Perceptions of Nursing Practice: Capacity for High-Quality Nursing Home Care

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Emerging evidence indicates that harmful nursing home resident outcomes occur because of ineffective collaboration between registered nurses (RNs) and licensed practical nurses (LPNs) during assessment, care planning, delegation, and supervision. This observational, factorial vignette survey related video vignettes of RN–LPN collaboration in nursing home care to RN perceptions of: 1) current practice in their home; and 2) preferred practice in their home ($N = 444$ rated vignettes of nursing practice). Current practice ranged from collaboration with few or poor-quality connections and a lack of differentiation between RN and LPN roles (low-capacity practice) to strong RN–LPN connections and clearly differentiated roles (high-capacity practice); RNs identified high-capacity practice as preferred. Interventions that bring together RNs and LPNs to learn new ways of giving care by differentiating roles while also strengthening connections show promise as levers for changing quality of care in nursing homes.

Emerging evidence indicates that harmful nursing home resident outcomes, such as medication errors, pain, and poor quality measures as well as avoidable hospitalizations result from ineffective collaboration between registered nurses (RNs) and licensed practical nurses (LPNs) (Corazzini, Anderson, Mueller, Hunt-McKinney, et al., 2013; Corazzini et al., 2015; Corazzini, Anderson, Mueller, Thorpe, & McConnell, 2013; Vogelsmeier, Scott-Cawiezell, & Pepper, 2011). This ineffective collaboration involves few or no formal or informal connections between RNs and LPNs and a blurring of their scopes of practice. As a result, RNs and LPNs interchangeably perform assessment, care planning, delegation, and supervision (Corazzini, Anderson, Mueller, Hunt-McKinney, et al., 2013).

Interventions that bring together RNs and LPNs to learn new ways of giving care by differentiating roles and strengthening connections show promise as levers for changing RN–LPN collaboration (Corazzini et al., 2015). In nursing homes, unit-level teams of the nursing staff at all licensure levels are the foundational clinical teams for quality of care; studies focused on these teams suggest that efforts to improve quality and care outcomes should focus on their learning capacity (Anderson et al., 2012; Estabrooks et al., 2011; Mohr, Batalden, & Barach, 2004). Distinguishing the contributions of RNs and LPNs and strengthening the quality of RN–LPN connections foster the ability to exchange information and solve problems, integrating RN-level clinical expertise in a meaningful way. This ability to seek and share new knowledge and ideas with other members of the care team is known as reciprocal learning (Leykum et al., 2011), which has been related to the successful implementation of quality-improvement initiatives (Leykum et al., 2011; Noël, Lanham, Palmer, Leykum, & Parchman, 2013).

However, acceptance of interventions targeting RN–LPN collaborations for unit-level team learning and higher quality of care requires an awareness of the differences between RN practice and LPN practice and the importance of the quality of their connections for achieving better resident outcomes. In foundational work to this study, RNs and LPNs in nursing homes described how they contribute to assessment, care planning, delegation, and supervision. Case study analysis comparing nursing homes yielded three general patterns of practice:

- Practice with a poor capacity for RN–LPN collaboration (poor connections and blurring of RN–LPN roles)
- Practice with a high capacity for RN–LPN collaboration (multiple formal and informal connections and clear distinctions between the scopes of practice and roles of RNs and LPNs)
- Practice with a mixed capacity for RN–LPN collaboration (elements of the first two patterns) (Corazzini, Anderson, Mueller, Hunt-McKinney, et al., 2013).

Compared with high-capacity practice, poor- and mixed-capacity practices were associated with poorer or more inconsistent quality of care outcomes (Corazzini, Mueller, et al., 2013).

A gap in understanding remains about how to measure these practice dimensions because the descriptive case study approach is not feasible in large-scale studies, which must rely on staff perceptions of practice. Thus, research is needed to examine whether RNs can recognize their own practice patterns and whether they can determine if their practice patterns are desirable for a high quality of care.

Awareness of practice also is relevant in designing interventions targeting RN–LPN collaboration to improve care quality. Specifically, the diffusion of innovation framework (Rogers, 1995) elucidates characteristics of an innovation that affects adoption, including the perceived compatibility and relative advantage of an innovation with what currently occurs in an organization (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). This framework has been widely adopted in health and social care to explain adoption of new care practices (Greenhalgh et al., 2004), including the adoption of new ways for staff to provide nursing care in nursing homes (Boström et al., 2012; McConnell et al., 2011). To predict whether nurses would be likely to adopt a new practice pattern, it is important to know whether they view an intervention that targets RN–LPN collaboration as compatible with current practice, and to assess whether nurses perceive relative advantages to a more collaborative approach, such as believing that higher-capacity collaborative practice is linked to better quality of care.

Therefore, the purpose of this study was twofold: to explore whether nursing home RNs can recognize their practice pattern (i.e., low, mixed, or high capacity) and to explore whether RNs in nursing homes see nursing practice characterized by high-capacity practice as linked to better resident outcomes in two areas: pain in short-stay patients and falls in long-stay residents. This study directly addresses an important gap in our empirical knowledge about the extent to which an intervention to clarify the roles and scopes of RN and LPN practice and strengthen the quality of connections between RNs and LPNs in nursing homes would be considered compatible and advantageous, supporting adoption within the diffusion of innovation framework (Rogers, 1995).

Method

The research team conducted a cross-sectional, observational, factorial vignette study (Rossi & Nock, 1982) to examine RN perceptions of Corazzini, Mueller, Anderson, Day, Hunt-McKinney, and Porter's (2013) framework of patterns of nursing practice in nursing homes. Step one was developing the Web-based, multimedia factorial vignette survey instrument. Step two was administering the instrument to RNs working in nursing homes. Step three was conducting analyses of RN perceptions. Institutional review board approval was obtained from the investigators' universities.

Sample and Recruitment

The sampling frame was all RNs employed in nonhospital-based, Medicare- or Medicaid-certified nursing homes. Probability and nonprobability samples (Singleton, Straits, & Straits, 1993) were drawn from the sampling frame and combined for analysis. For the probability sample, 1,500 nursing homes were selected based on a stratified random sample, with nine strata defined by differences in state nurse practice acts (Corazzini,

Anderson, Mueller, Thorpe, et al., 2013). RN directors of nursing (DONs) for each nursing home received a written letter inviting them and their nursing staff to participate in the study. Interested DONs returned a postcard indicating the number of nurses employed in the home. Then, study participation packets for the reported number of nurses were provided electronically or via regular mail to interested DONs.

For the nonprobability samples, an e-mail invitation with a link to the Web-based survey was disseminated to all members of a professional organization representing DONs in long-term care and all nurses employed by a Southeast regional chain of nursing homes (N = 52 homes). Additionally, the research team approached seven DONs in a Southeast metropolitan area who were participating in a separate study and shared information about the current study. Interested DONs (N = 4) allowed the research team to recruit a convenience sample in their nursing homes by staffing a conference room with laptop computers that nurses could use to access the Web-based survey.

Measures and Procedures

Factorial vignettes are a commonly used methodology in health care research to measure judgment and perceptions (Evans et al., 2015). In factorial vignettes, the researcher randomly varies key dimensions of interest (e.g., age of the patient, diagnosis), creating a factorial matrix of possible combinations of dimensions. Respondents then evaluate multiple vignettes with various dimensions randomly sampled from this matrix. The approach addresses multiple methodological limitations of traditional vignette studies, such as the limited range of dimensions feasible when all respondents evaluate the same set of vignettes (Rossi & Nock, 1982).

For this study, factorial video vignettes were developed to capture low-capacity, mixed-capacity, and high-capacity nursing practice patterns in two clinical care scenarios. The first was the care of a short-stay rehabilitation patient who was just admitted to the nursing home and is experiencing moderate to severe pain. The second was the care of a long-stay resident who falls. For each scenario, a four-scene sequence was filmed to capture nursing assessment, care planning, delegation, and supervision on the unit involving the patient or resident, an RN, an LPN, and a nursing assistant. Three versions of each scene were filmed to capture low-capacity, mixed-capacity, and high-capacity patterns. The factorial of combinations, therefore, was 3*3*3*3 or 81 possible combinations for each clinical scenario (total, 162 combinations). As examples, Figures 1 and 2 contrast low- and high-capacity vignettes. Further details of the construction of the video vignettes, including the development of the scripts, are described elsewhere (Day et al., 2014).

Two measures were administered for each vignette:
- Did the vignette reflect actual practice in the respondent's nursing home?
- Did the vignette reflect preferred practice?

Actual practice was operationalized by a single item, 11-point Likert scale, ranging from "not at all like practice" to "just like practice." Preferred practice was operationalized by a single item, 11-point Likert scale, ranging from "not at all desirable" to "very desirable."

Additional Measures

Additional measures included RN perceptions of reciprocal learning (Leykum et al., 2011) and organizational characteristics of RNs' nursing homes. Reciprocal learning was measured using Leykum et al.'s (2011) 5-item, 5-point reciprocal learning scale. Items describe aspects of team learning, such as whether new things are learned from one another in giving care. The scale has demonstrated adequate reliability in primary care practice settings (Leykum et al., 2011).

Organizational characteristics included publicly available comparisons of staffing, ownership, size, and quality. Data are available through the Centers for Medicare & Medicaid Services' (CMS) nursing home compare website (www.medicare.gov/NursingHomeCompare/search.html). Staffing was measured as RN hours per resident day; ownership was measured as whether the nursing home was for-profit; size was measured as the number of certified beds; and quality was measured as the summary, 5-point quality measure derived from resident assessment data (Centers for Medicare & Medicaid Services, 2010). To facilitate the most parsimonious set of variables, additional staffing measures incorporating LPN hours per resident day and quality measures specific to pain and falls were not included.

Survey Procedures

All 162 video clips were uploaded to the Internet and embedded in Qualtrics, the Web-based survey platform. Each time a respondent accessed the survey, two videos of the short-stay patient and two videos of the long-stay resident were randomly sampled without replacement (Singleton et al., 1993) by the Qualtrics program. Therefore, each RN participant viewed and rated four vignettes.

Before the survey was administered, usability of the complete instrument was evaluated with a convenience sample of DONs attending a national conference. Research team members staffed a booth in the exhibit hall and recruited DONs (N = 24) who completed the survey. Data on completion time, assistance needed to complete the survey, and responses to open-ended questions about general experiences were used to refine the instrument.

Sample RN participants accessed the Web-based link to complete the self-administered survey from the location of their choice; as a thank-you, participants were given access to a Web-based continuing education module. RN participants recruited through the probability-based sampling strategy who wished to receive a pencil-and-paper copy of the survey instead of using the Web-based version were able to contact the study coordinator

Short-Stay Patient: Low-Capacity Practice vs. High-Capacity Practice

Pain Vignette Scene 4: Low-Capacity Nursing Practice Pattern. The licensed practical nurse (LPN) charge nurse problem solves with the nursing assistant about how to address the patient's pain. The nursing assistant does not know what to do; the LPN hopes to avoid having to call the physician on call.

Pain Vignette Scene 4: High-Capacity Nursing Practice Pattern. The registered nurse (RN) visits the unit to see how the LPN and nursing assistant are doing with the newly admitted patient. They discuss his pain, and the RN invites both to go with her while she conducts a comprehensive assessment.

and receive a DVD and a paper copy of the questions. The DVD included four video vignettes that had been randomly sampled from the matrix of vignette combinations, making them like the Web-based version. Participants mailed their responses using postage-paid response envelopes. All survey responses entered online were downloaded in an electronic spreadsheet format; paper survey responses were entered using double data-entry into the electronic spreadsheet. Data were merged with organizational characteristics by matching the respondent-provided nursing home name with the CMS provider identifier and the date of survey completion with the respective dates of the organizational data. Merged spreadsheet data were imported into SPSS/PC 21® and HLM 7.0 for analysis.

FIGURE 2

Long-Stay Resident: Low-Capacity Practice vs. High-Capacity Practice

Falls Vignette Scene 2: Low-Capacity Nursing Practice Pattern. The licensed practical nurse (LPN) charge nurse telephones the on-call registered nurse (RN) to review the resident's fall. The LPN's collected data inform the RN's care plan update; discussion follows procedures.

Falls Vignette Scene 2: High-Capacity Nursing Practice Pattern. The RN visits the unit to review the LPN's collected data and ask questions. Potential causes of the fall are identified and a plan of action is created.

Analysis

Researchers estimated four hierarchical linear models of the simultaneous effects of nursing home–level and vignette-level characteristics on RN ratings of the vignettes. Specifically, two models were estimated of the ratings of pain vignettes: the degree to which nursing practice in the vignette reflected actual practice (model 1) and preferred practice (model 2), and two models were estimated of the ratings of falls vignettes: the degree to which nursing practice in the vignette reflected actual practice (model 3) and preferred practice (model 4). HLM 7.0 multilevel modeling software was selected to account for the nested nature of the data (i.e., multiple rated vignettes within each nursing home) (Raudenbush & Bryk, 2001) and to test for cross-level effects of vignette dimensions on ratings by organizational characteristics.

All nursing home–level predictors were examined using univariate and bivariate statistics before model entry. An adequate alpha coefficient was estimated for the reciprocal learning scale (α = .81), and intraclass correlation coefficient (ICC) indicated

meaningful aggregation at the nursing home–level (DeVellis, 2012). All interitem correlations of nursing home–level predictors were less than .40, well below suggested cutoffs for problems with multicollinearity (Munro & Page, 1993). For each of the four models, a fully unspecified model was estimated first to calculate sources of variance by level. Next, vignette dimension covariates were added to the model. Nursing home–level measures then were entered as a block to assess the direct effects on outcomes after accounting for all vignette dimension covariates. Finally, interaction terms of any significant nursing home–level covariates were created to test for cross-level effects. Models were estimated with robust standard errors.

Results

In the study, 114 RNs from 26 states rated 444 vignettes and provided complete demographic and nursing home employer information to link to organizational characteristics data. Because of the administration procedures used, 261 additional vignettes were rated by other nursing home staff members, including LPNs and nursing assistants, but only RN data were included in this analysis. Of the RNs, 33 (29%) were DONs; 43 (38%) were either assistant DONs or other nursing home administrators; 26 (23%) held unit-level RN positions, such as charge nurse or supervisor; and the remaining 12 (10%) did not provide clarifying information on their positions. Almost all of these nurses were non-Hispanic (97%), either white (85%) or African American (11%). Forty-one (36%) were prepared at the bachelor's degree in nursing or higher educational level. The RNs were from 65 different nursing homes.

Of the nursing homes, 38 (59%) were recruited via the probability sample; 21 (32%) from the regional provider; 4 (6%) from the Southeast metropolitan area; and 2 (3%) from the national organization. The final sample consisted of 45 (69%) for-profit homes and 20 (31%) not-for-profit homes. The mean number of certified beds was 138 (sd, 8.5), and the mean RN staffing level was 0.75 RN hours per resident day (sd, .04). The mean overall CMS quality measure was 3.1 (sd, .20) stars. Relative to the United States overall, homes were of comparable profit status and quality, but were generally larger and had higher RN staffing levels (American Health Care Association [AHCA], 2015; Boccuti, Casillas, & Neuman, 2015).

Perceptions of Actual Practice

Results of the multilevel models of the extent to which the vignettes portrayed current practice are summarized in Table 1. The ICC estimates of the amount of variance in ratings attributable to between-vignette factors compared with between–nursing home factors indicated that the majority of the variance for both the pain and falls vignettes occurs between nursing homes. As a result, no vignette-level dimension of high-, mixed-, or low-capacity practice significantly predicted a greater extent of RN

Summary of Estimates for Multilevel Models of Nursing Home and Vignette Characteristics on RN Perceptions of Vignettes as "Just Like Practice" in Their Nursing Home

	Pain		Falls	
	β	SE	β	SE
Nursing Home Level				
Reciprocal learning			-0.95*	0.49
RN hours per resident day	2.23†	0.50	1.47‡	0.57
Profit status				
Number of certified beds				
Summary CMS quality star rating				
Vignette Level				
Scene 1 high-capacity	0.21	0.46	-0.36	0.40
Scene 2 high-capacity	0.50	0.38	-8.89◊	2.74
Scene 3 high-capacity	0.73	0.70	0.64	0.45
Scene 4 high-capacity	0.43	0.41	0.56	0.35
Scene 1 mixed-capacity	-0.01	0.41	0.32	0.41
Scene 2 mixed-capacity	0.05	0.41	-0.59	0.47
Scene 3 mixed-capacity	0.42	0.66	0.52	0.44
Scene 4 mixed-capacity	-0.45	0.36	-0.10	0.33
Cross-Level Effects				
Reciprocal learning X Scene 2 high-capacity practice			2.26†	0.66
	Var	SD	Var	SD
Intercept	0.86◊	0.93	1.03◊	1.02
σ^2	4.84		4.79	
Deviance	918.63		902.49	
Number of parameters	2		2	
-2*log likelihood	-4.69 E+002		-4.51 E+002	
Unconditional model τ(σ^2)	1.42 (4.85)		1.13 (5.21)	

Note. All models are the final, reduced model with level-1 and level-2 characteristics included. β = coefficient estimate; SE = standard error; * = $p < .10$; † = $p < .001$; ‡ = $p < .05$; CMS = Centers for Medicare & Medicaid Services; ◊ = $p < .01$; Var = variance component; SD = standard deviation; σ^2 = residual variance component; degrees of freedom for intercepts = 60; unconditional model τ (σ^2) = fully unconditional model between and within variance components for intraclass correlation calculations and comparison with final models.

belief, on average, that the vignette showed current practice. Rather, all levels of practice were recognized as being related to current practice. The exception to this finding was the cross-level effect of reciprocal learning with the falls vignette scene 2 on rating. Specifically, RNs reporting higher levels of reciprocal learning, rated the version of scene 2 that shows high-capacity for care as more like practice in their nursing home relative to the version of scene 2 showing low-capacity for care ($p < .001$). Of the additional organizational contextual factors entered into the model, profit status, bed size, and CMS quality rating did not relate to rating. RN staffing levels, however, did relate to RN vignette rating of current practice.

Perceptions of Preferred Practice

Results of the multilevel models of the extent to which video vignettes portrayed preferred practice are summarized in Table 2. Unconditional models to estimate ICC indicated significant variance between vignettes and not between nursing homes, in sharp contrast to the RN ratings of actual practice. The null hypothesis was accepted for the test of randomly varying intercepts in the model for pain vignettes and falls vignettes. Therefore, only fixed effects of level-1 predictors with robust standard errors were estimated of the effects of vignette dimensions of practice on outcomes. Table 2 summarizes the descriptive means across practice levels by scene. High-capacity practice was preferred, on average, for each of the four pain vignette scenes relative to low-capacity practice, and two of the four falls vignette scenes. Further, mixed-

RN Vignette Ratings of Preferred Practice by Scene for High-, Mixed-, and Low-Capacity Practice

	Pain			
Capacity	Scene 1	Scene 2	Scene 3	Scene 4
High capacity	6.90 (3.45)◊	6.27 (3.68)◊	7.48 (3.35)‡	8.23 (2.70)◊
Mixed capacity	5.60 (3.35)	6.74 (3.40)◊	4.88 (3.36)	5.91 (3.58)◊
Low capacity (reference category)	5.61 (3.90)	5.30 (3.64)	4.30 (3.37)	4.49 (3.42)
	Falls			
Capacity	Scene 1	Scene 2	Scene 3	Scene 4
High capacity	6.11 (2.77)	6.63 (2.39)†	7.19 (2.67)	6.59 (2.63)†
Mixed capacity	6.73 (2.17)	6.10 (2.56)	6.46 (2.39)	6.34 (2.61)
Low capacity (reference category)	6.43 (2.40)	6.46 (2.52)	6.09 (2.46)	6.27 (2.12)

Note. All ratings are presented as mean (standard deviation); ratings range from 0, "not at all desirable," to 10, "very desirable"; $N = 223$ pain vignettes; $N = 221$ falls vignettes; fixed effects with robust standard errors were estimated in fully specified Pain and Falls models: ◊ = $p < .01$; ‡ = $p < .05$; † = $p < .001$; reference categories for model comparisons is "low capacity."

capacity practice was preferred in two of the four pain vignette scenes relative to low-capacity practice.

Discussion

RNs in this study identified the full range of practice patterns occurring in current practice in relation to pain in short-stay patients and falls in long-stay residents. The organizational environment related to whether RNs identified certain practice patterns. Specifically, the cross-level effect of reciprocal learning with high-capacity practice suggests that RNs in nursing homes with higher levels of reciprocal learning may more readily recognize their homes as characterized by high-capacity nursing practice. This effect occurred for the vignette on the long-stay resident who falls. The finding is consistent with previous literature on learning organizations for nursing home care quality (Colón-Emeric et al., 2013) as well as with our conceptual framework of how strong RN–LPN connections and RN–LPN differentiation create the cognitive diversity and quality of interactions needed for effective learning and problem solving regarding care (Corazzini et al., 2015).

The greatest limitation of this study is the nonstatistically representative sample of participants, which significantly limits the generalizability of the findings and the ability to test for between-state sources of variance (e.g., between-state differences in LPN scope) in perceptions; of the 26 states represented, 35% of facilities were from one state. Only the sampling strategy of partnering with a regional corporate provider to disseminate the survey internally achieved an acceptable, facility-level response rate (40%). Importantly, the corporation configured secured access to the online videos to allow participants access from work-based computers. Thus, while RN participants could have chosen to access the survey using their mobile devices or personal computers, it is probable that the majority of long-term care nurses recruited through the additional recruitment strategies did not have work-based external Internet access, creating a significant barrier to participation that the DVD-and-paper option did not solve.

The novel video vignette survey methodology developed by the research team captured important practice variability as evidenced by the range of RN responses endorsing low-, mixed-, and high-capacity practice as reflecting practice in their homes. Moreover, during usability testing, nurses liked the realism of videos, even noting a willingness to view additional videos, if added. However, the Internet access barrier is an important consideration for future researchers targeting this population.

Despite this important limitation, the distribution of profit-status and summary quality of care rating was comparable to the distribution of these characteristics in the United States (Boccuti et al., 2015). This supports drawing upon findings as a first step in addressing the gap in empirical knowledge of RN perceptions of nursing practice, whereby RNs identified high-capacity practice as preferred for both pain management in short-stay patients and falls management in long-stay residents. Regardless of whether an RN was currently employed in a nursing home with low-, mixed-, or high-capacity practice, he or she identified strong RN–LPN connections and differentiation between RN and LPN contributions to assessment, care planning, delegation, and supervision as the goals for accomplishing care related to pain and falls. This finding suggests that even in homes where RNs are not able to effectively collaborate with LPNs, high-capacity practice-focused interventions are likely to be met with RN support because of this perceived relative advantage. Next steps analyses should explore congruence of these findings with LPN perceptions as well as explore RN factors that may affect these perceptions, such as current position in the facility.

Conclusions and Future Directions

Licensed nursing staff in nursing homes require new tools and strategies to more effectively collaborate for care. Our findings provide preliminary, encouraging findings of how RNs positively perceive high-capacity nursing practice, supporting next-steps intervention development. As the majority of respondents were RNs in administrative positions, our findings suggest potential administrative support for strategies that facilitate practice change at the point of care (e.g., developing supportive practice environments; Flynn, Liang, Dickson, & Aiken, 2010).

Furthermore, nursing practice regulation efforts that target differentiating RN and LPN practice, and clarifying the distinct contributions of each, fully align with study findings. In the context of ongoing, limited RN staffing presence (AHCA, 2015), whereby few RNs will continue to partner with many LPNs and nursing assistants, new approaches are needed to encourage and support RNs to "practice to scope" (Institute of Medicine, 2011), thereby allowing RNs to use their full clinical expertise to shape how nursing care occurs on the front lines of long-term care.

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