

# Using Quantitative and Qualitative Methods to Pretest the Publication *Take Charge of Your Diabetes: A Guide for Care*

LYNDA A. ANDERSON, PhD; DAWN SATTERFIELD, C-ANP, RN, MSN, CDE; ROBERT GERMAN, MPH; ROBERT M. ANDERSON, EdD

*Quantitative and qualitative methods used to pretest the guidebook Take Charge of Your Diabetes: A Guide for Care are presented in this paper.*

*Questionnaires were used as the quantitative method (completed by 59 diabetes educators and 301 people with diabetes) and focus groups were used as the qualitative method (3 groups composed of 22 black men and women with diabetes) to examine the relevance, purpose, content, and presentation of the Guide. Findings from between-methods triangulation supported the relevance, clarity of messages, identification of groups that would be most likely to benefit, readability, understandability, and credibility of the Guide. Specific areas that needed modification were identified. Each evaluation method provided unique data; for example, quantifiable data on intention to change behavior was provided from one method and a recommendation that diversity be maintained was provided from the other method. The relative strengths and limitations of combining quantitative and qualitative approaches are described.*

The importance of incorporating the needs and perspectives of people with diabetes into diabetes education programs has long been recognized.<sup>1,2</sup> Based on this principle, pretesting of diabetes education materials before widespread dissemination is recommended. Both quantitative and, less often, qualitative<sup>3</sup> approaches have been applied. The quantitative strategy is consistent with the major goal of pretesting, which is to collect measurable data on the extent to which the purpose and objectives of the materials are understood.<sup>4</sup> But in other areas of diabetes research,<sup>5-7</sup> qualitative methods such as focus groups are being used to obtain more personalized feedback on the beliefs, attitudes, and behaviors of participants, which may be missed through quantitative methods.<sup>8</sup> Although combining quantitative and qualitative strategies may strengthen pretesting, there is a dearth of studies linking these approaches in the diabetes education literature.

In this paper the experience of using quantitative and qualitative methods to pretest the guidebook *Take Charge of Your Diabetes: A Guide for Care* (English version, herein after termed the *Guide*)<sup>9</sup> is described. Quantitative feedback first was obtained from diabetes educators and people with diabetes through self-administered questionnaires on the perceived usefulness and appropriateness of the *Guide*. Qualitative feedback then was obtained from people with diabetes on their perceptions of the *Guide* and areas that needed modification. The purpose of examining combined results from quantitative and qualitative approaches was to identify specific areas in the *Guide* that need to be modified, and to share the findings about the relative usefulness and limitations of combining these approaches.

## **Background: Development of the Guide**

The mission of the Division of Diabetes Translation of the Centers for Disease Control and Prevention (CDC) is to

From the Division of Adult and Community Health (Dr Anderson), the Division of Diabetes Translation (Ms Satterfield), and the Division of Cancer Prevention and Control (Mr German), Centers for Disease Control and Prevention, Atlanta, Georgia and the University of Michigan Diabetes Research and Training Center, University of Michigan, Ann Arbor, Michigan (Dr Anderson).

Correspondence to Lynda Anderson, PhD, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion (K-30), 4770 Buford Hwy, NE, Atlanta GA 30341-3724.

Reprint requests to *The Diabetes Educator*, 367 West Chicago Avenue, Chicago IL 60610.

reduce the burden of diabetes by ensuring that diabetes research findings are translated into improved clinical and public health practice.<sup>10</sup> Print materials play a critical role in comprehensive diabetes education programs<sup>11-12</sup>; this form of communication can reinforce instructions and lend itself to more detailed message delivery than oral forms of communication used alone.<sup>13</sup> One example of print materials developed by the Division to promote quality diabetes care is the 1991 guidebook *The Prevention and Treatment of Complications of Diabetes: A Guide for Primary Care Practitioners*.<sup>14-15</sup> More recently, the Division developed a companion guide, *Take Charge of Your Diabetes: A Guide for Care*.<sup>9</sup> The purpose of the *Guide* is to promote the involvement of people with diabetes in their care and to prevent complications by providing recommendations about diabetes self-care. The *Guide* is designed to complement direct instruction by practitioners.

The *Guide* has four goals: (1) to deliver messages about prevention and self-care activities to people with diabetes, (2) to encourage individuals to ask members of the diabetes care team about diabetes-specific management, (3) to facilitate behaviors that should occur at regular intervals (eg, obtaining annual dilated eye examinations), and (4) to promote documentation and record-keeping of other diabetes-related activities (eg, sick-day care). The text and illustrations in the *Guide* promote self-care by increasing knowledge and improving personal record-keeping. Flowsheets are incorporated that address such topics as concerns to be discussed and tests to be completed at upcoming clinic visits; readers are reminded throughout the text to record this information on the flowsheets. The flowsheets are distinguished by a yellow background and are designed so that readers can record diabetes-specific management notes for up to 6 years.

The *Guide* was pretested as part of the formative evaluation process. Pretesting helps establish the personal and professional relevance of materials, identify strong and weak points in the text, fine-tune the wording and visual images, and determine the cultural appropriateness of a document before widespread dissemination.<sup>13,16</sup> Thus, pretesting the *Guide* offered CDC a chance to improve the document before additional resources were committed to produce a finished product, in this case another edition.

The framework for developing and evaluating the *Guide* was the health communication "wheel" that the CDC previously had created as part of a broader movement to integrate health communications into prevention programs.<sup>17</sup> The 10-step process from the health communication wheel began with reviewing information about current gaps in diabetes education materials, determining communication objectives, identifying and segmenting the intended audience, selecting communication channels, and pretesting for the relevance and readability of materials.<sup>17</sup>

Initial review by members of the American Association of Diabetes Educators (AADE) revealed a need to lower the reading level of the *Guide*,<sup>18-19</sup> which then was adjusted to a 6th-grade standard. Other characteristics of the *Guide* that affected how easy it was to read and understand were graphics, print style, organization of ideas, amount of preexisting knowledge required by the reader, and amount of information presented. Thus, information was reinforced through

illustrations, flowsheets were developed as described earlier. A preliminary version of the *Guide* then was developed and subjected to the additional pretesting described in this report.

## Methods

**Study Design** A quantitative approach was determined to be necessary for collecting data that would measure the extent to which the *Guide* was viewed as useful to practice, appropriate to specific audiences, capable of enhancing knowledge about diabetes care and health care behaviors, and able to influence an individual's intentions to alter specific diabetes care behaviors. Early in the research process, however, we became aware that quantitative information alone would not provide sufficient guidance for improving the *Guide*. Thus, a decision was made to collect qualitative data that would enrich the pretesting findings. Focus group research was selected because it permits in-depth probing for information, which is not possible using a questionnaire. The focus group initiative was to obtain feedback on the understandability and cultural appropriateness of the *Guide* from a minority group perspective.<sup>20</sup> Black men and women were chosen as the focus because this minority group was underrepresented in the written survey. The informal homogeneous groups and open-ended nature of the questions were thought to encourage participants to share their thoughts and feelings.<sup>8</sup>

## Quantitative Data: Self-Administered Questionnaires

**Procedures** In 1992 the Division of Diabetes Translation entered a collaborative agreement with the AADE to pretest the *Guide* among diabetes educators and their clients. A nonprobability sample of diabetes educators was obtained through an announcement in the *AADE Newsletter*. As part of this process, respondents were asked to indicate the number of copies of the *Guide* (up to 10) and corresponding questionnaires they needed to distribute. Then each respondent was sent a diabetes educator questionnaire along with a packet of copies of the *Guide* and client questionnaires. Explicit instructions were provided for selecting eligible participants from the practice. In brief, respondents were asked to select a start date randomly and then have an office staff member randomly select a number between 1 and 10. For example, if the respondent selected the following Wednesday and the staff person selected the number 3, the third client seen on that Wednesday was invited to participate in the study. After identifying the first candidate, respondents were requested to ask each subsequent client to participate in the study until all the questionnaires and copies of the *Guide* were distributed.

Study participants were given a copy of the *Guide* to review at home and were asked to complete and return the questionnaire within 3 to 4 weeks. The research team was blinded to the identity of participants; all information was collected by participant numbers. Educators who consented to participate in this study followed the informed consent procedures stipulated by their institutions for recruiting research subjects. Only data for participants over the age of 18 years are included in this report.

**Measures** The questionnaire for diabetes educators requested demographic and background information about

Table 1. Key Issues by Information Source

Issue	Self-Administered Questionnaire		Focus Group
	Diabetes Educators	People With Diabetes	People With Diabetes
<b>Relevance</b>			
Teaching	✓		
Resource for different groups	✓		
Appropriateness			•
<b>Purpose</b>			
Most important message		•	•
Prevention/self-care	✓	✓	•
Involvement in care	✓	✓	•
Behavior change		✓	
Promote record-keeping			•
<b>Content</b>			
Readability	✓	✓	•
Topics			•
Suggested revisions	•	•	•
<b>Presentation/Style</b>			
Format			•
Illustrations			•
Suggested revisions	•	•	•

✓ Closed-ended question(s).  
• Open-ended question(s).

their practices. In addition, evaluation was sought on various aspects of the *Guide* through closed- and open-ended questions (Table 1, column one). The questionnaire contained four items that addressed the educator's perceptions of the utility of the *Guide* in terms of teaching and seven items regarding their perceptions about its use as a resource for specific groups of individuals with diabetes. Two items were included about the ability of the *Guide* to facilitate self-care management skills and promote involvement in diabetes care, and one item each about perceived readability and coverage of important topics. A comment section also was provided for making suggestions about revisions.

The questionnaire for people with diabetes was used to collect information on demographics, personal history of diabetes, and current diabetes care practices. As with the educators, both questionnaires contained closed- and open-ended questions (Table 1, column two). One item each was included on the degree to which the *Guide* provided a prevention message and promoted personal involvement in care; one item also addressed their perception of the readability of the document. Nine items were included about the degree to which the *Guide* influenced the reader's intentions to alter personal behavior. In the final section were three open-ended questions about the *Guide*: What was the most important message the respondents obtained from it? What did they like about it? How could it be improved? Copies of the questionnaires are available from the authors upon request.

**Sample** Fifty-nine healthcare professionals completed and returned a questionnaire (60% of those who inquired about the survey). This convenience sample was composed largely

(94%) of certified diabetes educators; nurses comprised 78% of the sample, with 40% having a master's degree or higher. The mean age of respondents was 46.5 years (SD=9.3); the mean number of years they had provided patient education was 13.3 years (SD=8.3) and diabetes education was 9.8 years (SD=7.3).

The questionnaire for people with diabetes was completed and returned by 301 respondents, representing a mean of 5.1 questionnaires per educator (SD=2.3). Approximately 63% of the respondents were women. The mean age of the sample was 54.4 years (SD=15.6), the majority of respondents (86%) were white, 46% reported an annual income of \$20 000 or greater, and 43% had a high school education or greater. Forty-six percent of respondents reported that they had non-insulin-dependent diabetes mellitus (NIDDM), 30% had insulin-dependent diabetes mellitus (IDDM), and 20% were uncertain as to the type. This information was missing for 4%. Of those who reported taking diabetes medications (85% of the sample), 43% took oral medications and 57% were treated with insulin. All participants were currently receiving diabetes education, and 60% indicated that they had attended a formal diabetes education program in the past.

**Qualitative Data: Focus Groups Procedures** In 1994 the Division of Diabetes Translation contracted with the Health Promotion Council (HPC) of Southeastern Pennsylvania to conduct focus groups with black men and women to pretest the *Guide*. Recruitment was designed to yield three groups of people defined by varying lengths of experience with the disease and different levels of accessibility to diabetes education classes. HPC recruited diabetes educators from seven publicly funded municipal health centers in Philadel-

phia to solicit volunteers for the focus groups. The *Guide* was distributed to the participants' residences several weeks prior to the focus group meetings. HPC held focus groups at two public health centers; sessions lasted approximately 1½ hours. A \$50 honorarium was provided to each participant. Each session had two moderators who were black, one served as the principal moderator and the other as the moderator's assistant and recorder.

**Measures** The focus group used a discussion guide containing the following core areas: relevance, purpose, content, and presentation of the *Guide*. The discussion guide is available from the authors upon request. A series of predefined questions were used to elicit discussion within each area (Table 1, column 3). Groups were audiotaped with the participants' consent.

**Sample** There were 22 participants in the three focus groups, 15 black women and 7 black men. Participants ranged in age from 35 to 81 years. All participants were receiving health care at a publicly funded health center or medical clinic that accepted Medicaid patients. Of the 19 participants for whom employment status was available, 12 were retired or unemployed. Of the 17 persons who indicated their educational attainment, one third had completed less than high school, another third had a high school education, and the remaining third had 1 or 2 years of college.

**Data Analysis** Standard statistical techniques were used to analyze the quantitative data. Response options were collapsed from five to three categories for the closed-ended questions (ie, Strongly Agree and Agree were combined into one category, No Opinion was retained as the middle category, and Strongly Disagree and Disagree were combined into the third category). In terms of open-ended responses, the first two authors (LAA and DS) independently grouped these responses into categories. All reported responses that are presented were categorized by consensus of the authors.

The techniques used to analyze the qualitative data<sup>8</sup> were suggested in the literature. The moderator and assistant moderator listened to audiotaped transcripts and read meeting notes; based on these two data sources they identified major themes and findings from the participants' responses and described them in a written report.<sup>20</sup>

Between-methods triangulation was used to link and compare data from the quantitative and qualitative approaches.<sup>21-23</sup> Between-methods triangulation refers to the use of dissimilar methods to generate and compare data about the same phenomenon.<sup>21</sup> In this study frequency distributions and open-ended responses from questionnaires were contrasted with the themes obtained from the content analysis of the focus groups. The areas of overlap between the approaches are shown in Table 1.

## Results

The results are summarized in three sections: findings from the between-methods triangulation, quantitative findings in which no comparable qualitative data were available, and qualitative findings in which there were no comparable quantitative data.

**Between-Methods Triangulation** Comparative data from the questionnaires and focus groups are shown in Table 2. Both methods revealed that the messages of the *Guide* were understood by the intended audience (ie, people with diabetes indicated that the *Guide* had a self-care/prevention orientation, increased knowledge, and encouraged active involvement in their diabetes care). In terms of suggested revisions, a number of the diabetes educators highlighted the need to identify the intended audiences and state the objectives clearly in the introductory section. Participants in the focus groups underscored the importance of having a message that was suitable for all ethnic groups and recommended that the *Guide* continue to reflect cultural diversity but not be tailored to a specific ethnic population.

Both methods confirmed that the *Guide* was understandable and credible (Table 2). All three groups of respondents (the two groups who answered the questionnaires and the focus groups) indicated that more information was needed in the *Guide* on nutrition and physical activity. Participants in the focus groups suggested that supplementary materials should be cited so that information not available in the *Guide* could be easily located. All respondent groups agreed that the flowsheets should be made portable. Diabetes educators also suggested that the flowsheets include sheets for monitoring lifestyle behaviors such as physical activity.

**Quantitative Data** All of the educators agreed that the *Guide* had value as a home reference for individuals, 98% indicated that it was useful as a teaching tool, 98% indicated that it provided recommendations consistent with what is currently taught, and 91% indicated that it was accurate [data not shown in tables]. The educators viewed the *Guide* as most useful for people with NIDDM on oral medications, then for people with NIDDM with diet/physical activity prescriptions, and then for people with NIDDM using insulin. Although over 85% of responding educators indicated the *Guide* would be useful for older adults, less than half believed it would be useful for women with IDDM planning to become pregnant or for parents of children with diabetes.

Respondents with diabetes were very likely (95%) to agree that they would recommend the *Guide* to family and friends. Respondents' reports of current behavioral patterns as well as their intentions to alter each behavior after reading the *Guide* are shown in the Figure. For example, although 45% of respondents indicated that they had their urine checked every year for albumin or protein, more than 52% reported that they intend to request this test as a result of reading the *Guide*. More than 30% of respondents indicated that they did not know they should get dilated eye exams, check their feet daily, and wear identification but reported they planned to do these things after reading the *Guide*. Over 90% of respondents indicated that they already knew about wearing shoes that fit. All reported that they knew or intended to follow illness care procedures.

**Qualitative Data** Respondents indicated that the *Guide* was appropriate for many groups but would be especially useful for people who were either newly diagnosed or who had not yet attended diabetes education classes [data not shown in tables]. Participants noted that the spiral binding, large print, and tabs separating sections enhanced the appeal

**Table 2. Major Findings From Between-Methods Triangulation**

<b>Issue</b>	<b>Quantitative Method: Questionnaires</b>	<b>Qualitative Method: Focus Groups</b>
<b>Purpose</b>		
<b>Message</b>	<ul style="list-style-type: none"> <li>• Ninety-five percent of people with diabetes agreed that the <i>Guide</i> helped them understand how to prevent problems.</li> <li>• Eight-four percent of people with diabetes agreed that they would discuss the <i>Guide</i> with their provider.</li> <li>• Comments from people with diabetes revealed that the <i>Guide</i> provided new information, taught new skills, promoted an active role, and enhanced coping skills.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants indicated that the <i>Guide</i> had the following attributes: encouraged them to ask questions and work with providers as part of a team, made it easier for them to plan diabetes-related activities, and gave them information about how to manage diabetes.</li> <li>• Participants indicated that the <i>Guide</i> would serve as a useful resource in the future.</li> </ul>
<b>Suggested revisions</b>	<ul style="list-style-type: none"> <li>• Twenty percent of diabetes educators made recommendations suggesting that the introductory section be expanded to identify the intended audience and objectives of the <i>Guide</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants indicated that the <i>Guide</i> should continue to show diversity and not target a single ethnic group.</li> </ul>
<b>Content</b>		
<b>Readability</b>	<ul style="list-style-type: none"> <li>• Eighty-eight percent of the diabetes educators indicated that the <i>Guide</i> was easy to read and at an appropriate reading level.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants indicated that the <i>Guide</i> was easy to read and understand, fairly comprehensive, and credible.</li> </ul>
<b>Suggested revisions</b>	<ul style="list-style-type: none"> <li>• Twenty comments from educators suggested expanding the amount of information about nutrition, meal planning, and physical activity.</li> <li>• Forty comments from people with diabetes suggested including more information on diet and exercise.</li> </ul>	<ul style="list-style-type: none"> <li>• Participants indicated that the <i>Guide</i> needed to include more information on diet and exercise.</li> <li>• Even though the <i>Guide</i> could not address everything, respondents suggested that more information should be given on diet and exercise.</li> <li>• Participants suggested that other sources of information should be provided about where to go for more information on topics not presented.</li> </ul>
<b>Presentation/Style</b>		
<b>Suggested revisions</b>	<ul style="list-style-type: none"> <li>• Diabetes educators suggested that flowsheets should be expanded to include more lifestyle issues, flowsheets should be replaceable, and the <i>Guides</i> should be constructed to be more portable.</li> <li>• People with diabetes suggested that flowsheets should be more portable (ie, pocket-size).</li> </ul>	<ul style="list-style-type: none"> <li>• Participants suggested that the yellow flowsheets should be removable.</li> <li>• Participants suggested that the <i>Guide</i> should be designed so people can easily identify the different parts.</li> </ul>

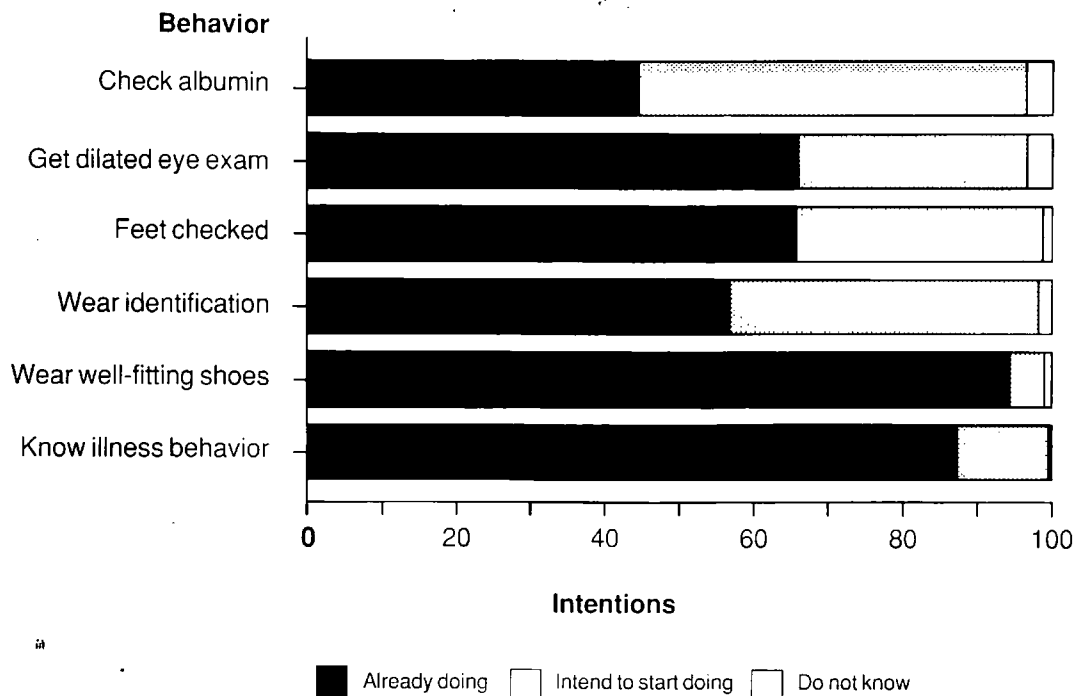
of the *Guide*. Although focus group participants indicated that the *Guide* made it easier for people to plan and keep records of diabetes-related activities, they cited numerous difficulties with record-keeping, including not being accustomed to keeping records, having to expend too much effort to keep the records either daily or when they were sick, and their beliefs that doctors do not do all the tests anyway. In brief, participants indicated that the *Guide* was easy to use but that record-keeping would still be difficult even with the flowsheets. Participants also pointed out a lack of clarity in several of the formatting features, including the icon to remind people to write things down and the yellow flowsheets in the back of the book.

## Discussion

Methods chosen for pretesting materials should suit the problem being investigated. In this study, questionnaires and focus groups were employed to generate and collect data about key issues important in pretesting the guidebook *Take Charge of Your Diabetes: A Guide for Care*,<sup>9</sup> and between-method triangulation was used to compare and contrast the findings. The aim of using these two approaches, which were

thought to be complementary, was to examine the relevance, purpose, content, and presentation of the *Guide*. Quantitative data was sought to document the extent to which specific beliefs and opinions were held, and qualitative information was sought to gather viewpoints from a specific minority group (blacks). The use of multiple strategies helped to validate study findings and contribute to convergence in suggested areas for revision.<sup>21-23</sup> For example, both approaches offered supportive evidence for the relevance, clarity of messages, identification of groups most likely to benefit, readability, understandability, and credibility of the *Guide*, and both indicated that specific areas needed modification. An additional benefit was that each method potentially could uncover unique perspectives not revealed by a single method, which was found to be the case. Each approach provided unique data; quantifiable data on intention to change behavior was uncovered by one method and a recommendation that diversity be maintained in the *Guide* was revealed by the other method.

Several problems are inherent in using multiple research methods.<sup>21,24</sup> The unit of analysis is likely to differ between methods; in survey research individuals are the unit of



*Diabetes-related behaviors and intentions to change.*

**Table 3. Modifications made to *Take Charge of Your Diabetes: A Guide for Care***

**Purpose**

Expand the preface to include statements about intended audience, objectives of the *Guide*, and use of *Guide* to supplement education programs.

Restate the purpose of the *Guide* in the introduction and clarify that the scope is restricted to prevention of complications.

**Content**

Add a brief overview of diabetes to the introduction and explain the value of balancing nutrition, physical activity, and medications in achieving glucose control.

Add more discussion of stress and support issues in the section on feelings about diabetes.

Write an introduction to the record-keeping section addressing some of the barriers to use and emphasizing the benefits of record-keeping.

**Presentation/Style**

Reduce the number of flowsheets to those that assist in monitoring tests and minimize the grid appearance.

Add glossary of terms.

Remove hand icon for recording information.

Provide captions for illustrations that describe the positive actions the person is performing.

Add new simple line drawings depicting positive activities.

Continue to use illustrations that depict people from different cultures in a respectful way.

analysis, whereas in focus group research the group is the unit of analysis. As a result there is no certainty that the data are comparable across methods. Costs also are greater when two methods are used than when either method is used alone. In addition, the complexity of combining, analyzing, and interpreting large amounts of dissimilar data can be overwhelming.

Other limitations also should be noted. Convenience samples, which were relied on in this study, frequently have limited generalizability. Convenience samples may be biased because exposure to the materials cannot be controlled and a certain level of reading and writing skills is required to com-

plete the questionnaire and read the *Guide*. In addition, the findings from the focus groups cannot be generalized to the larger population of blacks because the groups were from a specific geographic area and the number of participants was quite small.

A final summary of the revisions that are being made in the *Guide* based on the lessons learned from these pretesting activities is presented in Table 3. The CDC is incorporating the majority of recommendations from both the people with diabetes and the diabetes educators. The revisions addressing the recommended expansion of information on nutrition and physical activity will include a new introductory section that

emphasizes the importance of these activities in achieving good glucose control. Additionally, readers will be directed to other sources to obtain specific guidance.

This study offers an example of using between-methods triangulation to link quantitative and qualitative methods. There are a variety of forms of triangulation (eg, data, investigator, and methods),<sup>21</sup> all of which can be applied to a number of research issues including hypothesis generation, program evaluation, and development of quantitative measures. A number of studies<sup>22-25</sup> in health education and nursing research have linked quantitative and qualitative research; this study is one of the first to do so in the diabetes education literature. As diabetes educators continue to champion the necessity of pretesting their materials in a rigorous fashion, it is hoped that this process can be enhanced by partnering quantitative and qualitative methods to gather data and combining these methods through triangulation. The authors hope that this paper illustrates the strengths and limitations of combining qualitative and quantitative methods in pretesting diabetes education materials.

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## References

1. Funnell MM, Haas LB. National standards for diabetes self-management education programs. *Diabetes Care* 1995;18:100-16.
2. Duchin SP, Brown SA. Patients should participate in designing diabetes educational content. *Patient Educ Counsel* 1990;16:255-67.
3. Hosey GM, Freeman WL, Stracqualursi F, Gohdes D. Designing and evaluating diabetes education material for American Indians. *Diabetes Educ* 1990;16(5):407-14.
4. Steckler A, Eng E, Goodman RM. Integrating qualitative and quantitative evaluation methods. *Hygiene* 1991;2;10:16-20.
5. Quatromoni PA, Mibbauer M, Posner BM, et al. Use of focus groups to explore nutrition practices and health beliefs of urban Caribbean Latinos with diabetes. *Diabetes Care* 1994;17:869-73.
6. Anderson RM, Barr PA, Edward GJ, et al. Using focus groups to identify psychosocial issues facing urban African Americans with diabetes. *Diabetes Educ* 1996;22(1):28-33.
7. Satterfield DW, Edgar TM, Erlich AB, et al. Assessing community perceptions of diabetes using a qualitative education tool. *Diabetes* 1996;45(2):44A.
8. Kingry MJ, Tiddje LB, Friedman LL. Focus groups: a research technique for nursing. *Nurs Res* 1990;39:124-25.
9. Centers for Disease Control and Prevention. Take charge of your diabetes: a guide for care. Atlanta, Ga: US Department of Health and Human Services, Public Health Service, Centers for Disease Control, Division of Diabetes Translation, 1992.
10. National Diabetes Advisory Board. The national long-range plan to combat diabetes. Washington, DC: National Institutes of Health, 1988; NIH publication no. 88-1587.
11. Funnell MM, Donnelly MB, Anderson RM, Johnson PD, Oh MS. Perceived effectiveness, cost, and availability of patient education methods and materials. *Diabetes Educ* 1992;18(2):139-45.
12. Yasenchak PA, Bridle MJ. A low-literacy skin care manual for spinal cord injury patients. *Patient Educ Couns* 1993;22:1-5.
13. Bemier MJ, Yasko J. Designing and evaluating printed education materials: model and instrument development. *Patient Educ Couns* 1991;18:253-63.
14. Centers for Disease Control and Prevention. Prevention and treatment of complications of diabetes: a guide for primary care practitioners. Atlanta, Ga: US Department of Health and Human Services, Public Health Service, Division of Diabetes Translation, Centers for Disease Control, 1991.
15. Satterfield D, Lyons A. Development of a consensus publication by the Centers for Disease Control (CDC): the prevention and treatment of complications of diabetes — a guide for primary care practitioners. *Diabetes Educ* 1992;18(6):473-75.
16. Alcohol, Drug Abuse, and Mental Health Administration. Pretesting is essential; you can choose from various methods. Washington, DC: Public Health Service, Office for Substance Abuse Prevention, US Department of Health and Human Services, 1992; ADAMHA publication no. MS428.
17. Roper WL. Health communication takes on new dimensions at CDC. *Public Health Rep* 1993;108:179-83.
18. Hilltman D. Readability, readability formulas, and cloze: selecting instructional materials. *J Reading* 1987;22:117-22.
19. Pastore PO, Berg BK. The evaluation of patient education materials: focus on readability. *Patient Educ Counsel* 1987;9:216-19.
20. Health Promotion Council of Southeastern Pennsylvania Health Literacy Project. A focus group evaluation of Take Charge of Your Diabetes: A Guide for Care. Philadelphia, Pa: submitted to CDC, Division of Diabetes Translation, April, 1994; project no. 93-231.
21. Duffy ME. Methodological triangulation: a vehicle for merging quantitative and qualitative research methods. *IMAGE: J Nurs Scholar* 1987;19:130-33.
22. Breitmayer BJ, Ayres L, Knafl KA. Triangulation in qualitative research: evaluation of completeness and confirmation purposes. *IMAGE: J Nurs Scholar* 1993;25:237-43.
23. Banik BJ. Applying triangulation in nursing research. *Applied Nurs Res* 1993;6:47-52.
24. Buchanan DR. An uneasy alliance: combining qualitative and quantitative research methods. *Health Educ Q* 1992;19:117-35.
25. Steckler A, McLeroy KR, Goodman RM, Bird ST, McCormick L. Toward integrating qualitative and quantitative methods: an introduction. *Health Educ Q* 1992;19:1-8.