How to Create Research Posters

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4/2018
Objectives

- Identify main components of a research poster, guidelines and best practices
- Recognize how to discuss the quality of evidence
- Understand the use of tables, graphs and images
Basic Guidelines

Scientific posters are designed to highlight the **most important** aspect of the work.

- **Succinct Writing:** Use short/clear sentences
- **Headers:** Use headers to help organize data
- **Writing Style:** Use active voice and avoid pronouns
- **Avoid:** The use of jargon and abbreviations
- **Visual:** Show your work using tables, graphs and images
- **Less is More:** Do not include too much details to avoid making it too busy
- **Proofread:** Proofread! Proofread! Proofread!
Poster: Tell a Story....

Your poster should tell the story of your research

- Stand alone story
- Easy to follow process
- Convey main points
Poster - Introduction

- **Problem Statement/Introduction**: Purpose of the research and make the case why this research is important. Remember to use words that will grab the reader’s attention.
  
  - Brief few sentences (one or two short paragraphs)
  - How does it contribute to the scholarly literature?
  - Identify the gap in the literature
Introduction

Coal-fired power plants emit 66% of sulfur oxides, 40% of carbon dioxide, 33% of mercury and 22% of nitrogen oxides in the U.S. and are linked as risk factors to respiratory diseases, cardiovascular diseases and other ailments shown to impact environmental and human health. Along with the injurious health effects that come with the presence of hazardous waste sites like coal fired power plants, there are broader socioeconomic trends and outcomes related to their siting, especially affecting those who live near these facilities. This systematic literature review research study surveyed the relationship between the location of coal fired power plants and the socioeconomic conditions and trends of proximate communities and the cumulative evidence suggested there to be a link.

- There are **500+**
- Coal Fired Plants In U.S.
- Produce **42%**
- Total energy In U.S
- Emit • **66% SO₂**
  - **40% CO₂**
  - **33% Mercury**
  - **22% NOₓ**

Objective

To review peer-reviewed literature and assess the association between the proximity and placement of coal fired power plants and the socioeconomic trends and outcomes observed in nearby communities.
Poster – Methods Example

METHODS

- Systematically searched for articles in English in all years, using keywords and MeSH terms, in the databases Scopus, Medline, and Web of Science. No regional limit criteria was set.

- The following were the criteria for inclusion:
  - The study was peer-reviewed and was published in English.
  - The article was not a randomized controlled trial of a vaccine or drug, or an intervention study related to schistosomiasis.
  - The study concerned schistosomiasis.
  - The study examined a specific occupational group in Africa.
  - The study identified the specific occupation as a factor to contracting schistosomiasis.

After eliminating internal and external duplicate studies, articles were excluded first based on the titles, then by reading the abstracts, and last by reviewing the entire study.
**Method**

**Data Sources and Study Selection**
- The Cochrane Library, PsycINFO and PubMed databases were searched in March 2012.
- **Inclusion Criteria**: studies needed to be an Internet- or computer-based prevention program for alcohol or other drugs, delivered in a school setting.
- Figure 1 shows the search strategy and study selection process used.

**Study Quality**
- Quality was assessed using a validated measure for rating study quality (Jadad, 1996).
- Studies were rated against 3 key criteria, on a scale from 0-5*: 1) randomisation, 2) double-blinding, 3) withdrawals and drop-outs.

*School-based interventions rarely receive scores above 3 as double-blind conditions and full randomisation are often not possible (Neil & Christensen, 2009).

**Outcome Measures**

**Include databases searched**

**Inclusion criteria of selected studies**

**How you measured the quality of the studies found**
**TABLE 1**

**ARTICLE EVIDENCE LEVEL AND QUALITY GUIDELINES FOR LITERATURE REVIEW**

<table>
<thead>
<tr>
<th>Evidence Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Evidence from experimental study, randomized controlled trials</td>
</tr>
<tr>
<td>Level II</td>
<td>Evidence from quasi-experimental study, a control study without randomization</td>
</tr>
<tr>
<td>Level III</td>
<td>Evidence from nonexperimental descriptive study, systematic review of a combination of randomized control trials, quasi-experimental design studies, observational studies, surveys</td>
</tr>
<tr>
<td>Level IV</td>
<td>Evidence from expert and nationally recognized committee reports or opinions</td>
</tr>
<tr>
<td>Level V</td>
<td>Evidence from literature review, quality improvement, case reports</td>
</tr>
</tbody>
</table>

Adapted from Dearholt & Dang (2012).

**Table 2**

Classification of scientific evidence in systematic literature reviews

<table>
<thead>
<tr>
<th>Quality</th>
<th>Type of evidence</th>
</tr>
</thead>
</table>
| 1       | A: systematic review of RCTs  
B: individual RCT with narrow CI  
C: series of cases “all or nothing” |
| 2       | A: systematic review of cohort studies  
B: individual cohort studies. RCT with drop outs > 20%  
C: ecological studies |
| 3       | A: systematic review of control cases  
B: individual case control |
| 4       | Series of cases |
| 5       | Expert’s opinion |

RCT: randomized clinical trial. Adapted from *Levels as evidence of the Oxford Centre for Evidence-Based Medicine*. 

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**THE GEORGE WASHINGTON UNIVERSITY**

WASHINGTON, DC
Poster - Results

- **Results**: Connect to methods – as a result of conducting the review of the literature what were your findings? Include the following:
  - Author & year
  - Characteristics of participants
  - Results outcomes
  - Level of evidence
  - Use graphs, tables, images

*Tip*: No interpretation or analysis – Just state the facts!
**Poster – Results Table Example**

<table>
<thead>
<tr>
<th>Trial</th>
<th>Substance</th>
<th>Sample</th>
<th>Intervention</th>
<th>Substance Use Post-intervention ES/OR</th>
<th>Substance Use Follow-up ES/OR</th>
<th>Secondary Outcomes Post-Intervention &amp; Follow-up ES/OR</th>
<th>Quality Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buller et al., 2008</td>
<td>Tobacco</td>
<td>Australia, 10-16yrs, n=2077</td>
<td>Online, 6 lessons</td>
<td>30-day smoking prevalence (whole cigarette), ES 0.05* (INT&lt;CO)</td>
<td>-</td>
<td>Future smoking intentions PI, OR 0.01</td>
<td>2</td>
</tr>
<tr>
<td>Tobacco</td>
<td></td>
<td>USA 10-14yrs, n=1234</td>
<td>Online, 6 lessons</td>
<td>30-day smoking prevalence (whole cigarette), ES 0.23</td>
<td>-</td>
<td>Future smoking intentions PI, OR 0.13* (INT&lt;CO)</td>
<td>2</td>
</tr>
<tr>
<td>Norman et al., 2008</td>
<td>Tobacco</td>
<td>Canada 14-16yrs, n=1402</td>
<td>Online, 5 stages</td>
<td>Cigarette use, OR 1.27; Cigarette use among non-smokers, OR 0.79* (INT&lt;CO)</td>
<td>-</td>
<td>Resistance (whole sample), OR 1.03 and resistance among baseline smokers, OR 1.22* (INT&gt;CO); Behavioural intentions to smoke, OR 1.04 and behavioural intentions among baseline smokers, OR 0.82* (INT&lt;CO)</td>
<td>3</td>
</tr>
<tr>
<td>Prokhorov et al., 2008</td>
<td>Tobacco</td>
<td>USA 15-16yrs, n=1574</td>
<td>CD-ROM, 5 lessons + booster</td>
<td>Smoking initiation, OR 2.87* (INT&lt;CO); Cigarette smoking behaviour, ES 0.12* (INT&lt;CO), both at 18mth F/U</td>
<td>-</td>
<td>Decisional balance, ES 0.25* (INT&gt;CO); Temptation to smoke, ES 0.20* (INT&lt;CO); Self-efficacy, ES 0.02; Resistance skills, ES 0.26, all at 18mth F/U</td>
<td>2</td>
</tr>
</tbody>
</table>
Conclusion: This section should contain the most important take-home message of the study. Succinctly expressed in a few sentences. Major implications of your findings should include:

- Highlight primary outcomes
- Analysis/Interpretation of results
- Discuss any additional important findings
- Unexpected findings should also be discussed

Tip: Include 3 take-aways/key findings
Conclusions

- Moderate evidence exists in favor of TT interventions in balance and stroke rehabilitation programs.
- With TT, training intensity may be a more critical factor than specificity of training.
- Arm swing amplitude, cognitive demand & motor unit recruitment may be used to increase intensity.
- Critical parameters for “reverse transfer” of TT interventions have not yet been defined.

7/8 studies concluded that there was no statistically significant difference in student scores when two different modalities were used to teach anatomy.

8/8 studies scored a 2 on the Kirkpatrick scale indicating that learning was achieved through the teaching intervention.

3/8 studies scored a 3 on the BEME indicating that conclusions can probably be based on results, and 5/8 studies scored a 4 indicating that results are clear.

Future studies may choose to explore how the strategy used affects not only test scores, but also students’ ability to perform as practitioners.
Clear synthesis of main findings.

State main take-away message

Avoid extrapolating/over interpreting the data beyond what your results state
Score Level of Evidence- Tips

Rating Evidence in Medical Literature

SORT table

SORT: A Patient-Centered

Oxford Centre for Evidence-based Medicine - Levels of Evidence
# Score Level of Evidence - SORT

<table>
<thead>
<tr>
<th>SORT (Strength of Recommendation Taxonomy)</th>
<th>Examples:</th>
</tr>
</thead>
</table>
| A Recommendation based on consistent and good-quality patient-oriented evidence | • Systematic Reviews or meta-analysis of high quality studies  
• High-quality randomized-controlled trials  
• High-quality diagnostic cohort study |
| B Recommendation based on inconsistent or limited-quality patient oriented evidence | • Systematic Reviews or meta-analysis of lower-quality studies or inconsistent findings  
• Lower-quality clinical trials  
• Cohort study of treatment  
• Retrospective cohort study  
• Case-control study |
| C Recommendation based on consensus, usual practice, disease-oriented evidence, case series for studies of treatment or screening, and/or opinion | • Consensus guidelines  
• Usual practice or expert opinion  
• Disease-oriented evidence using only intermediate or physiologic outcomes  
• Case series |
Poster Design - Tips

- **Images:** Avoid poor quality resolution (Choose TIFF or GIF images)
- **Font:** Easy to read (Avoid too much text)
- **Font Size:** Depends on the size of your poster (usually 24-36pt font)

*Remember use the accurate GW logos/title*
  - The George Washington University
Good layout, graphs, images
Comparison of Pediatric Outpatient Antibiotic Prescribing Patterns for Specified Indications in Primary Care Practices

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Lehigh Valley Health Network, Allentown, Pennsylvania

**PURPOSE**

The objective of this study is to evaluate antibiotic utilization for pediatric patients in the outpatient setting and to describe characteristics related to the patient, prescriber, or specified conditions that may lead to increased antibiotic prescribing.

**BACKGROUND**

- Antibiotics are the most commonly prescribed medication class in pediatrics, with the use of broad-spectrum antibiotics for pharyngitis on the rise.1
- Efforts to decrease antibiotic use for conditions where they are not indicated in the pediatric population and research on this subject have been mainly focused on the inpatient setting.1
  - Guidelines written by the Infectious Diseases Society of America acknowledge the importance of improving outpatient antibiotic use, but do not specify interventions or recommendations on the implementation of an outpatient antimicrobial stewardship program due to a lack of data in this area.2
- An outpatient antimicrobial stewardship intervention, consisting in part of clinician education, has been shown to significantly reduce off-guideline antibiotic use.3
  - Decreasing guideline-discordant broad-spectrum antibiotic use is an area where improvement is necessary, as broad-spectrum third-generation cephalosporins are often utilized for conditions where they are not indicated in the pediatric outpatient setting.5

**STUDY DESIGN**

- Retrospective chart review of outpatient encounters
- Inclusion criteria:
  - Age 1 month to less than 18 years
  - Outpatient encounter for diagnosis of upper respiratory tract infection (including common cold), bronchitis, bronchiolitis, and/or pharyngitis between March 2, 2015 and September 1, 2015
- Exclusion criteria:
  - Neonates <30 days postnatal age
  - Other identified bacterial infection or ongoing bacterial infection coded during same outpatient encounter as above diagnoses
  - Patients with complex chronic conditions5

- The primary outcome of this study will be to calculate the percentage of encounters which resulted in an antibiotic prescription out of all encounters for the conditions specified for which an antibiotic is not indicated.

**METHODS**

- Office encounters for specified conditions between March 2, 2015 and September 1, 2015 will be reviewed for pediatric patients within Lehigh Valley Physician Group (LVPG) practices that utilize the electronic health record (EHR), Epic.
- An antibiotic prescription for any of the specified conditions will be considered non-indicated.
- Our goal will be to include at least 60 different providers, each having a minimum of 5-10 encounters for a specified condition for pediatric patients during the designated time period.
- Data to be collected will include:
  - Patient age, gender, and health insurance coverage
  - Provider specialty, practice site, practice location (urban, suburban, or rural),6 level of provider training
  - Data of encounter, diagnosis assigned, and whether or not an antibiotic was prescribed at the encounter
  - Antibiotic class if an antibiotic was prescribed

- The percentage of overall encounters which resulted in an antibiotic being prescribed will be reported. Descriptive statistics will be used to summarize the characteristics of the encounters as a whole, such as patient age, gender, type of insurance coverage, season of the year in which the encounter occurred, the diagnosis, and the type of antibiotic if one was prescribed.
- The percentage of encounters that were with a pediatric provider and a family medicine provider will be reported.

References:

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WASHINGTON, DC
Organization
Difficult to Read
Who is Your Audience?

- Students
- Faculty
- Judges

1-2 Minute Rule – Students
3-5 Minute Rule – Judges/Faculty
Complementary Alternative Medicine Guide

What is Complementary Alternative Medicine (CAM)?

Definitions:
- MayoClinic - Consumer: Health Complementary and alternative medicine: What is it?
- MedicinePlus: Complementary and Alternative Medicine
- What is Complementary and Alternative Medicine? (NCCAM)

Best Places to Start

- AMED (Allied and Complementary Medicine)
- Dietary Supplements Labels Database (National Library of Medicine)
  The Dietary Supplement Label Database (DSLD) is a joint project of the National Institutes of Health (NIH) Office of Dietary Supplements (ODS) and National Library of Medicine (NLM). The DSLD contains the full label contents from a sample of dietary supplement products marketed in the U.S.
- National Center for Complementary and Integrative Health (NCCIH)
  The National Center for Complementary and Integrative Health (NCCIH) is the Federal Government’s lead agency for scientific research on complementary and integrative health approaches. Site includes Clinical Research Toolbox, Statistics/Surveys and Guidelines.
- PubMed: Complementary Medicine
  Provides subject headings to facilitate searching in the area of complementary and alternative medicines.
- Natural Medicines
  Natural medicines information including alternate and scientific names, uses, safety, efficacy, mechanism of action, active ingredients, adverse reactions, interactions, drug influence on nutrient levels and depletion, dosage and administration, brand names, and patient education handouts.
- NIH: Office of Dietary Supplements
  Provides reliable, science-based facts on dietary supplements including information on research

Subject Guide

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