

Survey Research: An Effective Design for Conducting Nursing Research

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An important advantage of survey research is its flexibility. Surveys can be used to conduct large national studies or to query small groups. Surveys can be made up of a few unstructured questions or can involve a large-scale, multisite longitudinal study with multiple highly validated questionnaires. Regardless of the study's degree of sophistication and rigor, nurses must understand how to properly conduct survey research. This article describes survey research, including design, methods, analysis, limitations, and implications for researchers.

Learning Objectives

- Describe the steps of the survey research project.
- Differentiate survey research methods.

The most familiar example of survey research is the U.S. National Census Survey. This single survey will have a major impact on our national goals, our national finances, the make-up of our national government, and more. Another well-known method of survey research is the Gallup poll, which keeps the public informed of momentary changes in popular opinion.

Survey research can be an excellent means of obtaining information from large populations, but the true advantage of this research is flexibility. Survey research can be used to conduct large national studies, such as the census, or to query small groups. Surveys can be made up of a few unstructured questions or can involve a large-scale, multisite longitudinal study with multiple highly validated questionnaires. Regardless of the degree of sophistication and rigor, survey research can be a valuable research tool.

In the hierarchy of research methodologies, surveys rank low because they use self-reported data, unlike a highly scientific experimental research project, such as a randomized, control trial (Polit and Beck, 2008). The major assumption underlying survey research is that respondents will respond honestly. However, respondents typically want to portray themselves in the best light and may enhance responses to please the researchers or make themselves look good. This influence is commonly referred to as *social desirability*. For example, if a researcher were to ask a group of students to report illicit drug use, findings would most likely be underestimated because of the social desirability factor (Paulhus, 2002). However, survey research remains an important, informative method that can greatly impact nursing practice.

For example, every 4 years, the U.S. Department of Health and Human Services conducts the National Sample Survey of

Registered Nurses (U.S. Department of Health and Human Services Health Resources and Services Administration, 2010). This survey provides data that tell us what our profession looks like, including the demographic, educational, and salary data and professional trends. The results are used to estimate the capacity of nurses to meet the health-care needs of Americans and have long-lasting effects on national policies regarding nursing and health care, national funding, educational incentives, and future directions for the nursing profession.

Nurse scholars use survey research to examine many areas of nursing practice. Some familiar ones include nurse competencies, nurse knowledge and knowledge gaps, professional practice patterns, patient-safety issues, patient satisfaction, and investigation of population profiles (Aiken, Clarke, Silber, & Sloane, 2003; Blegen, Gearhart, O'Brien, Sehgal, & Alldredge, 2009; Kleinpell, 2003; Merwin & Thornlow, 2006). A 1-year systematic review conducted by a popular health-care journal found that 26% to 35% of all research articles published in their journal used a survey research design (Draugalis, Coons, & Plaza, 2008).

Depending on the goals of the study, the degree of sophistication for survey research can be highly variable. However, whether the survey research project is large or small, sophisticated or simple, the methods must be rigorous, and the survey tool must be reliable and valid, so the results can be meaningful. This article discusses important factors nurses must take into account when considering a survey research project.

Research Question

The research question is the most important initial step in the research process because it defines the expected outcomes and drives the project design. The research question should be clear and concise. It also should be measurable and take into consideration the variables involved in the study. For example, in the National Sample Survey of Registered Nurses, the questions

TABLE 1

Survey Research Methods

	Advantages	Challenges
Face-to-face interview	• Personal connection • Enhanced response rate • Ability to clarify questions and responses	• Time consuming • Difficult to reach large number of subjects • Travel for researchers or subjects
U.S. mail	• Convenient • Easy to reach subjects • Subjects able to respond at their leisure	• Cost of mailing • Lower response rates • Time consuming to input data • Increased risk of data entry error • Undeliverable mail
Web-based	• Easy access • Subjects able to respond at their leisure • Ability to reach large number of subjects	• Reliance on motivation of subject to connect to website • Need for subject to have web access • Risk of subject bias • Impersonal • Cost of obtaining web address • Cost of web manager • Outdated websites
E-mail	• Easy access • Subjects able to respond at their leisure • Ability to reach large number of subjects	• Need for subjects to have e-mail • Risk of subject bias • Impersonal • Undeliverable e-mail • Outdated listserves
Windshield	• Ability to cover a large geographic area	• Need for researcher to have car • Limited geographic area • Cost of gas

reflect well-defined demographic variables, such as age, gender, and race, and other questions ask for the specific details of the work environment, such as number of hours worked and salary. The survey has a clear purpose of examining the nurse workforce to inform the nation about the state of nursing and the future ability of the nursing profession to meet the health-care needs of the nation (US Department of Health and Human Services Health Resources and Services Administration, 2010).

The research question should also take into consideration the work already published on the topic and should address a topic that has significance to nursing (Draugalis et al., 2008). After the research question has been clearly explicated, other aspects to be considered include the research design and method, methods for protecting human subjects, sample, geographic limitations, timeframe for the study, tools to be used and their reliability and validity, data collection, data analysis, cost, the plan for reporting the findings, and the implications for evidence-based practice.

Design and Method

While the research question drives the design of the project, the design gives researchers an overall plan or framework that will guide the project. Some examples of research designs are survey research, ethnographic research, randomized control trials, and exploratory descriptive research.

After selecting the design, researchers must consider the method or the manner in which the study will be carried out. Some examples of survey research methods include face-to-face interviews, paper-and-pencil surveys, electronic (e-mail and web-based) surveys, telephone surveys, and windshield surveys. They each have their advantages and challenges (see Table 1). The method used will dictate the degree of sophistication and magnitude of the study.

Face-to-face interviews allow for a personal connection to the subject and typically have excellent response rates. This method is highly valued because of the quality of information obtained.

The most popular method is developing a questionnaire to collect responses, using paper and pencil, e-mail, or web-based services. Other methods include telephone interviews, which may be computer-assisted; windshield surveys, which involve driving through a community and tracking a specific trait, such as the number of full-service grocery stores (Nicotera, 2007); and mixed-method surveys. Generally, a mixed-method survey uses the telephone interview method with a back-up plan to interview subjects face-to-face if they are not available by phone (Dillman, 2006, 2007; Polit & Beck, 2008). In a study of alcohol use among college students, the mixed-method survey used a web-based survey with a follow-up mail survey for nonresponders (McCabe, Diez, Boyd, Nelson, & Weitzman, 2006). A mixed-

method survey is different from mixed-method research, which generally refers to the combination of qualitative and quantitative research designs in the same study.

The use of Internet-based methods, such as e-mail and web surveys, has grown dramatically over the past few years because these surveys are less expensive, have the ability to reach large numbers of subjects, and can include efficient methods of data entry. One criticism of web-based and e-mail surveys is a potential subject bias. In a recent survey comparing respondents of web-based surveys with those of mailed surveys, web respondents were more likely to be male and younger, have a high school diploma or college degree, and work in information technology or a technical occupation (Smith, Smith, Gray, & Ryan, 2007).

Mailed surveys remain a popular and important means of conducting survey research. A recent study found that when given the option of taking a mailed or Internet survey, 24% of the respondents chose to use a mailed survey (Kroth et al., 2009). One problem with both mailed and Internet methods is that many surveys are undeliverable because of invalid postal or e-mail addresses or outdated listserves (Draugalis et al., 2008).

Protection of Human Subjects

Researchers must secure approval from an investigational review board (IRB) before initiating a study. The IRB determines whether the survey could cause harm to the respondents, including psychological distress, and whether the study is significant enough to be worth the respondents' valuable time. Most journals will not publish studies without IRB approval.

For survey research, informed consent is implied when the survey is completed and returned because the respondent has the option of not participating. The IRB must be assured that responses are not coerced with excessive monetary, personal, or professional or political rewards for returning the survey. If the survey is not anonymous, the researchers must consider whether answering the questions poses any threat to the respondent. For example, will the respondent face consequences, such as professional, political, or personal persecution, if the answers are not favorable?

Sample

The most common type of survey conducted by nurses is a sample survey. Unlike a census survey, which surveys an entire population, a sample survey (also called a *purposive sample*) targets a specific population. Nurses most often conduct these surveys because they are usually looking for information from a specific set of colleagues, patients, other health-care providers, or consumers.

Researchers need to define the target sample. Who are the people, the populations, or institutions that can provide the most information about the research question? Although researchers are rarely able to obtain information from an entire population,

they must have a plan to include a sample that will adequately represent all aspects of the problem under study. Any possibility that a sector of the population will not be included must be clearly justified. Researchers must consider which criteria must be met for subjects to be included in the sample. For example, will the subjects need to speak English? Will they have to fall within a specific age category (Draugalis et al., 2009)? For the National Sample Survey of Registered Nurses, all states were asked to share their lists of licensed registered nurses. All nurses were eligible to participate, and a random list was generated.

Sample Size and Response Rate

The researchers must determine the number of responses needed to make the study statistically significant by conducting a power analysis. They also must anticipate the response rate. If the power analysis determines that 100 completed surveys are needed, and the anticipated response rate is 50%, the researchers need to administer 200 surveys. Predicting accurate response rates is crucial to the success of the study and can be one of the most difficult aspects. The best way to predict response rates is to examine the response rates of published surveys using similar designs and populations.

Researchers must guard against a *response bias*, which occurs when people of like opinion all respond and those with opposing views do not respond. If, for example, a study on the general population receives more than 50% of its responses from elderly people, the data will have a response bias. The best way to avoid a response bias is to institute measures that enhance the response rate. Response rates for surveys vary from less than 10% to 100% (Grava-Gubins & Scott, 2008). There is little agreement in the literature about an acceptable response rate. Acceptable response rates vary from 30% to 75% as minimum numbers (Draugalis et al., 2008).

The most popular method for increasing response rates using mail surveys is the *tailored design method* (TDM), developed by a well-known survey researcher named Don Dillman. The TDM suggests using five elements to enhance the response rate: a respondent-friendly questionnaire; four contacts by first-class mail with an additional "special contact" (phone call); return envelopes with real first-class stamps; personal correspondence; and a token financial incentive (Dillman, 2007). In a systematic review of the literature, investigators examined 481 research studies using postal questionnaires. Response rates doubled when subjects were offered money for their responses. In a 2008 study on enhancing physician response rates, Thorpe et al. (2009) found that two items increased the response rate more than any other: sending gift certificates with the surveys and sending the surveys via registered mail. In another study of physicians, researchers found that the size of the monetary incentive mattered. In a study of 578 physicians, those who received a \$20 gift certificate achieved a 52% response rate, and those who received a \$50 gift

TABLE 2

Factors that increase Response Rates to Questionnaires

Monetary incentives (OR 1.87; CI 1.73–2.04)
Recorded delivery (OR 1.76; CI 1.43–2.18)
A teaser on the envelope (OR 3.08; CI 1.27–7.44)
An interesting topic (OR 2.00; CI 1.32–3.04)
Prenotification (OR 1.45; CI 1.29–1.630)
Follow-up contact (OR 1.35; CI 1.18–1.55)
Unconditional incentives (OR 1.61; CI 1.36–1.89)
Shorter questionnaires (OR 1.64; CI 1.43–1.87)
A second questionnaire at follow-up (OR 1.46; CI 1.13–1.90)
Mention of an obligation to respond (OR 1.61; CI 1.16–2.22)
Mention of university sponsorship (OR 1.32; CI 1.13–1.54)
Personalized questionnaires (OR 1.14; CI 1.07–1.22)
Use of handwritten addresses (OR 1.25; CI 1.08–1.34)
Use of stamped return envelopes (OR 1.24; CI 1.14–1.35)
Assurance of confidentiality (OR 1.33; CI 1.24–1.42)
First-class outward mailing (OR 1.11; CI 1.02–1.21)

Note. OR = Odds Ratio: Relative measure of risk comparing two groups; if both groups have an equal chance of having an outcome from exposure to a variable as compared with another group, the odds ratio is 1 (1/1). CI = Confidence Interval: An estimated range of values in which the outcome is likely to occur within a given percent of certainty.

certificate achieved a 68% response rate (Keating, Zaslavsky, Goldstein, West, & Ayanian, 2008).

A study by Pedrana and colleagues found that sending a questionnaire by registered mail rather than first-class mail enhanced their response rate from 67% to 86% (Pedrana, Hellard, & Giles, 2008). A note on the envelope enticing subjects to open it, an interesting topic, and a prenotification indicating that a questionnaire would be coming are other ways to enhance response rates (Edwards et al., 2009). (See Table 2 for a detailed list.) Asking questions of a sensitive nature has been found to reduce response rates. When considering how to improve response rate, researchers must be creative because of the importance of the rate in determining the significance of the findings.

Geographic Limitations and Time Frames

Researchers need to consider the geographic limitations of their study. Will the study focus on a unit or an institution? Will it examine local, regional, national, or international issues? Online surveys are becoming more and more popular because the number of possible respondents and the geographic access are unlimited.

Researchers also must consider the amount of time allowed to conduct the study. Will it be conducted over a few days, a few weeks, months, or years? Will this be a longitudinal study that will be conducted at specific intervals of time? If the study were to progress over generations, will a team be available to sustain it?

A time line, which will guide the flow of the study, should include the time of idea inception, survey design, consultation and expert reviews, pilot testing, mailing, data entry, data cleaning, data analysis, and the report of findings (see Figure 1).

Survey Tools and Questions

The researcher must determine whether to design a new survey tool or use an existing one. The process of designing or selecting such a tool should be based on the research question and the review of the literature. A literature review should focus on all the possible variables in the study and a review of current and past tools that have demonstrated good reliability and validity data.

Most surveys begin by collecting demographic data on the subjects (sex, age, race, and ethnicity), which are important when publishing the findings. Readers need to understand who responded to the survey to determine external generalizability. In the past, most medical research was conducted using only White male subjects. This approach led to the National Institutes of Health requirement to collect racial and ethnicity data in a very specific manner and to ensure that data are collected from all groups. The U.S. government guidelines for collecting and reporting race and ethnicity data can be found at <http://www.fda.gov/RegulatoryInformation/Guidances/ucm126340.htm>.

The interview guide or questionnaire must be able to elicit specific answers to the research questions (also known as *construct validity*). Hundreds of research questionnaires have been published with excellent reliability and validity data. Some tools, such as those that measure stress or quality of life, have been used in thousands of studies and have proven to have excellent psychometric properties. If the researcher is designing a new survey, psychometric properties must be taken into consideration. The survey tool should be reliable, meaning that the instrument consistently measures the intended attribute. The tool also must be valid, meaning that it really measures the construct the researchers are getting at. Construct validity is measured in several ways, including criterion (measuring against an accepted gold standard) and face validity. For example, trying to measure obesity by asking all respondents to report their weight but not their height would result in an invalid measurement of obesity. To measure anxiety, one would not want to measure pain. Using criterion validity methods, a researcher would test a new anxiety measure against a gold standard measure of anxiety to compare how the new measure performs.

Face validity determines whether or not respondents understand what the question is asking. Face validity is often confirmed by asking a group of experts to review at the survey to determine if it will measure the constructs intended. How many experts are needed? There is no agreement in the literature to answer this question; however, some researchers use 10 reviewers for face validity.

Inter-rater reliability, another psychometric property, must be considered. When interpreting the survey responses, do all researchers involved in data entry and analysis interpret the responses in the same manner? Inter-rater reliability must be tested and validated before survey distribution (Polit & Beck, 2008). Inter-rater reliability is assessed by having a second researcher review all or a percentage of surveys coded by a different researcher and determining if there was any variance in the coding.

Research questions must be simple, clear, and concise. The respondent must easily understand the question to give a meaningful response. Questions should not be ambiguous and should be designed so every subject will interpret the question in the same manner (Brommage, 2006).

Piloting the Survey

After a group of experts determine the face validity, the researchers should pilot the survey with a small group of potential respondents. The responses should be examined for any confusing comments or responses, lack of agreement regarding the interpretation of the responses among the researchers, and any difficulty with coding the data. After the pilot test has been reviewed, any necessary changes have been made to the tool, and the research team is satisfied with the reliability and validity results, the researchers are ready to launch the survey.

Data Collection, Management, and Analysis

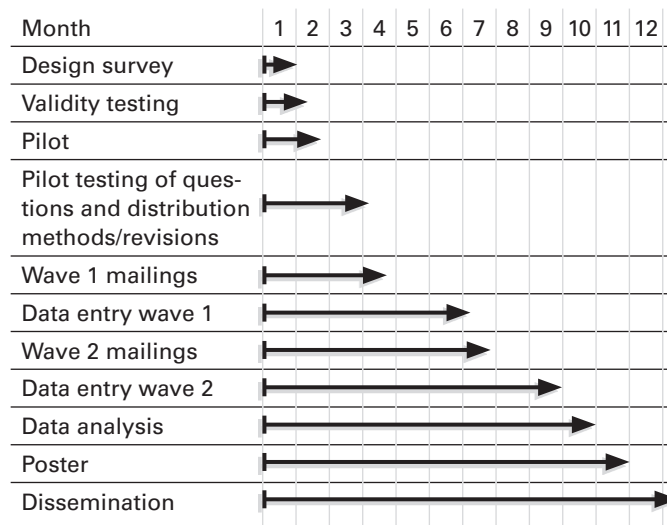
Researchers need a clear plan for data management, regardless of the size of the project. They must determine how the survey data will be entered, which software will be used, and who will enter the data. Online data are generally entered automatically, depending on the software. Data cleaning occurs when data entry begins. If data are entered manually, a process to test inter-rater reliability should be established.

If the survey involves a large number of respondents, sending the survey in waves can allow time for the researchers to better manage the data flow. The research team can enter and clean data from the first wave, troubleshoot any problems, and identify the subjects who have returned surveys and those who will need a second distribution. When the first wave has been managed, the second can go out, and the process begins again. Between waves, nonresponders are sent a second or third copy of the survey.

The manner in which the data are analyzed depends on the research question. The analysis can be as simple as reporting frequency data, such as numbers or percentages, or it can include sophisticated statistical analysis, such as regression models and statistical patterns. Statistical techniques should match the design. Tests that determine statistical significance and correlate variables provide the reader with confidence that the results are

FIGURE 1

Sample Time Line for a 12-Month Mailed Survey Research Project



meaningful (Brommage, 2006). Many researchers employ a statistical consultant to offer assistance and advice.

Costs

Costs may be covered by existing funds, or funds may be solicited. Either way, the researcher must plan the study in the context of the available resources. Software and websites may need to be purchased. Other costs include compensation for personnel to administer the survey and manage the data entry (principal investigators, project coordinators, and research assistants), costs directly associated with survey administration (mailings, paper, postage, and web manager fees), incentives for subjects, fees for expert consultation, and the cost of disseminating the findings (travel to conferences and poster development).

Online surveys eliminate the cost of mailing. In a study by Kroth et al. (2009), costs for technology support for a web-based survey were \$4,260 compared with \$6,230 for postage, envelopes, and stationery to mail the same survey. Depending on the budget, Internet and personnel resources, and the intended audience, many tools are available for use with online surveys, such as Snap (www.SnapSurveys.com), Survey Monkey (www.surveymonkey.com), and Zoomerang (www.zoomerang.com).

Interpreting the Results and Implications for Nursing Practice

Results should be reported objectively, stating the findings only. The criteria used to interpret the results should be clear to the reader, and the results should be easily reproducible by other researchers. In the discussion phase of the manuscript, the re-

searcher can inject opinions and offer suggestions for application of the findings and significance to nursing.

Implications of the research findings to nursing practice must be clearly identified. The researchers should tell the reader how the research has contributed to the science of nursing and how the findings will impact nursing practice of the future.

Reporting the Findings

The final phase of the survey research project is also the most important in terms of making a contribution to the profession: disseminating the findings. The findings should first be reported in an oral or poster presentation at a local, regional, national, or international conference. Making such a presentation is an excellent way to network and get findings out to the people who will use the research. Next, a manuscript reporting the findings should be published in a peer-reviewed journal that targets audiences who would be most impacted by or interested in the findings. For example, if the subject deals with public health, a public health journal would be sought.

Summary

Survey research can range from a small, quality project to a large, longitudinal, international study. It can spread over a small unit, a region, a state, a nation, or the globe. It can be rigorous, involving highly sophisticated statistical analysis, or it can report only one major finding. But no matter how big or small, survey research can have the power to change one person or the entire world. Survey research can be an effective way to increase the evidence in nursing practice.

Research can be intimidating, confusing, and exasperating, but one must be willing to expose oneself and take a plunge into the unknown to make new discoveries. In the words of Albert Einstein (Einstein, Mayer, & Holmes, 2003), "If we knew what it was we were doing, it would not be called research, would it?"

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- Differentiate survey research methods.



CE Posttest

Survey Research: An Effective Design for Conducting Nursing Research

If you reside in the United States and wish to obtain 1.6 contact hours of continuing education (CE) credit, please review these instructions.

Instructions

Go online to take the posttest and earn CE credit:

Members – www.ncsbninteractive.org (no charge)

Nonmembers – www.learningext.com (\$15 processing fee)

If you cannot take the posttest online, complete the print form and mail it to the address (nonmembers **must** include a check for \$15, payable to NCSBN) included at bottom of form.

Provider accreditation

The NCSBN is accredited as a provider of CE by the Alabama State Board of Nursing.

The information in this CE does not imply endorsement of any product, service, or company referred to in this activity.

Contact hours: 1.6

Posttest passing score is 75%.

Expiration: January 2014

Posttest

Please circle the correct answer.

- 1. The influence that causes respondents to portray themselves in the best light and enhance responses to please the researchers is called:**
 - a. social desirability.
 - b. social status.
 - c. validated practice.
 - d. validated response.
- 2. Which survey research method has the advantage of enhanced response rates?**
 - a. Web-based
 - b. Face-to-face interviews
 - c. U.S. mail
 - d. E-mail
- 3. Which survey research method is associated with a lower response rate?**
 - a. Web-based
 - b. Face-to-face interviews
 - c. U.S. mail
 - d. E-mail
- 4. Which survey research method does not allow subjects to respond at their leisure?**
 - a. Web-based
 - b. Face-to-face interviews
 - c. U.S. mail
 - d. E-mail
- 5. Which of the following statements is a criticism of web-based and e-mail surveys?**
 - a. They have the potential for researcher bias.
 - b. They are time consuming.
 - c. They reach too many participants.
 - d. They have the potential for subject bias.
- 6. Which statement about survey research and protection of human subjects is correct?**
 - a. A signed consent form from each participant is required.
 - b. Approval from an institutional review board is not needed.
 - c. Informed consent is implied when the survey is completed and returned.
 - d. Respondents cannot be asked for information that would identify them.
- 7. What is another term for a sample survey?**
 - a. Purposive sample
 - b. Population study
 - c. Target survey
 - d. Subset sample
- 8. If the power analysis determines that 200 completed surveys are needed to make a survey statistically significant and the anticipated response rate is 25%, how many surveys should be administered?**
 - a. 900
 - b. 800
 - c. 600
 - d. 400
- 9. Which of the following is one of the five elements of the tailored design method?**
 - a. A questionnaire sent by registered mail
 - b. A questionnaire that is at least 10 pages long
 - c. Four contacts by mail followed by a "special" contact
 - d. The addition of a form letter to the questionnaire
- 10. The ability of a questionnaire to elicit specific answers to research questions is called:**
 - a. outcome validity.
 - b. inter-rater validity.
 - c. face validity.
 - d. construct validity.
- 11. Which of the following determines whether respondents understand what a question is asking?**
 - a. Outcome validity
 - b. Inter-rater validity
 - c. Face validity
 - d. Construct validity
- 12. Having one researcher review a percentage of surveys coded by another researcher can help determine:**
 - a. inter-rater reliability.
 - b. intra-rater reliability.
 - c. concept validity.
 - d. database validity.
- 13. A strategy to help a large survey run more smoothly is to:**
 - a. send the surveys out in waves.
 - b. send all surveys out at one time.
 - c. hold data entry until the end of data collection.
 - d. hold data cleaning until the end of data collection.

14. Which statement about statistical analysis is correct?

- a. Statistical techniques should be independent of the design.
- b. Statistical techniques should match the design.
- c. Regression models should be used in the analysis.
- d. Pattern testing should be used in the analysis.

15. Which section of the manuscript contains suggestions for applications of the findings?

- a. Design
- b. Methods
- c. Data analysis
- d. Discussion

Evaluation Form (required)

1. Rate your achievement of each objective from 5 (high/excellent) to 1 (low/poor).

- Describe the steps of the survey research project.

1 2 3 4 5

- Differentiate survey research methods.

1 2 3 4 5

Rate each of the following items from 5 (very effective) to 1 (ineffective):

2. Were the authors knowledgeable about the subject?

1 2 3 4 5

3. Were the methods of presentation (text, tables, figures, etc.) effective?

1 2 3 4 5

4. Was the content relevant to the objectives?

1 2 3 4 5

5. Was the article useful to you in your work?

1 2 3 4 5

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1 2 3 4 5

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