

Getting Started in Research: It Can Be Done!

Maggie Powers, PhD, RD, CDE
Research Scientist
International Diabetes Center at Park Nicollet
Minneapolis, MN 55416

Abstract

Conducting research is not only for PhDs or those working in an academic setting. It is for anyone who has a question that needs to be answered. This brief article aims to encourage and guide more registered dietitians to get started in research addressing the delivery and value of nutrition therapy. Five steps to research will be reviewed.

The Question or Purpose

The first step in the research process is to identify a specific question. Some researchers keep a list of questions they encounter during their day. Keeping such a list can be useful when selecting a question that is most interesting to the researcher and important to the researcher's practice. It is helpful if the researcher is curious about the question because that will enhance his or her motivation to follow through on developing the research and finding the answer.

Examples of potential questions:

- Is there a difference in hemoglobin A1C (A1C) levels of patients who see the registered dietitian (RD) for two or four counseling sessions?
- Are the patients who cancel visits experiencing worse glycemic control than those who keep their appointments?

It is critical that the research question be focused, straightforward, simple and answerable. For example, if an A1C level cannot be obtained, one would not be able to research the first question listed above. The initial research question is typically not the final question; it will become more refined as the study is designed and budgeted.

The Study Participants

The second research step is to clearly identify who the study question relates to; the "who" will be the study participants. The study results will be interpreted as relating to the defined study participants. For example, it is important to know what type of diabetes the study participants in the first question have. The researcher might want to include all patients with either type 1 or type 2 diabetes (T2DM), or limit the question to those with type 2 diabetes who were recently diagnosed or those with T2DM who are taking a specific medication.

As participants are defined, the researcher develops a list of who will be included and excluded in the study. This information consists of the study's inclusion and exclusion criteria and provides context to the study results. If a study included only patients with a baseline A1C less

than 8%, then the study results should not be interpreted as applying to those with an A1C higher than 8%. Ideas for factors to consider for inclusion and exclusion criteria can be obtained from reading research articles that ask a similar question.

The decisions made about the study participants become part of the research question. However, not all of the inclusion and exclusion criteria need to be in the research question. Make the research question more specific:

- Is there a difference in A1C levels of *patients with T2DM* who see the RD for two counseling sessions or for four sessions *during 2012 at the diabetes center*?
- Are the *newly referred* patients who cancel visits experiencing worse glycemic control than those who keep their appointments?

The Intervention

The third step in the research process is to define the intervention. This is what the researcher will do, or has done, or was previously done by someone else. It answers the questions, "what exactly was done, when, where and how?" In research publications this is the methods or design section.

When defining the intervention, list the questions what, where, when and how and add bullet point responses to each of the questions. As details are added, the intervention becomes very clear. It is described in such detail that someone else could repeat the same study and obtain the same results. For example, the “what” originally may be defined as “usual medical nutrition therapy sessions.” This could be interpreted differently by others and requires further definition so others know exactly what will be done (prospective study) or what was done (retrospective study).

It takes effort to determine the best study design. Expert researchers frequently struggle over the best way to answer a question. Some researchers explore the literature to learn how others have addressed the same or similar question, and may choose to use the same or similar design. Others talk to other researchers to problem-solve and explore different designs.

Data: Identification, Collection and Analysis

Part of research design is identifying what data to collect and when. Data will be needed which describe the study participants and outcomes related to the study question. (See Table for examples of data to collect.)

New researchers often make the mistake of collecting too much data. Extraneous data collection adds cost to the study and detracts from the focus. By continuously revisiting the research question, researchers can more confidently identify the data needed to answer the question.

A recent study addressed the question as to whether a specific

Table: Suggestions for Data Collection

<p>Basic Demographic Information</p> <ul style="list-style-type: none"> • Gender • Patient ID (medical record number or your own ID system) • Birth date (month/day/year) • Height and weight (inches, centimeters, pounds or kilograms; use database to calculate BMI) • Type of diabetes (type 1, type 2, GDM, prediabetes) • Date of diagnosis (month/year; to calculate duration of diabetes) • Location of intervention: Type of clinic/setting, urban/rural
<p>Data that can be used to evaluate intervention</p> <ul style="list-style-type: none"> • Hemoglobin A1C and date (before intervention, and at specified times) • Systolic and diastolic blood pressure (before intervention, and at specified times) • Lipids (total cholesterol, LDL, triglycerides (before intervention and at specified times) • Medications (diabetes, hypertensive, lipid; before intervention and at specified times) • Prior MNT and/or DSMT (yes/no/unknown) • Current eating pattern; food frequency
<p>Intervention</p> <ul style="list-style-type: none"> • What was done and by whom—could be number of education visits or phone calls • You may develop protocols or meals that are followed for the intervention; document whether they were followed

BMI, body mass index; DSMT, diabetes self-management training; GDM, gestational diabetes mellitus; ID, identification; LDL, low-density lipoprotein; MNT, medical nutrition therapy.

quality improvement intervention lowered the mean systolic blood pressure in persons with diabetes at 12 healthcare settings. The researchers wanted to limit the amount of data collection yet wanted to be comprehensive in tracking data that could affect blood pressure. As an RD, the author highlighted the importance of collecting nutrition-related data so that data on nutrition/lifestyle counseling and referral for nutrition/lifestyle counseling were included (1).

Data can be collected in various ways ranging from manual specially designed data collection forms or surveys, to scanable forms, to data downloaded from an existing electronic database (i.e., medical

record). Instructions and training are provided to anyone collecting data to ensure that it is obtained in a consistent manner.

Basic data analysis is often easy (for example, mean age of study participants or percentage of total participants with A1C less than 7%). Yet, depending on the type of research undertaken, some extra data analysis support may be needed. This support can guide the RD in how to best analyze the data using software programs such as Microsoft Excel or a statistical analysis program and/or actually have someone do the data analysis for the researcher. It is most valuable to have the data analysis support person engaged early in the development

of the study because the analysis can help shape the research question and intervention.

Results and Conclusions

The fourth research step is to summarize and draw conclusions from the study results. Researchers write the results in a straightforward manner that does not include any bias. For example, one would write “100% of participants completed the training program” rather than “we were impressed that 100% of participants completed the training program.” Most research papers include a table or figure that presents the results of the data collection and analysis. Some researchers outline proposed tables and figures during the study design process because it guides data collection decisions.

A study’s conclusion offers the opportunity to review why the results are important and how they might be used. At this time, researchers reflect on additional questions that could be researched and limitations of the current study that could potentially be addressed in future research.

The Research Report

The research report includes the information listed before and is the fifth and final step for most research studies. However, it is often omitted for various reasons, including not enough time to complete the report or being uncomfortable with writing. If barriers to writing are known in advance, they are to be addressed upfront in the planning stage. The researcher may need to identify someone who will either perform this task or provide support to get it done.

As expected, research reports are written in a tone and format that fits

their audience. For a first study, a researcher may only need to write up a one- or two-page report. If writing a longer report, consider including an executive summary at the beginning and a table or figure that helps present the data. Researchers who want to publish their research in a journal or magazine can check the targeted publication’s specific author guidelines online.

Many journals have sections for original research and research briefs. I recently submitted a research manuscript to the *Journal of the American Dietetic Association* and the reviewers suggested that it be resubmitted as a research brief. Although it is difficult to delete written content on which one has worked hard, the article was tighter and published (2)!

Do Not Forget the Research Budget

It takes time to do research and time, of course, is money. Some find it easiest to examine a research question that is important in their work setting so it can be completed as part of their work and could potentially use other resources from their work setting. Researchers will often develop the budget as part of the design process or work with someone at their institution to put dollars to the study.

To develop a budget, the researcher lists, in some detail, all the steps that need to be performed and the people who will be involved in each step and for how many hours. Some grants allow the inclusion of overhead (space, utilities, equipment) and others allow the purchase of special equipment such as a nutrient analysis software program or laptop computer.

Once the detailed budget is developed, researchers often summarize the budget into broad categories. For example, headings for one research study included study development (protocol and chart audit), intervention (cost of performing study), data analysis (statistician and discussions with project team for interpretation), and dissemination (time to write a paper and present a poster session).

Resources

Those who are involved in recognized diabetes education programs need to conduct a continuous quality improvement (CQI) project each year. If an RD has participated in such an activity, then he or she has already conducted research! The CQI process is a form of research. A handbook published by the American Association of Diabetes Educators (AADE) provides a step-by-step approach to conducting a CQI project (3). The first edition of this handbook was written by AADE’s research committee to encourage a methodical approach to conducting this type of research.

The American Dietetic Association has several terrific research resources (4,5). The article by Sheean et al is the seventh article in a series published in the *Journal of the American Dietetic Association* on the importance of research design, analysis and epidemiology in the conduct, interpretation and publication of nutrition research.

Summary

Research does not need to be daunting. It is basically asking a question and finding the answer in a focused, unbiased manner. The nutrition profession would benefit from more RDs conducting research.

Much can be learned from nutrition-related research about delivering medical nutrition therapy and providing evidence for nutrition therapy and its effectiveness.

References

1. Powers MA, Cuddihy RM, Bergenstal RM, Tompos P, Pearson J, Morgan B. Improving blood pressure control in individuals with diabetes: a quality improvement collaborative. *Jt Comm J Qual Patient Saf.* 2011;37(3):110-119.
2. Powers MA, Cuddihy RM, Wesley D, Morgan B. Measuring the impact of carbohydrate using continuous glucose monitoring. *J Am Diet Assoc.* 2010;110:1912-1915.
3. American Association of Diabetes Educators. *A Step-by-Step Guide for Quality Improvement in Diabetes Education.* 2nd ed. Chicago, IL: American Association of Diabetes Educators; 2008.
4. Monsen ER, Van Horn L. *Research: Successful Approaches.* 3rd ed. Chicago, IL: American Dietetic Association; 2008.
5. Sheean PM, Bruemmer B, Gleason P, Harris J, Boushey C, Van Horn L. Publishing nutrition research: a review of multivariate techniques: part 1. *J Am Diet Assoc.* 2011;111:103-110.



DCE 2011 FNCE EVENTS

Friday, September 23, 2011

EC Meeting 8:00 am – 4:00 pm

Saturday, September 24, 2011

DCE Membership Meeting 8:00 – 11:30 am

Sunday, September 25, 2011

Spotlight Session 10:00 – 11:30 am

Enhanced by Technology: A New Level for Chronic Disease Self-Management Speakers: Neal Kaufman, MD, MPH and Janice Baker, MBA, RD, CDE, CNSC

Sunday, September 25, 2011

DCE & WM Member Reception 6:00 – 7:30 pm

Monday, September 26, 2011

DCE Awards Breakfast (by invitation) 6:30 – 8:00 am

Monday, September 26, 2011

DPG/MIG Showcase 10:30 am – 1:00 pm

Tuesday, September 27, 2011

DCE & WM Joint Member Breakfast 6:30 – 8:00 am

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Confused by the alphabet-soup of all the diabetes clinical research studies? Joslin Diabetes Center has created an at-a-glance summary chart of key studies for the busy clinician. To access a copy, go to www.dce.org (reprinted with permission from the Joslin Diabetes Center).