

Title of Project: Impact of state policies on nursing home patient safety culture

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Structured Abstract

Purpose: to identify different aspects of state nursing home regulatory & payment policies that may foster or prevent the development of nursing home patient safety culture.

Scope: relatively little attention has been paid to improving the safety culture in nursing homes. State policies are shown to have improved nursing home quality and outcomes in the past. Despite these positive findings, many safety and quality problems persist, suggesting the need for additional studies to better understand the strengths and weaknesses of these policies. This project is designed to fill a significant knowledge gap by evaluating the impact of these broad state nursing home policies on safety culture in nursing homes.

Methods: we surveyed top managers in a nationally-representative random sample of freestanding nursing homes (n=2254) using an AHRQ-developed instrument. We also employed administrative and public use data for 2016 and collected primary data for state nursing home regulations. We conducted multivariable analyses at the nursing home level to determine the associations among state regulatory and payment policies, nursing home safety culture performance, and outcome measures.

Results: state nursing home regulations on multidimensional performance in safety, effectiveness, and patient-centered care are associated with nursing home organizational culture of safe practices, suggesting an important role of state regulations in improving nursing home safety culture and safety of care. Improved organizational safety culture may, in turn, lead to better quality of care and resident outcomes.

Key Words: safety culture, nursing home, state regulation, Medicaid, quality of care, staffing

Purpose (Objectives of Study)

The purpose of this project is to identify different aspects of state nursing home regulatory & payment policies that may foster or prevent the development of nursing home patient safety culture. State nursing home regulatory & payment policies include Medicaid reimbursement approaches, state minimum quality mandates, and state minimum nurse staffing standards.

Scope (Background, Context, Settings, Participants, Incidence, Prevalence).

Nursing homes provide post-acute and long-term services that address the critical needs of older Americans who are too frail to be supported in community settings. The safety and quality of care provided to these vulnerable nursing home residents, however, are often suboptimal, and serious concerns about care problems have been repeatedly expressed by the public, federal and state legislators, consumer advocacy groups, and health professionals. Recent literature suggests ongoing quality and safety shortcomings in nursing homes, such as inappropriate medication use and high pressure ulcer rates. Moreover, reports from the US General Accounting Office (GAO) throughout the past decade suggest that, despite a decline in the proportion of nursing homes with significant quality-of-care problems, there are still 20% (n = 3500) nationally that are cited annually for serious care deficiencies that put residents into immediate jeopardy or cause them actual harms.

One of the key insights of the “To Err is Human” report by the Institute of Medicine (IOM) was that most adverse safety events and medical errors can be traced to system-level, rather than individual staff-related, issues. This has shifted patient safety improvement efforts from targeting individual staff to re-engineering the structures and processes of care in order to prevent future errors. This focus on “culture of safety” also emphasizes support for (rather than blame and punishment of) providers, continuous performance improvement, and evidence-based practices. A large body of the acute care literature published since the IOM report

suggests that well-developed patient safety culture has a powerful influence on the behaviors and strategies toward medical errors and leads to improved clinical outcomes in healthcare organizations, such as hospitals. Though important efforts have been made to improve the patient safety culture in hospitals, relatively little attention has been paid to improving the safety culture in nursing homes.

During the past several decades, federal and state policies have been implemented to address the longstanding resident care issues plaguing the nursing home industry. Key state policies – including Medicaid nursing home reimbursement rates and methods (e.g., case-mix adjusted payment), federal/state minimum quality mandates, and state minimum nurse staffing standards – are shown to have improved nursing home quality and outcomes. Despite these positive findings, many safety and quality problems persist, suggesting the need for additional studies to better understand the strengths and weaknesses of these policies.

This project is designed to fill a significant knowledge gap by evaluating the impact of these broad state nursing home policies on the development of safety culture in nursing homes.

Methods (Study Design, Data Sources/Collection, Interventions, Measures, Limitations).

In this project, we surveyed top managers (administrators, directors of nursing [DONs], and unit leaders) in a nationally-representative random sample of free-standing nursing homes (n=2254) using the AHRQ developed and validated Nursing Home Survey on Patient Safety Culture (NHSPSC) instrument. We also employed administrative and public use data for 2016 as well as collected primary data for state nursing home quality policies and state Medicaid programs. These data were used to construct nursing home safety culture measures and measures of state policies, facility covariates, and market conditions.

In particular, multiple domains of nursing home safety culture performance (e.g., management support for resident safety, nonpunitive response to mistakes, and teamwork among healthcare providers) were measured using the AHRQ NHSPSC instrument.

(See Table 1 below for the list of safety culture domains.) Each domain was assessed with three or four items or questions (total of 42 items), and each item used a 5-point Likert scale response category (strongly disagree, disagree, neither, agree, and strongly agree) to measure staff perceptions of safety culture. The AHRQ developed and refined the nursing home SOPSTM instrument based on a previous version for hospitals and evidence-based research and practices that reduce errors and improve clinical outcomes in nursing homes.

We conducted multivariable analyses at the nursing home level to determine the associations among state regulatory and payment policies, nursing home safety culture performance, and nursing home quality, safety, and outcome measures.

Table 1. Characteristics of study nursing homes compared to freestanding nursing homes nationally

	Study nursing homes (n=818)	Free-standing Nursing homes nationally (n=14,091)	P value
	Mean±SD or Prevalence (%)		
Safety culture score (positive response rate), %			
Overall (domains 1-12)	81.6±14.1	--	--
Domain 1: teamwork	86.0±23.2	--	--
Domain 2: staffing	64.5±28.7	--	--
Domain 3: compliance with procedures	63.4±25.9	--	--
Domain 4: training & skills	74.0±28.5	--	--
Domain 5: nonpunitive response to mistakes	72.4±25.3	--	--
Domain 6: handoffs	70.8±26.6	--	--
Domain 7: feedback & communication about incidents	96.4±12.0	--	--
Domain 8: communication openness	87.6±21.7	--	--
Domain 9: supervisor expectations & actions promoting resident safety	92.0±19.3	--	--
Domain 10: overall perceptions of resident safety	96.5±13.0	--	--
Domain 11: management support for resident safety	91.5±18.3	--	--
Domain 12: organizational learning	83.6±20.9	--	--
Number of healthcare deficiencies	7.4±6.4	7.6±6.8	0.314
Number of substantiated complaints	4.2±7.1	4.3±7.6	0.766
Total amount of fines, \$ x 1000	10.8±34.1	14.8±56.4	0.048
Facilities of 4- or 5-star ratings for overall quality, %	53.7	49.2	0.013
Total number of beds	114.2±52.7	107.7±58.9	0.002
Total number of residents	93.7±48.6	87.5±52.3	0.001
Ownership type, %			0.000
For-profit	66.8	73.0	
Non-for-profit	25.7	21.4	
Government-owned	7.5	5.6	
Chain affiliation	56.0	58.3	0.207

Case mix acuity	1.2±0.1	1.2±0.2	0.957
Percent of residents funded by Medicare, %	13.7±10.9	14.6±13.0	0.060
Percent of residents funded by Medicaid, %	59.9±20.4	59.6±22.3	0.685
Percent of racial or ethnic minority residents, %	17.2±21.1	19.3±21.6	0.007
Nurse staffing (hrs per resident day) for			
Registered nurses	0.7±0.3	0.6±0.4	0.153
Total (RNs+LPNs+CNA's)	3.8±0.7	3.8±0.8	0.618
Market competition for nursing home care	0.8±0.2	0.8±0.2	0.384

RN=registered nurse; LPN=licensed practical nurse; CAN=certified nursing assistant.

Results (Principal Findings, Outcomes, Discussion, Conclusions, Significance, Implications).

We received responses from 529 administrators, 379 DONs, and 539 unit leaders. Overall, 818 out of the 2254 sampled nursing homes had at least one completed survey returned for a response rate of 36%. Following the recommendation of the AHRQ and also the approach of recent studies, we first calculated the positive response rate for each safety culture domain; it was done by dividing the number of items in the domain with positive responses by the total number of non-missing items in the domain. For each item, a positive response was defined as a response of agree or strongly agree if the item was positively worded, and a response was considered disagree or strongly disagree if the item was negatively worded. We then calculated the facility-level positive response rate for each domain (hereafter referred to as facility safety culture score for each domain) as the average of domain-specific positive response rates for all types of staff responses (i.e., administrator, director of nursing, and unit leaders). Finally, we calculated the overall facility safety culture score as the average of the facility safety culture scores for all 12 domains. The key independent variables in analyses below were the domain-specific and overall safety culture scores (i.e., positive response rates), with a higher value indicating a better overall safety culture of the nursing home.

The overall positive response rate for the 12 safety culture domains and all staff responses had an average of 81.6% and varied considerably over facilities (Table 1 and Figure 1). The positive response rate for each domain had an average ranging from 63.4% (domain 3 – compliance with procedures) to 96.5% (domain 10 – overall perceptions of resident safety) and varied over facilities.

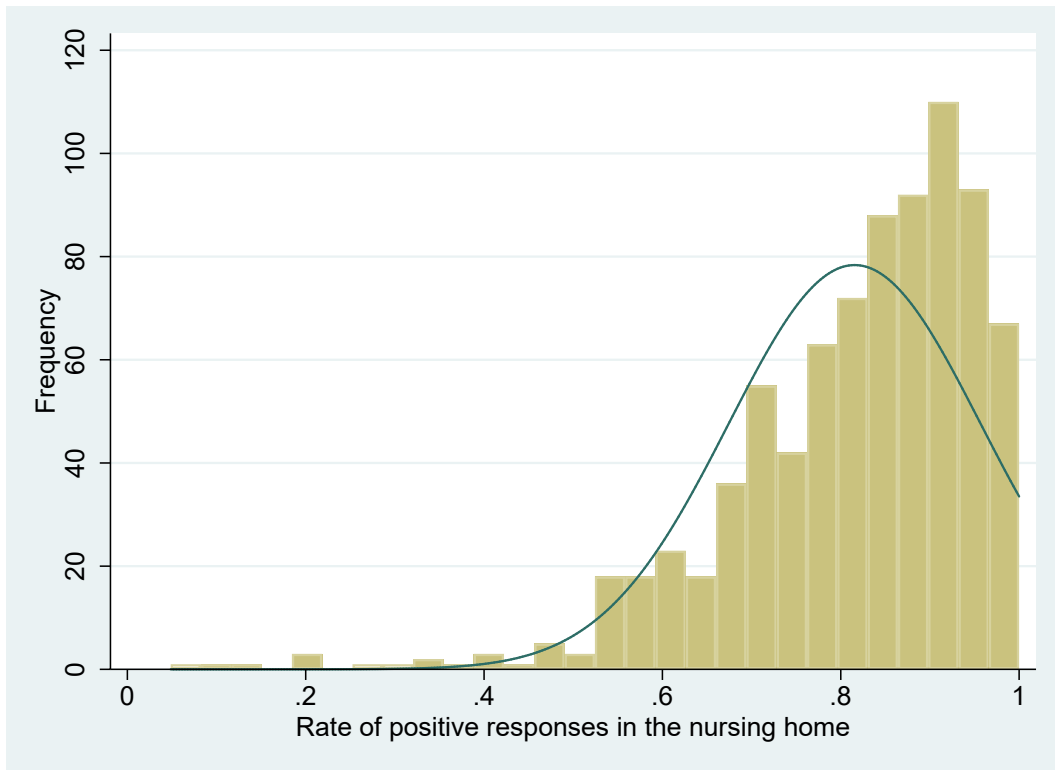


Figure 1. Distribution of overall safety culture score (positive response rate) of study nursing homes.

Note: all items in the AHRQ Survey on Patient Safety Culture for nursing homes use 5-point Likert scales (strongly disagree, disagree, neither, agree, and strongly agree) for responses. We calculated positive response rate for each domain as the percent of positive responses (strongly agree or agree) of all non-missing items in the domain. The figure reports the average rate of positive responses for a nursing home over all 12 domains and staff responses (administrator, director of nursing, and unit leaders).

Compared to free-standing nursing homes in the sampling frame nationally (n=14,091), responding nursing homes had, on average, a similar number of healthcare deficiencies (Table 1, 7.4 vs. 7.6), number of substantiated complaints (4.2 vs. 4.3), and number of nurse staffing levels (e.g., 3.8 hours per resident day totally for both groups). However, responding nursing homes were slightly more likely to be larger, and non-for-profit facilities had a lower amount of fines (\$10.8k vs. \$14.8k on average) and were more likely to have overall 4- or 5-star ratings (53.7% vs. 49.2%).

Table 2 shows that, in unadjusted analyses, a higher overall safety culture score was associated with lower healthcare deficiencies, substantiated complaints, and fines. Multivariable analyses with adjustment for nursing home, market, and state covariates and use of alternative specifications of overall safety culture score (e.g., a continuous variable and categorical variables) largely confirmed these negative associations. For example, in adjusted analyses, every 10 percentage point increase in overall safety culture score was associated with 0.56 fewer healthcare deficiencies (p=0.001), 0.74 fewer substantiated complaints (p=0.004), and a reduction of fines by \$2285.20 (p=0.059).

Table 3 further shows that, in both unadjusted and adjusted analyses, improved overall safety culture score was associated with increased odds of facilities being ranked as 4- or 5-star for overall quality, survey deficiencies, and risk-adjusted quality measures. In adjusted analyses, every 10 percentage point increase in overall safety culture score was associated with 20% increased odds of facilities having 4- or 5-star ratings (odds ratio [OR]=1.23, p=0.003 for overall ratings; OR=1.18, p=0.019 for deficiency ratings; and OR=1.19, p=0.012 for quality measure ratings).

Table 2. Associations of nursing home safety culture score with “Nursing Home Compare” regulatory outcomes

Overall safety culture score (average percentage point of positive responses over 12 safety culture domains and administrator, DON, and unit leader responses)	Number of healthcare deficiencies		Number of substantiated complaints		Total amount of fines	
	β -coefficient	P-value	β -coefficient	P-value	β -coefficient	P-value
Continuous variable (percentage point x 10)						
Unadjusted ^a	-0.85	0.000	-1.06	0.000	-2575.86	0.017
Adjusted ^b	-0.56	0.001	-0.74	0.004	-2285.20	0.059
Binary groups (\geqmedian vs. <median)						
Unadjusted ^a	-1.27	0.003	-2.05	0.000	-4377.36	0.073
Adjusted ^b	-0.95	0.023	-1.60	0.001	-3419.29	0.175
Tertile groups						
2 nd vs. 1 st tertile group						
Unadjusted ^a	-2.87	0.000	-3.25	0.000	-7928.12	0.003
Adjusted ^b	-1.60	0.006	-1.99	0.001	-5919.83	0.030
3 rd vs. 1 st tertile group						
Unadjusted ^a	-2.04	0.000	-2.73	0.000	-5307.45	0.102
Adjusted ^b	-1.29	0.016	-1.90	0.003	-1919.64	0.599

^a Derived from bivariate linear regression models with nursing home random effects and robust variance-covariance estimates.

^b Derived from multivariable linear regression models with nursing home random effects and robust variance-covariance estimates as well as further adjustment for covariates including nursing home bed size, total number of residents, profit status (non-for-profit or government-owned vs. for profit), chain affiliation, a case mix acuity index, percentage of Medicare residents, percentage of Medicaid residents, percentage of racial and ethnic minority residents, market competition for nursing home care, and state dummies.

Note: Estimates with p value<0.05 are highlighted in bold.

Table 3. Associations of nursing home safety culture score with “Nursing Home Compare” 5-star ratings (4 or 5 stars vs. 1-3 stars)

Overall safety culture score (average percentage point of positive responses over 12 safety culture domains and administrator, DON, and unit leader responses)	Overall ratings		Ratings for survey deficiencies		Ratings for quality measures	
	Odds ratio	P-value	Odds ratio	P-value	Odds ratio	P-value
Continuous variable (percentage point x 10)						
Unadjusted ^a	1.24	0.000	1.16	0.005	1.14	0.027
Adjusted ^b	1.23	0.003	1.18	0.019	1.19	0.012
Binary groups (≥median vs. <median)						
Unadjusted ^a	1.65	0.002	1.29	0.069	1.24	0.224
Adjusted ^b	1.82	0.001	1.47	0.022	1.36	0.127
Tertile groups						
2 nd vs. 1 st tertile group						
Unadjusted ^a	1.87	0.001	1.76	0.006	2.11	0.000
Adjusted ^b	1.88	0.006	1.64	0.039	2.75	0.000
3 rd vs. 1 st tertile group						
Unadjusted ^a	1.68	0.006	1.37	0.077	1.47	0.057
Adjusted ^b	1.69	0.017	1.42	0.105	1.75	0.024

^a Derived from bivariate logistic regression models with nursing home random effects and robust variance-covariance estimates.

^b Derived from multivariable logistic regression models with nursing home random effects and robust variance-covariance estimates as well as further adjustment for covariates including nursing home bed size, total number of residents, profit status (non-for-profit or government-owned vs. for profit), chain affiliation, a case mix acuity index, percentage of Medicare residents, percentage of Medicaid residents, percentage of racial and ethnic minority residents, market competition for nursing home care, and state dummies.

Note: Estimates with p value<0.05 are highlighted in bold.

The above results demonstrated that a patient safety culture, as perceived by nursing home leaders, varied substantially across facilities. Better patient safety culture score predicted better state regulatory performance indicators, including reduced deficiency citations for healthcare, fewer substantiated complaints, a lower amount of fines paid by nursing home to the CMS for quality and safety issues, and increased odds of being designated as 4- or 5-star facilities. These findings persisted after multivariable adjustment for nursing home, market, and state covariates, and they were robust to alternative ways of computing safety culture scores.

These results suggest a substantial potential that state nursing home regulations on multidimensional performance in safety, effectiveness, and patient-centered care can improve nursing homes' organizational culture of safe practices, which in turn improve quality of care resident outcomes (as demonstrated below). Furthermore, our findings showed that the associations of overall safety culture score with focused performance metrics (Tables 2 and 3) were stronger and more consistent than those of individual safety culture domains (results not shown). This further suggests that broadly-targeted state quality and care practice regulations may help improve overall performance in safety culture and safety of care, but improvements may manifest in different ways (i.e., shown in different safety culture domains) for different nursing homes in the state.

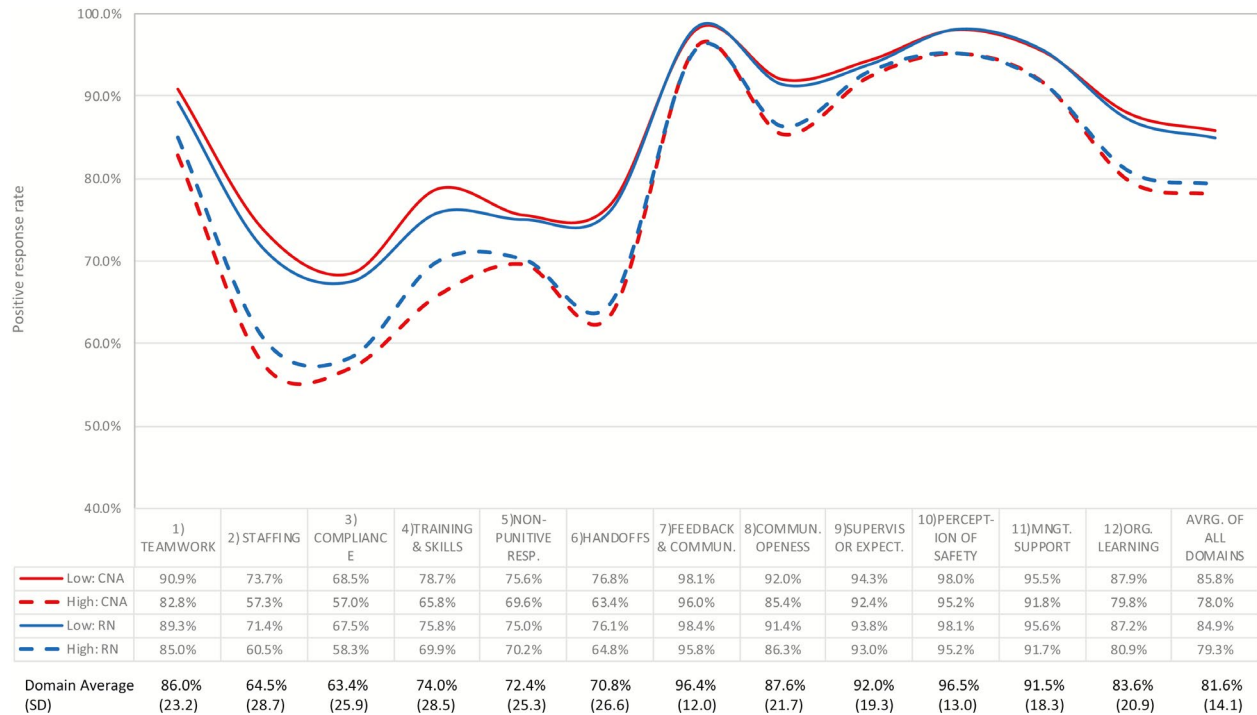


Figure 2. Nursing home safety culture positive response rate (=>4): Average and by certified nurse assistant and registered nurse turnover rate.

In further analyses, we also revealed the associations between each of the 12 PSC domains and turnover rates among the CNAs (certified nursing assistants) and RNs (registered nurses), stratified by low (<15% for RNs and <35% for CNAs) versus high (Figure 2). PSC in NHs with low versus high staff turnover appeared to vary most for the first six domains. For example, for the domain of handoffs, the PSC score was 10% higher in NHs with low CNA and RN turnover compared to facilities experiencing higher staff turnover. The difference in the PSC scores for the domain of staffing was even greater between homes with low turnover (71.4% and 73.7% for RNs and CNAs, respectively) compared to high turnover (60.5% and 57.3% for RNs and CNAs, respectively). For the average overall PSC score, the difference between facilities with high versus low turnover was 6–7 percentage points. The differences in PSC scores, based on turnover, were much smaller in the domains of feedback and communication, supervisor expectations, and overall perceptions of patient safety.

Table 4. Adjusted Association of Nursing Home Safety Culture Performance with Nursing Staff Turnover

Percent of positive (≥ 4) responses to patient safety culture (dependent continuous variable)	Low (<15%) RN Turnover		Low (<35%) CNA Turnover	
	β -coefficient	<i>p</i> value	β -coefficient	<i>p</i> value
Overall PSC score: average of 12 domains	4.037	.002	6.285	<.000
Domain 1: teamwork	3.492	.136	6.091	.009
Domain 2: staffing	4.184	.128	13.760	<.000
Domain 3: compliance with procedures	7.432	.006	9.836	<.000
Domain 4: training and skills	1.990	.495	11.952	<.000
Domain 5: nonpunitive response to mistakes	5.311	.043	4.496	.083
Domain 6: handoffs	8.306	.002	9.907	<.000
Domain 7: feedback and communication about incidents	2.716	.011	1.513	.149
Domain 8: communication openness	4.114	.042	4.894	.014
Domain 9: supervisor expectations and actions promoting safety	0.705	.715	2.001	.292
Domain 10: overall perceptions of resident safety	2.630	.039	2.436	.052
Domain 11: management support for resident safety	3.451	.020	2.586	.078
Domain 12: organizational learning	4.537	.028	6.144	.003

Note: CNA = certified nurse assistants; PSC = patient safety culture; RN = registered nurses.

In Table 4, we show the adjusted associations between turnover and PSC scores, both for the average overall score and for each domain separately. In NHs with low RN and CNA turnover, the overall PSC scores were 4.037% and 6.285% higher, respectively, than in NHs with high nursing staff turnover.

The effect size for the association between turnover and PSC was greater than the average in several domains. For example, in NHs with low RN turnover, PSC scores for compliance with procedures (domain 3), nonpunitive response to mistakes (domain 5), and handoffs (domain 6) were, respectively, 7.432%, 5.311%, and 8.306% higher than in facilities with high RN turnover. Similarly, in NHs with low CNA turnover, PSC scores for domains 3 and 6 were, respectively, 9.836% and 9.907% higher than in homes with high CNA turnover. For CNA turnover, the largest effects were with regard to domains of staffing (domain 2) and training and skills (domain 4) at 13.760% and 11.952%, respectively. It is interesting to note that, though there was some overlap in the significance of the association for both RN and CNA turnover with certain PSC domains—notably compliance with procedures (domain 3), handoffs (domain 6), communication openness (domain 8), and organizational learning (domain 12)—this was not true across all domains. Furthermore, we found no statistically significant association between RN or CNA turnover with the domain of supervisor’s expectations and actions promoting safety (domain 9).

In another set of analyses on nursing home residents with dementia and how the safety culture and state minimum nurse staffing requirements may affect their place of death (NH vs hospital), our unadjusted models showed that 10-percentage-point increases in nonpunitive response to mistakes, communication openness, and overall perceptions of resident safety were associated with a 4.0%-7.0% decreased odds of in-hospital death (Table 5, Unadjusted Model). For nonpunitive response to mistakes and overall perceptions of resident safety, these associations were attenuated and became insignificant after controlling for resident, NH, county, and state-level characteristics. In NHs reporting higher communication openness scores, however, decedents with dementia had 5.0% lower odds of in-hospital death across models adjusting for resident, NH, and county characteristics. In contrast, associations between teamwork and in-hospital death became significant when adding resident, NH, and county-level covariates. Across all domains, adding county- and state-level characteristics did not significantly improve model fit.

Table 5: Multivariable results for patient safety culture domains from logistic regression models of in-hospital death among nursing home (NH) decedents with dementia who died in 2017 in the NH or hospital from NHs responding to the NH patient safety culture survey.

	Unadjusted Model OR^a (95% CI)^b [p-value]	Fully Adjusted Model^c OR (95% CI) [p-value]	Interaction p- value^d
Overall (domains 1-12)	0.95 (0.88, 1.01) [0.105]	0.97 (0.90, 1.04) [0.356]	0.089
Domain			
1: teamwork	0.99 (0.95, 1.02) [0.422]	0.97 (0.93, 1.00) [0.077]	0.356
2: staffing	0.99 (0.96, 1.02) [0.493]	0.99 (0.96, 1.03) [0.730]	0.615
3: compliance with procedures	1.01 (0.97, 1.04) [0.715]	0.99 (0.96, 1.03) [0.692]	0.155
4: training and skills	1.01 (0.97, 1.04) [0.742]	1.01 (0.98, 1.05) [0.505]	0.823
5: nonpunitive response to mistakes	0.96 (0.93, 0.99) [0.011]	0.98 (0.95, 1.02) [0.377]	0.160
6: handoffs	0.98 (0.95, 1.02) [0.330]	1.00 (0.96, 1.03) [0.749]	0.810
7: feedback and communication about incidents	0.95 (0.88, 1.01) [0.113]	0.99 (0.91, 1.08) [0.867]	0.913
8: communication openness	0.94 (0.91, 0.98) [0.005]	0.96 (0.92, 1.00) [0.062]	0.011
9: supervisor expectations and actions promoting resident safety	0.97 (0.93, 1.01) [0.128]	0.99 (0.95, 1.04) [0.792]	0.078
10: overall perceptions of resident safety	0.93 (0.88, 0.98) [0.005]	0.96 (0.89, 1.04) [0.293]	0.001
11: management support for resident safety	0.95 (0.90, 1.01) [0.082]	0.97 (0.91, 1.03) [0.311]	0.196
12: organizational learning	0.97 (0.93, 1.02) [0.255]	0.98 (0.93, 1.03) [0.502]	0.149

^a: OR: Odds ratio. Patient safety culture domains are expressed in terms of 10-percentage point increases in each domain. Each patient safety culture domain was included individually in 13 separate models, and covariate groupings were sequentially added to the unadjusted models.

^b: Confidence interval

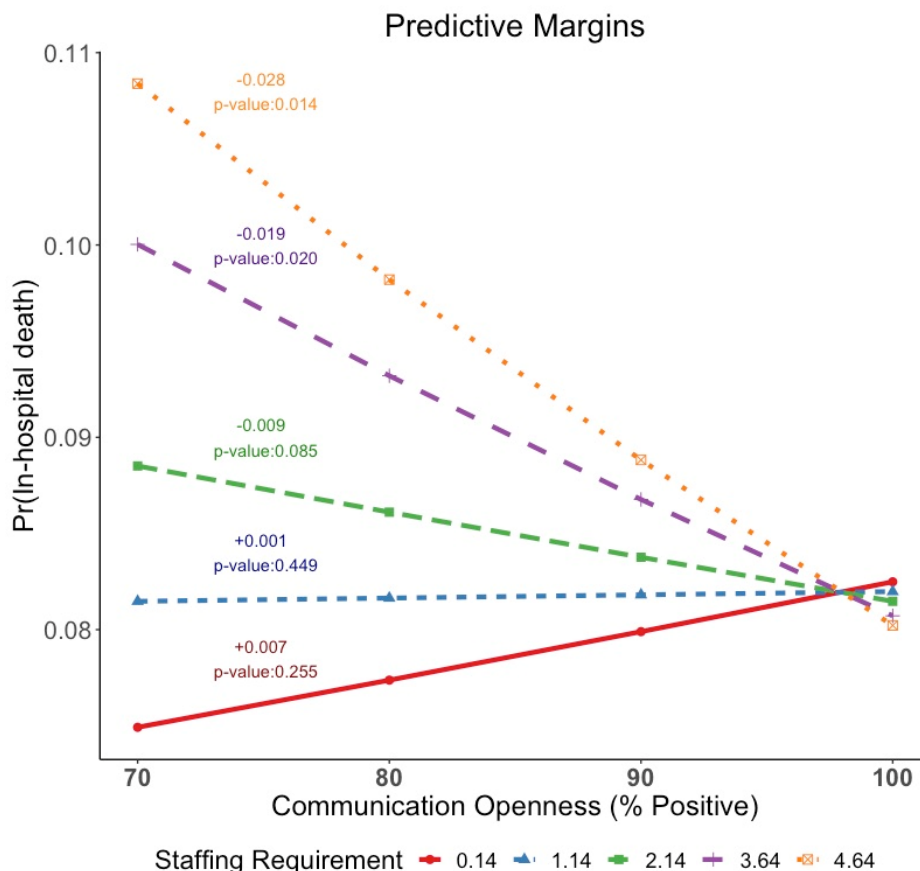
^c: Models adjusted for resident, NH, county, and state characteristics. Wald p-values >0.05, testing the statistical significance of additional covariate groupings from the unadjusted models.

^d: The p-value is for the interaction term between each patient safety culture domain and state minimum NH nurse staffing requirements for the fully adjusted models.

In 2017, all states had requirements for licensed staff, and 17 states did not have requirements for CNAs; eight states had updated CNA requirements since 2010. The majority of NHs (82.9%) met or exceeded state staffing requirements for total staffing HPRD among our sample. The average difference between total staffing HPRD and state staffing requirements across states was 1.81, ranging from -0.71 (Illinois) to 4.14 (North Dakota).

The interaction between communication openness and state minimum NH nurse staffing requirements in the fully adjusted model was significant ($p=0.011$), suggesting that such requirements moderate effects on place of death. The interaction with overall perceptions of resident safety was also significant but not explored further, as the main effect was overall insignificant across models. Further examining the interaction between communication openness and minimum staffing requirements in relation to the probability of in-hospital death among NH residents with dementia, Figure 3 demonstrates a stronger relationship with in-hospital death in NHs located in states with higher (above 2.14 HPRD [average]) minimum NH nurse staffing requirements. In these states, increasing communication openness from 70% to 100% (one standard deviation around the mean score of 87.8%) was associated with 1.9%-2.8% absolute reductions in probabilities of in-hospital death (19.3%-26.0% relative reductions).

Figure 3: Predictive Margins for the Probability of In-Hospital Death. Differences in probabilities of in-hospital death when increasing communication openness from 70% to 100% for different levels of state staffing requirements are shown.



In a final set of analyses, we examined patient safety culture in nursing homes and whether better patient safety culture would improve the likelihood of successful community discharge among post-acute care residents. A successful discharge to the community was defined as occurring within 100 days of an SNF admission and without subsequent readmissions, unplanned hospitalizations, or death within 30 days. Table 6 shows that, after controlling for resident-level, nursing home-level, and county-level characteristics, for one SD (0.57) increase in the average score of the domain of teamwork, the odds of successful discharge increased by 12.57% (OR=1.1257, p=0.0027). Similar trends can be observed for the domains of training and skills (OR=1.0759, p=0.0383), handoffs (OR=1.0907, p=0.0305), supervisor expectations and actions promoting resident safety (OR=1.1139, p=0.0051), and overall perceptions of resident safety (OR=1.0993, P=0.0399). A borderline significant association was also found between the overall average PSC score and successful discharge (OR=1.0935, p=0.0954).

Table 6. Regression Result for Successful Community Discharge among Post-acute Care Residents

Safety Culture Domain	OR	p
	(One SD Increase)*	
Domain 1: Teamwork	1.1257	0.0027*
Domain 2: Staffing	1.0472	0.1568
Domain 3: Compliance with Procedures	1.0437	0.2620
Domain 4: Training and Skills	1.0759	0.0383*
Domain 5: Nonpunitive Response to Mistakes	1.0164	0.6864
Domain 6: Handoffs	1.0907	0.0305*
Domain 7: Feedback and Communication about Incidents	1.0530	0.3035
Domain 8: Communication Openness	1.0267	0.5424
Domain 9: Supervisor Expectations and Actions Promoting Residents Safety	1.1139	0.0051*

Domain 10: Overall Perceptions of Resident Safety	1.0993	0.0399*
Domain 11: Management Support for Resident Safety	1.0453	0.2893
Domain 12: Organizational Learning	1.0432	0.3113
Overall Average	1.0935	0.0954†

p<0.05 are highlighted in bold and denoted with *

p<0.1 are denoted with †

In conclusion, results of this project show that state nursing home regulations on multidimensional performance in safety, effectiveness, and patient-centered care play an important role in improving nursing homes' organizational culture of safe practices. Improved organizational safety culture, such as better communication openness and teamwork, may in turn help improve quality of care and resident outcomes, such as reduced staff turnover, less hospital use at the end of life, and higher likelihood of successful community discharge for post-acute care residents. State nursing home regulations, such as minimum nurse staffing requirements, may interact with organizational safety culture in their effects on resident outcomes.

List of Publications and Products

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