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Long-term Care Training and Provider Regulations for Optimal Resident Outcomes

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Background

- Certified Nursing Assistants (CNAs) are the frontline care workers for 2 million US nursing home residents (Health in Aging, 2016)
- CNA training requires minimum 75 hours (including 16 clinical) to work in Nursing Homes (NHs)
- Many believe more initial training is required (Sengupta et al., 2010; OIG, 2002)

Background

- CNAs in states with more training hours had lower turnover, higher job satisfaction (Han, et.al., 2014: Choi & Johantgen 2012)
- Higher training hours associated with improved resident care outcomes (Trinkoff, et.al., 2017; Smith, Kerse, Parsons, 2005)
- Many states have increased training requirements beyond the minimum (PHI, 2014)

Research Problem

Though increases in training hours found to benefit outcomes, evidence is lacking on the:

Optimal number of training hours (total, clinical, clinical vs didactic) required to achieve higher quality of care outcomes.

Purpose

To estimate how many training hours are needed for optimal nursing home outcomes.

- How many total hours?
- How many clinical hours?
- How best to divide total hours between clinical and didactic?

Methods

- Sample & Design:
  - 15,300 Medicare & Medicaid NHs, 50 US states + DC
  - Exclusions: 1,695 NH, missing outcomes data
  - Final Sample: 13,608 NHs
  - Cross-sectional, 2014
- Data Sources

  -State-level CNA Training Hour Requirements
    - PHI, 2014 website; State contacts for missing info

  - NH outcomes: NH Quality Indicators (QIs)
  - NH Compare data, 4th quarter 2014, CMS.gov

Measures: Independent Variable

CNA Training Hours:

-Total: hours required for initial CNA certification

-Clinical: minimum clinical hours required

-Clinical to didactic ratio: clinical divided by didactic hours

Source: State-level CNA training regulations

Measures: NH Outcomes

NH QIs (Nursing/CNA sensitive):

- Activities of Daily Living (ADLs): increased need for assistance with late-loss activity (bed mobility, transfer, eating, toileting) since previous assessment
- Falls with injury: 1 or more falls leading to major injury in target period or "look back" of 1 year
- Pain: almost constant or frequent moderate-severe pain, or any extremely severe pain, past 5 days

Source: Nursing Home compare, CMS, 2014

Measures: NH Control Variables

- We also included NH factors that could serve as potential confounders:
  - Ownership: for-profit, gov't, not-for-profit
  - Facility size: number of beds
  - Case Mix: expected staffing

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Sample data: Training hours

Total hours: range 75-180, avg 100 total hrs
Clinical hours: range 16-100, avg 40 hrs

1/3 NHs in states w minimum training hrs
19 states: had minimum for clinical or total hrs

Ratio: Didactic > clinical, 36 states (75% NHs)
Clinical > didactic, 15 states (25% NHs)

TABLE 1

Proportion of Residents Having Problems With Activities of Daily Living, Falls With Injuries, or Pain by Required Number of CNA Training Hours[a]

	Activities of Daily Living		Falls With Injuries		Pain	
Training Hours	Median (MAD)	p^b	Median (MAD)	p^b	Median (MAD)	p^b
Total		<.001		<.001		<.001
Federal minimum (75 hours)	15.15 (1.66)		3.20 (0.62)		7.09 (1.61)	
More than federal minimum	14.68 (3.08)		2.65 (1.01)		5.75 (2.59)	
Clinical		<.001		<.001		<.001
Federal minimum (16 hours)	15.00 (1.63)		3.15 (0.60)		7.25 (1.59)	
More than federal minimum	14.72 (3.10)		2.67 (1.03)		5.73 (0.00)	

Note. CNA = certified nursing assistant. MAD = median absolute deviation.

[a] Data from 2014, quarter 4 (CMS, 2016a).

[b] *p* values determined using the Wilcoxon signed rank sum test.

Analysis: Optimal training hours

Models:

- Multivariate polynomial regression with generalized estimating equations (GEE)
- Squared and cubic terms: test non-linear rel. of training to QIs, as std-ized (z-score) training hours
- Three models: total; clinical: clinical-didactic ratio

Variables:

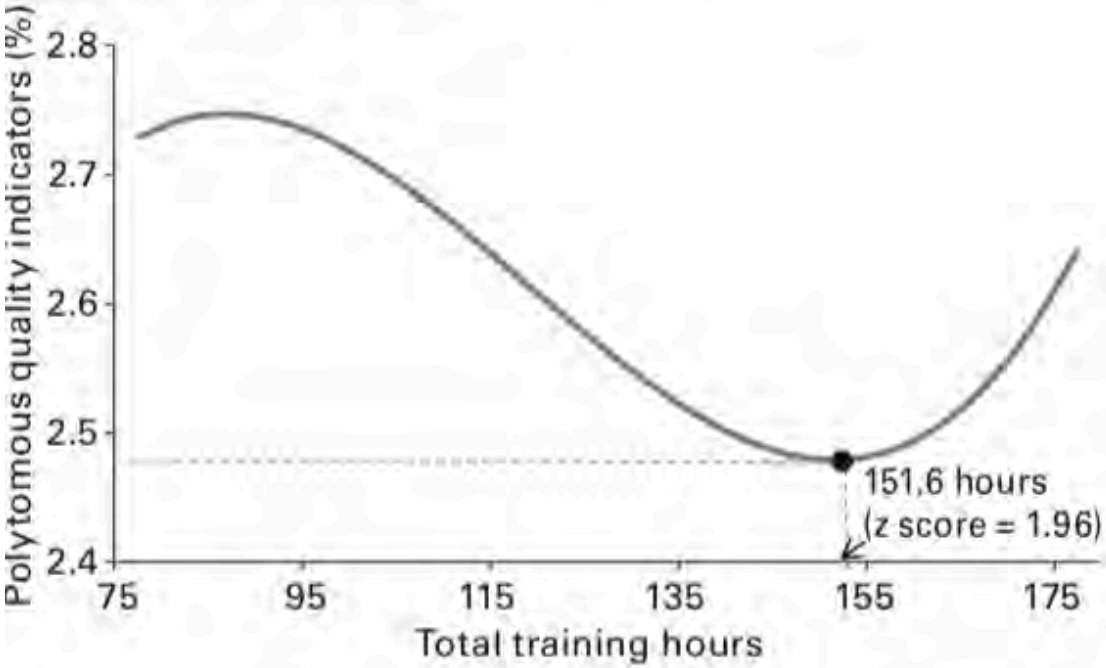
- QIs entered simultaneously as polytomous outcomes: ADLs, falls, pain
- Models adjusted for size, ownership, case mix

Analysis: Optimal Training Hours

- Optimal training hour graphs: lower QIs reflect better quality.
  - Minimum point: lowest QI score= highest quality.
  - Maximum point: highest QI score= lowest quality.
  - Optimal point: where lowest QI meets training hours

FIGURE 1

Graph of Analytic Model (Cubic Function) for the Polynomial Relationship Between Total Training Hours and Polytomous Quality Indicators



Note. The black point indicates the optimal total training hour threshold where quality indicators reached the lowest score (the best resident outcomes).

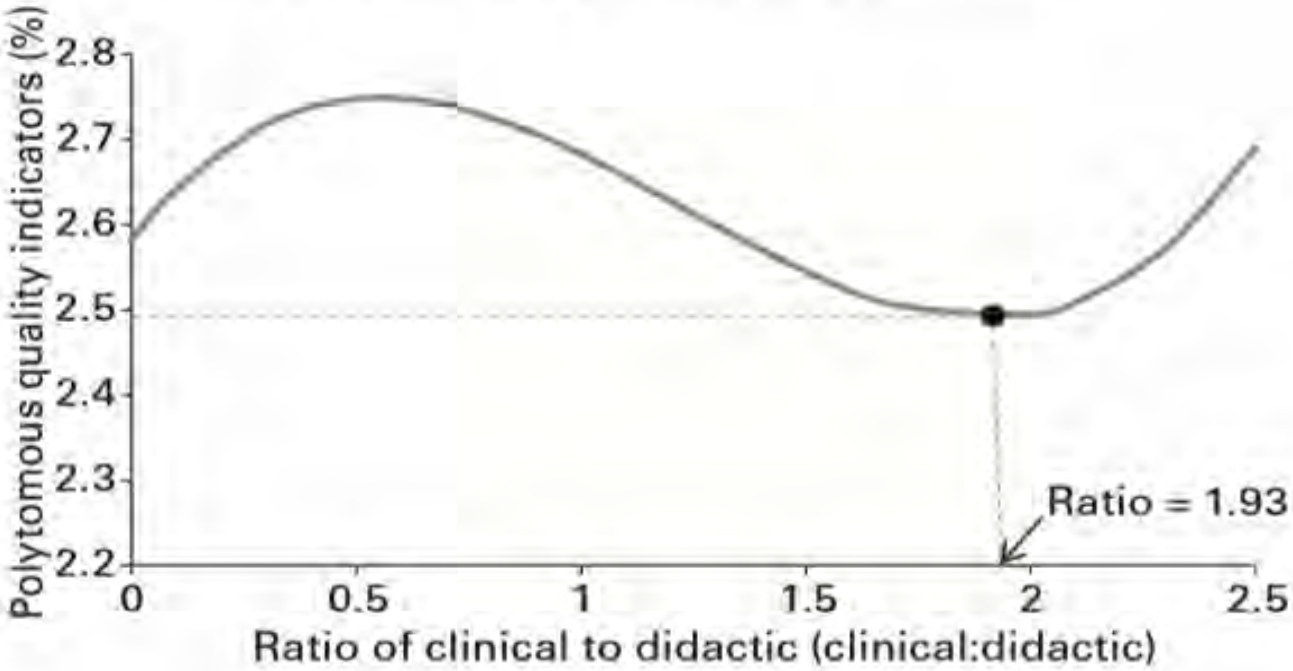
FIGURE 2

Graph of Analytic Model (Cubic Function) for the Polynomial Relationship Between Clinical Training Hours and Polytomous Quality Indicators

Note. The black point indicates the clinical training hour threshold where nursing home quality indicators started decreasing on a consistent basis (the point where the clinical training makes a steady improvement in nursing home resident care quality).

FIGURE 3

Graph of Analytic Model (Cubic Function) for the Polynomial Relationship Between Ratio of Clinical-to-Didactic Hours and Polytomous Quality Indicators



Note. The black point indicates that the optimal threshold of ratio of clinical to didactic training hours where nursing home quality indicators reached the lowest score (best resident outcomes).

Results

Optimal hour estimates:

- Total training hours=151.6 hours
- Clinical training hours=69.2 hours
- Clinical to didactic ratio=1.93

- Optimal training:
- 151.6 total hours with 69.2 clinical hours, ratio of 1.93
  - Didactic 51.6; clinical hours 100= 151.6 total hours

Discussion

- This study estimated that 4 weeks of training (2-2.5 weeks clinical) yielded the best outcomes, based on ADLs, falls, and pain as QIs.
- These training hours are higher than US average levels, but still below Canada and Western Europe (Fujisawa and Colombo, 2009)
  - Spain: 11 weeks, heavy clinical focus
  - Denmark: 16-22 months with 2/3 clinical
  - Netherlands: 2-3 years

Discussion

- Changes in training regulations since 2010:
  - More states have increased total hours
  - No states with prior increases have reduced hours
- Most still below optimal level
- Optimal ratio of clinical to didactic supports

  Benner's (1982) clinical competence theory-practice with skill development and acquisition promotes competence

Source for tables/graphs:

Determining the CNA Training-Hour Requirement for Quality Care in U.S. Nursing Homes

Trinkoff et al., Journal of Nursing Regulation, 2017

References Cited

Choi, J., Johantgen, M., 2012. The importance of supervision in retention of certified nursing assistants. Res. Nurs. Health 35 (April (2)) 187–199.

Fujisawa, R., & Colombo, F. (2009). *The long-term care workforce: Overview and strategies to adapt supply to a growing demand* (OECD Health Working Paper No. 44). Paris, France: OECD Publishing.

Han, K., Trinkoff, A. M., Storr, C. L., Lerner, N., Johantgen, M., & Gartrell K. (2014). Associations between state regulations, training length, perceived quality and job satisfaction among certified nursing assistants: Cross-sectional secondary data analysis. *International Journal of Nursing Studies, 51*(8), 1135–1141. doi:10.1016/j.ijnurstu.2013.12.008

Health in Aging. (2016). *Nursing homes: Basic facts & information.* Retrieved from http://www.healthinaging.org/aging-and-health-ato-z/topic:nursing-homes/

Hernandez-Medina, E., Eaton, S., Hurd, D., & White, A. (2006). Training programs for certified nursing assistants. Washington, DC American Association of Retired Persons

Menne, H. L., Ejaz, F. K., Noelker, L. S., & Jones, J. A. (2007). Direct care workers' recommendations for training and continuing education.*Gerontology & Geriatrics Education, 28*(2), 91–108.

Paraprofessional Healthcare Institute. (2014). *Nurse aide training requirements,October 2014.* Retrieved from http://phinational.org/sites/phinational.org/files/research-report/nurse-aide-training-requirements-2014.pdf

Sengupta, M., Harris-Kojetin, L. D., & Ejaz. F. K. (2010). A national overview of the training received by certified nursing assistants working in U.S. nursing homes. *Gerontology and Geriatratics Education, 31*(3), 201 –219. doi:10.1080/02701960.2010.503122

Smith, B., Kerse, N., & Parsons, M. (2005). Quality of residential care for older people: Does education for healthcare assistants make a difference? New Zealand Medical Journal, 118, U1437. Retrieved from http://www.nzma.org.nz/ journal/118–1214/1437/.

Trinkoff, A. M., Storr, C. L., Lerner, N. B., Yang, B. K., & Han, K (2016). CNA training requirements and resident care outcomes in nursing homes. *The Gerontologist.* Retrieved from https://doi-org. proxy-hs.researchport.umd.edu/10.1093/geront/gnw049

Trinkoff, A. M., Johantgen, M. E., Lerner, N. B., Storr, C. L., Han, K., & McElroy, K. (2013). State regulatory oversight of

Thank you