

Designer's Corner

Methodological Considerations in Acute-Care Research: Issues in Securing Self-Report Data

Therese S. Richmond

Clinical nursing research is subject to numerous field conditions and, as Hinshaw (1981) and Oberst (1992) note, it is rarely possible to implement a perfect research design without compromise. Nowhere is this more challenging than when conducting research with the acutely ill. While there have been several papers addressing methodological considerations in collecting physiologic data in this setting (Kiiski, Takala, & Eissa, 1991; Norman, Gadaleta, & Griffin, 1991; Sneed & Hollerbach, 1992), less attention has been given to the collection of accurate self-report data in the acutely ill. The important issue is not whether self-report data are valid, but rather the more relativistic issue of when are self-report data valid (Brown, Kranzler, & Del Boca, 1992). Not all problems in acute-care research are amenable to control; the tension lies in deciding how many concessions can be permitted while still obtaining accurate data (Bell, May, & Stewart, 1987; Hinshaw). It is important therefore to examine the context in which self-report data are obtained and develop ways in which confidence in self-report data can be maximized. Conducting pilot studies, establishing sampling criteria, overcoming patient access barriers, attending to measurement considerations, and enhancing recall of past events are specific strategies that enhance the accuracy of self-report data in the acutely ill. Examples from the author's experiences with data collection in a group of acutely injured patients are used.

Therese S. Richmond Ph.D., C.C.R.N., F.A.A.N., is Lecturer and Interim Program Director of the Tertiary Nurse Practitioner Program in the School of Nursing at the University of Pennsylvania in Philadelphia. Requests for reprints may be made to Dr. Richmond at the School of Nursing, University of Pennsylvania, Philadelphia, PA 19104.

Pilot Studies: Maximize Effectiveness

Because of the complex nature of acute illness and the wealth of confounding variables that surface in acute-care research, timeframes for interviews of ill subjects are hard to generalize. Pilot studies serve to assess the feasibility of the study, examine the adequacy of instruments, and highlight problems in data-collection strategies, including subject burden. Despite the benefits of pilot studies, they are rarely mentioned in published research reports, with less than 20% of studies examined referring to pilot data (Prescott & Soeken, 1989). Pilot studies highlight issues of importance in the acutely ill such as the ability to comprehend during a time of physiologic and psychological stress, to attend to and participate in the interview, and to communicate responses. Most importantly, the pilot serves to inform the researcher of the level of fatigue and emotional burden experienced by subjects.

Sampling Criteria

One of the challenging issues in acute-care research is the volume of potentially confounding variables. One option is to create such stringent sampling criteria so as to eliminate many of the identified threats to validity. However, if all subjects with potential threats were eliminated, the researcher would be left with only a small and atypical minority. In other words, while stringent entry criteria increase internal validity, subjects remaining are not representative of the population at large and therefore external validity suffers (Zimmer et al., 1985).

Use of alcohol and illicit drugs is prevalent in today's society and frequently becomes an issue in the acutely ill. Commonly associated with trauma, ingestion of illegal substances are known to place individuals at risk for injury. In the acutely injured population withdrawal from substances such as cocaine is common and challenging to the clinical researcher. Acute withdrawal from cocaine results in overwhelming exhaustion, prolonged sleep, anergia, and depression (Wallace, 1991). The cognitive effects of withdrawal such as impaired concentration (Rawson, Obert, McCann, & Ling, 1993) produce difficulty maintaining attention, with subjects not attending to or even falling asleep during the interview process. Withdrawal from cocaine lasts from zero to 15 days, after which cognitive and behavioural manifestations normalize (Rawson et al.), but by this time subjects may be discharged. Strategies such as maintaining close physical contact with subjects, touching them on the arm throughout the course of the interview, maintaining eye contact, and taking a break to stimulate them with refreshments or position changes (if possible) may facilitate the completion of

the interview. Were trauma patients who were substance abusers to be automatically excluded from studies, clinical relevance and generalizability of findings in this population would be at significant risk.

Patient Access

There are unique environmental challenges in collecting data from the acutely ill, as data collection takes place in settings over which there is limited control, such as the intensive care unit with its disruptive sights and sounds. In non-intensive care settings, rooms are often semi-private with limited opportunity for privacy. Distractions and interruptions such as other patients entering the room, physicians and nurses giving care, and transports to therapy sessions, x-ray, or even operations should be anticipated (Egan, Snyder, & Burns, 1992). Kelsey and colleagues (1989) observed that when the timeframe for data collection is very close to discharge, activities such as physical and other therapies are more intensive, resulting in less availability of patients for research.

Strategies to enhance access of subjects in acute-care settings and ensure privacy can be difficult at best. Frequent checks on patients' conditions are necessary to find patients at a quiet time in their rooms during which data can be collected (Kelsey, O'Brien, Grisso, & Hoffman, 1989). Because acutely ill patients often have multiple services involved in their care, they often become increasingly fatigued as the day progresses. In the trauma population, the best time to approach subjects is early in the day or on Sunday morning when scheduled tests/therapies are not typically conducted. In addition, visitors are rarely present during this time, resulting in fewer interruptions and less fatigue.

The use of a face-to-face structured interview has major advantages such as the inclusion of the illiterate, the ability of the interviewer to stimulate or maintain the respondent's interest, and creation of an atmosphere conducive to answering questions (Nay-Brock, 1984). Using data collectors for structured interviews is time-consuming and labour-intensive (Fink, 1993). When multiple sites are used, the cost, in terms of transport and time, may be prohibitive. In acute-care settings, time must be planned for repeated visits, to deal, in a timely fashion, with unavailable subjects or interrupted interviews. When interviews are interrupted and cannot be completed during hospitalization, the choice must be made either to eliminate the subject from the study or to complete a telephone interview immediately post-discharge (Kelsey et al., 1989).

Measurement Considerations

Data-collection procedures may require modification to accommodate the unique challenges of the acutely ill. These challenges can be ascertained in a pilot study (Prescott & Soeken, 1989). The physical task of completing a questionnaire has been identified as a problem in many populations (Bell et al., 1987; Zimmer et al., 1985) and may be insurmountable for acutely ill patients with physical deficits. While the use of structured interviews alleviates some problems, other challenges arise. For example, in the trauma population, patients may have massive facial fractures requiring wiring of the face and jaw, be intubated, or have tracheostomies, all resulting in significant verbal communication difficulties that provide challenges for conducting structured interviews. Despite the presence of physical compromise, these physiological changes alone are not usually sufficient to preclude involvement in the study (Bell et al.). Pilot studies can highlight the feasibility of using other modes of communication such as lip-reading, written responses, or use of notebook computers (instead of verbal responses) in this sub-group of patients.

Respondent burden is a major issue considered by human subjects boards. However, approval from these boards cannot be assumed to eliminate all ethical concerns (Smith, 1992). According to Kelsey and colleagues (1989), healthy subjects younger than 75 years of age can complete a questionnaire or a series of questionnaires that take approximately one hour. This does not easily translate to the acutely ill. Egan et al. (1992) reported that fatigue or pain is problematic and Cassileth and Lusk (1989) further identified the difficulties of contending with impaired physical status. In the acutely injured trauma population, this author found that pain and its treatment, invasive procedures, repeated surgeries, and substance abuse withdrawal all affect the ability of subjects to attend to research interviews.

The duration of interviews requires careful consideration. Enough questions should be included to ensure reliability. However, interviews that are too long may be stressful and fatiguing to subjects and may result in answers given carelessly or without thought (Shaw, 1992). The difficulty is that briefer questionnaires may be too limited to provide the information required by the study at hand (Cassileth & Lusk, 1989). In essence, research materials should be simple, well organized, short enough to accommodate the needs of the sample, but long enough to assure reliability. Fowler and colleagues (1992) identified subject fatigue as a major logistical problem in collecting self-report data from people with AIDS. They reported that interviews often took twice the time that

would be expected in other populations. This problem is not unique to patients with AIDS and frequently surfaces in the acutely ill, many of whom are slower in their response time and require more time than the average healthy adult.

An option for dealing with respondent burden includes conducting the interview in more than one session. However, this is not without its challenges. Some instruments (e.g., the Sickness Impact Profile: Bergner, Bobbitt, Carter, & Gilson, 1981) specify that the instrument must be completed within 24 hours. Using shorter forms of existing instruments is also an option. However, validity and reliability must be carefully attended to with the investigator recognizing the increased potential for floor and ceiling effects and less variability of responses in shorter forms. An alternative is to use family members as proxy respondents. However, information about highly personal issues may be so confounded as to be unreliable (Cassileth & Lusk, 1989; Fowler et al., 1992). Additionally, there may be no family, or the family situation may be tumultuous and chaotic. Furthermore, in the traumatically injured, family members may have accidentally caused the injury (e.g., drivers in accidents), purposely injured the subject (i.e., domestic violence), or may have been critically injured or killed in the same event.

Maximize Reliability of Self-Report Data

Individuals may have recall that is unintentionally inaccurate (Coughlin, 1990). Such random errors usually result from transient states common in the acutely ill, such as hypoxia, the presence of toxic metabolites, transient alterations in cognitive states, and analgesia. With increasingly shortened stays, convalescence no longer takes place in hospitals, and therefore return to normal or baseline cognition may occur at home. For example, patient-controlled analgesia (PCA) for pain management is commonly used in the acutely ill. With the rapid transit through hospitals, PCAs are often stopped just prior to discharge, making it logistically difficult to obtain self-report data following their discontinuance, yet prior to discharge. The same issue holds true for other types of sedatives commonly used. Such states are often beyond the control of the investigator and threaten the reliability of the data obtained.

In order to maximize reliability of self-report data, the investigator can take several steps. First, recognize that even in patients who are fully oriented (to person, time, and place) and who retain decision-making capacity for informed consent, subtle cognitive changes may be present, resulting in unintentional distortion of responses. Incorpor-

ating a mini-mental-status exam at the commencement of data collection is one strategy that can maximize reliability. Second, the researcher is confronted with a difficult choice: to weigh the limitations of collecting data from those in intense pain versus including subjects on PCA who may be slightly sedated but have sufficient pain control to attend to the interview process. If those with PCA are eliminated from the sample, many acutely ill patients would be eliminated, providing an unrepresentative sample. Alternatively, discontinuing such therapy for the purpose of the research would be both unethical and impractical (Bell et al., 1987; Zimmer et al., 1985). Many studies have found sedation with PCA to be relatively mild, with patients occasionally drowsy but easily aroused (Eige, 1992). As most effects of opiates are dose-related, the researcher must individually judge the optimal time when data can be obtained.

Enhance Recall of Past Events

Respondent characteristics and motivation are of central concern to the collection of self-report data. Subjects may intentionally distort information, referred to as *biased recall*, resulting in threats to validity. Despite the significance of the conscious distortion of self-report data, characteristics of individuals who may distort data have received scant attention in the research literature (Chapman & Brena, 1990). Some groups, such as the elderly, may intentionally provide incorrect responses to satisfy the interviewer, especially if they cannot recall pertinent events (Fink, 1993; Zimmer et al., 1985). However, the researcher must be careful not to pre-judge based on age alone, since studies have demonstrated that older respondents are sometimes more accurate than younger respondents when comparing responses to objective evidence (Rodgers & Herzog, 1987). Conscious distortion also occurs in the hope of obtaining extrinsic goals (Chapman & Brena).

Given the unexpected nature of many acute illnesses, researchers are confronted with the challenge of obtaining accurate pre-illness information. For example, when using functional recovery as a major outcome variable, assessment of pre-illness level of function is important. However, memory is fallible and recall bias may occur (Abramson, 1990). The time interval since the event and the degree of detail required in self-report data have been shown to influence the accuracy of recalled data (Coughlin, 1990).

Interviewing techniques and the content and form of questions have been shown to influence the recall of past events (Coughlin, 1990). The use of specific questions or carefully designed probes assists recall

(Kelsey et al., 1989; Preston-Martin, Bernstein, Maldonado, Henderson, & White, 1985). In pilot work, this author examined two instruments measuring a main outcome variable: functional status. The instrument that used semi-structured questions requiring significant verbal output, rather than structured responses, was problematic on three fronts. First, subjects who had limited verbal skills were unable to construct and articulate their inner thoughts. Second, subjects responded much better to a structured interview in which they had to affirm only if the statement read applied to them, rather than volunteering responses without cues. Finally, when the study design requires interviews in less than personal areas (i.e., semi-private hospital rooms), subjects were not likely to volunteer the presence of deficits in highly private areas of function. However, when asked a specific item from a structured interview schedule for which they only had to respond with a yes or no, data could be obtained. Although it would be preferable to assure that the subject is alone and comfortable during any interview, this is not always a viable alternative during acute hospitalization.

Summary

Conducting research in the acutely ill and injured is important to broaden the scientific foundation of nursing practice for the specialty. Given the nature of acute illness, challenges to the collection of self-report data are numerous, but they are not insurmountable. Attending to these challenges and planning for strategies to enhance the accuracy of data are important tasks for any investigator considering research in groups of patients with acute illness or injury.

References

- Abramson, J. H. (1990). *Survey methods in community medicine*. Edinburgh: Churchill Livingstone.
- Bell, J. A., May, F. E., & Stewart, R. B. (1987). Clinical research in the elderly: Ethical and methodological considerations. *Geriatrics and Gerontology*, 21, 1002-1007.
- Bergner, M., Bobbitt, R. A., Carter, W. B., & Gilson, B. S. (1981). The Sickness Impact Profile: Development and final revision of a health status measure. *Medical Care*, 19, 787-805.
- Brown, J., Kranzler, H. R., & Del Boca, F. K. (1992). Self-reports by alcohol and drug in-patients: Factors affecting reliability and validity. *British Journal of Addiction*, 87, 1013-1024.
- Cassileth, B. R., & Lusk, E. J. (1989). Methodologic issues in palliative care psychosocial research. *Journal of Palliative Care*, 5, 5-11.

- Chapman, S. L., & Brena, S. F. (1990). Patterns of conscious failure to provide accurate self-report data in patients with low back pain. *Clinical Journal of Pain*, 6, 178-190.
- Coughlin, S. S. (1990). Recall bias in epidemiologic studies. *Journal of Clinical Epidemiology*, 43, 87-91.
- Egan, E. C., Snyder, M., & Burns, K. R. (1992). Intervention studies in nursing: Is the effect due to the independent variable? *Nursing Outlook*, 40, 187-190.
- Eige, S. (1992). PCA opioids: Common side effects and their treatment. In R. S. Sinatra, A. H. Hord, B. Ginsberg, & L. M. Preble (Eds.). *Acute pain: Mechanisms and management* (pp. 182-193). St. Louis: Mosby Year Book.
- Fink, A. (1993). *Evaluation fundamentals: Guiding health programs, research, and policy*. Newbury Park, CA: Sage.
- Fowler, F. J., Massagli, M. P., Weissman, J., Seage, G. R., Cleary, P. D., & Epstein, A. (1992). Some methodological lessons for surveys with persons with AIDS. *Medical Care*, 30, 1059-1066.
- Hinshaw, A. S. (1981). Problems in doing research: Compromise? Always! Where? How Much? *Western Journal of Nursing Research*, 3, 109-113.
- Kelsey, J. L., O'Brien, L. A., Grisso, J. A., & Hoffman, S. (1989). Issues in carrying out epidemiologic research in the elderly. *American Journal of Epidemiology*, 130, 857-866.
- Kiiski, R., Takala, J., & Eissa, T. (1991). Measurement of alveolar ventilation and changes in deadspace by indirect calorimetry during mechanical ventilation: A laboratory and clinical validation. *Critical Care Medicine*, 19, 1303-1309.
- Nay-Brock, R. M. (1984). A comparison of the questionnaire and interviewing techniques in the collection of sociological data. *Australian Journal of Advanced Nursing*, 2, 14-23.
- Norman, E., Gadaleta, D., & Griffin, C. C. (1991). An evaluation of three blood pressure methods in a stabilized acute trauma population. *Nursing Research*, 40, 86-89.
- Oberst, M. T. (1992). Warning: Believing this report may be hazardous... *Research in Nursing & Health*, 15, 91-92.
- Prescott, P. A., & Soeken, K. L. (1989). The potential uses of pilot work. *Nursing Research*, 38, 60-62.
- Preston-Martin, S., Bernstein, L., Maldonado, A. A., Henderson, B.E., & White, S.C. (1985). A dental x-ray validation study. *American Journal of Epidemiology*, 121, 430-439.
- Rawson, R. A., Obert, J. L., McCann, M. J., & Ling, W. (1993). Neurobehavioral treatment for cocaine dependency: A preliminary evaluation. In F. M. Tims & C. G. Leukefeld (Eds.). *Cocaine treatment: Research and clinical perspectives* (pp. 92-115). Rockville, MD: National Institute of Drug Abuse.
- Rodgers, W. L., & Herzog, A. R. (1987). Interviewing older adults: The accuracy of factual information. *Journal of Gerontology*, 42, 387-394.

- Shaw, R. (1992). Nursing research: Threats to reliability and validity in gerontology. *Journal of Gerontological Nursing* (August), 31-36.
- Smith, L. (1992). Ethical issues in interviewing. *Journal of Advanced Nursing*, 17, 98-103.
- Sneed, N. V., & Hollerbach, A. D. (1992). Accuracy of heart rate assessment in atrial fibrillation. *Heart & Lung*, 21, 1427-1433.
- Wallace, B. C. (1991). *Crack cocaine: A practical treatment approach for the chemically dependent*. New York: Brunner/Mazel.
- Zimmer, A. W., Calkins, E., Hadley, E., Ostfeld, A. M., Kaye, J. M., & Kay, D. (1985). Conducting clinical research in geriatric populations. *Annals of Internal Medicine*, 103, 276-284.

Acknowledgements

The study referred to in this paper was partially supported by a National Research Service Award from the National Institute of Nursing Research (#NR07036-07). The author acknowledges the careful review during the development of this manuscript by Anne Keane, Ed.D., F.A.A.N., and Lorraine Tulman, D.NSc., F.A.A.N.