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The Effect of Feedback Given to Nurse Aides on Response Latency to Patient Call Lights in a Geriatric Nursing Home

Patricia L. Matuszak
Western Michigan University

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THE EFFECT OF FEEDBACK GIVEN TO NURSE AIDES ON RESPONSE LATENCY TO PATIENT CALL LIGHTS IN A GERIATRIC NURSING HOME

by

Patricia L. Matuszak

A Thesis
Submitted to the
Faculty of The Graduate College
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Department of Psychology

Western Michigan University
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THE EFFECT OF FEEDBACK GIVEN TO NURSE AIDES ON RESPONSE LATENCY TO PATIENT CALL LIGHTS IN A GERIATRIC NURSING HOME

Patricia L. Matuszak, M.A.
Western Michigan University, 1986

Feedback has been used in staff performance and management systems in various human service settings. It was applied to four female nurse aides in a geriatric nursing home to decrease response latency to patient call lights. A multiple-baseline-across-subjects design was used with each aide receiving feedback on her mean response time to assigned patients' call lights. Two of the four subjects demonstrated a decrease in mean response times, while two showed little effect after feedback.
ACKNOWLEDGEMENTS

The author would like to acknowledge Brenda Martin and the entire staff of the Friendship Village Health Center for their interest and cooperation throughout the course of this study. Appreciation is also extended to my advisor, Jack Michael, for his useful suggestions and comments, to Mary Rees, Jane Stark, and Dave Ray for their assistance in conducting this research, and to Paul Ellis for organizing the data displays. I would like to especially thank Sue Kent for her superb job of editing and typing this manuscript. Finally, I would like to express my gratitude to my family and friends for their constant support and encouragement throughout my educational career.

Patricia L. Matuszak
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Western Michigan University

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INTRODUCTION

Staff performance and management systems have been used extensively with staff dealing with a variety of clients in various human service settings. The most common areas are: educational and school settings (Krumhus & Malott, 1980; Shook, Johnson, & Uhlman, 1978), infant care (Kunz et al., 1982), psychiatric facilities (Hollander & Plutchik, 1972; Kreitner, Reif, & Morris, 1977; Pomerleau, Bobrove, & Smith, 1973), and institutions for the mentally retarded (Burg, Reid, & Lattimore, 1979; Burgio, Whitman, & Reid, 1983; Kissel, Whitman, & Reid, 1983; Quilitch, 1975; Quilitch, 1978).

Shook et al. (1978) used posted feedback with staff in a school setting for multiply handicapped students. They investigated its effect on graphing data collected during instructional sessions, and found feedback to be more effective than instructions in maintaining completion of graphs. Krumhus and Malott (1980) found similar results when feedback and modeling were used, as opposed to instructions with tutors in a university-based reading and mathematics tutorial program.

Kunz et al. (1982) used feedback to improve staff behavior in a child care center. Public posting and supervisory feedback increased staff performance of checking and changing diapers, and staff interactions with the children.

A performance feedback system was used with mental health technicians in a study by Kreitner et al. (1977). The posted the technicians' previous week's performance on three tasks:
conducting and completing group therapy sessions, conducting and completing an individual therapy session, and completing daily routine duties. This feedback was shown to be effective in improving the staff's performance on all three tasks.

Institutions for the mentally retarded have been the settings for much research on improving staff performance. Feedback through public posting of employee suggestions and management responses was studied by Quilitch (1978). He found an increase in suggestions made which resulted in improvements in the work setting.

Burgio et al. (1983) and Quilitch (1975) both attempted to use self-management techniques with institutional staff in mental retardation facilities to improve interactions with clients. The initial training phases used feedback and instructions. Burgio et al. (1983) found increases in interactions with self-management, while Quilitch (1975) found better results and improvements when specific instructions and feedback were used.

Burg et al. (1979) used a self-recording and supervision program to increase staff-client interactions in a state residential facility for profoundly retarded individuals. The results indicated improvements in staff-client interactions when self-recording of staff and client behaviors was used. Custodial duties were found to have improved slightly, as well, when the self-recording phase was in effect.

The use of behavioral training and self-management skills with institutional staff was found to improve self-care sessions with severely and profoundly retarded residents (Kissel et al., 1983). They also found that specific skill training generalized to other
self-care sessions. It also maintained with less supervision.

Reinforcement programs have also been implemented in institutional settings. Holland and Plutchik (1972) used trading stamps to increase staff participation in research tasks. They found the stamps very effective, and when no longer available, participation returned to low baseline rates. Pomerleau et al. (1973) found similar results when cash awards for "most cooperative aide" and greatest patient improvement were present. When the monetary award was no longer available, patient improvement decreased as well as staff efforts to be voted "most cooperative aide."

Policy control to improve staff compliance to program functions was used with staff at a forensic psychiatry setting (Andraski, McNamara, & Abbott, 1978). When an absence policy for residents was implemented, staff were required to evaluate resident attendance at an employment program and take specific action according to number of absences. Feedback was given to staff on their performance, with appropriate actions taken showing a definite increase.

Different aspects of performance feedback were the subjects of study by Emmert (1978) and Frederiksen, Richter, Johnson, and Solomon (1982). Frederiksen et al. (1982) examined specificity of performance feedback on charting response by therapists in a clinic setting. They found that feedback given on specific staff performance did not generalize to other staff behaviors. Emmert (1978) found that individual performance feedback was more effective than group performance feedback in improving productivity in an industrial setting.
Various techniques in staff management have been used in human service settings, but these have typically not been employed in the area of nursing care and nursing homes. The most prevalent technique has been inservice training (Hameister, 1977; Hickey & Fatula, 1975; Lehman & Vargo, 1979; Morrison, 1970).

Hickey and Fatula (1975) and Lehman and Vargo (1979) attempted to improve staff attitudes by implementing inservice programs in geriatric nursing homes. Lehman and Vargo (1979) utilized the Attitudes Toward Disabled Persons (ATDP) Scale (Yukor, Block, & Campbell, 1960) to determine inservice effectiveness. Both studies claimed improved attitudes among nurse aides following the inservice training.

Hameister (1977) and Morrison (1970) proposed guidelines for inservice programs. Both placed emphasis on attitudes, morale, and motivation. Other articles (Goldin, 1985; Gordon, 1982; Lancaster, 1985; Schwartz, 1974; Waxman, Carner, & Berkenstak, 1984; Winn, Elias, & McComb, 1978) also examined job performance in these general terms.

Other research (Lubinski, 1981) examined staff behavior in relation to communication skills of aged nursing home residents. Lubinski (1981) saw staff-resident interactions as a means of environmental control for the aged. Similar comments were made by Baites, Homm, Barton, Orzech, & Largo, (1983) in addressing dependence and independence in nursing home residents.

The role of nurse aides has been one of custodial care provider. This is particularly true in geriatric nursing homes as a result of the medical model of care (Wack & Rodin, 1978). As previously
in nursing homes has concerned attitudes and motivation. There is almost no research data on job performance, itself. Such data would be of value in possibly leading to improved job performance in such settings, and also of general value in helping to understand an important type of human service setting.

One type of nurse aide behavior that is often complained about by patients and is also thought by some supervisors to be a problem is long delayed response to patient call lights. It is not clear what constitutes appropriate call-light response, since failure to respond as soon as the call light comes on is generally due to the nurse aide being involved in some other job-related activity. No data were found in the relevant literature regarding standards with respect to this type of behavior. Since the situation is not one of acute medical emergency at most geriatric nursing homes, it is possible that relatively long delays are not unreasonable. It seems likely, however, that unless supervisors maintain an active interest in call light response times, even to the point of systematic monitoring, average times would be longer than reasonably necessary.

The purpose of the present study will be to obtain some systematic data on call light response and to try, using feedback, to reduce the average response time. Averages across the various nurse aides will be useful in determining relative standards, at least. Also, if average times are reduced considerably with no other noticeable changes in job performance, it would be reasonable to assume that they had been too long.
METHOD

Subjects

The subjects for the study were four female nurse aides. They ranged in age from 18 to 26 years, with a mean age of 23. The length of employment ranged from two months to two years.

These nurse aides were chosen because of their full-time status on the 3-11 shift. From a total of 11 full- and part-time aides, these four verbally agreed to participate in the study.

Setting

The study took place in a 57-bed privately-owned, skilled geriatric nursing home. The facility was comprised of two halls of patient rooms in an L-shaped design. The nurses' station was located where the halls met. The dining room was located opposite the nurses' station between the two building wings. A large-faced clock was visible from the nurses' station, and this clock was used in the collection of time measurements.

All patient rooms were semi-private except for one private room. Each room had a call light fixture above the door in the hallway, at the head of each bed, and in the bathroom. The room call lights were turned on with hand-held push-button devices. The bathroom call lights used a pull-chain action to turn on (U.S. Department of Public Health, 1985, R 325.21310, R 325.21313).

The nurses' station was equipped with a numbered light panel.
corresponding to patient room numbers. When call lights came on, they were visible at the nurses' station, and also outside the patient's room above the door. The lights-on were accompanied by a bell which rang at a fixed, 3-second interval until the call light was answered.

The call lights used in the patient's room resulted in a steady light-on situation at the head of the bed, outside the door, and at the nurses' station. A button, located on the wall at the head of the bed had to be manually pushed from that location to cancel the light-on situation.

When a patient used the bathroom call light, the result was a flashing light in the bathroom, outside the patient's room in the hallway, and at the nurses' station. The bell rang in unison with the blinking light every one second. To cancel the light-on situation, one had to manually press the button located in the patient's bathroom. No call lights could be cancelled from the nurses' station.

Determination of nurse aide responsibility came from the scheduled patient assignment sheet located at the nurses' station. Patient assignments were divided according to difficulty of patients, not upon sequential rooms. Assignments were divided according to five or six nurse aides scheduled to work. When fewer aides were present, they teamed together to complete patient care duties. Breaks for meals were listed according to specific groups of patients assigned.

Evening meal breaks occurred at 7:00 and 7:30 p.m.
Materials

Materials used for data collection were standardized data sheets (see Appendix B), a pen, and clock. Reliability observers used the same form of data sheet as the primary observer. Both observers used the clock located near the nurses' station to derive time measurements.

Feedback forms used with the nurse aides were standardized to allow insertion of numbers relevant to the particular aide. The forms included spaces to record total number of lights on and mean response latency (see Appendix C).

Dependent Variable

The variable under investigation was the length of time patient call lights remained unanswered. Data were collected on: time light came on, the room number and patient, time answered, total time on, and nurse aide assigned to care for that patient. Data were collected from 6:30 to 8:30 p.m., Monday through Friday. Times recorded were broken down to the nearest standard fifteen second interval (i.e., 6:30:15), to provide a more accurate total time. Slash marks (latency units) each representing fifteen seconds, were used to compute total times from the difference between time answered and time-on categories.

Total number of lights-on and mean response latency per aide were adjusted to exclude those call lights which were turned on during the nurse aide's break.
A primary observer, and reliability observers (i.e., to check the data collection of the primary observer on occasion) were located at the nurses' station for data collection. The call light panel was easily accessible as were the light fixtures located above each patient room. A large wall clock was located within visual range of the nurses' station for recording times. The observer(s) could visually sweep both halls for call lights on, as well as check the light panel.

Patient call lights only determined the room number, not the specific patient. Nurse aides were assigned to specific patients, not both patients in a room. When a call light came on, the observer recorded the room number and time on. The observer then went to the room and checked which patient used his/her light to determine nurse aide responsibility. This was decided by checking the light fixture at the head of the patient's bed. The observer was as unobtrusive as possible and took care to respect the privacy of the patients.

Data were collected on the subjects when individual patient assignments were given. When staffing consisted of four or fewer nurse aides, they were teamed up per hall. When this situation occurred, no data were collected. Also, when an aide was present but given no specific patient assignment, no data were collected on that subject. All situations of no-specific-patient-assignments were also excluded from the graphs.

Reliability observers were instructed to use the data sheet and to record times using the standard fifteen-second intervals. They were also trained to use the patient assignment sheets to determine
the aide responsible for answering that specific patient's call light. (No specific prerequisite skills were required for reliability observers.)

Interobserver agreement was computed according to total call lights on, and mean response latencies to the nearest standard 15-second interval per nurse aide. Agreements divided by agreements plus disagreements times 100 was the equation used to determine degree of interobserver agreement.

Independent Variable

The variable manipulated in the study was presentation of feedback forms describing each nurse aide's performance with regard to patient call lights. The forms (see Appendix C) listed that specific aide's total call lights on and mean response latency per observation period. The forms were given to the aides after data collection each day, with the observer reading the form to each aide. The aides were instructed to return the forms to the observer after each had initialed her form. The observer kept the forms in a file. Nurse aides were allowed to view their own forms only. During baseline, data were collected but no feedback was given to the aides regarding their performance in answering call lights.

Experimental Design

A multiple-baseline-across-subjects design was used. According to Bailey and Bostow (1979), this design was more appropriate to use than a reversal since reversing would be unethical.
The treatment phase using feedback forms was implemented for an aide with a relatively stable baseline rate for at least four days. Subsequent aides were introduced to the feedback forms on a random basis, as long as they had achieved stable baseline rates.

The rotation schedule was designed to account for staffing on weekends. This meant that nurse aides in the study would not be working consistently each week. Graphs were designed to specify only when aides were present and had call lights on during the observation periods.

Absences, when regularly scheduled, resulted in fewer staff on and a team approach to patient care. This situation made it difficult, if not impossible, to determine staff responsibility for specific patient's care.

Human Subjects Protection

The nurse aides had given verbal approval to be in the study. They also received a written informed consent form to read and sign (see Appendix A). The aides who had given verbal agreement were not bound by that agreement to sign the consent form. No pressure or persuasive techniques were used.

The aides were given a brief description of the study, that the area of concern was nurse aide response to patient call lights. Details of the feedback forms were withheld to prevent changes in response times prior to the feedback phase.

The benefits of the study were to make the aides aware of at least one aspect of their job performance, and to improve the level
of patient care. Both benefits were important and required attention from supervisors and administrators. Other benefits may also have been recognition from supervisors and peers for improved performance.

There were no risks involved in the study. Participation was voluntary. All data collected remained confidential; aides were assigned numbers for dissemination purposes. Data derived from the study had no impact on job security. Since data were collected on routine tasks, work assignments were not altered or patient care jeopardized.

The nurse aides were informed that all data collected would be kept confidential. Only the observer(s) had access. Names were replaced by assigned numbers, so that only the primary observer would know what data belonged to which aide.

The subjects were also advised that the data collected would be used in the written thesis, in possible future research, and/or submitted for publication in a scientific journal. Names of the nurse aides would be omitted for reasons of privacy and confidentiality.

The nurse aides could withdraw from the study at anytime with no repercussions. Since participation in the study was voluntary, the aides were not required to remain as participants for the duration of the study. The aides would not be required to give reasons for withdrawal from the study. They were asked to notify the primary observer with any concerns about the study, or in the event of withdrawal.
RESULTS

Specific written feedback was effective in decreasing two of the four subjects' mean response latency to patient call lights. The other two subjects displayed little change in mean response times from their baseline rates. The daily mean response times for the four subjects are displayed in Figure 1.

The data for the four subjects were also recorded by three-day-average means (see Figure 2) and three-day-running-average means (see Figure 3). These additional graphic displays depicted the data without their extremes. All graphs displayed only those sessions where data were collected for the respective aides. All absences and no-call-lights-on conditions were excluded from the graphs.

The number of call lights on per session per nurse aide ranged from one to ten with an average of two per session. There were no differences between subjects with regard to number of call lights on per session.

Subject 1 reported a range of mean response times of .5 to 17.25 minutes during baseline. After feedback was introduced, the range was .25 to 12.67 minutes which was reported on the first day of feedback.

Subject 2 reported a baseline range of mean response times of .5 to 24.0 minutes. After feedback, the range was 1.0 to 6.75 minutes.
Figure 1. Daily Mean Response Times for the Four Subjects During Baseline and Feedback Phases Displayed on a Multiple-Baseline-Across-Subjects Graph.
Figure 2. Three-Day Mean Response Times During Each Two-Hour Observation Period.
Figure 3. Three-Day Running Mean Response Times During Each Two-Hour Observation Period.
Subjects 3 and 4 reported little change in mean response times after feedback was introduced. Subject 3 showed a mean range of .5 to 12.25 minutes during baseline. The range was .25 to 10.33 minutes after feedback was introduced.

Subject 4 reported a relatively low mean response time throughout both baseline and feedback phases. The range during baseline was .5 to 10.5 minutes. After feedback the range of mean response times was .25 to 5.75 minutes.

Reliability observations were made on two occasions. Arrangements for several other reliability observations were made but had to be changed due to the lack of a second observer. Subjects 1 and 3 were present on the first occasion with an interobserver agreement of 100% for mean response times for both subjects. Subjects 1, 2, and 3 were present for the second reliability check. Interobserver agreement was also 100% for the mean response times across all three subjects.
DISCUSSION

Specific performance feedback can be used to decrease the response times of nurse aides to patient call lights in a geriatric nursing home. Subject 1 demonstrated a dramatic decrease in response time to call lights after feedback was given which maintained throughout the course of the study. Subject 2 showed a more gradual decrease in response latency.

Subjects 3 and 4 maintained relatively stable response times across the baseline and feedback phases. Both subjects had relatively low response times.

All subjects were cooperative throughout the study and inquired about their performance. The data sheet was easily accessible to the staff and no attempts were made to restrict their viewing it.

Subject 1 demonstrated a marked decrease in response time to patient call lights following the introduction of feedback. Subject 2 reported a similar decrease prior to her receiving feedback, but corresponding to the introduction of feedback to Subject 1. When Subject 2 showed an increase in response time, feedback was introduced to her. She then showed a gradual decline in her mean response time to call lights. It was noted by the author that Subjects 1 and 2 were very close friends and often took breaks together.

Subjects 3 and 4 were apparently unaffected by the feedback given regarding their response to patient call lights. This situation was not entirely negative because their response times were already quite low with means of five minutes. These subjects had
been included in the study because of major staff turnovers which resulted in a smaller number of experienced nurse aides. All of the subjects for this study had been employed at the nursing home for at least one year.

Assuming the effectiveness of the feedback intervention, it is appropriate to consider why it was successful. It seems reasonable to believe that call light answering is the type of job task that can vary considerably in importance across the different aides. An aide might consider call light answering to be an activity of high priority, but simply not realize how long she was making the patients wait. The feedback might then affect the aide in such a way that the call light as a stimulus evokes self-reminders about the importance of answering quickly, and these behaviors result in more rapid disengagement from some other activity. It is also possible that this research activity, although clearly related to my graduate study at the university, is viewed, nevertheless, as reflecting the priorities of the supervisor.

For an aide who was not independently motivated for quick call light responding by genuine concern for patients' comfort, the feedback might constitute a form of mild threat regarding possibly inadequate job performance. The onset of a call light, then, would function as a slightly more aversive condition than it had previously and generate somewhat quicker answering. The first interpretation seems somewhat more plausible since the aides did not seem worried about their job performance nor did they show any hostility toward the primary observer or toward the supervisor in her presence,
as might have occurred if increased aversive control was the primary basis for the improvement.

Staff turnover, schedules for the nurse aides, and specific patient assignments were variables for which the author was unable to control. Nurse aides were scheduled to work on a rotation basis to cover weekend duties. This situation led to inconsistent data collection from day to day. The graphs depicted the data collected in a compact form so as to exclude the nurse aides' absences and days off.

Specific patient assignments changed two weeks before the conclusion of the study. The initial assignments had patients grouped by difficulty of care, not adjacent rooms. This situation resulted in assignments with patients on both halls, which made it virtually impossible to attend to call lights on the other hall. The altered assignments were basically adjacent rooms with only a few exceptions, due to difficulty of the patient care, which resulted in lower response times.

Routine activities for the nurse aides were often interrupted by the presence of a call light on. In some instances the long response latency was unavoidable. In some cases, two aides were required to perform certain patient care duties. This was not found to be the reason for most long response times though. A specific reason was not determined.

Dinner breaks for the nurse aides changed daily depending on the specific patient assignment. While the aides were on break, they were not responsible for any of their assigned patients' call
lights which came on. However, many of those call lights remained on for long durations while the aides were gone.

Many of these problems are not uncommon in other applied settings. While this author was unable to control for these variables, some suggestions could be offered to remedy these situations.

One major problem found during the present study was staff schedules. In order to have more consistent patient care, the nurse aide could be scheduled for three or four consecutive days with the same patient assignment. This might allow for better staff-patient communication and anticipation of patient needs.

Another suggestion involves coverage of patient call lights while the aides are on break. It would appear logical to assign remaining staff to be responsible for the call lights of aides on break. Currently, this has been done on an informal basis. With formalized assignments, there would be better response to call lights and patient needs.

Since the average number of call lights on per any nurse aide was two, a more descriptive study of response times might be a group feedback measure. This measure could be accomplished by averaging all response latencies for the observation period. This group feedback might also be enhanced by publicly posting the data.

No data were collected on response times to call lights outside of the observation periods. It is unknown if the times remained low or if the presence of the observer controlled that response. If the methodology of this study is reliable, the behavior would have to continue across the shift and over time. Since the data collection
method was quite simple, the nursing supervisors could easily con-
tinue this practice.

Although several variables were not controlled for in the pre-
sent study, the data collected were relevant to behavioral and
gerontological research. An initial step has been taken with re-
gard to nurse aide job performance in nursing homes. Other research-
ers could expand on the use of feedback with others aspects of the
nurse aides' job, or further examine its use on response latency
to call lights. It was the hope of the author to stimulate others
to do research in the area of nurse aide job performance.
APPENDIX A

INFORMED CONSENT

Dear Nurse Aides,

My name is Pat Matuszak and I am a graduate student in Psychology and Gerontology at Western Michigan University. I am interested in conducting research for my thesis at this nursing home and will be needing a few nurse aides to participate as subjects.

The thesis topic involves nurse aides' responses to patient call lights. It will involve no extra work on your part; just follow your daily routine. I will do all data recording, Monday through Friday from 6:30 to 8:30 p.m.

Participation in this study is voluntary and you may withdraw at any time. All data collected will be confidential. Your names will not be used in any write-up. The data will be graphed and discussed in my thesis, but your identity will not be disclosed.

You may find it beneficial to look at your own job performance and be recognized for good work. Participating in this study alone will not jeopardize your job security.

If you are willing to participate, please sign below.

I have read this consent form and understand that I may withdraw at any time. I understand that my name will remain confidential. I also understand that data collected on my behavior will be used for the present thesis.

I agree to participate as a subject in this research study.

______________________________  _______________________________
Name                                      Date
### APPENDIX B

**DATA SHEET**

<table>
<thead>
<tr>
<th>Time On</th>
<th>Room and Patient</th>
<th>Time Answered</th>
<th>Latency Units</th>
<th>Total Time</th>
<th>Nurse Aide and Break</th>
</tr>
</thead>
</table>

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APPENDIX C

FEEDBACK FORM

Nurse Aide ___________________________  Date ________________

You had a total of _________ call lights on. Your average time to
answer the lights was __________.

Nurse Aide Initials ________________
Observer Initials ________________
BIBLIOGRAPHY


