

# Nurse Aides' ratings of the resident safety culture in nursing homes

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## Abstract

**Purpose.** First, the resident safety culture of nursing homes from a Nurse Aide's perspective was compared with existing data from hospitals. Second, how the safety culture of nursing homes varied according to facility characteristics and market characteristics was examined.

**Methods.** Data came from 72 nursing homes and 1579 Nurse Aides (response rate of 55%). From these nursing homes, Nurse Aides completed The Hospital Survey on Patient Safety Culture (HSOPSC) instrument, a previously validated survey with 12 subscales used to assess safety culture. The nursing home scores from this instrument were compared with the hospital scores. Ordinary least squares regression was used to examine the association between nine nursing home facility characteristics and two market characteristics and the overall safety culture score.

**Results.** All of the 12 HSOPSC subscale scores from the nursing home sample were considerably lower than the benchmark hospital scores, indicating a less well-developed safety culture. The significant facility and market characteristics from the regression analysis resembled many of those found when similar characteristics are used in examinations of quality.

**Conclusions.** These results are important in clearly showing that the resident safety culture of Nurse Aides in many nursing homes may be poorly developed.

**Keywords:** culture, nursing homes, safety

With the publishing of the Institute of Medicine report *To Err is Human*, policymakers, researchers, and practitioners were sensitized to the degree and cost of medical errors in the US health care system [1]. For example, it is possible that 98 000 patients die as the result of hospital mistakes each year. Substantial effort has gone into reducing these errors. Nevertheless, 5 years after the release of this report, progress in the area of patient safety was reported to be 'slow' [2]. These two reports addressed the whole health care system but invariably had a hospital focus. Very little is known about resident safety in nursing homes.

Nursing homes characteristically lag behind other areas of the health care system when it comes to change. For example, quality improvement initiatives were slower to develop in nursing homes than hospitals [3,4]. Thus, it is likely that resident safety initiatives are less well developed in nursing homes than they are in hospitals. In this research, using information collected from Nurse Aides, I first report on the safety culture of nursing homes and compare the results with existing data from hospitals. Second, how the safety culture of nursing homes varies according to facility characteristics (e.g. ownership) and market characteristics (e.g. rural location) is examined.

The safety culture of nursing homes was examined, because this represents a set of norms and beliefs; and although norms and beliefs do not always predict behavior [5], they may be an

important harbinger representing the extent of progress that will likely be made in resident safety in nursing homes. For example, an improved safety culture was recently shown to reduce medication errors [6]. Indeed, some authors believe that the safety culture–quality relationship is so strong that measures of the safety culture could be used as a proxy quality measure [7]. Cooper [8] stated 'the most fundamental barrier to improving the safety of patient care—the culture of health care organizations'.

An accepted safety culture definition comes from the Health and Safety Commission [9]: 'The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management.' However, no standard definition exists, and other definitions of safety culture are provided by Guldenmund [7]. A commonly cited, short, and intuitive understanding of this culture is it 'is the way things are done around here' [10]. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures [9,11].

Facility and market characteristics were examined, first because such characteristics are often included in nursing

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home analyses [e.g. 12]. Second, these characteristics were examined, because they help in understanding the context under which nursing homes operate. This context can influence norms and beliefs, which may include norms and beliefs toward resident safety. No hypotheses are offered regarding these facility and market characteristics, as this investigation is the first to examine resident safety culture, and as such the analyses presented are exploratory.

## Conceptual model

I argue above that resident safety culture may be related to quality of care. The question still arises as to how the safety culture can influence care in the nursing home. Berends's [13] safety culture model conceptually answers this question and was therefore modified for this examination of nursing homes.

In this model, individual norms and beliefs influence each other. Norms are the cues that govern daily interactions. In this model, norms are influenced by individual, interactional, and organizational factors. Beliefs are the individual's values toward safety. These beliefs are influenced by the controllability of safety, causes of accidents, human nature, and results of a safe working environment. All of these factors interact to form the safety culture. The influence of safety culture is in turn recursive and influences both norms and beliefs. This conceptual model is shown in Figure 1.

## Data and methods

### Data source

The Hospital Survey on Patient Safety Culture (HSOPSC; described below) was mailed to Nurse Aides working in nursing homes. In establishing the sample to collect this

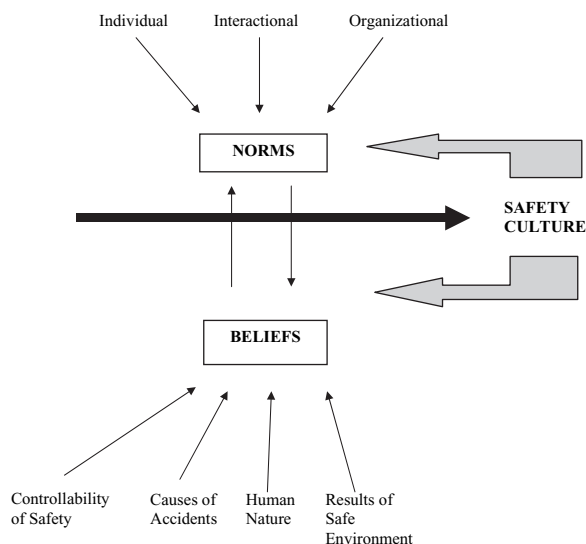


Figure 1 Conceptual model.

information from Nurse Aides, a sample of facilities willing to help with this research was first needed. A random sample of ~10% ( $n = 240$ ) of nursing homes was chosen from five states (New York, Oregon, Michigan, Colorado, and Florida). These states were chosen randomly from all 50 states. Eligible nursing homes were defined as those participating in Medicare and/or Medicaid certification, which includes ~97% of all facilities in the United States. This eligibility definition was used because these are the nursing homes included in the On-line Survey, Certification, and Reporting (OSCAR) system data, which were used to identify the mailing address of these facilities. Hospital-based facilities and small facilities with <40 beds were excluded from the sampling frame. At the time of this study (spring 2005), eligible facilities included 2449 nursing homes.

In the initial mailing, administrators were asked whether they would be willing to distribute the job satisfaction questionnaire to Nurse Aides. In return, administrators were given \$100 as compensation and a report of the aggregate survey results. Seventy-two facilities agreed to participate (giving a facility response rate of 30%).

Participating facilities were given prepackaged mailing materials. This consisted of the HSOPSC, a letter describing the study, a postage-paid return envelope, and reminder post cards. Participating facilities were asked to address and mail these prepackaged materials to all Nurse Aides ( $n = 2872$ ), including those working full-time, part-time, and all shifts. They were then asked to address and mail the reminder post cards 2 weeks later. From these Nurse Aides, 1579 surveys were returned, giving a Nurse Aide response rate of 55%. The survey was distributed to Nurse Aides because they are by far the most numerous staff type found in nursing homes and as such provide 80–90% of resident care [3], and because of this are likely influential in the resident safety culture of the facility.

### The Hospital Survey on Patient Safety Culture

The HSOPSC was used in this research. This survey tool was developed by the Agency for Healthcare Research and Quality [14]. The survey is in the public domain and was released in November 2004. The HSOPSC was developed using existing literature, cognitive testing of items, and factor analyses. Extensive details of the development and psychometric analyses of this instrument can be found on the World Wide Web [15]. The final instrument was pilot tested in 21 hospitals with 1419 employee responses. Using Cronbach's alpha, all subscales were shown to have acceptable levels of reliability.

Because I used this instrument in nursing homes, some modifications were made to the wording of items. For example, where it made sense the word 'hospital' was replaced by 'nursing home', and the word 'patient' was replaced by 'resident'. No other changes were made to the instrument, and the format, response options, and question order remained the same as in the original instrument.

### Analyses

Descriptive analyses are presented consisting of the percent or mean response for each of the questionnaire items, and the

facility and market characteristics. Item-scale internal consistency was determined, using Cronbach’s alpha for each subscale, and represents the degree to which items correlate within each subscale. In addition, bivariate comparisons were used for respondent and non-respondent facilities, using the OSCAR data.

Multivariate analysis was also used to analyze the association of resident safety culture with facility and market characteristics. Ordinary least squares regression was used because the distribution of the overall score from all of the questions in the HSOPSC was approximately normal (with a mean of 42% and standard deviation of 14). In order to account for the possible correlation of variables within facilities (which can bias the standard errors of the estimates), the Huber–White sandwich estimator clustered by facility was used in the multivariate analysis [16].

The independent variables in the multivariate analysis include the facility characteristics of staffing levels, bed size, ownership, chain membership, private-pay occupancy, overall resident census, and case mix [using activities of daily living (ADLs)]. Market characteristics are rural location and number of nursing homes in the county.

## Results

In general, most items on the questionnaire were answered. Missing data occurred in <1% of cases and were evenly distributed across questions. Also, because we were able to link

facilities with OSCAR data, we determined that no significant differences in facility characteristics (i.e. bed size, ownership, chain membership, private-pay census, and staffing levels) existed for respondents compared with non-respondents (results not shown).

Table 1 presents descriptive statistics of the Nurse Aide sample, along with characteristics of the nursing homes in which they worked. However, reflecting the wide differences in staffing characteristics of nursing homes across the United States, some of the average Nurse Aide characteristics per facility were varied (not shown). For example, in some facilities, Nurse Aides were primarily African American (i.e. one facility had 91% African American Nurse Aides), whereas in others they were primarily Caucasian (i.e. one facility had 87% Caucasian Nurse Aides).

In examining the subscale scores from the nursing home sample and comparing these scores with the hospital benchmark scores, we see in Table 2 that in all cases, the nursing home scores are lower. Some of the largest differences were for organizational learning, with nursing homes having an average score of 37%, compared with the hospital score of 71%. Large differences were also identified for the communication openness subscale, with nursing homes having an average score of 43%, compared with the hospital score of 61%. Cronbach’s alphas for the domains are also shown, and ten of the 12 were higher than the usually recommended level of 0.70.

The multivariate regression results, examining the association between the composite resident safety score and facility and market characteristics, are summarized in Table 3. This

**Table 1** Characteristics of Nurse Aides and nursing homes

Characteristics	Percent [ <i>n</i> ] or mean (SD)	Range
Nurse Aides ( <i>n</i> = 1579)		
Sex (female)	84% [1325]	–
Age (years)	32 (18)	18–57
Race (Caucasian)	64% [1011]	
Highest level of education:		
High School	92% [1453]	–
Bachelors degree	8% [126]	–
Number of prior places employed as a Nurse Aide	8.2 (3.1)	0–15
Tenure in current facility (years)	3.9 (4.3)	0.1–15.5
Tenure as a Nurse Aide (years)	21.9 (12.2)	0.1–28
Nursing homes ( <i>n</i> = 72)		
Full-time equivalent Nurse Aides per 100 residents	29.3 (8.6)	11–44
Full-time equivalent Licensed Practical Nurses per 100 residents	11.2 (9.4)	2–26
Full-time equivalent Registered Nurses per 100 residents	8.5 (8.1)	2–17
Bed size	98 (41)	40–243
For-profit	67% [48]	–
Member of a chain	45% [32]	–
Average occupancy	85% (12)	76–100
Average private-pay occupancy	28% (14)	12–39
Activities of daily living	1.25 (1.35)	0.51–2.63
Rural location	37% [27]	–
Number of nursing homes in county	21 (15)	1–79

**Table 2** Descriptive statistics of survey on patient safety culture and benchmark scores

Subscales and survey items	Nursing home score (SD)	Benchmark score
Overall perceptions of safety (Cronbach's alpha = 0.74)	44 (13)	56 <sup>3</sup>
Resident safety is never sacrificed to get more work done	46 (11)	50
Our procedures and systems are good at preventing errors from happening	49 (12)	67
It is just by chance that more serious mistakes do not happen around here	38 (16)	56
We have patient safety problems in this facility (R)	35 (15)	53
Frequency of events reported (Cronbach's alpha = 0.62)	35 (14)	52 <sup>3</sup>
When a mistake is made but is <i>caught and corrected before affecting the resident</i> , how often is this reported?	42 (11)	43
When a mistake is made but has <i>no potential to harm the resident</i> , how often is this reported?	40 (16)	42
When a mistake is made that <i>could harm the resident</i> , but does not, how often is this reported?	34 (13)	71
Management expectations and actions promoting patient safety <sup>1</sup> (Cronbach's alpha = 0.67)	60 (11)	71 <sup>3</sup>
Management says a good word when he/she sees a job done according to established resident safety procedures	47 (14)	63
Management seriously considers staff suggestions for improving resident safety	65 (13)	68
Whenever pressure builds up, my manager wants us to work faster, even if it means taking shortcuts (R)	59 (18)	72
My manager overlooks resident safety problems that happen over and over (R)	46 (12)	77
Organizational learning (Cronbach's alpha = 0.75)	37 (16)	71 <sup>3</sup>
We are actively doing things to improve resident safety	31 (15)	78
Mistakes have led to positive changes here	40 (16)	68
After we make changes to improve resident safety, we evaluate their effectiveness	45 (13)	68
Teamwork within units (Cronbach's alpha = 0.75)	39 (14)	74 <sup>3</sup>
People support one another between units	43 (13)	84
When a lot of work needs to be done quickly, we work together as a team to get the work done	41 (14)	81
In all units, people treat each other with respect	44 (14)	72
When one area in this unit gets really busy, others help out	32 (19)	59
Communication openness (Cronbach's alpha = 0.72)	43 (15)	61 <sup>3</sup>
Staff will freely speak up if they see something that may negatively affect resident care	49 (13)	72
Staff feel free to question the decisions or actions of those with more authority	39 (15)	43
Staff are afraid to ask questions when something does not seem right (R)	46 (16)	65
Feedback and communication about error (Cronbach's alpha = 0.79)	39 (17)	52 <sup>3</sup>
We are given feedback about changes put into place based on event reports	38 (16)	48
We are informed about errors that happen in the units	46 (22)	52
In this facility, we discuss ways to prevent errors from happening again	31 (21)	58
Non-punitive response to error (Cronbach's alpha = 0.70)	38 (14)	43 <sup>3</sup>
Staff feel like their mistakes are held against them (R)	35 (16)	47
When an event is reported, it feels like the person is being written up, not the problem (R)	38 (15)	47
Staff worry that mistakes they make are kept in their personnel file (R)	46 (13)	33
Staffing (Cronbach's alpha = 0.71)	35 (13)	50 <sup>3</sup>
We have enough staff to handle the workload	35 (12)	40
Staff in this facility work longer hours than is best for resident care	36 (15)	54
We use more agency/temporary staff than is best for resident care	34 (14)	67
We work in 'crisis mode' trying to do too much, too quickly (R)	30 (11)	37
Management support for resident safety (Cronbach's alpha = 0.81)	41 (13)	60 <sup>3</sup>
Management provides a work climate that promotes resident safety	43 (11)	72
The actions of management show that resident safety is a top priority	39 (12)	60
Management seems interested in resident safety only after an adverse event happens	38 (14)	49
Teamwork across units (Cronbach's alpha = 0.74)	45 (12)	53
There is good cooperation among units that need to work together	52 (10)	54
Units work well together to provide the best care for residents	44 (11)	59

*continued*

Table 2 *continued*

Subscales and survey items	Nursing home score (SD)	Benchmark score
Units do not coordinate well with each other (R)	43 (12)	41
It is often unpleasant to work with staff from other units (R)	50 (10)	57
Handoffs and transitions (Cronbach's alpha = 0.77)	37 (16)	45 <sup>3</sup>
Things 'fall between the cracks' when transferring residents from one unit to another (R)	38 (14)	42
Important resident care information is often lost during shift changes (R)	25 (16)	58
Problems often occur in the exchange of information across units (R)	36 (16)	38
Shift changes are problematic for residents in this facility (R)	34 (18)	42
Overall score <sup>2</sup>	42 (14)	

R = Item was reverse-coded, so that higher scores are more favorable.

<sup>1</sup>Most items in the questionnaire were answered by all respondents, with the exception of this scale.

<sup>2</sup>Representing the average score from all of the items.

<sup>3</sup>Significantly different *t*-test at  $P < 0.05$ , using same SD for both scores (*t*-tests used only to compare subscale summary scores).

Table 3 Multivariate results examining resident safety culture scores and facility characteristics

	Coefficient <sup>2</sup> (SD)	<i>P</i> -value
Facility characteristics <sup>1</sup>		
Full-time equivalent Nurse Aides per 100 residents (per 5 unit increment)	0.69 (0.19)	0.004
Full-time equivalent Licensed Practical Nurses per 100 residents (per 5 unit increment)	0.47 (0.32)	0.271
Full-time equivalent Registered Nurses per 100 residents (per 5 unit increment)	0.90 (0.07)	>0.001
Bed size (per 10 bed increment)	-0.22 (0.08)	0.043
For-profit (for 1 versus 0)	-0.31 (0.11)	0.037
Member of a chain (for 1 versus 0)	0.76 (0.26)	0.025
Average occupancy (per 10% increment)	-0.48 (0.10)	0.002
Average private-pay occupancy (per 10% increment)	0.17 (0.09)	0.072
Case-mix (activities of daily living) (per 1 unit increment)	0.10 (0.08)	0.311
Market characteristics		
Rural location (for 1 versus 0)	-0.09 (0.07)	0.051
Number of nursing homes in county (per 10 unit increment)	0.21 (0.17)	0.035
Intercept	1.02 (0.14)	>0.001
Adjusted R <sup>2</sup>	0.35	

<sup>1</sup> $n = 1579$  Nurse Aides in 72 nursing homes.

<sup>2</sup>Analyses used the Huber-White sandwich estimator clustered by facility.

shows that the facility characteristics of Nurse Aide staffing ( $P = 0.004$ ), Registered Nurse staffing ( $P > 0.001$ ), bed size ( $P = 0.043$ ), for-profit ownership ( $P = 0.037$ ), chain membership ( $P = 0.025$ ), average occupancy ( $P = 0.002$ ), and average private-pay occupancy ( $P = 0.072$ ) are significantly associated with the composite resident safety score (at conventional  $P$ -values). The market characteristics, rural location ( $P = 0.051$ ) and number of nursing homes in the county ( $P = 0.035$ ), are associated with the composite resident safety score (at conventional  $P$ -values).

## Discussion

It would seem, based on the results, that most nursing homes have a long way to go as far as developing a positive resident

safety culture of Nurse Aides is concerned. This conclusion is based on the fact that all of the subscales of the HSOPSC survey scores were considerably lower than those found in the hospital setting. Even without these hospital figures, all of the nursing home average scores were low in all cases, they were <50%.

The significant facility and market characteristics resemble many of those found when similar characteristics were used in examinations of quality. This lends some support to the assertion that resident safety culture of Nurse Aides may be a proxy for quality of care [7]. For example, we found for-profit facilities to be associated with lower safety culture scores. This follows the notion that for-profit providers may compromise care in pursuit of profits [17]. Facilities that are members of chains were associated with higher safety culture scores. This follows the notion that chains provide some

degree of economies of scale and may free some resources for member facilities to pursue resident-care initiatives [12,18].

Possibly our most interesting significant facility characteristic is Registered Nurse staffing levels. Higher Registered Nurse staffing levels were associated with higher safety culture scores. Several authors have identified benefits in terms of quality of care associated with higher caregiver staffing levels [e.g. 19]. Our study result adds safety culture to these benefits. However, it is also interesting that in our study results, similar associations were identified for other caregivers, specifically Nurse Aides. We speculate that the safety culture (as with the work culture found in many satisfaction studies; see [20]) is more highly influenced by Registered Nurses, because they influence the interactional norms in a facility and many of the organizational norms (see Figure 1). Registered Nurses are in leadership positions in nursing homes, and as Mohr, Abelson, and Barach [21] describe, leaders must address systems issues to promote safety.

On the basis of the results, I believe that determining how and what nursing homes can learn from other areas of health care that have successfully implemented patient safety initiatives would appear pertinent. The success of the Veterans Health Administration in developing a culture of patient safety may serve as a model for nursing homes [22]. The success of this initiative is thought to lie in the fact that the patient safety efforts did not evolve into a bureaucracy, and 'necessary support and infrastructure without impeding innovation, creativity, and rapid cycle improvement' [22] were avoided. Alternatively, Pronovost and associates [23] recently described implementing an eight-step safety program in an intensive care unit. The eight steps used were: measure safety climate; educate staff on the science of patient safety; identify staff's safety concerns; senior executive adopt a unit; implement improvements; document results; share stories; and re-measure safety culture. As part of this initiative, nursing turnover was reduced from 9 to 2%, which may be of great benefit to many nursing homes.

Yet, changing an organization's culture can take a considerable amount of time [24,25]. Nursing homes should be well advised to begin this transformation. The initiatives we have witnessed in hospital settings are probably a harbinger of things to come for nursing homes. In many states, hospitals are now required to hire patient safety officers, submit information for safety report cards, and include safety in accreditation activities. If the past is any indication of the future, then nursing homes will likely at some point be required to undertake similar initiatives.

### Limitations and suggestions for future research

With the cross-sectional data used, it is not possible to disentangle causal direction. I propose that the facility and market characteristics examined influence resident safety culture. In reality, with this cross-sectional data, I cannot infer that this is the case. Thus, the results should be interpreted as associations. Longitudinal data should be used in the future to determine the causal direction of the effects.

The HSOPSC scores only provide a relative picture of the respondents. The scores enable one to determine whether

differences between nursing homes exist. But, I am unable to say with certainty that at a certain score, the safety culture is adequate. Neither can I say with certainty that a score of 50% is twice as good as a score of 25%. That is, the practical significance of the scores needs to be determined.

Other patient safety culture surveys could have been used in this investigation. No instrument seems to be favored in the few investigations that exist in this area. Furthermore, none of these previous investigations were performed in nursing homes. However, in a recent review of available instruments, the HSOPSC was noted as one of only a few with available favorable psychometric properties [26].

The available benchmark data from the hospital setting as a comparison for our scores from nursing homes were used. This approach is limited because the HSOPSC instrument was validated in hospital settings, and not in nursing homes. Thus, some bias may exist by modifying this instrument for use in nursing homes. Indeed, there is a need for an instrument developed specifically for use in nursing homes.

Characteristic of many surveys of Nurse Aides, the response rate was also low. The rate was above the often recommended level of 50%. Still, I was not able to compare respondents with non-respondents and ascertain whether any bias exists because of the non-response. Moreover, the facility participation rate at 30% was also low. As such, this likely limits the generalizability of the findings.

In addition, the nursing home data came only from Nurse Aides, whereas the hospital data came from management and caregivers. Management and other caregivers may have differing opinions on the safety culture of the organization [23]. I did not collect data from these other sources in this investigation, so this clearly represents a further limitation of the results. Therefore, the results should be interpreted as representing the patient safety culture of Nurse Aides, and not the organization as a whole. Nevertheless, it should be noted that the levels of patient safety reported are very similar to those reported in a recent study examining nursing home physicians, pharmacists, advanced practitioners, and nurses [27].

Several authors have distinguished between the concepts of culture and climate [e.g. 28]. Some ambiguity may exist as to whether instruments (such as the HSOPSC) capture one concept and not the other. Nevertheless, both culture and climate are quantifiable and both are associated with safety outcomes [26].

The resident safety culture of the nursing home also only represents a subculture within the organization. Many other subcultures exist, such as a quality subculture [28]. Given the current interest in culture change in general in nursing homes (see, for example, the Pioneer Network [29]; Eden Alternative [30]; Wellspring Model [31]), simultaneously examining several subcultures may prove instructive.

It should also be recognized that the OSCAR data do have some limitations. Examinations of the facility characteristic data have shown it to be reliable [see 32], but no comprehensive psychometric analyses of the aggregate resident data are available. Some authors have identified poor reliability for the staffing variables [33], thus our findings for Registered Nurses (discussed above) should be interpreted with caution.

## Conclusion

The results from a large sample of nursing homes show that the resident safety culture of Nurse Aides in many facilities is lower than data from hospitals. I argue that nursing homes in the near future should begin addressing the resident safety culture. This may improve resident care, and it may improve the image of the industry.

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