

# Research Minute

## Writing Journal Articles

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Sandra Burge, Ph.D.

Journal articles describing research, evaluation, or quality improvement have a standard format called **IMRAD**—**Introduction, Methods, Results, and Discussion**. The *Introduction* describes the need for the study and poses a Study Aim. *Methods* describes how you gathered and analyzed data, *Results* presents the data, and *Discussion* interprets the findings.

When I was a pup, writing was *not* my strength. When I began graduate study, I did not realize that a research career meant authorship. I struggled with organizing the fog of ideas that made up the Introduction, that described how to justify my work. The middle was easier; I could easily describe what I did, and what I found. But the Discussion also required some creativity that could baffle me. Writer's block was a regular condition, so I began attending every writing workshop I could find. Over time, I discovered a writing structure that worked for me. In this Research Minute, I share my outline with you.

### IMRAD

#### Introduction

...(aka "Background") presents the rationale for the study. It is structured as a critical review of the research literature. Keep in mind that your research probably looks at the association between **Two Phenomena**. Examples: 1. Group Visits and 2. Childhood Obesity; or 1. Problem Lists and 2. Staff Training. With these **Two Phenomena** in mind, structure the Introduction like so:

**Paragraph 1.** "What do we already know about Phenom 1?" Cite research articles addressing prevalence and harms (obesity) or benefits (physical activity).

**Paragraph 2** introduces Phenom 2, and presents "What do we already know about Phenom 1 and its association with Phenom 2?"

**Paragraph 3** addresses what is *unique* about your study. Does it address a gap in the research literature? A limitation of previous research? An issue particular to your community? (like high rates of diabetes amputations, or minority populations?)

**Final Paragraph.** Finish by stating the aim of your study, or the research hypotheses.

#### Methods

...is the easiest section to write; I often start my writing project here.

**1. Setting & Subjects.** Describe: Where did you conduct the research, and what are the inclusion and exclusion criteria for your subjects?

**2. Intervention (if you do one).** Interventions include medicines, group visits, educational programs, clinical improvements, and other things.

**3. Measurement.** Describe Phenom 1 and Phenom 2. How did you assess if they are high or low, better or worse, present or absent? If you are using a survey, describe the *concepts* addressed by your survey questions (e.g. knowledge, attitudes, behaviors) and the scoring plan for the survey.

**4. Procedure** for gathering data. How did you gather your information? Who did it? Did you use surveys, chart reviews, lab findings, observation?

**5. Analysis.** Restate your research aims/ hypotheses, and describe how you will analyze them. Use statistical methods for numeric information, (like lab values and survey scores) and use qualitative methods for text information (like interview transcripts).

#### Results

My general strategy is to draft tables of my findings and describe them.

**Describe the sample:** age, gender, ethnic background, and other information relevant to your study.

**Middle section.** Describe simple analyses of Phenom 1 and Phenom 2.

**Final section.** Describe more complex (multivariate) analyses.

#### Discussion

**Paragraph 1.** Summarize your most exciting findings. Compare these to others' research; is it "consistent with," or "departing from" previous findings?

**Paragraph 2.** Do you have puzzling or surprising findings? If so, describe potential explanations.

**Paragraph 3.** Describe the limitations of the study. Does your sample allow generalizability? Are your surveys susceptible to response bias? Is your sample size large enough?

**Final Paragraph or "Conclusions."** End with recommendations. If you have researched a clinical issue, provide recommendations for clinicians—how will they use this information? If you have researched a curriculum, provide recommendations for teachers.

*I am grateful to Dr. Barry Weiss, former editor of Family Medicine, who taught me how to write an Introduction, and Lucy Candob who taught me how to get unstuck..*