

*DIRECT ASSESSMENT OF QUALITY OF CARE IN
A GERIATRIC NURSING HOME*

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Direct observation was used to examine multiple aspects of care provided in a proprietary nursing home. Time samples were taken at random intervals, 7 days per week for 5 weeks, across several categories of environmental and resident conditions as well as staff and resident activity. Results showed a high degree of compliance with predefined standards (based on current federal regulations) for environmental and resident conditions. Overall distributions of resident and staff activity showed results similar to those found in previous studies, with residents spending most of their time engaged in nonsocial activity and staff spending the majority of their time engaged in nonresident work. When data were analyzed across areas of the facility, times of day, and weekdays versus weekends, some differences were noted. Weekend versus weekday comparisons showed higher resident:staff ratios on weekends and more resident inactivity, but no significant differences in environmental or resident conditions. In addition, more frequent resident care, resident interaction, and resident activity were observed in Medicare units than in non-Medicare units. Results are discussed in terms of federal requirements for monitoring the quality of care in nursing homes and the potential use of time sampling expressly for this purpose.

DESCRIPTORS: assessment, gerontology, nursing home, time sampling

The Nursing Home Quality Reform Amendments, part of the Omnibus Budget Reconciliation Act (OBRA) of 1987, represent the most comprehensive attempt by our federal government to improve the quality of life in nursing home facilities. These standards, which became effective October 1, 1990, may now begin to accomplish what has already occurred in other types of institutions (e.g., developmental disabilities and mental health). Previously, the regulatory process placed greater emphasis on a facility's capacity to provide required services than on the quality of services actually delivered. Perhaps the most significant change under OBRA was the addition of four new "conditions of participation"—quality of life, quality of care, resident assessment, and resident rights—that clearly place the responsibility for outcomes of care on the nursing home staff (Ammentorp, Gossett, & Poe, 1991). The inspection process

also changed substantially under OBRA, which now includes a set of "interpretive guidelines" outlining specific criteria and procedures to be used as the basis for program evaluation. Under these new regulations, surveyors are required to use a variety of methods, including structured resident interviews and direct observation of staff-patient interaction, in addition to the traditional record review.

There is evidence, however, that many of the currently used survey procedures may provide inadequate (possibly even erroneous) information about quality of care, especially as it pertains to staff interactions with residents. For example, several observational studies of staff and resident behavior in institutions for persons with developmental disabilities have shown that, contrary to survey results, the extent of rehabilitative training implemented in federally funded facilities was no greater than that found in facilities without such funding (Reid, Parsons, Green, & Schepis, 1991; Repp & Barton, 1980). It has been suggested that the typical survey process may yield unrepresentative re-

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sults due to infrequent and subjective methods of data collection, and that more extensive and quantitative observation procedures may be necessary (Zarcone, Iwata, Rodgers, & Vollmer, 1993). Because results obtained during the survey process are frequently used as the basis for making important decisions about institutional licensing, funding, staffing, and so forth, the development of improved assessment procedures seems to be warranted.

The use of time sampling to observe staff and resident behavior permits direct observation of large groups over a short periods of time. Data collected using brief time samples have been shown to be representative of those collected continuously (Alevizos, DeRisi, Liberman, Eckman, & Callahan, 1978; Saudargas & Zanolli, 1990), and several studies of staff activity in nursing homes have used time-sampling methods. Moos, David, Lemke, and Postle (1984) observed the staff-resident interactions among different types of personnel (e.g., nursing, housekeeping, etc.) during 5-min observation periods to assess the effects of ininstitution relocation on staff and resident behavior. Although Moos *et al.* used objective measurement procedures, they did not obtain any measures of interobserver reliability. In another study, Baltes, Honn, Barton, Orzech, and Lago (1983) used an interval time-sampling procedure to observe staff activity over a 2-day period. More recently, Burgio, Engel, Hawkins, McCormick, and Scheve (1990) conducted an extensive analysis of staff behavior by scheduling observations 5 days per week over a 37-month period. A momentary time-sampling procedure was used to compare categories of behavior across different types of nursing staff (nurse's aides, licensed practical nurses, and registered nurses).

Most research conducted to date has focused on either resident behavior or interactions between staff and residents. Relatively few studies have examined other aspects of quality of care, and these typically were limited to molar variables such as facility size (Curry & Ratliff, 1973), proximity to community resources

(Carp, 1985), and availability of public transportation (Christensen & Cranz, 1987). However, variables related to physical living conditions, such as cleanliness of facilities, safety factors, the availability of supplies and materials, and the presence of caregivers, probably contribute directly to the overall quality of services provided to residents in long-term placements. Similarly, the physical condition of residents themselves (e.g., adequacy of grooming, freedom from injuries) is an important index of quality of an elderly person's life.

Zarcone *et al.* (1993) recently demonstrated the use of a time-sampling procedure that combined a number of the above measures. Observations were conducted several times per day in two large state residential facilities for persons with developmental disabilities. During each sample, observers collected data on the general categories of environmental condition, resident appearance, staff behavior, and resident behavior; these, in turn, were divided further into subcategories. The results illustrated the utility and efficiency of time-sampling procedures in providing objective data of multiple aspects of service delivery, and suggested that similar approaches could be used while conducting program evaluation in residential care facilities for the elderly. Thus, the purpose of this study was to extend the use of time-sampling methodology to the examination of multiple aspects of quality of care in a geriatric setting.

METHOD

Subjects and Setting

The study was conducted in a community-based proprietary nursing home serving 104 residents ranging in age from 65 to 101 years (mean age, 80 years). The home was licensed as a skilled nursing care facility and was divided into four living areas (Areas I, II, IIIA, and IIIB) and a large dining and social area. None of the areas was locked. Each living area contained a separate nursing station for administrative work and preparation and storage of med-

Table 1
Percentage of Residents Rated for Each Category of
Functional Status Across Areas

Rating	Area I	Area II	Area IIIA	Area IIIB
A	12.5	10	14.3	15.8
B	0	6.7	14.3	5.3
C	31.25	20	21.5	42.1
D	56.25	63.3	42.9	35.8

ications and a small social and activity area in which organized activities (e.g., bingo games) occurred and meals were served. Areas I and II were the oldest units of the facility, where rooms and hallways were slightly smaller than those found in newer areas (IIIA and IIIB). Several storage areas, administrative offices, housekeeping and maintenance areas (e.g., laundry areas), and a staff break area were located throughout the facility.

Data on the functioning level of the residents are summarized in Table 1, which shows the percentage of residents by living area who received ratings in each of four categories of functional status according to Department of Health and Human Services resident rosters. Residents rated A were those who were interviewable and relatively independent (e.g., they required some assistance to bathe or dress, but were mobile and independent in toileting and eating). Residents rated B were those who were interviewable and relatively independent, but required extensive staff assistance to transfer, use the toilet, and eat. Residents rated C were those who were noninterviewable and required staff supervision, but did not require extensive staff assistance to perform activities of daily living. Residents rated D were those who were noninterviewable, showed noticeable cognitive impairment, and required total staff assistance to perform activities of daily living. Approximately 10% of the residents were Medicare recipients (all residing in Area IIIB) and 75% received Medicaid. Although residents were not formally assigned to living areas according to level of functioning, many of those who lived in Areas

I and II were more limited and dependent upon staff than were residents in Areas IIIA and IIIB. Areas I and II were older sections of the facility, and the new wing (Area III) had been added as a Medicare rehabilitation unit. Therefore, residents of Areas IIIA and IIIB were typically younger and more active and alert due to their recent admission or their designation as Medicare rehabilitation patients (whose eventual goal was a return to a less restrictive environment).

The facility employed 72 staff in full-time positions, including 48 nurse's aides, 11 registered nurses, six housekeeping and maintenance staff, two speech therapy aides, and one each of the following: occupational therapist, physical therapist, physical therapy aide, social worker, and speech therapist. Nurse's aide:resident ratios for first and second shifts were 1:11.5 and 1:8.5, respectively. Three registered nurses were assigned to each shift. The remainder of the employees worked day shifts, typically from 8:00 a.m. to 4:00 p.m. The mean staff turnover rate for the previous year was approximately 10% (mostly nursing staff).

Approval to conduct the study was obtained from both the facility administrator and the university institutional review board. Informed consent from individual residents and staff was not required because there was no identification of individual data. However, staff were informed of the nature and results of the study following its completion.

Observation Procedures

Residents and staff were observed according to a semirandom schedule between the hours of 7:00 a.m. to 8:00 p.m., 7 days per week over a period of 5 weeks, for a total of 85 observations. No more than two observations were conducted per day in a given area. Three graduate students trained in the use of the data collection procedures conducted the observations. Formal data collection commenced when observers obtained three consecutive sessions with interobserver agreement of 100% across all scoring categories. For comparative purposes, the observers record-

Table 2
Distribution of Observations Across Area, Time, and Day, and Numbers of Staff and Residents Present During Observations

	Area I	Area II	Area IIIA	Area IIIB	Dining	Total
Number of observations						
7 a.m. to 9 a.m.	2	3	3	3	3	14
9 a.m. to 11 a.m.	3	3	3	3	2	14
11 a.m. to 1 p.m.	3	3	3	3	3	15
1 p.m. to 3 p.m.	3	2	3	3	3	14
3 p.m. to 5 p.m.	2	3	3	3	2	13
5 p.m. to 8 p.m.	3	3	3	3	3	15
Weekdays	13	14	16	14	12	69
Weekends	3	3	2	4	4	16
Mean number of staff and residents observed						
Staff						
First shift	3.9	5.3	2.2	4.6	4.0	4.0
Second shift	4.0	3.0	2.7	4.7	1.4	3.2
Weekdays	4.8	3.6	4.8	2.3	2.5	3.6
Weekends	3.2	3.5	4.0	1.0	2.0	2.7
Residents						
First shift	10.5	10.5	7.6	9.9	9.8	9.6
Second shift	12.3	8.0	6.4	8.6	14.0	8.8
Weekdays	10.3	10.4	8.8	7.0	16.6	9.1
Weekends	14.8	15.5	9.6	5.5	15.0	11.3

ed the date and time, area (Areas I, II, IIIA, IIIB, or main dining room), and activity at the start of each observation. The smaller activity and dining areas were not included in the study because residents were rarely in these rooms other than during meals. In addition, to maintain resident privacy and reduce reactivity, observations were conducted from the hallways. If a resident's door was closed or the resident and staff member were not visible from the hallway, activity in that room was not recorded. Also excluded from observation were administrative offices, storage areas, maintenance areas, and the staff break room. Table 2 shows the distribution of observations by area, time of day, and weekdays or weekends; the mean number of residents and staff observed across areas, shifts, and weekdays or weekends; and resident:staff ratios for weekdays versus weekends.

Upon entering the facility, the observer proceeded to each observation area and scored categories of environment condition, resident condition, and resident and staff activity using a

time-sampling procedure in which observers recorded the event of interest at the "moment" of observation (Burgio et al., 1990). Residents and staff were observed sequentially in the order in which they were encountered, beginning from the left. Observers did not interact with staff or residents while data were being collected. The data sheet and definitions for resident condition, environmental condition, resident activity, and staff activity were adapted from those used by Zarcone et al. (1993) to correspond with OBRA regulations. Figure 1 shows the data sheet and Table 3 lists the scoring rules used by observers.

Environmental condition. The condition of the environment was scored as the observer proceeded through the area. Environmental conditions included cleanliness, safety, supplies and materials, and supervision (see Table 3). As violations of elements pertaining to the physical condition of the residence were observed, a minus was entered on the data sheet corresponding to each element for which criteria were not

Area: Observer: _____	Date						Totals
	Time						
	Activity						
	Rel. Observer						
Environment	a) Cleanliness						
	b) Safety						
	c) Supplies/materials						
	d) Supervision						
Resident Condition	Number present						
	a) Grooming						
	b) Clothing						
	c) Free from restraint						
	d) Free from injury						
Resident Activity	Number present						
	a) Approp. Social						
	a1. Conversation						
	a2. Rec. inst./care						
	a3. Sharing materials						
	b) Approp. Nonsocial						
	b1. Self-care						
	b2. Leisure/materials						
	b3. Attend to TV						
	b4. Eating						
	c) Inappropriate						
	c1. Self-injury						
	c2. Aggression						
	c3. Prop. destruction						
	c4. Disruption						
d) No activity							
Staff Activity	Number present						
	a) Interaction (other)						
	b) Resident care						
	c) Resident positive						
	d) Resident negative						
	e) Non-resident work						
	f) Off-task						

Figure 1. Data sheet used for observations.

met. If, after proceeding through an entire area, no violation was observed for a given category, a plus was recorded corresponding to that category. Therefore, for each category of environmental condition, only one score was obtained (+ or -) to indicate either compliance or violation for the area.

Resident condition. When an observer encountered a resident, a hatch mark was entered on the data sheet indicating the number of residents present, and all categories of resident condition were scored (see Figure 1): adequate grooming, appropriate clothing, freedom from restraint, and freedom from injury. A hatch

Table 3
Scoring Rules for Observation Categories

Environment

- (a) Cleanliness: Score (–) if presence of urine or feces; three or more items of trash, food, or containers on floor or furniture, unstored linen or clothing. Score (+) otherwise.
- (b) Safety: Score (–) if broken furniture; toxins (including unattended medication carts), glass, or other dangerous items within reach; presence of structural hazards. Score (+) otherwise.
- (c) Supplies and materials: Score (+) if materials relevant to ongoing activities are available. Score (–) otherwise.
- (d) Supervision: Score (+) if at least one staff member is present. Score (–) otherwise.

Resident condition (Indicate number present and number meeting the following criteria)

- (a) Grooming: Resident's clothing is unsoiled, and body and hair are free from visible dirt, food particles, or other soil.
- (b) Clothing: Resident is wearing shirt and pants (or dress) that are properly zipped, buttoned, or otherwise closed, and shoes (if outside bedroom).
- (c) Free from restraint: Resident is not wearing restraints or protective equipment (exclude geri-chairs and seat belts in wheelchairs).
- (d) Free from injury: Resident does not have a visible current injury (open wound or scab, bruise, bandage, cast, etc.).

Resident activity (Indicate number present and number engaged in the following behaviors)

- (a) Appropriate social: Resident is interacting with staff or another resident. Also indicate which of the following behaviors occurred:
 - 1. Conversation: Resident is talking to someone.
 - 2. Receiving instructions or care: Resident is receiving assistance or instruction from another.
 - 3. Sharing materials: Resident is engaged in a game with another or is giving or receiving materials.
 - (b) Appropriate nonsocial: Resident is exhibiting appropriate behavior but not interacting with another. If resident is moving wheel chair or walking, mark "A" for ambulation. Also indicate which of the following behaviors occurred:
 - 1. Self-care: Resident is dressing, combing hair, or engaged in other self-care activity.
 - 2. Interact with leisure materials: Resident is engaged in solitary activity (e.g., reading, sewing).
 - 3. Attend to TV: Resident's eyes are oriented toward TV while TV is on.
 - 4. Eating: Resident is placing food or drink in mouth, chewing, or manipulating utensils in the presence of food.
-

Table 3
(Continued)

(c) Inappropriate: Resident is engaged in one of the following behaviors (indicate which one).

- 1. Self-injury: Resident is engaging in self-directed behavior that produces physical harm.
- 2. Aggression: Resident is engaged in other-directed behavior that can produce harm.
- 3. Disruption: Resident is yelling, crying, cursing, spitting, tearing clothes, destroying or attempting to destroy property, or engaged in repetitive nonsensical verbalizations.

(d) No activity: Score only if resident has not engaged in the above behaviors at the end of 30 s.

Staff activity (Indicate number present and number engaged in the following behaviors)

- (a) Staff-other interaction: Staff member is interacting with someone other than a resident.
 - (b) Resident care: Staff member is providing resident care of a noninstructional nature (e.g., self-care or assistance with transition). Also score as resident positive or negative if interaction occurs.
 - (c) Resident positive interaction: Staff member is engaged in neutral conversation with resident, delivering praise or physical affection, or giving "do" instructions.
 - (d) Resident negative interaction: Staff member is reprimanding resident, giving "don't" instructions, or using physical intervention.
 - (e) Nonresident work: Staff member is involved in facility maintenance, paperwork, etc.
 - (f) Off task: Score only if staff member has not engaged in the above behaviors at the end of 30 s.
-

mark was entered on the data sheet corresponding to each category for which the resident met minimal criteria as defined in the scoring rules (see Table 3). No entry was made for criteria not met.

Resident activity. Once the condition of a resident was scored, the observer noted the resident activity at the moment of observation, recording hatch marks to indicate whether the resident was engaged in appropriate social behavior (conversation, receiving instructions or care, sharing materials or recreation), appropriate nonsocial behavior (self-care, interacting with leisure materials, attending to TV, eating), or inappropriate behavior (self-injury, aggression, or disruption). If the resident was ambu-

lating, an A was scored in the nonsocial category. If the resident's behavior did not immediately correspond to one of the defined categories of resident activity (see Table 3), observation continued until a defined activity occurred or 30 s elapsed, whichever came first. If 30 s elapsed with no defined activity, "no activity" was scored.

Staff activity. When a staff member was encountered, the observer recorded a hatch mark on the data sheet for number of staff present. The observer then noted the category of staff behavior occurring at the moment of observation, recording hatch marks to indicate whether the staff member was engaged in staff-other interaction, resident care, resident positive interaction, resident negative interaction, or nonresident work (see Table 3). If no defined category of behavior could be scored immediately, the observer waited until a defined behavior occurred or until 30 s elapsed, whichever came first. If 30 s elapsed with no defined activity, "off task" was scored.

Data Calculation

For environmental condition, compliance percentages for a given category were calculated by summing the number of plus scores and dividing by the number of observations. Percentages for resident condition were calculated by adding the number of residents in compliance for a given category and dividing by the number of residents observed. For resident or staff activity (and for each subcategory of activity), percentages were calculated by summing the number of residents or staff recorded for each category and dividing by the number of residents or staff observed. Subcategory percentages were calculated by summing the number of residents recorded for each subcategory and dividing by the number of residents observed in the broader category. Percentages for resident and environmental condition and resident and staff activity were calculated for the entire facility, for each area, for each time of day (arbitrarily defined as 7:00 a.m. to 9:00 a.m., 9:00 a.m. to 11:00 a.m.,

11:00 a.m. to 1:00 p.m., 1:00 p.m. to 3:00 p.m., 3:00 p.m. to 5:00 p.m., and 5:00 p.m. to 8:00 p.m.), and for weekdays (Monday through Friday) and weekends (Saturday and Sunday).

Reliability

Interobserver agreement was assessed by having a second observer conduct simultaneous but independent observations. During reliability observations, the primary observer nodded in the direction of the individual to be scored to indicate to the reliability observer who was to be scored and when to begin the observation. Each observed resident was first scored for resident condition. For resident and staff activity, observers scored the first category observed and signaled each other by nodding when the observation had been recorded. Although Zarcone et al. (1993) observed each resident and staff person for 30 s during reliability observations to control for cueing the reliability observer, the possible reactivity due to observing both residents and staff for 30 s when they were engaged in activities precluded such observations in this study. Therefore, the observers signaled each other when scoring was complete and proceeded to the next resident or staff member. Reliability for resident condition, resident activity, and staff activity was calculated by comparing the number of individuals noted in each category for both observers and dividing the smaller number in each category by the larger number. These fractions were then summed across all pairs of observations and divided by the total number of individuals observed in that category to get the percentage of agreement between the two observers. Interobserver agreement for environment condition was calculated by dividing the number of agreements (both plus or both minus) by the total number of observations. All scores were then averaged within and across categories.

Reliability was assessed for 28.2% of the observations (24 of 85), and all agreement scores exceeded 90%. Mean agreement scores were 97.9% for environment condition (range, 91.7% to 100% for subcategories), 96.9% for resident

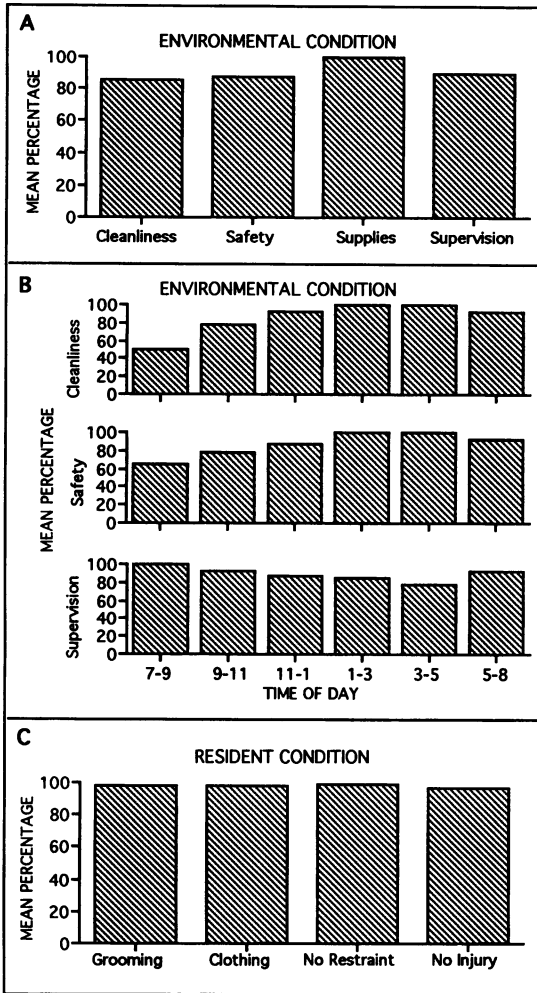


Figure 2. Environmental and resident conditions. Panel A: mean percentages of time samples found to meet standards for cleanliness, safety, supplies, and supervision; Panel B: mean percentages of time samples found to meet standards for supervision, safety, and cleanliness across times of day; Panel C: mean percentages of time samples found to meet standards for grooming, clothing, restraints, and injury.

condition (range, 96.4% to 98% for subcategories), and 98.5% for resident and staff activity (range, 91.4% to 100% for subcategories).

RESULTS

Panel A of Figure 2 shows the overall results obtained for the environmental conditions of cleanliness, safety, supplies, and supervision.

The facility mean percentages were 85.9% for cleanliness (area means: 75% for Area I, 76.5% for Area II, 83.3% for Area IIIA, 94.4% for Area IIIB, and 100% for the main dining area), 87% for safety (area means: 81.3% for Area I, 88.2% for Area II, 72.2% for Area IIIA, 94.4% for Area IIIB, and 100% for the main dining area), 100% for adequate supplies and materials (100% for all areas), and 89.4% for supervision (area means: 93.8% for Area I, 88.2% for Area II, 100% for Area IIIA, 88.9% for Area IIIB, and 75% for the main dining area). A Pearson product moment correlational analysis showed a high negative correlation between safety and supervision for areas ($r = -.929$), indicating that where safety was high, supervision was low and vice versa. There were no significant differences across areas.

Panel B of Figure 2 shows the facility mean percentages for supervision, safety, and cleanliness across times of day. Inspection of these data suggests increasing trends for the categories of cleanliness and safety across time of day and a decreasing trend for the category of supervision. Computation of Spearman's rho yielded a high positive correlation ($r = .985$) between cleanliness and safety for the various time periods, indicating that at times when cleanliness was high, safety was also high. Negative correlations were obtained between cleanliness and supervision ($r = -.883$) and between safety and supervision ($r = -.812$), indicating that at times when supervision was high, safety and cleanliness were low.

Panel C of Figure 2 shows results obtained for the categories of resident condition. The facility mean percentages were 98.1% for appropriate grooming (area means: 94.6% for Area I, 97.3% for Area II, 100% for Area IIIA, 99.2% for Area IIIB, and 100% for the main dining area), 97.8% for appropriate clothing (area means: 94% for Area I, 96.8% for Area II, 99.3% for Area IIIA, 98.4% for Area IIIB, and 98.6% for the main dining area), 99.3% for freedom from restraint (all area means were 100% except for Area I, $M = 94.1%$), and

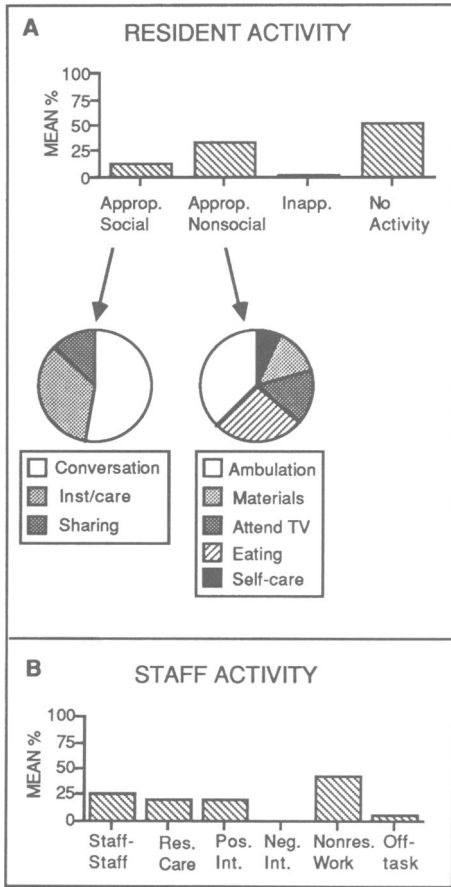


Figure 3. Resident and staff activity. Panel A: mean percentages of time samples for resident activity and subcategories of activity; Panel B: mean percentages of time samples for staff activity.

96.8% for freedom from injury (area means: 95.1% for Area I, 94.7% for Area II, 97% for Area IIIA, 98.4% for Area IIIB, and 97% for the main dining area). Rank order correlations across times of day and *t*-test comparisons between areas showed no significant differences for resident condition.

Panel A of Figure 3 provides an overall summary of resident activity based on 890 occasions during which a resident activity was recorded. Mean percentages for these observations were as follows: 12.1% appropriate social behavior, 34% appropriate nonsocial behavior, 2.5% inappropriate behavior, and 51.4% no activity (asleep or idle). The pie charts show distribu-

tions of resident behavior by subcategory. When appropriate social behavior was observed, 52.8% of that activity consisted of conversation, 34.1% involved receiving instructions or care, and 13.1% consisted of other appropriate social behavior (e.g., sharing materials). Appropriate nonsocial behavior was distributed as follows: self-care, 7%; interacting with materials, 13.3%; attending to TV, 15.7%; eating, 26.3%; and ambulation, 37.7%. Of those residents engaged in inappropriate behavior, 95% exhibited disruptive behavior, and 5% were self-injurious (scratching wounds). Results of *t* tests comparing resident behavior across areas and times of day revealed significant differences between Areas I and II versus Areas IIIA and IIIB for the categories of appropriate nonsocial ($t = -5.236, p < .001$), appropriate social ($t = 5.24, p < .0001$), and no activity ($t = 6.52, p < .0001$), with higher levels of appropriate social and nonsocial activity and lower levels of inactivity in Areas IIIA and IIIB than in Areas I and II. There were no significant differences in resident activity across times of day.

Panel B of Figure 3 shows an overall summary of staff activity based on 259 observations. The number of samples is lower for staff activity than for resident activity due to resident:staff ratios (see Table 1) and the fact that staff were not always present. Mean percentages for these observations were 25.1% staff-other interaction, 19.7% resident care, 21.2% positive interaction with residents, 0.8% negative interactions with residents, 42.5% nonresident work, and 5.4% off task. *T* tests revealed no significant differences in staff activity across areas or times of day.

The upper panel of Figure 4 shows a comparison of resident activity during weekends versus weekdays. Statistical analysis based on sample proportions for weekends versus weekdays revealed the following significant differences for all major categories of resident activity: appropriate social activity ($z = -2.68$, two-tailed $p = .008$); appropriate nonsocial activity ($z = 2.18$, two-tailed $p = .0292$); inappropriate activity ($z = 2.409$, two-tailed $p = .016$); and

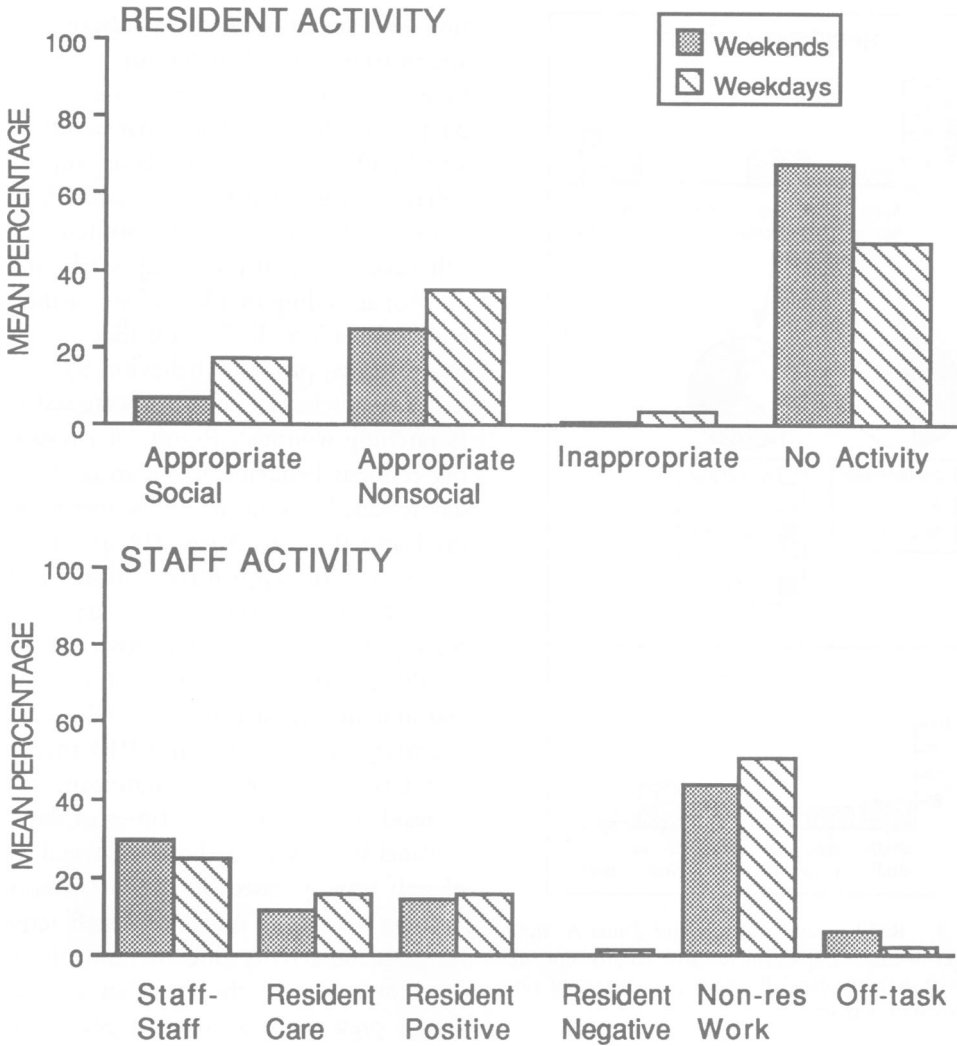


Figure 4. Distributions of resident activity (upper panel) and staff activity (lower panel) during weekends and weekdays.

no activity ($z = 4.14, p < .0001$). Thus, residents engaged in more activity (both appropriate and inappropriate) during weekdays than on weekends. The lower panel of Figure 4 shows a comparison of staff activity. No statistically significant differences were noted between weekends and weekdays for any of the staff activity categories.

DISCUSSION

A substantial body of research has demonstrated the feasibility of using time-sampling

procedures to measure the ongoing behavior of staff and residents, as well as more “static” aspects of care such as the condition of clients and facilities, in residential settings for the developmentally disabled. Burgio et al. (1990) extended this methodology to the analysis of staff behavior in geriatric nursing homes, and the present study offers a further extension through its examination of multiple aspects of service delivery in a nursing home. Although in the present study many samples were taken over a 5-week period to obtain a substantial database, the procedures described here could easily be

used by administrative staff and surveyors for routine evaluative purposes (e.g., to monitor compliance with federal or state regulations). Furthermore, although the scoring categories used in the present study were not exhaustive (i.e., they did not cover all areas of service delivery subject to regulation), both the diversity and the relatively wide range of activities subjected to measurement suggest that the procedures are extremely flexible and can accommodate many service outcomes specified in OBRA regulations. Thus, the general methodology described in this study offers service providers and surveyors an objective, efficient, and flexible basis for program evaluation.

The specific results obtained in this study revealed some interesting general findings as well as differences across several of the measures. For example, although results for environmental conditions (Figure 2, Panel A) showed overall high percentages of compliance, Areas I and II had the lowest mean percentages for cleanliness (75% and 76.5%, respectively) yet high mean percentages for supervision (93.8% and 88.2%, respectively). This finding was perhaps related to differences in functioning level of residents across areas (see Table 1). It is likely that the high level of staff assistance and intervention required by residents in these areas produced both an increase in supervision and a decrease in cleanliness.

Another interesting trend was seen in the categories of cleanliness and safety, which appeared to have similar temporal characteristics (see Figure 2, Panel B). Both were at their lowest mean percentages during early morning hours, increased to perfect compliance in the midafternoon, and decreased in the early evening. Staff presence, however, followed an opposite pattern. These results may be due to the high levels of physical activity that occur during times of low cleanliness and safety (e.g., during early morning hours residents are being awakened, groomed, dressed, and prepared for breakfast). Similarly, a negative score for safety was often the result of unattended medication carts,

which typically are present more often in the early morning and evening hours. Also, during the high-activity hours, safety violations may increase due to the presence of mops or cleaning materials.

An analysis of resident activity (Figure 3, Panel A) also showed interesting results. First, the largest percentage of resident activity (51.4%) was found to be "no activity." Similar results were reported by Moos et al. (1984), who noted that 54.1% of the residents engaged in passive behavior (asleep or idle). The second largest proportion of activity was appropriate nonsocial (34%), and the majority of activity observed in this category was ambulation. Similarly, Moos et al. reported that 30.4% of their residents engaged in "active task-oriented behavior" (self-care, radio or TV, independent activity, and locomotion). Finally, very little inappropriate resident behavior (2.5%) was observed in the present study, although informal discussions with staff and facility administrators suggested that disruptive resident behavior was a significant concern. The apparent discrepancy between observed behavior and these anecdotal reports may reflect the relative contrast between the many sedentary and few disruptive residents (i.e., noisy individuals are more easily noticed) or a general inability on the part of staff to manage behavior problems successfully.

Staff members observed in the present study spent most of their time (42.5%) engaged in nonresident work (see Figure 3, Panel B), a finding consistent with that reported by Moos et al. (1984). The second most frequently observed activity was staff-other interaction (25.1%), and both Burgio et al. (1990) and Moos et al. reported similar levels of staff-staff interaction. One notable difference between current and previous findings was in the category of staff-resident interaction. Burgio et al. found that staff members interacted with patients during 10.7% of the observed intervals, whereas staff-resident interaction was observed more than twice as often in the present study (22%).

There were few differences noted in resident or staff activity across times of day within areas; however, data showed noticeable differences across areas. Compared to Areas IIIA and IIIB, residents in Areas I and II were less active, and staff members engaged in less resident care and less resident interaction. Conversely, in Area IIIB, where residents were most active and appropriate, staff members engaged in the most resident care. Although these data may seem counterintuitive (less active residents should require more care), it may be that residents who are more alert and oriented are more likely to evoke staff interaction than residents who are asleep or idle. In addition, most residents in Areas IIIA and IIIB were more recent admissions (therefore, relatively younger), and most residents in Area IIIB were Medicare recipients (who received rehabilitation therapy). However, in light of growing concerns over the prevention of reversible dependence (Baltes, 1988), these data may indicate a need to restructure the facility's habilitative practices for sedentary residents.

Comparisons of activity between weekdays and weekends showed no significant differences for staff behavior; however, residents were much more inactive during weekend observations than during weekday observations (67.5% and 47.5%, respectively). The actual numbers of staff members and residents observed on weekdays versus weekends (Table 2) show that there were slightly fewer staff and more residents present on weekends, resulting in a higher resident:staff ratio on weekends. Although these data suggest that residents may have been receiving poorer quality of care during weekends, no differences were observed in the categories of either environmental or resident condition. Thus, it appears that the net effect of a higher resident:staff ratio on weekends was more resident inactivity rather than greater risk to health care.

In addition to the above findings, several potential limitations should be noted. First, other researchers have reported problems with reac-

tivity (e.g., Repp & Deitz, 1979), which is a major concern when attempting to observe ongoing behavior (Reid & Whitman, 1983). Although the degree to which observer presence affected the behavior of residents or staff in the present study is unknown, we attempted to minimize reactivity in several ways. First, staff members were informed initially that observers would be collecting data on resident activity; they were unaware that staff activity was being observed. Second, the use of momentary time sampling kept observation time brief and limited the ability of staff to change their ongoing behavior. Third, observations were unannounced and were conducted at random times of day.

In attempting to minimize reactivity, however, other limitations may have been incurred by this observation system. First, although observers did not enter a resident's room if the door was closed to afford greater privacy to residents and reduce their reactivity, it is possible that this procedure prevented observation of resident inappropriate behavior as well as attempts by staff to reduce it. In addition, the momentary time-sampling procedure may not have yielded accurate measures of low-rate behavior such as disruption; other procedures such as frequency counts may be necessary to determine the actual prevalence of inappropriate behavior that does not occur often. The aims of the current study did not warrant more intrusive or intensive observations, but future research might focus specifically on measuring these behaviors and identifying the strategies used by staff to manage disruptive resident behavior (cf. Burgio & Bourgeois, 1992).

Other potential limitations of this study involve definitional problems. First, the inclusion of unattended medicine carts as a safety violation may have inflated this measure. Although not a recommended practice, it is common for nurses to leave medicine carts unattended in hallways when entering a room to administer medications, and whether or not this amounts to a real or potential safety violation is unclear.

Second, OBRA (1987) defines physical restraint as "any manual method or physical or mechanical device, material, or equipment attached or adjacent to the resident's body that the individual cannot remove easily which restricts freedom of movement or normal access to one's body" (p. 76). The definition used in this study may not have adequately reflected the intent of this standard and perhaps should be modified accordingly.

Finally, although the findings on resident and staff behavior presented here are generally consistent with those reported elsewhere (e.g., Burgio et al., 1990; Moos et al., 1984), comparative data on environmental and resident condition are not readily available, and our results for these categories may have limited generality. Researchers have found that type of ownership can affect other aspects of quality of care in nursing homes (Green & Monahan, 1981; Lemke & Moos, 1989); thus, our results should not be considered normative in the absence of further replication.

Additional research should be conducted to further examine the efficiency of this approach to monitoring quality of care. For example, it is unknown how many observations would be required to obtain a representative set of data for a given facility, nor is it clear how much time and effort would be needed to train typical surveyors and supervisors to use such tools.

Future studies should also examine environmental variables that are related to problem behaviors of elderly persons. A detailed analysis of individual staff-resident interactions was not conducted in this study; thus, the contingencies that maintained staff and resident behavior cannot be identified. An assessment of these relationships is needed to develop both intervention and prevention strategies. With the growing number of people age 65 and older, caregivers will need to acquire greater proficiency in the management of behavioral excesses and deficits of elderly individuals. These skills may reduce the number of people who require institutionalization or psychotropic medications.

The assurance of quality care in geriatric nursing homes requires that these facilities expand their services to include prevention and rehabilitation. Federal regulatory agencies have mandated a variety of changes in the operation of nursing homes that are aimed at reducing reversible dependency, maintaining adequate health care, and improving residents' quality of life. Assessment procedures such as those described in the present study permit the translation of these goals into measurable activities and outcomes that can be monitored regularly and used as the basis for client assessment, staff training, and implementation of remedial or incentive programs for staff members.

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