Descriptive Title: Critical Incident Technique: A user’s guide for nurse researchers

Short Title: Critical Incident Technique

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ABSTRACT

Aim: This paper describes the development and processes of the critical incident technique, demonstrates its applicability to nursing research by using a recently conducted study of the Australian nursing workforce as an exemplar, and raises issues for consideration prior to the technique being put into practice.

Background: Since 1954 the critical incident technique has been used to study people’s activities in a variety of professions.

Method: This technique is a five-step process that can be modified to suit specific settings and research questions. The fruitfulness of a study using the critical incident technique relies on gaining three important pieces of information during data collection. First, the participants’ complete and rich description of the situation or event to be explored; second, the specific actions of the person/s involved in the event to aid understanding of why certain decisions were made; third, the outcome of the event, whether positive or negative, to ascertain the effectiveness of the behaviour. As in other qualitative methodologies, a process of inductive analysis, involving two levels of interpretation, can be used with the critical incident technique.

Findings: Rich contextual information about the dynamic nature of the nursing profession and health workforce can be obtained using this technique. It generates information and uncovers tacit knowledge through assisting participants to describe their thought processes and actions during the event. The interviewer’s ability to use probing questions that determine how participants participate in certain events, or act in the ways they do, greatly enhances the technique. A full interpretation of the event can only occur when all aspects of the event are provided.
Conclusions: The critical incident technique is a practical method that allows researchers to understand complexities of the nursing role and function, and the interactions between nurses and other clinicians.

Keywords: Critical Incident Technique, methods, nursing, qualitative research, process, nursing roles

SUMMARY STATEMENT

What is already known?

- The critical incident technique has been successfully used in research to understand the activities of various professional groups.
- The critical incident technique can be used to describe roles and functions of health professionals such as nurses
- The critical incident technique has been widely used as a research technique for identification of organisational problems

What this study adds?

- Discusses the contribution of the critical incident technique, to understanding the common elements in nursing practice as well as those that are undertaken less frequently.
- Provides adaptations needed to successfully use the critical incident technique to investigate nursing role and function.
- Provides rationale for changing the approach from the critical incident technique to the significant event technique.
INTRODUCTION

The critical incident technique (CIT) (Flanagan 1954) has been used successfully by service industries for a number of years to evaluate consumer expectations and more recently, has been used in health research. Nurse researchers have found that CIT facilitates an understanding of both the nurses’ role and the interactions between nurses, patients and other clinicians (Byrne 2001). CIT has been used effectively in a variety of nursing research studies, including the examination of quality of nursing care (Redfern & Norman 1999), aged and extended care nursing (Cheek, O’Brien, Ballantyne & Pincombe 1997), the practical knowledge held by expert nurses (Conway 1998), reflective practice in mental health nursing (Minghella & Benson 1995) and exploring consumer views of nursing care (Cox, Bergen & Norman 1993). This paper describes the background, development, and use of CIT and highlights the strengths and limitations of the CIT method. Using a recently conducted study of the Australian nursing workforce, CIT’s applicability for nursing research is demonstrated.

OVERVIEW OF THE EXEMPLAR STUDY

The focus of the study used as an exemplar in this paper was on the patient care activities that staff believed should be delivered or delegated by various levels of nursing staff in acute care hospitals. This study constituted the second phase of a three-phase Australian Research Council-funded study in which the overall aim was to develop evidence-based workforce models for nursing services in acute care hospitals. Currently the exemplar study is in its analytic phase.

BACKGROUND AND DEVELOPMENT
Over 50 years ago, Flanagan (1954) described the CIT as a set of procedures to collect observations of human behaviour. He emphasized that CIT is flexible, requiring modification for specific situations. These modifications include both the means of collecting data (such as observations or interviews), and the subsequent analysis of the data. By focusing on ‘critical’ incidents this technique commonly elicits very effective or very ineffective practices, and aims to provide findings that are “highly focused on solutions to practical problems” (Kemppainen 2000, p. 1265).

Flanagan (1954) originally defined an incident as “any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act” (p. 327). These incidents may be events, activities or role behaviours, which affect the outcomes of the system or process and are memorable to those involved in the system. This predictive focus of the technique is useful in addressing practical problems and has been noted in nursing studies that utilized the CIT (Cox, Bergen & Norman 1993, Minghella & Benson 1995, Cheek, O’Brien, Ballantyne & Pincombe 1997, Redfern & Norman 1999). The term critical incident is used to refer to a defined event where upon the person involved is able to make a judgement of the positive or negative impact the incident has on the outcome of the situation (Norman, Redfern, Tomalin & Oliver 1992). Subsequent use of the method has broadened the concept of both ‘critical’ and ‘incident’. Byrne (2001) and Norman et al (1992) assert that some participants generate their account of incidents from the reduction of multiple experiences. These authors argue for acceptance of these reconstructed experiences as critical incidents. Norman et al (1992) also prefer to use the term ‘revelatory’ instead of ‘critical’ as it indicates to participants that the situation in question should be significant or meaningful rather than a dangerous situation.
PROCESS OF CIT

Step One: Identification of aims

There are five steps involved in CIT (Flanagan 1954). The first is identifying the aim of the study and the research question. Careful identification of the study’s aims is essential due to the influence on data collection and analysis. Important in any research, the aim is pivotal to CIT as relevant key events will only be elicited through clarity in the overall aims. While the original purpose of CIT method was to uncover major problem areas that reside in a system, the purpose of the exemplar study extended to determining not only actual problems, but also vulnerable areas with the potential to cause future problems, and to explore areas of strength in the system that may provide solutions for integration into guidelines for the nursing workforce. Thus, the specific aim of the study was to identify the patient care activities various levels of nurses perceive as being appropriate or inappropriate for their skills and knowledge.

Step Two: Identification of types of events to collected

The second step of CIT is to ascertain the types of incidents or events to be collected. To ensure specific and accurate accounts of behaviour are collected, Flanagan (1954) recommended that the incidents collected are remarkably effective or ineffective, as it is widely accepted that extreme or atypical incidents are more easily recalled and distinguished than those that occur during standard operations. This also applies in the health care environment where research has shown that expert nurses operate from a deep understanding of the total situation (Benner 1984) in which the more proficient nurses become, the harder it is to explain why they made a particular decision in their practice. Many will say ‘I just knew something was wrong’. Benner (1984) attributes
this to experts no longer being aware of the features and rules of a system, providing a potential explanation for the difficulty of recalling everyday events. CIT has been used in nursing research to generate data representing experiences or perceptions of aspects of best and worst practice (Byrne 2001). However, if common events are required the data collector may have to use strategies such as a pre data collection meeting to assist participants’ recall. Furthermore, a decision may be required about the admissibility into the research of experiences that are a reduction of multiple experiences, and a consistent process instituted for using such experiences as critical incidents. This did not occur in the nursing workforce research, however, there is a high possibility that it could occur given the nature of nursing work and the hospital environment.

To capitalise on CIT, a record of specific behaviours should be collected from those in the best position to make the necessary judgements. For example, information about nursing roles and activities is best obtained from nursing staff who are directly involved in these proceedings. In the nursing workforce study, the researchers identified the need to obtain examples of situations where the nursing staff believed they should have been undertaking the patient care activities, and examples where they were undertaking patient care activities that should have been either delegated, or undertaken by a higher level of care provider. Consequently, data about both positive and negative actions were required.

Step Three: Data collection

The third step, data collection, can be undertaken in a number of ways. Direct observations and record forms are useful when examining unambiguous overt
behaviour, but are less appropriate for covert behaviour such as cognitive activities like clinical decision-making or planning. Open-ended questionnaires can be posted or e-mailed and can cover a large number of people within an organisation. The benefits of questionnaires include the respondent being able to consider their responses and also remain anonymous. However, it is possible that the time it takes to adequately describe and compile events might be off-putting to some participants and result in them either avoiding the study or simply providing inadequate details for a successful CIT study. Moreover, questionnaires also prevent probing questions from being asked of participants which can limit the depth of responses. In-person open-ended interviews, individual or group, allow the interviewer to read nonverbal communication signs from participants and use these to probe for further in-depth responses and is probably the most frequently used CIT data collection method in the nursing literature. In studies where direct observation of the incident is not employed, such as interviews or questionnaires, there is potential for the participants’ perceptions of the events to be distorted due to the retrospectivity of the situation (Guba & Lincoln 1981). However, the individual interview format is seen as an appropriate method of data collection because it allows for greater opportunity for discussion than other methods. Perry (1997) suggests that the recollection of events by participants is a form of reflective practice and is therefore one of its strengths.

Reflection occurs when the anticipated outcome has not materialised and, as a result, the practitioner must determine why things were different than expected. This was particularly useful in the nursing workforce research where the aim was to determine the activities that were within the scope of practice of each level of nurse. In this instance, nursing staff were encouraged to reflectively determine the choices made which led to the nursing care activities being performed by themselves or by another
nursing or other health care professional. Additionally, interviews are aligned with the oral culture that is found in nursing practice. Talking in person rather than writing answers in questionnaires may be the preference of many nurses.

Maximising the data quality in CIT interviews

The accuracy of the technique depends on the ability of the researcher to tease out precise and accurate behavioural descriptions (Flanagan 1954). When using CIT, the interviewer’s role is to assist participants to be as specific as possible in their description of particular incidents. One way of reducing the provision of inadequate information is by having an appropriately trained interviewer. However, the CIT literature typically does not provide detailed information on effective interview techniques despite many authors citing the importance of the questioning technique. One approach that may enhance the quality of interviews in the CIT is the adoption of an interactive-relational (I:R) approach (Chirban 1996). This approach encompasses five components; self-awareness, authenticity, attunement, personal characteristics and new relationship. Using the I:R approach in conjunction with the CIT was found to improve the quality of the information gained from participants during this study. During the pilot interviews, while the interviewer was training in both techniques, the data gained initially was superficial with a resultant impact on analysis and interpretation. There was a noticeable difference with purposeful use of the I:R approach. Self-awareness is essential for the interviewer because the degree to which the interviewer can differentiate his or her perspective from that of the interviewee is crucial in being able to obtain accurate and reliable data (Chirban 1996). Attunement ensures that a sense of richness and insight is gained from the interview by going beyond the answers, to explore the context, situation and experience of the
interviewee (Chirban 1996). While not unique to CIT, this skill is particularly salient in CIT studies aimed at determining impacts on systems. Exploration of the wider context, and location of the individual within the situation, aligns the interview with the CIT method’s requirements of both understanding the individual perspective and ascertaining systemic implications of the event.

Developing a supportive relationship with participants is imperative in CIT interviews that have the declared intention of eliciting ‘best’ and ‘worst’ events in health care. Participants need to be supported in their disclosure of incidents that may have had less than optimal outcomes and about which they may be sensitive. The emphasis that the I:R approach places on attunement and developing a relationship with participants is an important aspect of a successful study using CIT.

Rous and McCormack (2006) advocate the use of the following specific questions to help elicit critical incidents:

- What preceded and contributed to the incident?
- What did the person or people do or not do that had an effect?
- What was the outcome or result?
- What made this action effective or ineffective?
- What could have made the action more effective?

These questions are particularly useful when employed in conjunction with the I:R approach. Conducting a number of pilot interviews gives the researcher an indication of whether the questions and interview technique will elicit the required information from future participants.
The sample size of a critical incident study should be based on the number of critical incidents rather than the number of participants (Flanagan 1954), as it is the incidents rather than the participants that are analysed. Twelker (2003) recommends that no less than 50 incidents be collected; however, placing an exact number on the number of incidents to collect will not be known until preliminary analysis commences and the quality of the data is ascertained. Additionally, the number of incidents will vary depending on the complexity of the research question.

When using interviews as the main data collection method, it is important to ensure that the information participants provide contains adequate description and depth so that rich understandings and deep meanings can be drawn out. Some people have difficulty in expressing these meanings and it is for this reason that sampling until data saturation is important. For example, it was noted during the study that not all nurses had the ability to express themselves and articulate their practice. Some participants found it hard to respond when asked why they felt a certain way and, as previously stated, analysis of superficial data can result in constrained findings. The use of the I:R technique in conjunction with the probing questions offered by Rous and McCormack (2006) help the interviewer overcome this hurdle. The collection of 50 or more incidents allows for the difference in participants’ ability to express themselves and should ensure an adequate amount and sufficient quality of usable data is gathered. If other data collection techniques are utilised, such as direct observation, the number incidents that need to be collected may be less as only usable events would be recorded by the data collector.

Step Four: Data analysis
Analysis of the observed or recorded data is the fourth step in the CIT process. In the nursing workforce study the data was thematically analysed and the themes were utilized in the third phase focus groups. However, the themes may be used directly to address any issues, or used in conjunction with other data that may also be collected, such as questionnaire results or observational reports. Flanagan acknowledged that this fourth step is less objective than the others (Flanagan 1954). However, there have been many advances in qualitative methodologies and standards of rigor since Flanagan’s original work, and the CIT method is congruent with contemporary qualitative data analysis and can be subjected to appropriate criteria for rigor.

It is imperative during the analytic process to ensure that interpretations are neither assumed nor overlooked. Thus, it is important that the researcher does not let their prior knowledge of the situation color the interpretations. This became an important issue during the workforce study as the primary investigator was also an employed registered nurse. One technique of limiting researcher bias used during the analytic phase of the study was through questioning every comment made by the participants. Detailed questioning of each piece of information prevents the researcher from making assumptions about the data. It also ensures that elementary data, that can sometimes be overlooked when the analyst is an expert in the field, is given the same attention as other key information. Prior knowledge, when managed appropriately, should deepen understanding of participant accounts and strengthen arguments. Having prior knowledge of the situation should not be seen as a limitation if bias is removed, rather, it should be embraced and utilized to it’s full potential.
A contact summary sheet (Miles & Huberman 1994), completed immediately after each interview is one tool to assist in beginning the analytic process. Contact summary sheets summarize salient points. Any questions arising that require inclusion into the next interview can also be documented on the summary sheet. Thus, these sheets help guide planning for the next interview and aid in reorientation when returning to the interview transcripts (Miles & Huberman 1994). The contact summary sheet became a pertinent analytic tool in the workforce study because many participants provided somewhat unstructured accounts of their incidents. Recording the crux of the participants ‘stories’ onto the contact summary sheet and then stapling these to each transcript made recollection of specific incidents easier.

Levels of Interpretation

Data analysis of a CIT study can be approached in a similar way to other qualitative studies, through inductive analysis (Polit & Beck 2004). The process of inductive analysis involves two levels of interpretation. The analysis of the individual transcripts is the first level of data analysis and involves reading and re-reading individual participant transcripts several times to identify themes and sub themes. It is important that the transcripts are first read individually to ensure independent categories are not overlooked. Iterative reading allows for consistencies and inconsistencies to be discovered and emerging themes to develop (Polit & Beck 2004). The event, context and circumstances should be analysed concurrently to promote understanding of the meaning of the events or incidents.

Understanding the context surrounding the events in CIT is important to its success. The context influences and gives clues as to why a participant makes a certain
decision and if given similar circumstances would make the same decision again.

Keeping transcripts separate and distinct during the first phase of analysis allows the significant events to emerge without influence. Because nursing care is highly interconnected, it would be easy to mesh together the events from the start of the analysis process, however, this could potentially cause some events to be overlooked or their importance under or overrated.

During the first level of analysis of the workforce data the differences in participant responses became very apparent. Some recollections of events contained a lot of extraneous information while others centered on short phrases that revealed little about the incident. The need to uncover the ‘core’ of each story was important during the first phase because comparison between events, the second level of analysis, was unworkable without this prior interpretation.

The second phase of data analysis involves the transcripts being read ‘horizontally’, which entails grouping segments of text, between transcripts. This comparative analysis (Polit & Beck 2004) parallels the differences and similarities of the transcripts aids in the development of overarching themes and sub themes. Particular attention should be made to inconsistencies or contradictory statements made by participants as these may give insight into their thought processes. Generally the unexpected information tends to be very useful, leading to a deeper level of interpretation as anomalies are analysed for meaning within the context and circumstances elicited by the critical incident technique. Categories are continuously reinterpreted in light of emerging information. Repeated reading of the transcripts
will ensure that the researcher remains close to the text to “preserve the temporality and contextuality of the situations” (Benner 1994, p. 77).

It was noted during the workforce study, that the second level of analysis was the most crucial step towards uncovering the hidden meanings of the events. Comparing participant’s comments about like events became an important tool to get at the deeper understanding of the significant events.

Coding Categories
Another avenue for approaching preliminary data analysis that is well suited to CIT is through developing coding categories (Bogdan & Biklen 1992). Developing such categories or schemes allows the researcher to organise the data and can become a crucial step in data analysis. Bogdan and Biklen (1992) devised a mid-range accounting scheme in which ten “coding families” (Bogdan & Biklen 1992, p. 167) are developed. Context codes, process codes and activity codes are but some of the ‘families’ devised by Bogdan and Biklen (1992). This type of a priori scheme can be helpful in sorting large amounts of complex and intertwined data and can become the first step towards data interpretation. Given the wide variation in incidents typically reported by participants in a CIT study, this can be a helpful means of managing data to enable sufficient depth of analysis. Using this approach in the analysis of workforce study’s nursing activities and roles was extremely useful because of the complex nature of nursing work.

Step Five: Project dissemination
The fifth and final step is to discuss and report the results of the study (Byrne 2001). Dissemination of research is an all-important part of the research process and the communication of knowledge to the profession. It is important to tailor the feedback to the target audience, such as academic journals or practicing clinicians. For example, in the nursing workforce study, the busy nature of the hospital environment generally means that nursing staff do not have much spare time in their work day, therefore feedback to this target audience must be concise and presented in an efficient manner. Short presentations during handover time, handouts or a poster for the ward are all time efficient ways to report back the findings to participants. One aspect to be mindful of when presenting the findings of a CIT project both to participants and the wider audience is to ensure that the incidents or events are unrecognisable. If it is impossible to de-identify sections of the transcript, due to the inclusion of third parties or easily identifiable circumstances or contexts, then, to maintain confidentiality, these sections should not be disseminated.

ISSUES FOR CONSIDERATION

Undertaking the nursing workforce study using CIT identified several issues, and highlighted the strengths and limitations of this method for nursing research. These include the struggle with the definition of the technique, the importance of preparation for the interviews, the benefits of interviewing as the main data collection method in CIT, and finally the impact of participants’ perceptions of the nurse-researcher as an ‘insider’ during interviews.

Definition of the technique
An everyday definition of incident is “any event which is not part of the standard operation of a service and which causes, or may cause, an interruption to, or a reduction in, the quality of that service” (Macquarie Dictionary 2005). This definition is synonymous with nursing perceptions of the term ‘incident’ because within the hospital setting it could include; a medication error, a patient fall or a needlestick injury. Therefore, dependant on the aims of the research and the specific events being investigated, the notion of a significant event, rather than a critical incident, may be more appropriately used when interviewing health professionals as it provides a better description of the types of examples required. Similarly, Norman et al. (1992) discovered the collection of the most meaningful data occurred when participants were allowed to recount the important activities surrounding the event rather than when clearly demarcated incidents with a beginning and end were collected. Changing the term from critical to significant does not change the fundamental process of the procedure as ascribed by Flanagan (1954); rather it provides the appropriate emphasis for the recollection of events.

In the workforce study, the need to change the term from ‘critical incident’ to ‘significant event’ became apparent when a number of participants commented on how they had not been involved in an ‘incident’. The difficulty of moving participants past the notion that an incident is where something goes wrong was obvious, and subsequently the researcher changed the term to significant event when approaching new participants. The steps of the technique were not changed but the revised title assisted participants in understanding that errors were not the only required discussion items.
Recollection of events

Once participants understand the types of events required, they need to spend time recalling them. In the nursing workforce study, nurses frequently commented on the difficulty of recalling specific events. Many participants stated there were thousands of activities they participate in each shift and choosing a select few was challenging. Some participants found it difficult to describe everyday events and activities, which was surprising because they happen on a daily basis. Other participants stated that it was easier to think of patient care activities that should have been conducted by someone of a higher level because events that occur outside of one’s scope of practice tend to occur more infrequently and ‘stick out’ in the mind. This reinforces Flanagan’s (1954) comment that ordinary incidents or events are more difficult to recall than atypical situations.

The importance of preparation was apparent when many participants discussed the difficulty in recalling events. Subsequently many participants arrived at the interview without any examples, and interview time was spent thinking about events to discuss. Many participants stated that the difficulty in choosing the events was not related to the questions asked of them, rather it was related to the nature of their work in which they perceive situations as wholes, rather than in discrete parts or aspects (Benner 1984). For example, participants had difficulty choosing individual or distinct events because they saw their nursing practice as being interconnected and hard to dissect. Discussion of events tended to flow between a myriad of events, and while they were not related to the workforce study, these events needed discussion because of their interrelationship with the initial event. Providing sufficient time between first contact and data collection assists in the recollection of events. Additionally, a phone call
prior to data collection is recommended to assist in clarifying any concerns related to their chosen events and should prevent time being wasted thinking of events to discuss during the interview. In regards to other potential data collection methods that may be used in CIT, the use of questionnaires may help overcome the difficulty of event recollection because participants would be able to work through the questions in their own time. However, it would be important for the researcher to be contactable in the event that participants have any questions. Similarly, the use of observational reports means that the events for interpretation are directly observed and do not require recollection by participants. However, both these data collection techniques access different types of information than that elicited during an interview, and such data must be carefully assessed as to see whether it will answer the research question.

It was also noted during the interviews, that participants wanted to discuss in detail the events that were out of their scope of practice but wanted to skip past the events that were appropriate for their skills. Despite participants being informed that it was important for both types of examples to be discussed (positive and negative), it needed to be reiterated during the interview to encourage the full discussion of all events with the focus being taken off the events outside of their scope of practice.

The title of the technique, coupled with the notion that extraordinary events appear to be more prominent and frequent in people’s minds than ordinary events, meant that many participants were concerned whether the activities they discussed during the interview were appropriate for the study. It was the method of the technique in
which questions were asked to stimulate discussion and reflection, such as, ‘Why do you think that, what did you do then?’ that ensured that the data was obtained.

Obvious questions

Some participants found it unusual when asked questions about basic patient care or where the answers were obvious to the participants themselves. Many commented that they felt strange answering the questions knowing that both parties (participant and interviewer) knew the answer because both were employed within the nursing workforce. Consequently, many participants were reluctant to provide detail when asked about basic patient care. Once this response was noted, the researcher reinforced that despite the answers being obvious to the participants themselves, it may not be to others and it was important for the interviewer not to assume the answers from their own experience. This raises the issue that while it may be beneficial for the interviewer to have previous experience of the profession in which the investigation is occurring, the interviews and data collected may differ if conducted by a person independent of the profession.

The idea of ‘obvious questions’ may advocate for the use of both someone known to the profession and also another researcher who is detached. Using an interviewer who is detached may access information on ideas that are taken for granted by the participants. Using someone with a background in the profession may elicit more complex information that may be withheld from the interviewer who has no previous experience because of fear that they would not understand. Asking fundamental, essential questions ensures a sound knowledge base on the topic is gained. Knowing,
grasping and understanding the obvious should be an important goal for the interviewer and should guide further questioning of participants.

Previous knowledge or a background in the profession under investigation also influences analysis of the events. It becomes impossible not to allow prior experience inform the analysis of the events which further enhances the importance of questioning the data and ensuring that accurate representations are derived from the events. Critical discussion with others can also remove potential bias which may occur if researchers are working within their local environment. Prior knowledge, when used carefully, and accurately managed, can greatly enhance a study’s findings and forms the basis of informed and grounded research findings. Self-reflection, both during and after data collection, and careful consideration of all the data obtained facilitates the development of new insights and knowledge. Conscious self-awareness that is identified and reported enhances rigour and facilitates openness in research.

CONCLUSION

The CIT is a practical methodology that allows researchers to understand complexities of the nursing role and function, and the interactions between nurses and other clinicians. It is a flexible approach that can be easily modified to suit specific settings and researchers and has also been shown in this study to make a valuable contribution to mixed method studies. The technique allows information to be obtained relatively quickly through encouraging participants to be as specific and concise as possible, which may have a potential cost-benefit by limiting the amount of time required with participants. While this paper has centred on its application in
nursing, it could be easily adapted to other professions and situations. Researchers using this technique should review Flanagan's original concepts and theory and combine them with those discussed here to determine whether it is the best fit for their proposed study. Careful planning and implementation, taking into consideration the issues raised in this paper should ensure successful project outcomes and completion.
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