

Exploratory Analysis of the Effectiveness of Cognitive Debriefing during Usability Testing of Questionnaire Format Migration

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AIMS

To investigate the effectiveness of cognitive debriefing interview methods when done as part of a usability testing procedure. The purpose of this type of cognitive interviewing is to assess the impact of questionnaire format migration on patient understanding of the text. Generally, the core goal of cognitive interviewing is to gather more information on patients' understanding of survey text in their own words. However, the effectiveness of a standardized comprehension-based cognitive interviewing approach as a method for detecting changes in patients' level of understanding between the electronic clinical outcome assessment (eCOA) format and the paper format has not been fully explored.

BACKGROUND

Converting a questionnaire from one format, such as a printed piece of paper, to a different format, such as an app on a mobile device, might seem a straightforward task. Sometimes, there are few changes to the survey, and conversion is as simple as replicating a single question from paper to screen or small changes in the instructions to better fit the new format. However, some changes are of greater magnitude, and involve modifying question wording, altering question presentation, or changes in mode of administration (such as a visual paper presentation to a phone interview). The level of evidence needed to demonstrate measurement equivalence between formats increases with the number and nature of any changes made during conversion [1,2]. Even minor differences across modes of administration can result in biased data [3].

Usability testing provides a moderate level of evidence that the measures are equivalent, and is appropriate where there are minor changes to the instrument. Often, usability testing is paired with cognitive debriefing interviews of the source text. The purpose of cognitive debriefing interviews is to determine "whether subjects are interpreting and responding to the items the same way on the new mode as they would on the mode from which the instrument was migrated" [2, p. 509]. A cognitive debriefing interview's purpose in this context is not to revisit the content validity of the source. Together, usability testing and cognitive interviewing explore how the patient's experience of a COA is affected by the migration from one format to another.

METHODS

RWS Life Sciences compiled the results of 10 usability testing projects measuring the impact of paper to eCOA migration. All 10 projects included both cognitive interviewing and usability testing, to compare patient experience between the original paper and eCOA formats. RWS Life Sciences reviewed all the patient feedback arising directly from the cognitive interviewing process, including both paraphrases and descriptions generated through direct questioning and also more general comments, with each piece of feedback treated as a single data point. These data points were first classified as either "positive" (indicating that the migration to eCOA had no impact on comprehension or usability), or "critical" (indicating altered comprehension, usability issues, or any other criticisms or concerns raised).

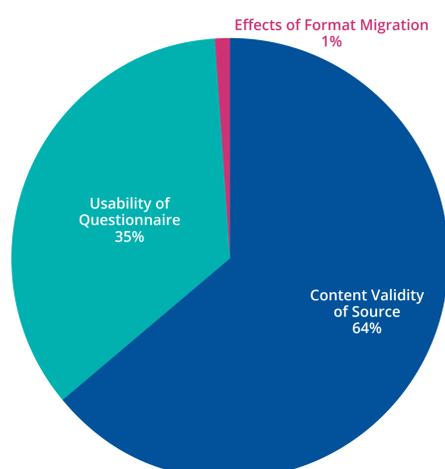
Using qualitative content analysis, the "critical" patient feedback was reviewed for type of feedback given (e.g., if their descriptions of the items indicated a misunderstanding due to context, if they thought the content was unclear, or if the response options were unsuitable for the question) and its frequency of occurrence throughout the sample. First, the types of feedback were ranked by frequency. Overall interview effectiveness was evaluated by how closely the desired types of feedback from the cognitive debriefing interviews aligned with the types of data actually collected. Second, the "critical" feedback was categorized as actionable (related to the migration of the questionnaire) or not actionable (related to the content validity of the source text). These categories were broken down by the area of the questionnaire that provoked the feedback (i.e., the title, instructions, a "lead phrase" used to introduce a set of questions, response options, "adapted questions" whose wording or layout was changed by the format migration, and "standard questions" unchanged by the format migration). Finally, an analysis was carried out to assess the quantity of actionable feedback raised per total number of items tested in each category and to identify whether the effectiveness of the cognitive interviewing process varied depending on the part of the text being reviewed.

RESULTS

4,495 patient comments from 10 usability testing projects that included cognitive debriefing interviews were reviewed and categorized using qualitative content analysis. 93% of the comments were classified as "positive" indicating that the migration to eCOA had no impact on comprehension or usability, and 7% were classified as "critical" feedback indicating altered comprehension, usability issues, or other potential issues. Of these 319 "critical" comments, 64% (205) were feedback on the content validity of the questions in the source text. In this context, the source text cannot be changed beyond eCOA-related adaptations and, therefore, this type of feedback, while potentially useful in other studies, cannot be exploited for the target purpose of eCOA testing.

35% (111) of critical comments were related to the usability and functionality of the eCOA device, such as 'Back' and 'Next' button sizes, screen responsiveness, or text size. Although this is not a central aim of debriefing, useful insights were gained from this category of comments that may not have been provided by other interviewing techniques. Only 1% (3) of feedback was related to the differential experience of answering a paper vs. electronic questionnaire (Figure 1). This figure reflects the context of conducting eCOA testing on well-developed eCOA adaptations; in each case, best-practice guidelines had been followed by the eCOA developers specifically to reduce any difference in experience between the paper and eCOA versions.

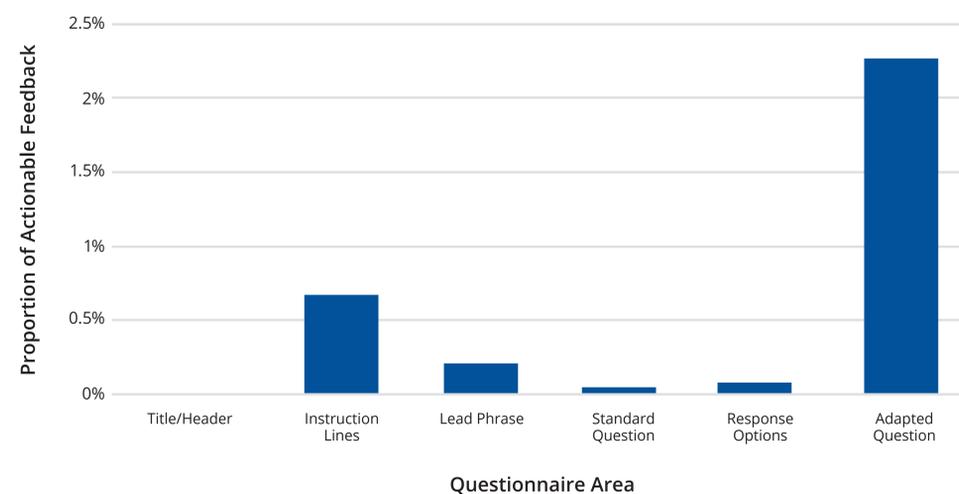
Figure 1: Types of Critical Feedback (%) from Usability Testing and Cognitive Debriefing Interviews



RESULTS (continued)

Figure 2 details the number of actionable items of feedback generated relative to the total number of questionnaire items tested (657) for each of the six defined categories. The rates of actionable comments per item tested were low for three categories of questionnaire content: title or header (0%), standard questions (i.e. those unchanged by the paper-to-eCOA migration process) (.024%) and response options (.048%). This is in line with expectations, as these parts of the text tend to be replicated as closely as possible between the paper and eCOA versions. Conversely, the rates for the sections of the text that had been altered (or were likely to have been altered) for the eCOA context, namely the instruction lines (0.68%), lead phrases (0.21%), and any adapted questions (2.25%), were significantly higher. This suggests that while the bulk of the text is likely to generate consistently positive or confirmatory results, focusing the testing on key parts of the text could be an effective way to generate the most relevant critical feedback.

Figure 2: Proportion of Actionable* Feedback per Item Tested for Each Questionnaire Area



* "Actionable" here means feedback that is useful for the purposes of format migration

CONCLUSIONS

The primary aim of cognitive debriefing interviews during usability testing of a questionnaire migrated from paper format to eCOA is to investigate how the patient experience and understanding are influenced by the change in modality. Given that eCOA development is based on the principles of eliminating differences in the patient experience, we can expect critical findings to be low, and so it is difficult to definitively prove the effectiveness of any testing method without a study of direct method comparison. Notwithstanding, this study demonstrates that cognitive debriefing interviews generate a large amount of insight representing the patient experience, most of which confirms an equivalent experience between the two modes, and that it can effectively be used to identify discrepancies.

We have also seen, in analyzing the feedback by questionnaire segment, that interview results from standard questionnaire items are highly likely to confirm a consistent patient experience. Less standardized parts of the text, which need to be modified for eCOA use, tend to yield higher levels of actionable feedback. This enables us to conclude that cognitive debriefing interviews can be used more effectively within eCOA testing by tailoring it to target the parts of the questionnaire more affected by format migration: the modified questions, the instructions, and any lead phrases that preface a set of questions. This approach would exploit the most effective aspects of cognitive debriefing interviews and would facilitate the addition of other information-rich methods, such as probing on the cognitive steps of judgement and response, specialized for format migration.

REFERENCES

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