



Creation and validation of the PERFECT: a critical incident tool for evaluating change in the practices of health professionals

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Keywords

assessment, critical incident technique, evidence-based practice, professional practice patterns, rehabilitation, treatment

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*Her research is funded in part by Centre de Recherche Interdisciplinaire en Réadaptation du Montréal Métropolitain (CRIR), 2275, Avenue Laurier Est, Montreal, QC, Canada.

Accepted for publication: 18 May 2009

doi:10.1111/j.1365-2753.2009.01288.x

Abstract

Rationale The critical incident technique provides a means to better understand the reasons behind clinicians' practices and changes in practice. No standardized tool exists to elicit information using this technique.

Objectives To create and validate a standardized tool that explores change and reasons for change in professional practice.

Method Item generation was based on expert consultation and a review of the clinical practice and knowledge translation literature. The draft tool was pilot-tested with a convenience sample of 10 rehabilitation clinicians to receive feedback on its content, clarity, optimal cueing, omissions and ease of recall of critical incidents.

Results The tool was progressively refined and validated according to feedback from both the clinicians and expert reviewers. The final version of the tool includes 33 questions designed to elicit information on change and reasons for change in four areas: problem identification, assessment, treatment and referral practices. In addition, it elicits information on factors that facilitate or hinder change in practice. Cues are included when necessary to clarify questions and facilitate responses. Regarding ease of recall, all clinicians confirmed that beginning with a 6-month recall of practice change and working back to 1 year was a facilitator. All clinicians mentioned that the tool encouraged them to reflect about changes they made in their practice or lack thereof.

Conclusion The newly created standardized critical incident tool, named the PERFECT (Professional Evaluation & Reflection on Change Tool) provides an opportunity for widespread applicability to explore change, reasons for change, as well as facilitators and barriers to change in the practices of health professionals.

Introduction

There is growing pressure on health professionals to expand their knowledge through various forms of continuing education, with the ultimate goal of intensifying the use of evidence-based practice (EBP) [1,2]. Integrating research evidence into daily practice is an important aim in that EBP has been shown to have a direct impact on improved patient outcomes [3].

Despite the advantages of using EBP, not all health professionals readily integrate scientific evidence into clinical decision making [4]. For rehabilitation clinicians specifically, strong evidence from the largest Canada-wide study of 1800 stroke rehabili-

tation clinicians indicates that best practices are not routinely being applied [5–9]. The existing evidence-to-practice gap is likely to widen unless effective actions are taken. This concern has led to a burgeoning interest in knowledge translation (KT) strategies aimed at closing this gap [10]. Yet, while we increasingly have information on facilitators and barriers to best practices [11], currently little is known about what triggers change in the practice behaviours of health professionals, and rehabilitation clinicians in particular. The lack of a coherent theoretical basis for understanding professional and organizational behaviour change limits our ability to formulate hypotheses about which KT interventions are likely to be effective under different circumstances [12].

One method for investigating these triggers in practice change, known as the critical incident (CI) technique [13] developed by psychologist John C. Flanagan, can provide an interesting venue for inquiry. This technique uses factual accounts of real life events, where both the consequence and purpose of behaviours are clear, in order to elicit the reasons for behaviours and actions [13]. Using inductive judgments, incidents can then be categorized according to themes. This technique has been shown to be particularly useful when investigators wish to understand the reasons behind clinicians' practice behaviours, especially when the subject matter is complex [14]. It has been described as 'the most successful method for developing taxonomies of clinical competence' [15]. The CI technique has been used widely in research pertaining to doctors and nurses [16–21]; however, there are no published studies to date that have applied this technique to evaluate practice change and reasons for change in the practices of rehabilitation clinicians specifically. Furthermore, there are no published standardized evaluation tools that utilize the CI technique to evaluate practice change in health professionals.

Thus, the global objective of this study was twofold: (1) to create a standardized tool to explore change and reasons for change in the practices of rehabilitation professionals and (2) to examine face and content validity of the tool with rehabilitation professionals. Practice is operationally defined as problem identification, assessment, treatment, and referral patterns of the clinician. Creation of this tool is a first step towards introducing the CI technique into the field of KT and rehabilitation as well as ensuring its widespread applicability to other health professions.

Methods

Study overview

The PERFECT (Professional Evaluation & Reflection on Change Tool) was created to explore reasons for change in rehabilitation clinicians' practice behaviours using a structured CI technique. The draft version was reviewed by the research team to ensure readability and to remove redundant or unclear items. Five experts in the field of stroke and KT research independently reviewed the tool for face and content validity. Then, the tool was pilot-tested with a sample of occupational therapists and physical therapists during in-person interviews. Feedback from clinicians was elicited using a set of pre-determined feedback questions. Debriefing periods took place where the research team met on an ongoing basis, after each block of two to three interviews, to qualitatively analyse the clinicians' responses. The tool was progressively refined according to the feedback from the expert reviewers and clinician interviews. Ethics approval was obtained from the Institutional Review Board at McGill University, Montreal, Quebec, Canada.

Tool development

The tool was developed and validated in four phases: (1) item generation to create the draft version; (2) face and content validation by expert reviewers; (3) pilot-testing with clinicians; and (4) final revisions. Appendix A has an excerpt of the section on problem identification to familiarize the reader with the types of

questions that were repeated in the sections eliciting information on change in assessment, treatment and referral practices.

Principles of the Tailored Design Method [22] to optimize content design of the tool, such as careful phrasing of questions or the use of introductory statements, were applied to achieve maximum participation and contribution of the respondents. To ensure that all aspects of practice were included in the tool, a review of the rehabilitation literature was conducted to identify key practice domains for this professional group. Practice was operationally defined as problem identification, assessment, treatment and referral practices of the clinician, and questions were designed to elicit information around these four main domains of practice. Questions were created using a structured CI technique [13]. Specifically, questions were generated to elicit information from the clinician regarding specific 'incidents' or changes in practice experienced as a result of a 'critical episode' during a certain time frame. Given that the tool requires clinicians to recall past events, aided recall techniques, such as providing the respondent with memory cues, were applied to each question to reduce the likelihood of recall error [23]. An effective memory cue is to begin questioning of the clinician using a more recent time frame to jog their memory, and then proceeding further into events of the past, in order to maximize recall [24,25]. Thus, questions on the PERFECT were framed to elicit information on changes in clinical practice over the past 6 months, and then over the past year. Interrogative questions were created to elicit information on each 'incident'. For example, regarding changes in problem identification the question stated: 'Think of your clinical practice over the past six months, when creating a problem list please describe any changes you have made with respect to how you identify problems'. Next, for each incident identified, the reason why it occurred was elicited ['Now I want you to think of (refer to each change listed in 1a or 1b). What were the reason(s) for this change in practice?'] as well as what factors facilitated the change. For example, new knowledge acquired by attending a conference, talking to colleagues, reading journal articles or seeking innovation may have helped ['Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, helped bring about this change?'] or hindered its occurrence ['Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, made it difficult to bring about this change?']. Questions were also framed to elicit information on desired change: 'Now think about how you have identified problems in the past year. Given an ideal world is there anything you would have changed?' (question 1f). This last question on desired change was created to draw out situations where a clinician may have wished to implement an EBP behaviour, but because of work-related or clinician-related barriers they were unable to do so [11]. Then, they were asked 'Now think of (refer to each change listed in 1f). What, if anything, would have made it difficult to bring about this change?' Finally, cues were created for some of these questions to orient the respondent if needed: 'Some examples of things that may make it difficult to bring about change are lack of departmental funding, busy schedule, lack of support, etc.'

Next, a series of questions was created, using the aforementioned principles of the Tailored Design Method [22], to elicit feedback about the tool. More specifically, these feedback questions were designed to identify the clarity, helpfulness of cues, omissions, redundancies, ease of recall, how questions could be

improved and if any additional areas of practice should be included.

Participant recruitment for tool validation

A convenience sample of rehabilitation clinicians working in Montreal, Quebec and known to the School of Physical and Occupational Therapy at McGill University (i.e. supervisors for student placements) was recruited. Efforts were made to include clinicians from each discipline (occupational therapy and physical therapy) and work setting (acute care, long-term care, rehabilitation, private practice and community), as well as those with a varying range of clinical experience. Eligibility criteria required clinicians to be English-speaking, currently practicing and working in the same setting with the same clientele for at least 1 year. Participants were contacted at their workplace to verify eligibility, highlight the time commitment (i.e. 30 minutes) and the steps that would be taken to maintain confidentiality, and obtain their verbal consent for participation. Clinicians who agreed were scheduled for an in-person interview outside of work hours, at a time and place that was convenient for them. A consent form was sent by fax, email or provided in person to each participating clinician, and adequate time was provided for them to review, ask questions and sign the form prior to the interview.

The goal was to continue to recruit and interview clinicians until saturation occurred, whereby no additional responses to the feedback questions were generated and no further alterations were suggested by clinicians regarding ways to enhance the quality of the tool.

Interview procedure

In-person interviews were conducted and tape-recorded by a trained interviewer. Each clinician was asked to undertake two tasks during the interview: first, to respond to the questions on the tool and then, to critique each question as well as the tool as a whole. Questions generated for each of the four domains (problem identification, assessment, treatment and referrals) were quite similar, so an abbreviated version was used to avoid a lengthy interview and encourage full clinician participation. Specifically, the entire first section on problem identification was included (Appendix A) as well as the first question from each of the three subsequent sections was included to ensure that the definitions of assessment practices, treatment practices and referrals were understood. Tool administration was interrupted after each section to ask the pre-determined feedback questions. Feedback was elicited on the clarity of each question, the utility of the cues and whether the time frames used (6 months and 1 year) maximized recall of changes in practice. Clinicians' perceptions regarding redundancies or omissions in the items were also elicited. Finally, clinicians were asked whether they would have preferred to complete the interview in a self-administered or interviewer-administered format, if any other areas of practice should have been included, and their overall impressions of the tool.

To optimize the use of clinician feedback, interviews were temporally scheduled to allow for debriefing periods where the research team met to discuss the interviews to date, compare results and make sequential adjustments to the tool when it was

clear that a change was warranted. The results section provides further detail of how the need for adjustment or change was determined.

Data management and analysis

Interviews were transcribed verbatim by two interviewers independently to ensure that all salient features of the interview were documented accurately. Responses to both the tool and feedback questions were then grouped into similar thematic responses to facilitate the analysis of clinicians' feedback.

Results

Ten clinicians, five occupational therapists and five physical therapists, were contacted and all of them were interviewed. Nine participants were female and one was male. Their average number of years of clinical practice was 15.5 years (± 10.2 , range 5–28 years). In addition, their average number of years working at the same site with the same population was 14.2 years (± 10.7 , range 3–28 years). Of the 10, three worked in an acute care hospital outpatient setting, one in acute care hospital inpatient, one in outpatient rehabilitation, two in subacute rehabilitation, two in inpatient and outpatient rehabilitation, and one in a private clinic. The clinicians worked with various client groups including geriatrics, hand therapy, orthopaedics, psychiatry, those with amputations and traumatic brain injury.

Overall, the 10 clinicians interviewed found that the tool's questions were generally clear. Minor modifications included rephrasing questions and definitions, combining redundant questions, and adjusting cues to prevent biased responses. One main issue identified was that the term 'problem identification' in the first section, was found to be vague by two of the first six clinicians that were interviewed. When this term was re-defined as 'problem list', no further clarifications were requested by the clinicians during the subsequent interviews. It was also noted that seven out of the 10 clinicians requested repetition of a question; however, not any one question specifically but many of the questions. Throughout the third set of interviews, one clinician felt that questions 1d [Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, facilitated this change in practice?] and 1e [Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, hindered this change in practice] implied that changes were only positive. Therefore, these two questions were reworded ['Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, helped bring about this change?' and 'Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, made it difficult to bring about this change?'] to allow for both positive and negative changes. Furthermore, the definition of referral practices was removed because no clinician requested clarification for this term, so that it was deemed unnecessary. The question pertaining to changes given an ideal world ('Now think about how you have identified problems in the past year. Given an ideal world, is there anything you would have changed?') was also re-worded, as clarification was frequently requested during the first series of interviews.

One concern was that the cues provided for each question occasionally resulted in the respondent basing their answer on

those specific cues. For example, one cue to possible barriers to change was: 'Factors that hinder change may include lack of departmental funding, busy schedule, lack of support, etc.' Three out of the six respondents indicated one of these responses. To deal with this potential source of bias, cues were removed from interviews seven to nine. However, during these three interviews respondents stated that examples would have been helpful. Therefore, to minimize the aforementioned bias, all cues were added back into the tool and a statement was added to point out that the cues were only examples rather than an exclusive list of responses: 'Some examples of things that may make it difficult to bring about change are lack of departmental funding, busy schedule, lack of support, etc.' Following the final interview, it was decided that the revised cues should remain in the tool as they helped clarify the questions and guide clinicians' responses in an unbiased manner.

Sometimes when respondents were asked 'Think of your clinical practice over the past six months, did you change anything about your practice with respect to how you identify a potential problem?', which required only a yes/no answer, their responses were better suited for the subsequent question: 'What did you change about your practice with respect to how you identify a potential problem over the past six months?' Therefore, these two questions were combined as 'Think of your clinical practice over the past six months, when creating a problem list please describe any changes you have made with respect to how you identify problems?' in order to eliminate redundancies and to allow for the natural tendency of clinicians to go right into a detailed response rather than a yes/no answer.

In terms of omissions, it was suggested by one respondent that the question 'Think of your clinical practice over the past six months, did you change anything in regards to referrals made to other health professionals' was limiting and that referrals to organizations should also be included. To permit inclusion of a wider range of referrals the question was adjusted to 'Think of your clinical practice over the past six months, please describe any changes you have made with respect to referrals to other health professionals, resources, and/or organizations?' This change was implemented for the last four interviews.

Another comment by five of the respondents was that additional areas of practice, such as discharges, patient involvement and self-directed learning, should be included. However, after discussion by the research team these areas were deemed to be partially incorporated within the four practice domains currently being questioned. Also, including additional components would have lengthened an already long tool, making it increasingly cumbersome to administer.

In regards to the recall techniques used, all 10 respondents confirmed that both a 6-month and 1-year time frame were sufficient to recall changes that may have occurred. Overall, clinicians found that starting with a shorter, more recent time frame and working back to the longer time frame helped them remember changes that they made over the course of 1 year. When asked for feedback or further comments, all clinicians expressed that they found the tool's content to be informative and a number mentioned that it triggered them to think about the changes they had made in their practice (or lack thereof): 'overall you covered the important information and it gets someone to think about changes made in their practice', and 'it (tool) was very good'.

Discussion

To gain a deeper understanding about what triggers change in practice behaviours among health professionals, we developed a standardized tool to explore this phenomenon with the hopes of narrowing the knowledge-to-practice gap. To date, there are no published standardized evaluation tools using CI methodology to evaluate practice change in health professionals. Based on the series of steps, the PERFECT was created and validated for use. A complete version will soon be posted on the StrokEngine Assess website (<http://www.strokengine-assess.ca>). The tool has four sections with a total of 33 questions. Responses to these questions can be grouped into themes to identify change in clinician practices and reflect on reasons for this change. These themes will help us understand the underlying factors that influence how a clinician responds to new scientific evidence and whether he or she ultimately changes their practice patterns when evidence supports the need for change. They will highlight the facilitators and barriers of that health professional and their organization to guide decision making about which KT interventions are likely to be effective.

This tool is applicable to rehabilitation professionals, our original target group and potentially to other health care disciplines as well. The PERFECT, while developed primarily as a research tool, may also prove useful as a tool to foster personal reflection and introspection by health professionals. Indeed almost all of the clinicians who participated in the validation phase made comments regarding how the tool took them to a line of thinking that was new for them. The tool may also serve as a means to stimulate intra- and inter-disciplinary communication and reflection regarding change in practice or lack of change and the reasons thereof, with the ultimate goal of increasing the use of EBP by professionals within a department or health care team.

Limitations

PERFECT was created in English only, and will therefore require forward and backward translation to permit its administration in various languages. Pilot testing of the tool was done on a limited sample of 10 clinicians in Montreal, Canada. Although the tool underwent preliminary validation, more detailed psychometric testing in a broader population of health professionals, including rehabilitation clinicians, would be important to ensure its widespread applicability. As well, if a self-administered format proves desirable, the validity of responses elicited using this mode of administration will need to be determined.

Conclusion

There is growing pressure on health professionals to expand their professional knowledge with the ultimate goal of intensifying the use of EBP. The CI technique has been used widely in research pertaining to health services; however, there are no studies to date documenting its use with rehabilitation professionals specifically. A standardized tool that explores change and reasons for change in health professionals' practices has been created and underwent face and content validation. The next step in our research agenda will be to use the PERFECT to measure change and reasons for change in practice among health professionals receiving an innovative KT intervention.

Acknowledgements

We acknowledge the Canadian Institute of Health Research (CIHR) for providing financial support for this study. Anita Menon is supported by a doctoral fellowship from a CIHR KT programme award. Nicol Korner-Bitensky is supported through a senior career award from the Fond de la recherche en santé du Québec. We wish to extend our gratitude to Dr Nancy Salbach, Dr Ann McKibbin and Dr Sharon Straus for their review of the PERFECT tool during its creation and development. We would also like to thank Dr Sharon Straus, Dr Nancy Salbach and Dr Sara Ahmed for their editorial comments on the manuscript. Finally we thank all the participating clinicians for their time and excellent feedback.

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Appendix A

Section 1: problem identification

The first seven questions are related to how you identify problems: By that we mean the integration of information collected through chart review, brief interview, screening or clinical observation in order to create a problem list regarding a client's health conditions, impairments, functional status, etc.

(1a) Think of your clinical practice over the past six months, when creating a problem list please describe any changes you have made with respect to how you identify problems?

- I. _____
- II. _____
- III. _____

(1b) Now, think of your clinical practice over the **past year**, when creating a problem list, please describe any changes you have made with respect to how you identify problems that you have not already told us about?

- I. _____
- II. _____
- III. _____

*If no changes were mentioned in 1a or 1b, skip to question 1f
(1c) Now I want you to think of (refer to each change listed in 1a or 1b). What were the reason(s) for this change in practice?

*ONLY IF THE PERSON IS UNABLE TO SPONTANEOUSLY RESPOND AFTER A DELAY OF 45 SECONDS cue them with: Examples of reasons for change may include having attended a continuing education course, acquired new knowledge from a professional journal, attended a conference, heard suggestions from colleagues, etc.

Past six months

- I. _____
- II. _____
- III. _____

Past year

- I. _____
- II. _____
- III. _____

(1d) Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, helped bring about this change?

***ONLY IF THE PERSON IS UNABLE TO SPONTANEOUSLY RESPOND AFTER A DELAY OF 45 SECONDS OR REQUESTS CLARIFICATION** cue them with: Some examples of things that may help bring about change are self-motivation, departmental funding, support from supervisor, etc.

Past six months

- I. _____
- II. _____
- III. _____

Past year

- I. _____
- II. _____
- III. _____

(1e) Now I want you to think of (refer to each change listed in 1a or 1b). What, if anything, made it difficult to bring about this change?

***ONLY IF THE PERSON IS UNABLE TO SPONTANEOUSLY RESPOND AFTER A DELAY OF 45 SECONDS OR REQUESTS CLARIFICATION** cue them with: Some examples of things that may make it difficult to bring about change are lack of departmental funding, busy schedule, lack of support, etc.

Past six months

- I. _____
- II. _____
- III. _____

Past year

- I. _____
- II. _____
- III. _____

(1f) Now think about how you have identified problems in the **past year**. Given an ideal world is there anything you would have changed?

- I. _____
- II. _____
- III. _____

***If no desired changes were mentioned in 1f, skip to question 2a**

(1g) Now think of: (refer to each change listed in 1f). What, if anything, would have made it difficult to bring about this change?

***ONLY IF THE PERSON IS UNABLE TO SPONTANEOUSLY RESPOND AFTER A DELAY OF 45 SECONDS OR REQUESTS CLARIFICATION** cue them with: Some examples of things that may make it difficult to bring about change are lack of departmental funding, busy schedule, lack of support, etc.

- I. _____
- II. _____
- III. _____