A Comparison of Two Distribution Methods on Response Rates to a Patient Safety Questionnaire in Nursing Homes
Kate L. Lapane, PhD, Brian J. Quilliam, PhD, and Carmel M. Hughes, PhD

Background: Survey research focusing on patient safety issues in the nursing home sector poses challenges owing to nursing staff turnover rates, and the adversarial and punitive nature of US nursing home regulation which may promote a negative culture of distrust. Using a patient safety questionnaire, we compared two methods of survey distribution on response rates, respondent sample characteristics, and resident safety ratings. We hypothesized that employees may provide overly positive perceptions when the surveys are distributed on-site as opposed to distribution to employees’ homes, as has been reported by studies evaluating patient satisfaction in other settings.

Methods: In August 2003, 26 nursing homes indicated their distribution method preference (mail directly to staff members’ homes vs. distributed at work) for a survey determining perceptions of resident safety. Facilities provided lists of currently employed nurses (n=721) and nursing assistants (n=1,233). The survey process included an initial mailing of the survey packet, a reminder postcard, a re-mail of the survey packet to non-respondents to the initial survey, and a final reminder postcard. Return envelopes were addressed to the research team.

Results: In nursing facilities where surveys were distributed at work, a greater proportion of respondents were identified as no longer currently employed. Response rates were similar regardless of distribution method, but with greater variability in the facility-specific response rate in surveys distributed at work. Regardless of staffing type, yield of the first mailing was lower and yield of the second mailing higher in homes with surveys distributed at work than those mailed directly to respondents’ homes. While characteristics of nurses were similar regardless of wave, nursing assistant responders to second mailing were more likely to be black relative to responders to the first wave.

Conclusion: Distributing surveys at the workplace may not result in a reduction of response rate, but may provide overly positive perceptions of patient safety issues. Mailing directly to homes may result in less facility-level variability in response rates. Multiple mailings may increase the diversity of the respondent pool.

Keywords: nursing homes; nursing assistants; nurses; survey methods; response rates

Low response rates to questionnaires can threaten the validity of studies by reducing the effective sample size and introducing bias.1 Research on methods to increase the response rates among physicians is common and has included estimating the effect of increasing the incentive size,2,3 mode of delivery,4 advance incentive,5,6 and use of a lottery.7–9 Data on the viability of increasing survey participation among nursing staff are scant.10 Based on a literature search using Medline and EMBASE, we believe that research on increasing response rates to staff surveys in the nursing home sector, as well as nonresponse bias research, is nonexistent.

Survey research in the nursing home sector poses challenges for several reasons. First, nursing turnover is high in this sector; the average 1-year turnover rate for nursing assistants and licensed practical nurses is 85.8% and for registered nurses 55.4%.11 Thus, capturing the correct enumeration of the sampling frame poses a challenge. Distributing surveys through the nursing facility may yield a more accurate assessment of nondeliverable surveys and an opportunity for includ-
ing new employees than would be obtained by sending surveys
to employees’ homes using the US Postal Service. Second, the
adversarial and punitive nature of US nursing home regulation
may promote a negative culture of distrust. The unease
with answering sensitive questions (ie, inquiry of job-related
stresses, poor practices, perception of patient safety) may
prevent nursing staff from completing surveys. Nursing staff
may fear retaliation as a result of the answers they provide
and therefore be reluctant to participate. Indeed, it could be
argued that nurses in many other settings would have similar
reservations. Such nonresponse may be compounded by
distributing surveys through existing work channels. It may be
that disenfranchised employees may be more motivated to
express their concerns regarding patient safety, but only if the
survey was administered outside of the workplace. Alternatively,
employees may provide overly positive perceptions
when the surveys are distributed on-site, as has been reported
by studies evaluating patient satisfaction. It is also possible
that only the most content employees would be motivated to
complete questionnaires owing to loyalty to the home. Socio-
demographic factors may have an impact on response rates.
Last, it is possible that these factors would lead to less vari-
ability in responses in surveys distributed within the work-
place, rather than outside of the workplace.

We believe that an employee’s decision to participate in a
survey regarding patient safety would be influenced by survey
methods and sociodemographic characteristics (such as nurs-
ing staff type, ethnicity, gender, and educational achieve-
ment), as well as employee opinions. As tools are created and
disseminated to evaluate worker perceptions of patient safety
culture, documenting the impact of distribution method on
response is important in the interpretation of potential biases.
This manuscript seeks to compare response rates, character-
istics of responders, and data when distributing the surveys at
the nursing facility to directly mailing the survey to the
employee’s home. This study was conducted in the context of
a randomized controlled trial to increase medication moni-
toring in 26 nursing facilities in Ohio. While study of the
impact of nonresponse bias is, by definition, impossible, indi-
rect evaluations of nonresponse bias are possible by consider-
ing nonresponse along a continuum according to the timing
of the response. Using a similar strategy as used to indirectly
evaluate nonresponse bias in a survey of patient perceptions,
we compared responses from early versus late respondents. As
has been observed in previous studies, we hypothesized that
more late responders were more likely to be persons of color
and less-educated employees. We hypothesized that respon-
dents receiving the survey at work might have more positive
perceptions of safety culture. We believe that the analysis
would be useful in assessing the impact that nonresponse bias
may have in surveys of employee assessments of patient safety.

**METHODS**

The Brown Medical School Institutional Review Board
approved this study protocol. Funded by the Agency for
Healthcare Research Quality, we evaluated the effectiveness
of a unique clinical informatics tool on patient safety out-
comes in nursing facilities in a large randomized clinical trial.
We recruited 26 nursing facilities to participate in this study.
Nursing facilities had to be Medicare/Medicaid certified, have
at least 50 beds, and be serviced by 1 of 2 long-term care
pharmacies participating in the randomized trial. The survey
implemented evaluated perceptions of patient safety among
nurses and nursing assistants. The participating nursing facil-
ities indicated their distribution method preference: mail sur-
veys directly to staff members’ homes OR distribute surveys at
work. The nursing facilities provided the necessary informa-
tion to distribute the information according to their prefer-
ence. Facilities provided lists of nurses (n = 721) and nursing
assistants (n = 1233). The survey process for both work and
home distribution included 4 mailings spaced 2 weeks apart
in the following sequence: an initial mailing of the survey
packet, a reminder postcard, a re-mail of the survey packet to
nonrespondents to the initial survey, and a final reminder
postcard. The survey packets consisted of a cover letter ex-
plaining the survey and including the elements of informed

**Table 1. Return Rate and Response Rate by Distribution Method (Work or Mailed to Home)**

<table>
<thead>
<tr>
<th></th>
<th>Nurses</th>
<th>Nursing Assistants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Mailed</td>
<td>% Returned Without Being Completed†</td>
</tr>
<tr>
<td>Individually mailed to employees at their homes (n = 7 nursing homes)</td>
<td>185</td>
<td>3.2</td>
</tr>
<tr>
<td>Distributed to employees at work (n = 19 nursing homes)</td>
<td>536</td>
<td>10.6</td>
</tr>
</tbody>
</table>

* The response rate was calculated by taking account of the number of questionnaires that were originally mailed minus the number returned because the recipient was no longer employed by the facility (producing the denominator). The numerator was the number of questionnaires returned and completed.
† Reasons for return without completion include person no longer employed at the company or returned undeliverable from post office.
consent, as well as the procedures necessary to receive the incentive for survey completion, the survey with the unique identifier included on the survey (but not the respondent’s name), and a postage-paid return envelope. Instructions to facilities suggested that the surveys be distributed according to their facilities’ established mechanisms. For example, surveys could be distributed with paychecks. Return envelopes were addressed to the research team at Brown Medical School. The respondents were asked not to complete the survey at work. Mailings began in August 2003 and continued throughout the fall of 2003, before the initiation of the intervention. All surveys were encoded with a unique number. On receipt of surveys, the unique number was entered into the survey-tracking file, which included the unique number and each employee’s identifying information. Once documented that a survey was received, the unique number was removed from the survey. Incentive checks of $15 were mailed on receipt of completed surveys.

The questionnaire included the following sections: sociodemographic items (gender, ethnicity, educational achievement, years worked in the nursing home, and years worked in present position), job satisfaction (6 items with the 5-point scale ranging from “never” to “most or all of the time”), a modified version of the Health Profession Stress Inventory (HPSI, containing 28 items with a 5-point scale ranging from “never” to “often or frequently”),19 a modified version of a communication effectiveness instrument,20 and questions regarding staff perceptions of resident safety (34 items with the 5-point scale ranging from “never” to “all of the time”).

Facility-specific response rates were calculated by nursing staff type (nurses and nursing assistants), distribution method (direct to employee home versus distributed at work), and wave of mailing (first and second wave). Sociodemographic characteristics of responders to the first and second mailings were compared to assist in determining the extent of nonresponse bias. We compared the distributions of categorical variables using chi-square tests and Fisher’s exact test when the expected cell sizes were less than 5.

RESULTS

On average, the nursing homes included in this study had 124 beds. Fifty percent were for profit and 46% were part of a chain. As shown in Table 1, response rates varied according to method of administration and nurse staff type (registered or assistant). Just over 10% and 15% of nurses and nursing assistants respectively who received questionnaires at work returned the documentation without being completed, compared with 3.2% and 8.7% of nurses and nursing assistants who received the questionnaire at their own homes and returned it uncompleted. Final response rates for completed questionnaires were somewhat comparable for those who received the survey at home (59% for nurses and 57% for nursing assistants) and those who received the survey at work (54% for nurses and 60% for nursing assistants). There was

<table>
<thead>
<tr>
<th>Characteristics, %</th>
<th>Overall Sample</th>
<th>Distributed at Work</th>
<th>Mailed to Employee's Home</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responded to First Wave (n = 329)</td>
<td>Responded to Second Wave (n = 145)</td>
<td>Responded to First Wave (n = 135)</td>
</tr>
<tr>
<td>Women</td>
<td>94</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Racial/ethnic minority</td>
<td>32</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school, GED or less</td>
<td>53</td>
<td>56</td>
<td>37</td>
</tr>
<tr>
<td>Vocational/trade school or at least some college</td>
<td>47</td>
<td>44</td>
<td>63</td>
</tr>
<tr>
<td>Age, y, mean ± SD</td>
<td>38.1 ± 14.5</td>
<td>37.8 ± 15.3</td>
<td>39.2 ± 14.5</td>
</tr>
<tr>
<td>Years worked for nursing home, mean ± SD</td>
<td>5.4 ± 6.3</td>
<td>5.1 ± 6.2</td>
<td>6.0 ± 6.9</td>
</tr>
</tbody>
</table>

Table 2. Impact of the Second Mailing on Increased Response Rates

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Median No. of Days From First Mailing to Return (Range)</th>
<th>% Returned/Completed With First Mailing</th>
<th>Median No. of Days From Second Mailing to Return (Range)</th>
<th>% Returned/Completed With Second Mailing (of Remaining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>Individually mailed to home 8 (4–29)</td>
<td>46.4</td>
<td>23 (5–166)</td>
<td>11.7</td>
</tr>
<tr>
<td></td>
<td>Distributed at work 18 (8–91)</td>
<td>33.2</td>
<td>18 (4–94)</td>
<td>17.7</td>
</tr>
<tr>
<td>Nursing assistants</td>
<td>Individually mailed to home 13 (7–35)</td>
<td>49.5</td>
<td>13 (6–82)</td>
<td>19.6</td>
</tr>
<tr>
<td></td>
<td>Distributed at work 21 (8–91)</td>
<td>41.5</td>
<td>19 (1–152)</td>
<td>25.0</td>
</tr>
</tbody>
</table>
less variability in the facility-specific response rates when the surveys were mailed to employees’ homes as opposed to distribution within the workplace.

Regardless of staff type, the median number of days for returned surveys after the first mailing was longer for those distributed at work as compared to those mailed directly to the employee’s home. The response rate from the first mailing was lower among nurses and nursing assistants receiving the surveys at work. The response rate from the second mailing was higher in homes where the survey was distributed at work (Table 2). For both staff types, the second mailing resulted in a significant increase in the response rate.

The characteristics of the responders to the first wave are compared to the characteristics of the responders to the second wave in Table 3 for nursing assistants and Table 4 for nurses. Regardless of distribution method, there was a greater proportion of black respondents to the second mailing among nursing assistants (Table 3). While no difference was observed in gender and education level in the surveys distributed in the home among nursing assistants, more men and those with a high school education or less were more likely to respond to the second wave relative to the first wave.

Ratings of job satisfaction were nearly identical regardless of survey distribution method (data not shown). Table 5 shows that respondents for whom the survey was distributed at work viewed the aspects of safety culture more favorably than respondents receiving the survey via the US postal system at their homes, particularly for nurses. Significantly more nurses who received the survey at home reported that they worked in a state of crisis all the time, that they had resident safety problems in their department, and that it was pure luck that more mistakes did not happen. Nurses mailed at home were also more likely to report that safety practices were overlooked for efficiency, staff did not learn from mistakes, and changes to improve things were difficult to implement relative to nurses receiving the survey at work.

**DISCUSSION**

Methodological research evaluating the role of survey design decisions and bias in nursing facilities is scant. As tools that characterize employee perceptions in various health care settings are widely disseminated, ramifications of design elements on issues of validity must be explored. In contrast to previous work that found the use of a simple reminder postcard had little impact on response rates from a large sample of nurses, the value of multiple mailings was evident in the current study. Repeat mailings improved the racial and socioeconomic diversity of the respondent pool. Yet, comparisons of early to later respondents did not vary substantially on key patient safety questions. Indeed, while the overall response rates appeared similar by distribution method, there is some evidence suggesting that different perceptions of patient safety may be obtained by distributing surveys through workplace channels compared to directly mailing surveys to employee’s homes.

Overall, it appeared that the distribution methods used had little impact on the response rate achieved among nurses and nursing assistants. In the current study, regardless of staffing type, the median number of days for response to the first and second mailing was longer in homes distributing surveys at work. Our survey protocol suggested that surveys be distributed according to preexisting mechanisms for delivery of correspondence to employees. The protocol specifically suggested distributing surveys with paychecks. Although the protocol suggested this method, we do not know how many facilities adhered to the protocol. We believe such delays did not introduce bias in this study.

Our data indicate that for nursing assistants, the characteristics of the responders to the second mailing differed from those responding to the initial mailing. Regardless of distribution method, the proportion of nursing assistants responding to the second mailing was more likely to indicate that they were black, relative to respondents to the initial mailing. The impact of the second mailing on increased participation by lower-educated respondents was greater in the mailings directly to the respondents’ homes than in employees who received their survey at work. Recruiting racially and socioeconomically diverse populations for participation in research projects is challenging for many reasons including fear and distrust. Typically, better-educated persons respond to mail questionnaires. Additional resources may be required to achieve diversity in nursing facilities research studies. In one hospital-based study, extraordinary (98%) response rates were
achieved by face-to-face delivery and pick up of completed surveys. Surveying by telephone may also increase response rates and data quality among populations with limited-English proficiency. Such methods may be useful in the nursing facility context, as well.

In the current study, a substantial monetary incentive was provided because of the length of the survey, as well as the sensitive nature of the questions. More cost-effective alternatives may exist. Modest advance payments may simultaneously increase response rate, while decreasing the administrative burden and overall cost of surveys. In surveys of low-income populations, considering literacy level and providing financial incentives increased response rates substantially. It is possible that financial incentives and repeat mailings may not improve response rates equally across racial/ethnic groups. Research on methods to optimize survey response rates among nursing staff is warranted.

These data suggest that employees may report different perceptions when receiving the survey at their workplace. It is possible that the highly regulated nursing home environment may place additional stress on employees to provide socially desirable responses. The consequences for a poor safety record or reputation in the nursing facility are serious in terms of sanctions. Survey instructions urged respondents to take the survey home to complete. Nevertheless, receiving the survey at the workplace may have placed unintentional influence on providing optimistic responses. Indeed, this phenomenon has been noted in surveys of patient satisfaction on-site. In the context of survey research in nursing facilities, more detailed instructions emphasizing the importance of accuracy may be required. Careful attention to vocabulary must be used to minimize a sense of judgment.

We consider these findings with caution. First, nursing facilities were not randomized to the distribution method.
of the survey. Nursing facilities selected the survey distribution method used in this study. It is possible that nursing facilities that selected distributing surveys via workplace channels were systematically different from the nursing facilities that selected distribution of surveys directly to the employees' homes. The findings reported in this study may be biased if factors that led to a nursing facility selecting a particular survey distribution method were also related to response rates and positive patient safety culture. We were unable to evaluate the extent to which this bias occurred in our study. As such, these findings must be confirmed using a randomized design in which homes are randomized to each distribution type. Second, our protocol for providing financial incentives must be considered when interpreting these data. Each survey was encoded with a special code that enabled the researchers to link returned surveys with a name and address. The completed surveys were mailed directly back to the researchers. Once in-house, the surveys were stripped of all identifiers as soon as the research assistants noted which employees responded in a separate tracking file. While this protocol was necessary to allow us to mail the incentive checks to the respondents, the protocol may have acted as a disincentive to participation or potentially skewed the distribution of participants. Indeed, some suggest mailing advance incentives to all potential participants as a way to increase response rates.22 Future better-controlled studies should address this potential bias. Third, the survey questions addressed a potentially sensitive subject—patient safety. This may have influenced response rates. However, the survey content was the same regardless of the distribution method. Last, we do not know if the findings presented in this study are generalizable to all nursing facilities. Our study included 26 Medicare/Medicaid-certified Ohio nursing homes with at least 50 beds serviced by 2 long-term care pharmacies. While the size of participating nursing facilities was representative of all nursing facilities in the United States, homes in the current study were less likely to be run for profit than all US nursing homes.31 In a study using similar survey protocols in North Carolina, nursing facilities that required the surveys be distributed at work had lower response rates (28% to 33%) than facilities that elected survey distribution to employees' home addresses (~55%).32 We do not know the extent to which the nursing facilities included in this study reflect the nursing home culture and workforce of all US nursing homes.

Despite these limitations, these data may be useful in resource planning for those undertaking comprehensive patient safety surveys in nursing facilities. For our survey, average costs incurred for mailing directly to the nurses/nursing assistants' home addresses (including all surveys and reminder postcards) were nearly double the costs of bulk mailing survey materials and reminder postcards directly to the nursing facilities for distribution ($2.01 per participant versus $1.03 per participant, respectively). When implementing surveys of nursing facility employees, researchers must balance "fixed" restraints including resources available for survey, incentives, and topic of the survey with the potential for introducing bias with each distribution method.

REFERENCES

12. Kapp MB. “At least Mom will be safe there”: the role of resident safety in nursing home quality. Qual Saf Health Care 2003;12:201–204.