Résumé

La préférence du personnel des soins prolongés pour les questionnaires électroniques

G. Peggy McFall et Doris L. Milke

Le personnel des soins infirmiers a-t-il l'impression de participer à un nombre trop élevé de recherches? Les questionnaires électroniques sont-ils une méthode pratique de collecte de données? On a demandé à des membres du personnel du plus important établissement de soins prolongés au Canada de répondre à ces questions dans le cadre d'un sondage (mené en versions électronique et papier). Vingt-cinq directeurs des soins infirmiers et 32 autres professionnels du secteur ont indiqué qu'ils préféraient les questionnaires électroniques. Ils ont rapporté être satisfaits de leur apport aux travaux de recherche et précisé que le principal facteur qui limitait leur participation était la charge de travail. Le recours aux questionnaires électroniques pourrait donc avoir un effet positif sur la relation entre chercheurs et personnel infirmier, condition essentielle de la qualité de la recherche menée en soins infirmiers.

Mots clés : collecte de données, personnel

Preference of Continuing Care Staff for Electronic Surveys

G. Peggy McFall and Doris L. Milke

Do care staff feel they participate in too much research, and are electronic surveys a convenient way of collecting data? Care staff at Canada's largest public provider of facility-based continuing care were asked these questions in a questionnaire (i.e., electronic survey or paper survey) developed for this study. A total of 25 nursing managers and 32 other professional care staff indicated that they preferred electronic surveys and were satisfied with the extent of their research participation. They also indicated that workload was the main deterrent to their research participation. Use of electronic surveys could positively affect the researcher/care staff relationship that is so important to the quality of health-care research.

Keywords: Data collection, computers, staff, applied research

Evidence-based practice in nursing care involves the inclusion of the best available research evidence in the decision matrix of good patient/client care. Gathering research in applied settings is a challenge, however, because care staff are often extremely busy and reluctant to take the time required to participate in data collection. The barrier to research participation most often cited by nursing staff is lack of time (Happell, 2004; Hutchinson & Johnston, 2003; Valente, 2003). This concern is validated by evidence that nurses are working harder and have a wider variety of duties now than in the past (Bojtor, 2003; Fitch, 2004). It is essential that the research process be made as attractive as possible to staff members who are directly involved in the provision of care. One way to do so is to decrease the time required for data collection.

Initially, staff members may be motivated to participate in research by the exciting prospect of contributing to research knowledge. If their participation does not produce results, however, they may be reluctant to take part in other studies and their relationship with researchers may become strained. The importance of the researcher/nursing staff relationship is well documented (Conn, Burks, Rantz, & Knudsen, 2002; Engle, 1999; Ruckdeschel & Van Hitsma, 1997). Collaboration between researchers and practitioners is essential to the development of good, robust research. To maintain a positive relationship with staff, researchers must ensure that data collection is manageable (Hutchinson & Johnston, 2003). This study focuses on ways to decrease the time needed for data

collection. Specifically, as care staff must take their workload into consideration, how can we tip the balance in favour of research?

Bojtor (2003) argues that, in health care, technology may be adding new tasks to an already busy work day. However, other researchers have shown that computer technology can significantly reduce the workload of nursing staff (Adderley, Hyde, & Mauseth, 1997; Wong et al., 2003). When an information technology system was implemented on an intensive-care unit, the proportion of time per shift that research nurses spent documenting tasks was reduced from 35% to 24%, and the time saved was translated into direct patient care (Wong et al.). A veterans-care facility implementing a paperless system found that computerization allowed more time for direct patient care; it addition, it decreased wait times for processing orders, eliminated transcription errors, and permitted faster communication among departments and between doctors and nurses (Adderley et al.). Electronic records used for monitoring cataract surgery patients have been cited as a major factor in improving access to cataract surgery (Johnston, Sparrow, Canning, Tole, & Price, 2005). These results indicate that technology can decrease the patient-care workload with regard to charting and sharing information. Therefore, it seems reasonable to assume that adopting computer applications in research, such as well-planned electronic surveys, will decrease the workload of direct-care staff and thus improve patient care.

Hanscom, Lurie, Homa, and Weinstein (2002) found that electronic surveys increased the consistency and completeness of the data collected and eliminated the need for manual data entry. Electronic surveys have been shown to be more convenient than paper surveys for researchers in several professions, by reducing costs, providing faster response times, and resulting in a more flexible and more easily standardized survey (Courtney & Craven, 2005; Jones & Pitt, 1999; Kiesler & Sproull, 1986; Raziano, Jayadevappa, Valenzula, Weiner, & Lavizzo-Mourey, 2001; Schleyer & Forrest, 2000; VanDenKerkhof, Parlow, Goldstein, & Milne, 2004). However, there has been little investigation of whether electronic surveys are more convenient for study participants. The present study examined whether electronic surveys allowed care staff to collect data more quickly and with less interference in day-to-day tasks.

We addressed four research questions: 1. *Do electronic surveys result in faster response times and higher response rates than traditional paper surveys? 2. Do care staff feel sufficiently competent with computers to use them for data-collection tasks such as completing electronic surveys? 3. Do care staff believe they spend too much time on research activities? 4. Do electronic surveys make it more convenient to participate in research?*

Method

The study used a two (electronic survey, paper survey) by two (nursing managers, other professional staff) between-subjects design. The factor of survey type allowed for exploration of response times and rates. The factor of staffing designation was used because nursing managers, who typically have a baccalaureate degree, were expected to have more computer and research experience than other nursing staff. In addition, at the time of the study there were constraints on computer access for frontline nursing staff whereas all nursing managers had computer access. The nursing managers in this study not only managed and coordinated the provision of care (24 hours a day, 7 days a week) for residents in an assigned unit, directing and supervising staff, but also served as the residents' case managers, coordinating the provision of interdisciplinary care (Capital Care Group, 1997). They therefore had a holistic view, the most complete picture of each resident's care. Ethical approval was obtained from the Arts, Science, and Law Human Research Ethics Board of the University of Alberta. The participants received no compensation for completing the survey, although it was assumed that they would be participating as part of their work day.

Setting

Prior to the study, CapitalCare in Edmonton, Alberta, Canada's largest public provider of facility-based continuing care, identified several issues concerning the use of technology among their care staff. As one component of an initiative to improve dementia care, 32 nursing managers were sent an electronic survey that had two goals: to encourage staff use of some recently introduced assessment tools, and to evaluate the extent to which these tools were being used. This was a novel way of collecting information from nursing managers, and it became apparent that some managers had rudimentary computer skills. Researchers also noticed that the completed electronic survey had a better return time and a higher response rate than the usual paper surveys. Researchers and best-practice leaders at CapitalCare were interested in determining whether another electronic survey would produce similar results. They also wished to investigate staff computer skills, particularly aspects that would make electronic data collection possible (implementation of computerized Minimum Data Set [MDS] -2.0/Resident Assessment Instrument-2.0 [RAI] was scheduled for 2006–07).

Participants

All nursing managers and other professional staff at CapitalCare who fit the study definition of care staff and had access to a computer were

invited to participate (computer access was required for random assign-
ment of the study conditions). Care staff were defined as staff members
who were directly involved with residents on a regular basis. Of the 79
people who fit this criterion, 31 were labelled as nursing managers. This
group performed managerial duties and were directly involved in resident
care, and all but one was a registered nurse. These staff members were
known to have some computer knowledge. They used computers in their
daily work and had previously been electronically surveyed by
CapitalCare. The remaining 48 potential participants were labelled as
other professional staff. This group included rehabilitation staff (occupa-
tional and physical therapists), recreational therapists, social workers, and
dietitians who interacted directly with patients. Their computer experi-
ence was unknown. All participants were recruited via an information
letter that accompanied the survey.

Of the possible 79 participants, 59 responded. They included 25
nursing managers (11 completed the electronic survey and 14 the paper
survey), 32 other professional staff (17 completed the electronic survey
and 15 the paper survey), and two who did not indicate their staffing
group; these two participants were included in the response rates and
times but were excluded from all other analyses. The nursing managers
had been employed in long-term care an average of 14 (*SD* = 7.5) years
and other professional staff an average of 9.7 (*SD* = 7.3) years.

Materials

A 12-item questionnaire (http://www.webcitation.org/5FI5DjK7z) was
developed with the technical support of the Department of Psychology
Instructional Technology and Resources Laboratory, University of
Alberta, and the Information Systems staff of CapitalCare's Corporate
Planning Department. It included questions about manager and staff
computer skills and their perception of the research workload and the
convenience of electronic surveys. The questions were primarily based on
a five-point Likert scale, with some yes/no, ranking, choice, and fill-in-
the-blank items. For the purposes of determining face validity and
resolving any technical difficulties, the questionnaire was pretested using
10 CapitalCare staff members who met the inclusion criteria but were
not included in the study. The questionnaire was completed in less than
10 minutes and no major difficulties were encountered.

Procedure

Nursing managers and other professional staff were randomly assigned to
either the electronic or the paper survey group. The two survey types
were timed to be received at approximately the same time. The electronic
survey group received a link to the questionnaire by e-mail and the paper

survey group received the questionnaire via interoffice mail. Previously at CapitalCare, questionnaires had been received by e-mail, printed, completed, and mailed back. In this study, the procedure served to prevent any overlap between the electronic and paper survey types.

The electronic survey was administered and submitted entirely via e-mail. The e-mail included a link to the questionnaire and instructions for completing it. Participants were instructed to open the questionnaire by double clicking on the link. When they opened the link, the first screen was an information letter, with the link that opened the questionnaire evident at the bottom. On completing the survey, participants were instructed to click the submit button to send it to the research database. The time of receipt in the database was recorded.

The paper survey was administered and submitted entirely via interoffice mail. The package sent to participants included a letter describing the survey, similar to the e-mail sent to the other group. The questionnaire was stapled to this sheet. A self-addressed envelope was also included. Participants were instructed to complete the survey, place it in the envelope, and return it via interoffice mail.

All participants were asked to complete the questionnaire within 2 weeks of receipt. A date sticker was included with the e-mail for the electronic survey group and with the instruction letter for the paper survey group. One week later, a reminder was sent to all participants via e-mail and interoffice mail, respectively.

Analysis

Descriptive data were reported for most questions. ANOVAs and *t* tests were conducted where appropriate using $\alpha = 0.05$. Participants indicated the number of hours they used a computer at work on a seven-point scale: 1 (0–4), 2 (5–9), 3 (10–14), 4 (15–19), 5 (20–24), 6 (25–29), 7 (≥ 30). They rated frequency of participation in research as 1 (daily), 2 (once a week), 3 (once a month), 4 (once every 3 months), 5 (once a year). Dichotomous questions were coded 0 (no) and 1 (yes). When ANOVA was used to analyze the data based on the Likert or dichotomous scale, the means of the scale was reported.

Results

The response rates were 28/39 (72%) for the electronic survey and 31/40 (78%) for the paper survey. Of the surveys sent to nursing managers, the return rate was 11/15 (73%) for the electronic survey and 14/16 (88%) for the paper survey. Of those sent to other professional staff, the return rate was 17/24 (71%) for the electronic survey and 15/24 (62%) for the paper survey.

The mean response time was 3.8 (SD = 4.5) days for the electronic survey and 5.5 (SD = 5.3) days for the paper survey. Although the response time for the paper survey was slower, it was not significantly different: t (57) = 1.35, p = .183.

When participants were asked if they had a computer at home, 90% said yes. Nursing managers used a computer at work significantly more (M = 3.6, SD = 1.5) than other professional staff (M = 1.9, SD = 1.1), F(1,50) = 41.8, p < .001. One respondent said, "The number of hours of using the computer weekly varies. Some weeks would be up to two hours daily and other weeks less."

The majority of respondents (> 60%) indicated that they were comfortable to extremely comfortable with all categories of computer use (see Figure 1) except for keeping patient data electronically. Three out of 11 nursing managers responding electronically (27%) and 8/14 responding via paper (57%) reported being comfortable or extremely comfortable. Four out of 17 other professional staff responding electronically (24%) and 6/12 responding via paper (50%) reported being comfortable or extremely comfortable. There was no significant effect of staffing designation for this item: F(1,49) = 0.50, p = .483.

Figure 1 **Respondents Who Rated Themselves Comfortable or Extremely Comfortable With Computers (N = 57)**
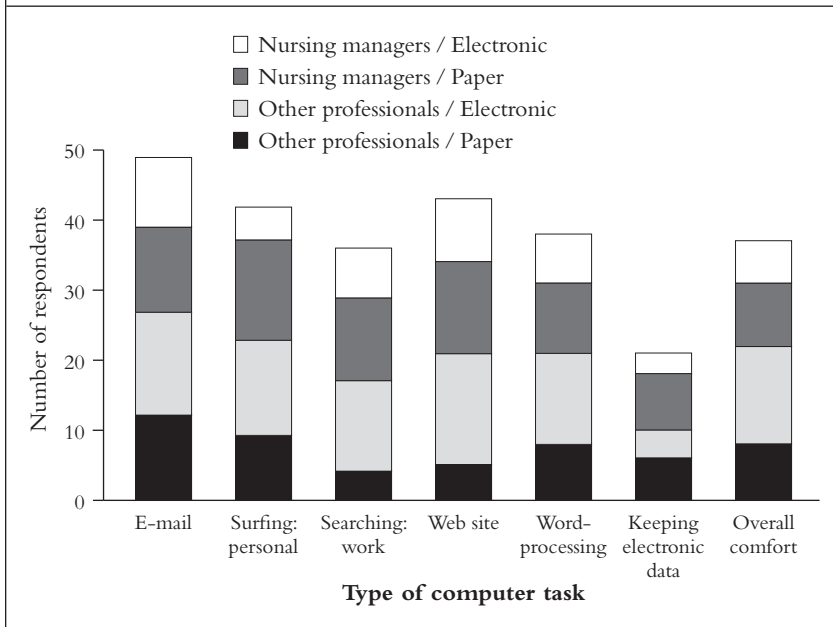
Of all nursing managers surveyed, 90% said they had completed an electronic survey before. Of other professional staff surveyed, 10/15 responding electronically (67%) and 8/14 responding via paper (57%) said they had completed an electronic survey before. Significantly more electronic surveys had been completed before by nursing managers ($M = .92$, $SD = .28$) than by other professional staff ($M = .62$, $SD = .49$), $F(1,49) = 6.4$, $p = .014$.

Of those who had participated in research over the previous year, nursing managers had done so more often ($M = .80$, $SD = .41$) than other professional staff ($M = .55$, $SD = .51$), $F(1,52) = 4.08$, $p = .049$. Eighty percent of nursing managers, compared to only 50% of other professional staff, indicated they had participated in research over the previous year. Of all staff members who had participated in research over the previous year, a majority (84%) had done so quarterly or less often.

The majority of respondents (58%) identified workload as the main barrier to their willingness to participate in research. There was no significant difference between staffing groups for this question: $F(1,51) = 1.49$, $p = .227$. Other factors affecting willingness to participate in research were the value of the research (18%) and the applicability of the research to their worksite (16%).

When participants were asked about their opportunities to take part in research, there was no significant effect between nursing managers ($M = 2.7$, $SD = 0.99$) and other professional staff ($M = 2.3$, $SD = 0.94$), $F(1,49) = 1.57$, $p = .216$. Of particular interest to CapitalCare was the basic breakdown for this question. Rehabilitation staff ($M = 2.1$, $SD = 0.95$, $n = 13$) and recreational therapists ($M = 2.0$, $SD = 1.0$, $n = 7$) reported having the fewest opportunities and dietitians the most ($M = 3.2$, $SD = 0.50$, $n = 4$). Nursing managers ($M = 2.7$, $SD = 1.0$, $n = 24$) and social workers ($M = 2.8$, $SD = 0.44$, $n = 5$) reported having "just the right" number of opportunities. One respondent commented: "As I do not have my masters I am not involved in research as I define it. However, staff do lots of informal research at their own level and on their own terms, particularly if taking [practicum] students from the University of Alberta." Another wrote: "Research initiatives are excellent. Some suggestions I have are [either] invest more time to explain the projects and their potential applications and benefits to our programs using layman terms, or reduce abstract objectives to more manageable ideas for us." A third was more pointed: "I like to partake in research on my unit when it directly applies to my area."

When asked to give their first choice in terms of electronic or traditional surveys, a majority of participants chose some form of electronic survey (see Table 1). One respondent who had just purchased a computer wrote: "Hopefully in a year's time with a few lessons from the right

Table 1   *Respondents' First Choice for Completing a Survey*

	Nursing Managers / Electronic (%)	Nursing Managers / Paper (%)	Other Professional Staff / Electronic (%)	Other Professional Staff / Paper (%)	Total (%)
Desktop Icon*	3/11 (27)	5/14 (36)	2/17 (12)	4/15 (27)	14/57 (25)
E-mail/e-mail return	2/11 (18)	7/14 (50)	8/17 (47)	(2/15 (13)	19/57 (33)
E-mail/postal return	1/11 (9.1)	2/14 (14)	0/17 (0)	1/15 (6.7)	1/57 (7.0)
Web site	2/11 (18)	1/14 (7)	8/17 (47)	3/15 (20)	14/57 (25)
Paper	2/11 (18)	2/14 (14)	1/17 (5.9)	5/15 (33)	10/57 (18)
Telephone	0/11 (0)	1/14 (7)	0/17 (0)	0/15 (0)	1/57 (1.8)
In person	1/11 (9.1)	1/14 (7)	0/17 (0)	0/15 (0)	2/57 (3.5)

* Desktop Icon was a Web site survey previously used by the institution. It was accessed via a desktop icon placed by the IT department. No Web site was apparent.

person I will be more comfortable. Most certainly then my responses to this questionnaire would be decidedly different." Of the various means presented in the questionnaire for completing and returning surveys, overall the participants reported liking the Web site survey the most, finding it the most convenient and the least time-consuming, and liking the e-mail survey returned in paper form the least, finding it time-consuming and the least convenient (see Table 2).

Discussion

The main findings of the study are as follows: (1) the response rates and response times were the same for the electronic and paper surveys; (2) participants felt comfortable using computers in all but one factor: keeping patient data electronically; (3) nursing managers and other professional staff indicated an ability to manage their research load, although some staffing groups, rehabilitation in particular, seemed to have few research opportunities; and (4) participants expressed a liking for electronic surveys, indicating Web site surveys as the preferred form. Respondents also indicated that they found electronic surveys more convenient than traditional surveys.

A central question of this study was whether, among nursing managers, electronic surveys result in faster response times and higher response rates than traditional paper surveys. Several recent studies have found a higher response rate for paper surveys but a faster response time for electronic surveys (Jones & Pitt, 1999; Kiesler & Sproull, 1986; Raziano et al., 2001). The present findings are consistent with these results: the response times were faster for the electronic survey than for the paper survey. Two studies report lower response rates for electronic surveys (Faulx et al., 2005; VanDenKerkhof et al., 2004). In the present study, response rates for the two surveys were very similar. As more research participants become comfortable with computers, electronic surveys may achieve better response rates than paper surveys.

Ajetunmobi (2002) notes that questionnaire response rates for health-care workers are notoriously low. However, others suggest that care staff will participate in more research, and will incorporate more research into their clinical practice, if they have a vested interest in the research (Gillibrand, Burton, & Watkins, 2002; Happell, 2004). It is possible that the electronic survey in the present study, which dealt with research and the use of computers, was of interest to CapitalCare staff and thus prompted response. Another factor that may have contributed to the relatively high response rate for the electronic survey was its brevity in comparison with other surveys that these personnel had recently been asked to complete.

Table 2 *Respondents' Preferences Among Various Electronic Surveys*

		Desktop Icon M (SD)	E-mail / E-mail Return M (SD)	E-mail / Paper Return M (SD)	Web Site M (SD)
Nursing managers	Liked survey	0.88 (0.33)	0.89 (0.32)	0.59 (0.51)	0.93 (0.26)
	Survey convenient	0.73 (0.46)	0.83 (0.38)	0.33 (0.49)	1.00 (0.00)
	Took less time	0.71 (0.47)	0.65 (0.49)	0.31 (0.48)	0.75 (0.45)
Other professional staff	Liked survey	1.00 (0.00)	0.94 (0.25)	0.33 (0.50)	0.93 (0.27)
	Survey convenient	0.88 (0.35)	0.81 (0.40)	0.13 (0.35)	0.85 (0.38)
	Took less time	0.88 (0.35)	0.81 (0.40)	0.13 (0.35)	0.92 (0.28)

CapitalCare staff were found to be very comfortable with computers and to use them both at work and at home. CapitalCare was actively involved in computer training and increasing computer availability to staff but had not formally surveyed staff to determine the level of computer training required. The one area where participants indicated a low level of comfort was keeping patient data electronically. This low comfort level may be due to the fact that only some staff had been involved in the pilot study introducing MDS/RAI, which is based on electronic patient records, during the province's gradual implementation of the program.

Despite the fact that care staff indicated workload as the number one factor affecting their willingness to participate in research, they also indicated satisfaction with the opportunity to participate in research. Hutchinson and Johnston (2003) report that 79% of their respondents indicated that workload was a moderate or great barrier to research utilization. In the present study, however, care staff seemed able to manage both their workload and their research activities. Rehabilitation and recreational staff indicated a preference for more opportunities to do research, and subsequently a CapitalCare clinical specialist initiated a brown-bag lunch to discuss research topics with this professional group. The dietitians indicated the most opportunities to engage in research, likely because one dietitian at CapitalCare was a co-principal investigator in a funded study and offered other dietitians research opportunities. Although the focus here has been data collection, nursing staff and other professional staff can play a pivotal role in many phases of research: suggesting methods of data collection, identifying issues that merit investigation, and the determination of the outcomes measured (Camberg et al., 1999; Conn et al., 2002; Courtney & Craven, 2005; Engle, 1999; Gillibrand et al., 2002; Ruckdeschel & Van Hitsma, 1997).

Another question posed was whether electronic surveys increased the convenience of taking part in research. Consistent with the findings reported in the literature, the majority of participants found electronic surveys more convenient and less time-consuming than traditional paper surveys (Adderley et al., 1997; Dumas, Dietz, & Connelly, 2001; Wong et al., 2003). The majority of participants indicated a preference for electronic questionnaires. However, it should be noted that the participants expressed a preference for returning the survey electronically, not just receiving it that way. When asked about a survey attached to an e-mail to be completed and returned in paper form, only 50% said they liked this format and found it more convenient than traditional paper surveys. This is an important distinction, and the electronic method used in this study may have contributed to the high response rate.

One limitation of the study is that only care staff who had computer access were invited to participate. This was due to computer access constraints within CapitalCare; specifically, the roll-out of computers within the organization had just begun when the study was conducted and therefore employee access to computers was limited. The study participants may have been CapitalCare's most computer-competent care staff. It would be interesting to extend the research by administering a paper survey to those who do not yet have access to a computer at work. It would seem that the less computer-competent a staff member is, the less comfortable he or she will be with electronic surveys. This would indeed be a barrier to research conducted using electronic data collection.

Overall, the results of this study suggest that electronic surveys are an important tool in the collection of research data. Because CapitalCare is Canada's largest public provider of facility-based continuing care, this finding may be generalizable to other facilities. However, a wide variety of technologies are being used in care institutions, and until there is an affordable way to implement computer management systems (see Howard, 2003, for suggestions), these findings may have limited applicability.

The electronic survey was well received. The implications are that research, quality assurance, and evaluation surveys should be administered electronically to nursing and other direct-care staff. The findings of a recent review of electronic data collection by Courtney and Craven (2005) suggest that while electronic surveys may be affected by many of the same trustworthiness issues as paper surveys, such as a bias towards socially desirable answers, electronic methods are highly beneficial for researchers. Because electronic surveys are more convenient for researchers, are accepted by participants, and have comparable response rates and times, one can conclude that they are the best way to administer questionnaires to long-term-care staff, especially as computer experience increases and as employers implement computer technology and provide computer training.

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Authors' Note

G. Peggy McFall, BA, is a doctoral candidate in the Department of Psychology, University of Alberta, Edmonton, Canada. Doris L. Milke, PhD, is Senior Researcher, CapitalCare, Edmonton; and Associate Adjunct Professor, Faculty of Rehabilitation Medicine, Faculty of Nursing, and Department of Psychology, University of Alberta.