Commentary

Application of cognitive interviewing to improve self-administered questionnaires used in small scale social pharmacy research

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Summary

Validating questionnaires for social pharmacy research with smaller sample sizes can be unnecessarily time-consuming and costly, a solution to this is cognitive interviewing with 2 interviews per iteration. This paper shows how cognitive interviewing with pairs of interviews per iteration of the questionnaire can be used to identify overt and covert issues with comprehension, retrieval, judgment and response experienced by respondents when attempting to answer a question or navigate around the questionnaire. When used during questionnaire development in small scale social pharmacy research studies cognitive interviewing can reduce both respondent burden and response error and should result in more reliable survey results. The process of cognitive interviewing is illustrated by a case study from the development of the Perspectives on Progesterone questionnaire.
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Introduction

Self-administered questionnaires are a time- and cost-effective method of collecting data; however, poorly constructed questionnaire reduces the value of a study's results.[1] Questionnaires involve written communication from the researcher to the respondent and back again. As with all forms of communication, questionnaires are open to misinterpretation by either the respondent, when reading them or responding to questions, or by the researcher when interpreting the response.[2] If the individuals in the study population do not interpret the questions in the way that the research team thinks they do, then the conclusions reached are likely to be inappropriate, be they theory-building or empirical, irrespective of the quality of the methodology. A qualitative approach, such as cognitive interviewing (CI), is required to understand the processes of respondent interpretation and give researchers confidence in the accuracy of both their quantitative data and their interpretation of it.[3] Qualitative interviews in the exploratory stages of a research project are typically used to explore content for the purpose of questionnaire development.[4] CI is about the data-gathering process, not about the data itself.

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The answerability of a questionnaire depends on the respondents' cognitive processes while completing it. Consequently, understanding these processes through CI should be a component of successful questionnaire development and deployment. CI can be undertaken via either concurrent or retrospective interviews.[5] Concurrent CI uses think aloud methodology, which has been found to have no major impact on cognition[6]; during the interview, participants are requested to read each question aloud, and then think aloud as they answer the question. During retrospective CI the participant completes the questionnaire in front of the interviewer then answers questions after completion of the questionnaire.[7]

CI has typically been used during the development of questionnaires for large-scale research[3] with groups of 5–15 participants per iteration.[8] Pre-testing groups of this size are impracticable in other research, but iterations of 1 or 2 interviews are feasible and useful. This article discusses the cognitive process, and possible respondent burden involved in answering questionnaires; and how CI can be used during the development of questionnaires to improve questionnaire data by reducing response errors due to language or navigation; examples, from the development of the Perspectives on Progesterone questionnaire, will then be used to illustrate how CI, with 2 interviews per iteration, can be used to test for and identify both overt/expected and covert/unexpected problems within a questionnaire.

Cognition and questionnaires

Responding to a questionnaire question is a complex cognitive process. First, respondents interpret the question and its intent [comprehension], then search for the required information [retrieval] before making a decision [judgment], and selecting the response that best represents their judgment [response].[9–11]

The cognitive steps can occur sequentially or in parallel, haphazardly or systematically, with or without backtracking, depending on the motivation and circumstances of the respondent.[10] The process can be cut short if a question is sensitive, appears irrelevant or is not of interest.[8] Problems with retrieval can occur because of strategies used, such as estimating if the event in question occurs frequently. They also can occur if the respondent did not store the information in their memory, or if the memory has been lost or blurred by time.[12] Respondents have been found to answer questions even if they have not heard of a term or known its meaning.[3,11] If the answer is not readily available, they might fabricate what they think is an acceptable answer, guess if the question concerns something they have not thought about, or interpret the question adaptively to fit their existing patterns of thinking. Question order also might influence answers through imposing a sequential logic on participants, and foreclosing their own sequential logics; preceding questions can give an impression that a particular answer is more desirable and thus bias the results.[11] Bias can be introduced if researchers uncritically use language that is part of their everyday experience as it may favor the researcher's orientation to the research question.[13] The harder a respondent has to 'work' to answer questions the higher the perceived cognitive demands of responding to the questionnaire will be.

Respondents tend to make the task of answering questions as easy as possible for themselves.[10] To reduce the cognitive demands of the response process some respondents may select the first answer that seems suitable or stop part way through a list of "tick all that apply" when they think they have placed enough ticks to satisfy the researchers. These respondents are said to be *satisficing*. The likelihood of satisficing increases with the difficulty of the task and if the cognitive skills or interest of the respondent are low.[14] Satisficing has been used to explain response order effects, acquiescence, discrepancy between ratings and rankings and selection of no-opinion responses.[15] Satisficing and guessing answers are ways respondents reduce the effort (respondent burden) of completing a questionnaire.

Researchers would like respondents to answer the intended questions. To minimize respondent burden the respondents need to be able to comprehend the question then retrieve the required information and make the appropriate judgments to respond to the questions in an accurate way with minimal effort.[12] Therefore a way of knowing how people from the population of interest will cognitively process the questions is required.

Cognitive interviewing (CI)

CI provides insight into how respondents interpret questions and navigate around a