...

John Balletto, LMT, CKTP
1st Annual Rhode Island Massage Therapy Convention

Why do we need research?

✓ It provides information
✓ It guides our critical thinking
✓ It fosters more questions
✓ It helps us communicate
✓ Simply, it helps us help

Does it limit how we work?

✓ No...it may help us determine
  ✓ what might work best, or
  ✓ what might not work at all
✓ Does not interfere with our creativity or individuality
  ✓ Actually, it keeps the HEART in what we do
Searching Research Databases

- PubMed
- Google Scholar
  - [scholar.google.com](http://scholar.google.com)
- Massage Therapy Foundation Research Database
  - [Massagetherapyfoundation.org](http://Massagetherapyfoundation.org)
- BiomedCentral
  - [www.biomedcentral.com](http://www.biomedcentral.com)

Anatomy of a Research Article

- IMRaD
  - Introduction
  - Methods
  - Results
  - Discussion
- Abstract

Abstract

- An abstract is a brief summary of a research article, and is often used to help the reader quickly ascertain the paper’s purpose
- Academic literature uses the abstract to succinctly communicate complex research.
- An abstract may act as a stand-alone entity instead of a full paper.
- Abstracts are protected under copyright law
- Many publishers make abstracts publicly available, even when the full text is protected by a toll barrier.
Introduction

• Describes the context of the study
  – Who performed the research?
  – What was the setting?
  – How have previous studies been conducted?
  – How does this study build on previous studies?
  – What is new and special about this study?
  – What are the study hypotheses?

• Thing 1 relationship to Thing 2


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Abstract

This study examines manual therapy (MT) as effective in the treatment of musculoskeletal pain. Moreover, the relationship through which MT works is still emerging. The purpose of this study was to evaluate the effectiveness of MT in reducing pain and improving function in patients with musculoskeletal pain. The results of this study suggest that MT is effective in reducing pain and improving function in patients with musculoskeletal pain.

Keywords

Manual Therapy, Musculoskeletal Pain
Methods

• Here, researchers lay out how they plan to test the research questions/hypotheses
  – Most critically important to the validity of the study’s outcomes
  – Crucial to ensuring that the study results are as valid as possible
  – Types of studies
    • RCT
    • Cross-over
    • Quasi-experimental
    • Case Report
    • Case Series
  – Sufficiently large study population
  – Explicit massage protocol that can be reproduced for future/further study

The Evidence Pyramid

Case Reports and Case Studies

• Simplest form of descriptive studies
• Describe the events related to the care of a single subject
• Through description, relevant detail and discussion of outcomes, CR and CS are distinct from anecdotes
• Often can lead to the development of research questions (hypotheses) that can be tested in pilot or larger studies
Pre-test and Post-test Design

- Very common in practice-based research
- Practitioner defines a hypothesis, establishes eligibility criteria, and methods
- Collects baseline data
- Provides an intervention
- Collects outcome measures

Cross-over Design

Group 1: Intervention then Control
Group 2: Control then Intervention

Randomized Control Trials (RCTs)

- Subjects randomly assigned to a group
  - Quasi-experimental when no random assignment
- There is a control group
  - Usual care
  - Placebo
- Blinding
  - Subjects
    - Those receiving and giving the intervention
    - Single blind vs Double blind
**Systematic Reviews**

- Provide a comprehensive review of relevant research studies on a particular clinical or health-related question.
- May combine information from both published and unpublished studies that focus on clinical trials or similar treatment interventions.
- Summarizes the findings.

**Meta Analysis**

- Studies on a particular question are grouped according to pre-established criteria.
- Literature search conducted on criteria.
- Results from studies are pooled:
  - Statistical power of the analysis is far greater than each/any of the individual studies.
- Often used to estimate the size of a treatment effect or to settle a question when there are several inconclusive studies with smaller number of participants.

**Methods Section**

- This is the section that tells you how the research will be conducted.
- How were subjects recruited?
- What were the inclusion/exclusion criteria?
- What is the size of the study (n=?)?
- A detailed description of the protocol:
  - (our weakest link!)
- How will the data be collected?
  - What will the statistical analysis be?
Methods Section

• This is the section where researchers will discuss what steps they took to strengthen their study and what challenges are left that readers need to consider in evaluating the study.
  — N sufficient? Statistical power?
  — Any bias?
  — Good control group?
  — Appropriate placebo?

Results Section

• This is where researchers report their findings without any interpretation of the data.
• Charts and Graphs
• Tables of data

And yes...this is where my eyes glaze over and I get that ...

Results Section

• “OMG, what are they talking about?” look all over my face...
Statistics...

• Really, all you need to know are a few simple stats to help you evaluate a study
  – Mean is the statistical average
  – Standard deviation shows how much variation or dispersion from the average exists.
    • A low standard deviation indicates that the data points tend to be very close to the mean
    • A high standard deviation indicates that the data points are spread out over a large range of values
    • The standard deviation is commonly used to measure confidence in statistical conclusions

Statistics...

• Really, all you need to know are a few simple stats to help you evaluate a study
  – The P-value
    • A p-value is the evidence against a null hypothesis.
    • It does not tell you that the null hypothesis is correct or right, only if there is significant evidence to reject it or not.
    • Commonly a p-value under 0.05 is considered statistically significant.

Statistics...

• Really, all you need to know are a few simple stats to help you evaluate a study
  – The T-test asks whether a difference between two groups’ averages is unlikely to have occurred because of random chance in sample selection.
  – A difference is more likely to be meaningful and “real” if
    • the difference between the averages is large,
    • the sample size is large, and
    • responses are consistently close to the average values and not widely spread out (the standard deviation is low).
Statistics...
• Really, all you need to know are a few simple stats to help you evaluate a study
  – ANOVA (Analysis of Variance) is a statistical technique by which we can test if 3 or more averages are equal.
  – It tests if the value of a single variable differs significantly among three or more levels of a factor

Discussion Section
• Can also be called Conclusions, Comments, Recommendations, etc
• It is the final section of an article
• Here, you find:
  – Grounding of the study back into context of other studies conducted
  – Strengths and weakness of the study
  – Interpretation of the results
  – Practice recommendations
  – What future studies would be helpful and why?

Book References
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Questions?

Thank you...

Thank you...  Thank you...

Thank you...  Thank you...

Thank you...  Thank you...

Thank you...