Supplemental Documents

Appendix A: Use of the Health Equity Implementation Framework to Inform Study Design

Appendix B: Case Vignette

Appendix A: Application of the Health Equity Implementation Framework to Inform Study Design

<table>
<tr><th>Framework Domains</th><th>Nursing Home Policies and Emerging Evidence</th><th>Study Design Strategies</th></tr>
<tr><td colspan="3">Societal Influences</td></tr>
<tr><td>Sociopolitical Forces</td><td>US National Medicare policies:
• established minimum nursing home care quality standards for any nursing homes receiving Centers for Medicare & Medicaid Services (CMS) funding.
• mandate minimum nursing home dementia training requirements are completed as specified in CMS Conditions of Participation (CoP)[1]
• Completion of standardized patient assessment for all long-term are residents at regular intervals as specified in the Medicare Benefit Manual.[2]</td><td>Facility-level inclusion criteria:
• Include nursing homes at all levels of quality.
• Track quality over time
Intervention implementation considerations to ensure alignment with nursing home staff current workflow and national provide regulations:
• Training in both arms must meet minimum training requirements specified by CMS CoP
• We leveraged the requirement of a common language in patient assessments with the MDS 3.0 as specified in the Medicare Benefit Manual.</td></tr>
<tr><td>Physical Structures</td><td>In the United States there are disparities in access to high quality nursing homes among historically underrepresented populations of older adults with dementias (e.g., Black, African American, Hispanic older adults, rural underserved older adults) resulting in higher likelihood of admission to a low-quality nursing home. [3,4]</td><td>Facility-level inclusion:
• Recruit nursing homes across the United States (e.g., regions [e.g., West, South, Northeast], rural, urban locations).
• Seek heterogeneity of resident demographics across nursing homes (e.g., differences in resident demographics).
• Recruit nursing homes across the five CMS quality ranking categories to include low, moderate, and high-quality nursing homes.
Data collection considerations:
• Track makeup of resident population over time
• Track quality ratings over time</td></tr>
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Framework Domains	Nursing Home Policies and Emerging Evidence	Study Design Strategies
Economics	There are inequities in finances and insurance coverage for nursing home residents in the United States as it relates to access to care. For example, dual eligible older adults are more likely to be admitted to lower quality nursing homes.[5,6]	Resident-level inclusion: • Included all residents with dementia, regardless of payment coverage (e.g., private pay, Medicaid) • Collected data on type of insurance.
Contextual Influence		
Regional Determinants	There is variation in state-level regulatory requirements for dementia training that exceeds the CMS minimum standards.[7-9]	Facility-level exclusion: • Nursing homes located in states that required more than six hours of dementia-specific training for staff each year, which is above the CMS minimum training requirements.
	There is state-level variation in nursing home regulations, such differences in state regulations allowing or prohibiting signage in the building and residents' rooms to serve as visual prompts for staff about residents' abilities and needs.	Identified potential regional determinants that may limit intervention implementation and strategies to overcome barriers to implementation: • Identified multiple intervention approaches to address changes to signage location to align with state-level regulations
Organization - physical environment	The physical environment and resources of nursing homes varies across US. • Nursing homes differ with respect to presence of a special care unit or locked dementia unit.[10]	Facility eligibility: • Included nursing homes with locked dementia care units and facilities without designated units. • Excluded nursing homes that had designated dementia care units with specialized training for staff beyond the CMS COP requirements.[1]

Framework Domains	Nursing Home Policies and Emerging Evidence	Study Design Strategies
	• The average US nursing home in the US is 40—50 years old, thus the physical structures had to be considered in the context of implementing the interventions (e.g., wooden vs. metal doorways).[11]	Identified potential physical environment barriers, which may limit intervention implementation in each nursing home, such as: • Develop alternative strategies to compensate for differences in the doorframe material (e.g., wood, metal doorways) at the entrance to each resident's room. For example, the placement of colored magnets on the metal doorframe of the resident's room required alternative strategies for nursing homes that had wooden doorframes. • Identify alternative locations to place intervention reference materials (e.g., posters, pocket reference collaterals) in nursing homes that do not have an unit nurse office or a medication room by leveraging other storage options on the unit, to promote staff access to collaterals. o Pocket reference materials were attached to the medical carts for staff access. o Multiple versions of reference posters were created to summarize intervention strategies to accommodate for (a) posting in public spaces where residents names could not be posted and (b) private staff only spaces (e.g., medication room) where resident staging and strategies could be documented on a poster. • Provided mobile/portable storage for stage specific activity kits for nursing homes that do not have a dining room or large gathering space to host and store group activities equipment, which requires bring activities to individual resident's rooms.

Framework Domains	Nursing Home Policies and Emerging Evidence	Study Design Strategies
	• Utilization of electronic health records in nursing homes varies across the US.[12]	As more nursing homes transition to electronic health records, the implementation of the interventions needed to take into account nursing homes that continue to rely on paper-based documentation and those that were fully paperless when considering team communication and need for integration of visual prompts into the staff workflow. • Paper-based nursing homes were provided with stage specific stickers that could be added to daily resident-specific staff documents, such as certified nursing assistant daily assignment sheets, resident charts, and medication and treatment administration records. • Paper-less facilities were provided alternative strategies for placing visual cues of a resident's cognitive stage, such as placing stage specific sticker on a resident's ambulatory device (e.g., wheelchair, walker), on bedframe, and/or dining room place card.
Organization – staff	Healthcare leadership and organizational culture are associated with high quality integrated care delivery.[13,14]	To capture information about the organizational culture and nursing home leadership, we collected data on: • Facility culture • Leadership engagement • Staffing levels Identified potential barriers to communicating with nursing home administration based on leadership and organizational culture, which may limit intervention implementation: • Tailoring communication to preferred mode of nursing home administration (e.g., phone call, email) • Adjusting time of day of interactions with nursing home administration based on organizational culture and leadership style.

Framework Domains	Nursing Home Policies and Emerging Evidence	Study Design Strategies
		To ensure staff participation in training: • Sessions were scheduled based on individual nursing home need determined by the organizational culture, leadership, and schedule.
Clinical Encounter		

Resident, family caregivers, nursing home staff	Nursing home staff include a wide array of job roles, such as registered nurses and dining room staff all of which have a role in patient care. The collective nursing home staff reflect:[9,15,16]
	• the wide range of educational experience (e.g., graduate, professional degrees, high school diploma or general education development [GED])
	• diversity of health literacy
	• diversity in primary language spoken
	
	Communication between and among nursing home staff, families, and residents is essential for delivering high quality patient-centered care.[17] To address health literacy, content should be developed for a sixth grade (or lower) reading level.[18,19]
		Intervention delivery:
		• Training content and intervention collaterals were designed to address health literacy barriers to promote accessibility across nursing home staff and family caregivers.
		Data recruitment and collection:
		• Recruitment materials and qualitative interview guides were tailored to a 5th grade reading level.
		• Collected data on:
		  ○ Demographics of staff and residents
		  ○ Experiences of family caregivers and staff
		  ○ Language discordance among staff in trainer survey

Characteristics of the innovation	Past evidence has documented challenges to providing dementia care to include gaps in communication and inconsistent care delivery.[20,21]	Interventions designed to: • Examine best approach to staff dementia training. • Promote interdisciplinary communication. • Use existing evidence-based assessments. • Provide collaterals to reinforce training.

Framework Domains	Nursing Home Policies and Emerging Evidence	Study Design Strategies
		Data collection strategies included: • Leveraging mandated clinical documentation to track resident-level care delivery. • Collecting facility-level fidelity of interventions

References supporting Appendix B.

1. Centers for Medicare & Medicaid Services (CMS). Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities (Final Rule). In: Health and Human Services (HHS), ed. Vol 81: Federal Register; 2016:185.
2. Centers for Medicare & Medicaid Services (CMS). Medicare Benefit Policy Manual. In. https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals
3. Rivera-Hernandez M, Kumar A, Epstein-Lubow G, Thomas KS. Disparities in Nursing Home Use and Quality Among African American, Hispanic, and White Medicare Residents With Alzheimer's Disease and Related Dementias. *J Aging Health.* 2019;31(7):1259-1277.
4. Rahman M, White EM, Thomas KS, Jutkowitz E. Assessment of Rural-Urban Differences in Health Care Use and Survival Among Medicare Beneficiaries With Alzheimer Disease and Related Dementia. *JAMA Network Open.* 2020;3(10):e2022111-e2022111.
5. Rahman M, Grabowski DC, Gozalo PL, Thomas KS, Mor V. Are dual eligibles admitted to poorer quality skilled nursing facilities? *Health Serv Res.* 2014;49(3):798-817.
6. Mor V, Zinn J, Angelelli J, Teno J, Miller SC. Driven to tiers: socioeconomic and racial disparities in the quality of nursing home care. *The Milbank Quarterly.* 2004;82(2):227-256.
7. Justice in Aging. Dementia training requirements state by state. 2022.
8. Shier V, Bae-Shaaw Y, Lekovitch C, Chew F, Leland N, Sood N. The Impact of State Dementia Training Requirements for Nursing Homes on Resident Outcomes. *Innov Aging.* 2021;5(Supplement_1):547-548.
9. Han K, Trinkoff AM, Storr CL, Lerner N, Johantgen M, Gartrell K. Associations between state regulations, training length, perceived quality and job satisfaction among certified nursing assistants: Cross-sectional secondary data analysis. *Int J Nurs Stud.* 2014.
10. Park-Lee E, Sengupta, M., Harris-Kojetin, L.D. . Dementia special care units in residential care communities: United States, 2010. . In: Statistics NCfH, ed. Hyattsville, MD2013.
11. American Health Care Association. Transforming Nursing Homes: Modernizing Physical Structures. In:2021:https://www.ahcancal.org/News-and-Communications/Press-Releases/Pages/Transforming-Nursing-Homes-Modernizing-Physical-Structures.aspx.
12. Bjarnadottir RI, Herzig CTA, Travers JL, Castle NG, Stone PW. Implementation of Electronic Health Records in US Nursing Homes. *Computers, informatics, nursing : CIN.* 2017;35(8):417-424.
13. Sfantou DF, Laliotis A, Patelarou AE, Sifaki-Pistolla D, Matalliotakis M, Patelarou E. Importance of Leadership Style towards Quality of Care Measures in Healthcare Settings: A Systematic Review. *Healthcare (Basel).* 2017;5(4).

14. van Beek AP, Gerritsen DL. The relationship between organizational culture of nursing staff and quality of care for residents with dementia: questionnaire surveys and systematic observations in nursing homes. *Int J Nurs Stud.* 2010;47(10):1274-1282.

15. Paul & Perkins PA. Types of nursing home employees. https://nursinghomeabuseguide.com/resources/types-of-nursing-home-employees/. Published 2023. Accessed.

16. Squires A. Strategies for overcoming language barriers in healthcare. *Nursing management.* 2018;49(4):20-27.

17. Farrell TW, Butler JM, Towsley GL, et al. Communication Disparities between Nursing Home Team Members. *International journal of environmental research and public health.* 2022;19(10).

18. Safeer RS, Keenan J. Health literacy: the gap between physicians and patients. *Am Fam Physician.* 2005;72(3):463-468.

19. Centers for Disease Control and Prevention, Division of Communication Services, Office of the Associate Director for Communication. (2009). Simply Put: A guide for creating easy-to-understand materials In: U.S. Department of Health & Human Services, ed. Atlanta, Georgia.

20. Kang Y, Hur Y. Nurses' Experience of Nursing Workload-Related Issues during Caring Patients with Dementia: A Qualitative Meta-Synthesis. *International journal of environmental research and public health.* 2021;18(19).

21. Jakobsen R, Sørlie V. Ethical challenges: Trust and leadership in dementia care. *Nurs Ethics.* 2016;23(6):636-645.