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REVIEW ARTICLE

Survey Research: 10 Essential Elements for Better Results

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Abstract

Survey research studies are frequently done badly, resulting in unreliable data. Response rates for clinical research are commonly below 30%, far less than considered reasonable for accuracy or validity. Addressing 10 weak points common to many studies would help to improve the quality of outcomes. Careful attention to the data needed to meet the research objective, clearly defined population definition, frame, sample and implementation planning all build a foundation for rigorous research. The survey delivery method(s), questionnaire design, write-up, pre-test of the questionnaire and mixed method, multiple follow-ups all should all work toward maximizing response rates. Well cleaned data will deliver high quality final results.

Keywords: Research design, population, frame, sample, method, questionnaire, design, test, implementation, Survey research

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The authors bring 80+ years of combined academic training and experience in the design, implementation and analysis of survey research studies for government, healthcare, industry and other organizations. Across our tenure in working with survey research, three fundamentals have remained consistent:

1. Better surveys deliver better, more accurate, more useful data.
2. Survey research is a unique and important methodology.
3. Survey studies are often done badly, sometimes very badly.

Our objective for this paper is to present 10 often skipped elements that are critical to the design and execution of a good survey study. These 10 are not exhaustive, but whatever the subject if you pay attention to them you will have a better survey.

We define survey research broadly: the collection of data from humans through their response to a questionnaire (1). This definition does not specify the subject matter, the participants, the kind of data to be collected, the method of data collection or analysis. The 10 topics that are addressed here apply to all surveys; some topics may deserve more or less consideration, but all are essential to a good survey study. And one or more are very commonly missed.

These topics are presented roughly in sequential order but they are not all sequential. For purposes of brevity the term "data" will be used to describe the information to be collected by the questionnaire; whether qualitative or quantitative.

10 Essential elements

1. First define the data needed to answer the research question(s) (2, 3). A survey study delivers data; it is very difficult to design a good study without first understanding what data are needed. Only when the needed data are understood should questions be written and questionnaires designed.

2. Define the population that will be surveyed; who (or what) do you need the findings to represent? (2) This could be individuals, e.g. cardiologists, or businesses, e.g. cardiologist practices, or events, e.g. experiences with a particular piece of equipment. Define exclusion and inclusion criteria, e.g. all cardiologist offices that have utilized this equipment, or 'only

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Table 1 Factors in minimizing costs/maximizing rewards

Factors in minimizing cost:
- ○ Write questions in language and concepts that the respondent population is comfortable with.
- ○ Write questions that are not too demanding or detailed. Examples of overly demanding/detailed questions (taken from two different survey questionnaires:
  - • Please estimate the proportional breakdown of payment sources for your clients for the past 6 months
  - • Please report (in whole numbers) the hours per week spent interpreting test outcomes.

  A respondent should be able to complete a questionnaire without having to leave their desk or search for information.
- ○ Minimizing anxiety raising questions; for example "What is your income?" "What is the level of your work position?"
- ○ Avoiding overly precise or overly detailed questions; for example "Please give the models and serial numbers of the 3 most often used imaging equipment in your office."
- ○ Ask for only needed information, that is information necessary to answer the research questions. Remove any and all questions that collect "nice to know" information.

And maximizing rewards:
- ○ Selling the research to the respondent. Tell them why the research is important (in terms that they will understand as well as share in) and why their response is valuable to the study.
- ○ Make the questionnaire interesting to the respondent.

Nursing in a neonatal intensive care unit can be very demanding intellectually as well as emotionally.
Considering your work over the past month, how demanding have you found it to be?
A. VERY DEMANDING
B. DEMANDING
C. A BALANCE OF DEMANDING AND NON-DEMANDING
D. NOT DEMANDING
E. DON'T KNOW

Figure 1 Create an interesting first question.

patients that have experienced…" (4)

3. Define the survey frame. The frame is a list of locations from where, specifically, you will get the data; who, specifically, will provide it and how will they be contacted (2). An important outcome of defining the survey frame is an understanding of the people that will be receiving and completing the questionnaires. Will they be cardiologists? patients? office administrators? Medical equipment operators? How busy are they? How many survey questionnaires do they receive each week? Whether the study is relatively simple or even slightly complex a carefully crafted survey frame is essential. The frame will often be used for the selection of a sample (5).

4. Design the sample. Sample design will depend on the research question, the study design, the degree of accuracy needed for analysis, the population and the frame (6). A sample may be simple, e. g. a consensus sample of all clinicians using XYZ equipment, or it may be complex, e.g. a representative sample of all patients that have received treatments within a given service area. It may be a simple list of all clinician offices or a stratified random sample of patients within a certain time frame. We recommend the services of an experienced statistician when designing a sample.

5. Identify the survey method(s), i. e. how the questionnaires (and follow-up reminders) will be delivered to the respondents. The most important consideration in selecting methods is which ones will get a response (7, 8). High response rates are critical to high quality data and selecting the best method is an important factor. Too often the method selected is based on ease of use for the researcher, e.g. a web-based survey app is simple and quick. But web-based surveys get consistently low response rates from clinician offices (9, 10). In the frame you identified the people that might receive your study; find out the best way to get your survey noticed by them. If all else fails, ask them.

6. Write the questions and design the questionnaire for the respondents in order to optimize the chances of them completing and returning it. The Exchange Theory suggests that people act based on perceived costs vs. rewards (Table 1) (11); if the costs of completing a questionnaire, e. g. time, effort to recall/find information, anxiety, outweigh the rewards they won't respond. Researchers are often more interested in the topic than the respondent and tend to ask for more information and in greater detail than the respondent can or is willing to deliver.

First impressions, including the first question, are important to perceived costs. If the first question(s) is unimportant or anxiety raising, e. g. "*1. Education level: a. RN b. BD c. Masters d. PHD*", the chances of response drop. The first question is the "hook," it should capture the character of the

Table 2 A minimum of two tests for every survey questionnaire

A minimum of two tests for every survey questionnaire:
○ Face validity test with colleagues. The objective is to determine if the data being collected will answer the research question.
○ Cognitive validity test with small sample of respondents, a minimum of 3. The objectives are to determine if:
• The research methodology, e.g. mail, telephone or web-based survey, will effectively deliver the questionnaire to the respondent
• The questionnaire can be completed easily by respondents, e.g. there are sufficient instructions and it is laid-out logically
• The questions are worded clearly and understood consistently
• The respondents can supply the requested information, that the questions are not too demanding, detailed, or anxiety raising.

study, explain its importance and be easy to complete. If there isn't such a question, make one up. See Figure 1 for an example (7).

The corollary to this rule is to put uninteresting and anxiety raising questions at the end. Once begun respondents are less likely to quit completion of the questionnaire. If detailed or demanding or anxiety raising information is required, tell the respondent why in terms they can appreciate and then thank them for supplying it. Group questions by common subject. Order those groups, high to low, by interest to the respondent (not importance to the researcher).

Rewards, such as a Starbucks gift card or entry into a drawing for an iPad, will not tempt respondents to complete a badly designed questionnaire nor will they entice a very busy clinician to respond, especially if s/he has little interest in the study (12). Focus on the design of a good questionnaire. If you want to offer a reward give it to them up-front, not based on whether they respond (12).

It is entirely up to the researcher to minimize costs and maximize perceived rewards (7).

7. Test the questionnaire as a part of design. A questionnaire should never be released without a minimum of two tests, face validity (13) and cognitive validity (14) (Table 2). A cognitive validity tests is best completed through 1-on-1 meetings. Respondents complete a questionnaire and can then voice any concerns about the questions, the instructions, etc. The researcher can query about whether questions or instructions are understood. A great deal can be learned about a questionnaire in these meetings.

8. Plan implementation logistics. Whether a relatively simple, small scale survey or a complex, large scale one, creating a schedule, checking contact dates against holiday schedules, checking required steps with available resources, and assuring that each step in the study is understood and agreed upon with staff is fundamentally important to a successful study (2, 3). Implementation plans should include preparation of survey components, e. g. frame and sample design, verification of sample, preparation and testing of the questionnaire, release and follow-up schedule and methods, handling of responses, creation of a data base and analysis.

9. Maximize response rates; this is critical to the quality of your research findings. High impact research journals may refuse to publish articles where the response rate is low, e.g. less than 65% (15). Some of the most important steps to maximizing response are already done with a well-defined frame and sample, a thoughtfully selected implementation method, and a carefully constructed, tested questionnaire. But multiple follow-ups, at least three, are needed. A mixed methods approach should be considered to bring the survey to the attention of the hoped-for respondent. For example a paper pre-notice letter with first class postage stamp (or sent FedEx) and 'real' signature, a web-based questionnaire release, a "thank you" postcard scheduled to arrive the day following the questionnaire release (this can double the initial response rate) and a paper letter or a phone call to follow-up with non-respondents may get attention where only email queries may not.

10. Clean the data on-going; check for outliers, corrupt or missing data. Never trust the data to be perfect; errors can come from a number of sources ranging from errors in questionnaire design, respondent errors, and data entry (16).

Conclusion

A high quality survey research study combines rigorous research design with careful attention to the respondent, who they are, what they are like, how to maximize the chance that they will complete and return the questionnaire. Maximizing response rates, e. g. >65%, requires careful attention to a variety of factors: frame and sample design, questionnaire composition, implementation methods and multiple follow-ups.

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