



# Nursing Home Characteristics and Resident Quality of Care Outcomes: A Scoping Review of Recent Empirical Research

RESEARCH

ROBERTO J. MILLAR

CHRISTIN DIEHL

ELIZABETH BLAKE

OLUDOLAPO FAKEYE

NANCY KUSMAUL

\*Author affiliations can be found in the back matter of this article



## ABSTRACT

**Context:** Despite extensive research linking facility characteristics to resident outcomes, the facility and resident factors under investigation vary in the context of a diverse industry landscape, emphasis on varied quality of care outcomes, and growing availability of empirical data sources.

**Objectives:** This scoping review focused on identifying key concepts, summarising existing findings, and identifying gaps in recent research linking broadly defined nursing facility and resident outcomes indicators.

**Methods:** Guided by PRISMA-ScR guidelines, this scoping review focused on empirical, English-language research published in five databases between 2005 and 2022. The research studies meeting specified inclusion criteria were subjected to thematic analysis for the extraction of key concepts and synthesis of findings.

**Findings:** The 91 research studies in the final analytic sample conceptualised facility-level characteristics and resident outcomes using six and nine broad domains, respectively. The subcategories making up these discrete domains varied widely across studies. While evidence of linkages between facility environments and resident outcomes varied, there was general support that higher staffing capacity and home-like environments with support for autonomy and social integration were linked to better functional outcomes and higher overall subjective well-being of residents.

**Implications:** It is imperative to understand how facility-level characteristics influence resident outcomes, and this scoping review provides insight into these complex relationships. A better understanding of this area is key to improving policies and regulatory oversight, as well as more broadly inform data-driven decision-making.

## CORRESPONDING AUTHOR:

**Roberto J. Millar, MA, PhD**

Policy Analyst Advanced, The Hilltop Institute at the University of Maryland, Baltimore County, Sondheim Hall, Third Floor, 1000 Hilltop Circle, Baltimore, MD 21250, USA

[rmillar@hilltop.umbc.edu](mailto:rmillar@hilltop.umbc.edu)

## KEYWORDS:

nursing homes; nursing facilities; long-term care; quality of care; resident outcomes; quality of life

## TO CITE THIS ARTICLE:

Millar, RJ, Diehl, C, Blake, E, Fakeye, O and Kusmaul, N. 2024. Nursing Home Characteristics and Resident Quality of Care Outcomes: A Scoping Review of Recent Empirical Research. *Journal of Long-Term Care*, (2024), pp. 171–186. DOI: <https://doi.org/10.31389/jltc.235>

## BACKGROUND

Nursing homes, or nursing facilities, are integral parts of the long-term care continuum and provide a setting where older adults and persons with disabilities receive essential services and supports. Underlying health conditions and compromised functional statuses make nursing facility residents highly dependent on their environments and the supports they receive (Lawton & Nahemow, 1973). Accordingly, a body of research explores how facility characteristics influence resident outcomes, including quality of life (QoL) and other indicators of health and wellbeing (e.g., Arling et al., 2007; Clemens et al., 2022; Schweighart et al., 2022). The facility characteristics and resident outcomes under investigation, however, vary substantially across studies given the diverse industry landscape and lack of consensus on key outcomes in long-term care.

### PRIOR RESEARCH ON NURSING FACILITY CHARACTERISTICS AND RESIDENT OUTCOMES

Introduced in 1966 by Avedis Donabedian, the structure, process, and outcome model is a leading framework in measuring healthcare quality (Donabedian, 1966, reprinted 2005). According to this model, structural characteristics of the healthcare setting (e.g., physical, organizational), and processes involved in the delivery of care (e.g., services) directly influence outcomes for care recipients (e.g., health status). Until the mid-1980s, few studies had applied this model to nursing facility care or focused on resident outcomes. Yet, a landmark 1986 report by the United States (US) National Academy of Sciences Institute of Medicine Committee on Nursing Home Regulations raised concerns about the quality of care in the country's nursing facilities and outlined strategies for improvement (Hawes & Phillips, 1986). The following year, the US federal government implemented stricter regulatory oversight through the Nursing Home Reform Act (NHRA), which set out guidelines to optimize the quality of care provided to nursing facility residents. Changes included the adoption of a standardized minimum data set (MDS) assessment of nursing facility residents, highlighting an increasing focus on resident outcomes.

Recognizing the complexity of care provided in nursing facilities, researchers further developed Donabedian's framework to emphasize the multidimensional aspects involved in the care of nursing facility residents (e.g., Glass, 1991; Kane et al., 1983; Rantz et al., 1999). These models went beyond a clinical view of care to include social aspects of facilities and resident care, including social engagement, home-like environments, and quality of life. In the United States, research teams led by Kane and colleagues, and other scholars were instrumental in developing quality assessments of nursing facilities while emphasizing residents as the focal point. Importantly, this research delineated differences and raised questions about two related but distinct concepts: quality of care (QoC) and

quality of life (QoL) (Kane, 2001; Kane et al., 2005; Schnelle, 2003). While QoC is specific to the processes involved in care delivery, QoL broadly focuses on the well-being of the resident (Kane, 2003). The growing attention to QoC in nursing facilities and to residents' QoL supported efforts to engage residents in the assessments of care quality.

The scope of this research has since benefited from an increasing number of data sources available in the last two decades. In efforts to promote transparency in care, there has been an increase in publicly accessible data on nursing facility performance on key metrics. In 1998, the Centers for Medicare & Medicaid Services (CMS), the primary payer of nursing facility care in the US, launched Nursing Home Compare (NHC), a web tool containing facility-level ratings in health inspections and staffing levels (CMS, 2016). In 2003, the tool was expanded to include resident outcomes drawn from the MDS assessment data, followed by continuous updates aimed at increasing transparency and consumer involvement. Similar efforts have been undertaken in Australia with the National Aged Care Mandatory Quality Indicator Program launched in 2019, and the Continuing Care Reporting System database launched in Canada in 2003. Together, these and similar efforts have resulted in a growth in the empirical scholarship examining care outcomes of residents. Yet, discourse about what constitutes QoC and how to measure it persists (Castle & Ferguson, 2010). The purpose of this review is therefore to synthesize recent empirical research linking facility characteristics to resident outcomes while maintaining a broad lens on the facility and resident-level outcomes under investigation.

The primary facility-level characteristic studied is staffing, including staff satisfaction, hours per resident per day (HPRPD), skill mix and staff accreditation, areas theorised to influence QoC and resulting resident outcomes (Plaku-Alakbarova, Punnett & Gore, 2018; Zhang et al., 2022). Other research examines, with various degrees of support, the relationships between resident outcomes and payer ratio or payer mix (e.g., privately vs. publicly funded), physical and social environments, facility size, occupancy, and location (Lee et al., 2021; Winblad, Blomqvist & Karlsson, 2017; You et al., 2016). Similarly, resident outcomes of focus vary across the research. This research draws from frameworks that view QoC in nursing facilities as multidimensional and can be observable or measurable in a number of ways (Donabedian, 2005; Gerritsen et al., 2004; Rantz et al., 1999). Care quality can be perceived differently across stakeholders such as residents, families, regulators, payers (such as CMS in the US) staff, and the larger public, all of whom may have different definitions and priorities (Kusmaul & Tucker, 2020). While some research and policy focus on clinical resident outcomes (e.g., falls, hospitalisations) as indicators of care quality, others emphasise residents' and family members' reported satisfaction as key to understanding QoC (Lee et al., 2021; Schweighart et al., 2022). As a result, efforts to

understand and improve care quality in nursing facilities are segmented and limited in scope.

### CONTRIBUTION OF THE CURRENT REVIEW

A better understanding of the linkages between modifiable facility characteristics and resident-driven outcomes is imperative to support data-driven decision-making, improve policies and regulatory oversight, identify gaps in research, and support value-based initiatives that encourage the optimisation of care environments. Existing reviews provide a narrow focus on the relationship between facility-level indicators and resident outcomes by focusing on specific predictors (e.g., facility staffing) and outcomes (e.g., clinical markers) (Armijo-Olivo et al., 2020; Easton et al., 2017; Lorini et al., 2018). For instance, a review by Xu and colleagues (2013) examined the effect of facility characteristics on residents' quality of life, measured as regulatory deficiencies in care or self-reported via a questionnaire. Similarly, Armijo-Olivo and colleagues' (2020) review focused on staff time and its relationship with care quality. There has not been, to our knowledge, a comprehensive review of empirical research encompassing a broad range of facility and resident indicators. The primary purpose of this scoping review is to map out evidence and identify knowledge gaps about how nursing facility characteristics are framed in empirical research as it relates to resident outcomes, as well as synthesise any evidence of their association. More specifically, this review addresses the following research questions:

1. How are nursing facility characteristics conceptualised?
2. How are resident outcomes conceptualised?
3. What are the key findings of the associations between nursing facility characteristics and resident outcomes?

### METHODOLOGY

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) guidelines to guide this scoping review (Tricco et al., 2018). The study protocol was registered with the Open Science Framework (OSF) and can be accessed online (Millar et al., 2023).

Following the identification of primary research questions, the research team developed specific eligibility criteria around sources of evidence. To be included in this review, sources had to be empirical research attempting to link nursing facility-level characteristics to resident outcomes, be published in a peer-reviewed journal between 2005 and 2022 and be written in English. This start date was chosen after a preliminary search showed a proliferation of empirical research on nursing facility quality and resident outcomes following this date. Furthermore, this timeframe is consistent with the growth in publicly available data

on nursing facilities and greater general interest among stakeholders in the quality of care provided to residents. Facility characteristics were intentionally left undefined to capture any facility-level descriptor (e.g., staffing, structural, physical, social environments) included in the research, while resident outcomes included self-reported outcomes and those where resident care was inferred and reported in the aggregate (e.g., hospitalisations, falls, resident preference, care deficiency citations). Additionally, we included quantitative, qualitative, and mixed methods manuscripts to capture a wider research landscape.

With the assistance of a subject-matter librarian, we identified a list of key descriptors indexed in the National Library of Medicine's Medical Subject Headings (MeSH) and developed the following Boolean search string: ('nursing facilit\*' OR 'nursing home\*' OR 'residential care' OR 'long-term care facilit\*') AND ('quality of care' OR 'care quality' OR 'quality of service\*') AND ('resident outcome\*' OR 'quality of life' OR 'resident care'). These broad terms were selected to capture a comprehensive body of research spanning a multitude of domains of investigation, both at the facility and resident level. We applied those search terms to identify articles published between January 1, 2005, and December 31, 2022, and indexed in the CINAHL, Medline, PsycINFO, Health Source Plus, and Web of Science bibliographic databases. Databases were selected with the intent of covering research spanning a wide range of relevant disciplines. We combined results from our search in EndNote and removed duplicates before beginning the title and abstract screening. Sources were randomly divided, and title and abstract screenings were conducted in dyads by the first author (RM) and a second reviewer (CD, EB, and OF) following an a priori list of inclusion and exclusion criteria (Table 1). An audit trail was maintained as a fifth author (NK) independently selected ten articles from each dyad pairing for additional review. Disagreements in screening were resolved by discussion, until consensus was reached.

Following the title and abstract screening process, two reviewers (RM and EB) began the full-text review and data charting process using a previously developed form framed around the research questions (see Supplementary File 1). The charting form was piloted and iteratively revised until a consensus was reached. Each reviewer charted data independently, and then a subset of 10 sources was randomly selected for additional review by a third reviewer (CD) to ensure the systematic and consistent extraction of relevant data items. We extracted the following data points for each source: author(s) and year of publication; country of the study; research design; research objectives; key facility-level predictors; key resident-level outcomes; key findings; and data sources. Once charted, we used thematic analysis to identify categories and subcategories that represented each of our primary research questions, categorising concepts related to facility characteristics, resident outcomes, key findings, and data sources for each record.

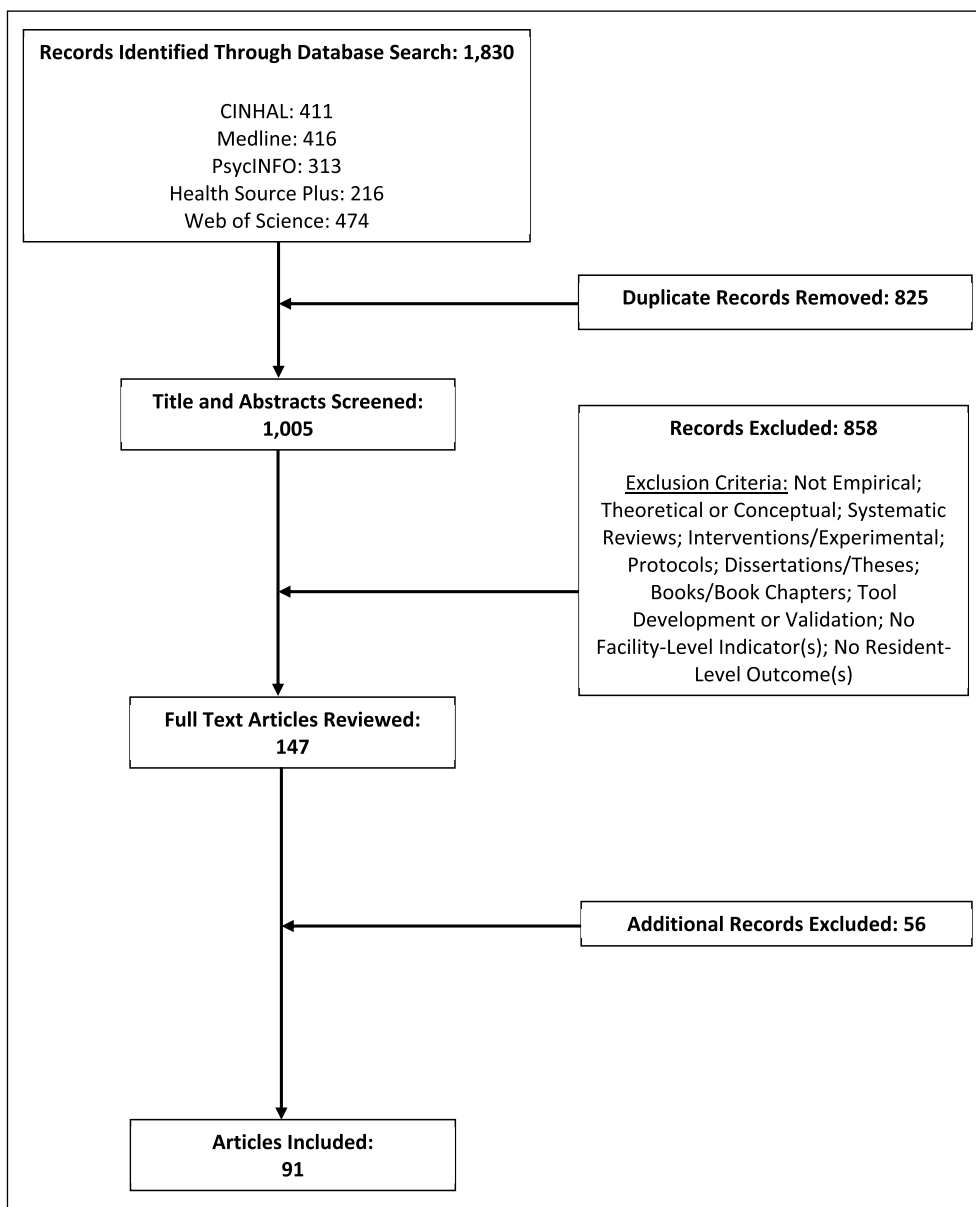
INCLUSION	EXCLUSION
<ul style="list-style-type: none"> <li>Published in English</li> <li>Published between 2005 and 2022</li> <li>Published in peer-reviewed source</li> <li>Empirical</li> <li>Nonexperimental</li> <li>Key predictor/antecedent variable(s) focused on long-term care facility attribute(s)</li> <li>Outcome variable(s) focused on resident-level attribute(s) or outcome(s)</li> </ul>	<ul style="list-style-type: none"> <li>Not empirical (e.g., theoretical, conceptual, review, opinion, policy documents)</li> <li>Systematic reviews</li> <li>Interventions/experimental</li> <li>Dissertations/theses</li> <li>Tool development or validation</li> <li>Key predictor/antecedent variable(s) not focused on long-term care facility attribute(s)</li> <li>Outcome variable(s) not focused on resident-level attribute(s) or outcome(s)</li> </ul>

**Table 1** Inclusion and exclusion criteria.

## RESULTS

We identified 1,830 records in our initial search (see Figure 1). Of those records, 825 were duplicates, leaving 1,005 for title and abstract screening. We then excluded 858

records not meeting our established criteria (see Table 1), leaving 147 publications for full-text review. The full-text review resulted in an additional 56 exclusions, resulting in 91 articles for in-depth analysis and data extraction (see Supplementary File 1).



**Figure 1** PRISMA flow diagram of articles identified from the search, screened, reviewed, and selected for inclusion.

**DESCRIPTION OF THE ANALYTIC SAMPLE**

Of the 91 research articles included in our analytic sample, 18 were published between 2005 and 2010, 26 between 2011 and 2015, and 47 between 2016 and 2022. Forty-six studies were published in the United States, nine in Canada, eight in Norway, six in Australia, five in South Korea, four in the United Kingdom (UK), and the remaining 13 in European, Asian, or South Pacific countries. Sixty-nine studies are quantitative, 16 qualitative, and six mixed methods.

**NURSING FACILITY CHARACTERISTICS AND RESIDENT OUTCOMES**

In our thematic analysis of the 91 empirical research studies, we identified six unique categories related to facility characteristics and nine categories related to resident outcomes (Table 2). Within each category, we further identified subcategories related to the conceptualisation of these facility and resident indicators. While a majority of studies focused on a single category or domain, a number examined facility and/or resident indicators across more than one category.

**Nursing facility characteristics**

The six sub-categories of nursing facility characteristics identified in this analysis include staffing (*n* = 44), physical environment (*n* = 13), industry environment (*n* = 22), social environment (*n* = 3), resident characteristics (*n* = 7), and care environment (*n* = 24). Studies that examined facilities in terms of staffing environment did so primarily as HPRPD, capacity, staffing ratio, skill mix, autonomy on the job, training, and retention/turnover (e.g., Hurtado et al., 2016; Jin et al., 2018; Kennedy, 2022; Kim et al., 2014; Konetzka, Stearns & Park, 2008; Shin, 2019; Yuan et al., 2019; Zhang, Li & Temkin-Greener, 2013). Studies with a focus on facility physical environment characteristics examined facility size, availability of home-like environments (e.g., photos and personal items), access to outdoor spaces, and urban/rural location (e.g., Keays, Wister & Gutman, 2009; Leung, Chan & Olomolaiye, 2013;

Moyo et al., 2020; Nordin et al., 2017; Van Malderen et al., 2016; Vossius et al., 2019). The studies that focused on the industry environment did so in terms of ownership type (for profit vs. not for profit), chain affiliation, staff unionization, payer ratio (private vs. public), regulatory deficiencies, occupancy, accreditation, and years in business (e.g., Brauner et al., 2018; Campbell et al., 2016; Castle et al., 2011; Troyer & Sause, 2011; Wagner, McDonald & Castle, 2012). Facility social environment attributes included access to recreational activities and opportunities for personally meaningful socialization (Leung et al., 2013; Nordin et al., 2017; Van Malderen et al., 2016). Resident characteristics studied in the context of facility-level indicators included the racial/ethnic census of the facility, the presence of residents who were military veterans, and the facility-level acuity of the resident population (e.g., Campbell et al., 2016; Havig et al., 2011; Johnson et al., 2007; Shippee et al., 2022; Shippee, Ng & Bowblis, 2020). Finally, care environments were conceptualised primarily in terms of attributes identified by residents as critical to care and well-being, presence of a dementia care unit, staff-resident relationships, shared decision-making, consistent staff assignment, and use of technology (e.g., Alexander et al., 2015, Anderson & Blair, 2021; Bergland & Kirkevold, 2006; Caspar, Brassolotto & Cooke, 2021; Jaye et al., 2016).

**Resident outcomes**

The nine sub-categories of resident outcomes identified in this analysis include adverse events (*n* = 31), function (*n* = 14), clinical interventions (*n* = 17), hours of care (*n* = 3), care perceptions (*n* = 44), clinical markers (*n* = 9), mental health (*n* = 13), medication management (*n* = 11), and regulatory outcomes (*n* = 18). The adverse events examined in this research consisted of deaths, falls, hospitalisations/emergency department (ED) visits, pressure injuries, pneumonia, urinary tract infections (UTIs), dehydration, and malnutrition (Alexander et al., 2015; Antwi & Bowblis, 2018; Livingstone, Hefele & Leland, 2022; McGarry et al., 2019; Wan, Zhang & Unruh, 2006; Yang et al., 2021).

CATEGORY	SUB-CATEGORIES	REFERENCES
<b>Nursing Facility Characteristics</b>		
Staffing environment	HPRPD, capacity, skill mix, autonomy on the job, training, retention/turnover	Aloisio et al., 2021; Anderson & Blair, 2020; Antwi & Bowblis, 2018; Arling et al., 2007; Barsanti et al., 2021; Boscart et al., 2018; Bowblis & Roberts, 2020; Castle & Lin, 2010; Castle et al., 2011; Castle, 2011; Cho et al., 2020; Cole, 2017; Dyck, 2007; Gucer et al., 2013; Havig et al., 2011; Hurtado et al., 2016; Jin et al., 2018; Kennedy, 2022; Kim et al., 2009; Konetzka et al., 2008; Lerner et al., 2014; Li et al., 2019; Livingstone et al., 2019; Livingstone et al., 2022; McKinney et al., 2016; Moyo et al., 2020; Pekkarinen et al., 2008; Sandsdalen et al., 2017; Shin & Hyun, 2015; Shin et al., 2021; Shin, 2018; Shin, 2019; Stevenson, 2006; Temkin-Greener et al., 2010; Thomas et al., 2012; Trinkoff et al., 2013; Trinkoff et al., 2017; Vossius et al., 2019; Wan et al., 2006; Wellard et al., 2013; Williams et al., 2016; Yang et al., 2021; Yuan et al., 2019; Zhang et al., 2013
Physical environment	Size, home-like environment (e.g., private rooms), outdoor spaces, urban/rural	Holt et al., 2021; Jin et al., 2018; Keays et al., 2009; Leung et al., 2013; Moyo et al., 2020; Nordin et al., 2017; Palm et al., 2019; Shippee et al., 2015; Shippee et al., 2020; Temkin-Greener et al., 2012; Troyer & Sause, 2011; Van Malderen et al., 2016; Vossius et al., 2019

CATEGORY	SUB-CATEGORIES	REFERENCES
Industry environment	Ownership type, chain affiliation, staff unionization, payer ratio, regulatory deficiencies, occupancy, accreditation, years in business	Brauner et al., 2018; Campbell et al., 2016; Castle et al., 2011; Decker, 2008; Friedman et al., 2019; Jin et al., 2018; Keays et al., 2009; Kim et al., 2014; Liu et al., 2014; McGregor et al., 2006; Moyo et al., 2020; Netten et al., 2012; Shippee et al., 2015; Stevenson, 2006; Towers et al., 2019; Troyer & Sause, 2011; Wagner et al., 2012; Wan et al., 2006; Williams et al., 2016; Yong et al., 2021; Zhang et al., 2013
Social environment	Recreational activities, socialization	Leung et al., 2013; Nordin et al., 2017; Van Malderen et al., 2016
Resident characteristics	Racial/ethnic census, veteran census, resident acuity	Campbell et al., 2016; Havig, et al., 2011; Johnson et al., 2007; McGarry et al., 2019; Shippee et al., 2015; Shippee et al., 2022; Shippee et al., 2020
Care environment	Care contributors as identified by residents, dementia care unit; staff-resident relationships, shared decision-making, consistent staff assignment, and use of technology	Alexander et al., 2015, Anderson & Blair, 2021; Bergland & Kirkevold, 2006; Caspar et al., 2021, Castle, 2011, Cooney at al., 2009; Cranley et al., 2020; Drageset, et al., 2017; Forbes-Thompson & Gessert, 2005; Gucer et al., 2013; Hall et al., 2014; Haugan, Hanssen & Moksnes, 2013; Haugan, Innstrand & Moksnes, 2013; Jaye et al., 2016; Joyce et al., 2018; McKinley & Adler, 2005; Milne, 2011; Milte et al., 2016; Milte et al., 2017; Murphy et al., 2007; Nakrem, 2015; Palm et al., 2019; Thompson et al., 2021; Van Hoof et al., 2016, Willemse et al., 2015
<b>Resident Outcomes</b>		
Adverse events	Death, falls, hospitalizations/ ED visits, pressure injuries, pneumonia, UTI, dehydration, malnutrition	Alexander et al., 2015; Antwi & Bowblis, 2018; Barsanti et al., 2021; Boscart et al., 2018; Brauner et al., 2018; Cho et al., 2020; Cole, 2017; Dyck, 2007; Friedman et al., 2019; Gucer et al., 2013; Hurtado et al., 2016; Johnson et al., 2007; Joyce et al., 2018; Konetzka et al., 2008; Livingstone., 2019; Livingstone et al., 2022; McGarry et al., 2019; McGregor et al., 2006; Moyo et al., 2020; Pekkarinen et al., 2008; Shin & Hyun, 2015; Shin et al., 2021; Shin, 2019; Temkin-Greener et al., 2012; Thomas et al., 2012; Trinkoff et al., 2013; Trinkoff et al., 2015; Trinkoff et al., 2017; Wan et al., 2006; Yong et al., 2021
Function	ADL/IADL, range of motion, physical activity, incontinence, cognitive performance	Aloisio et al., 2021; Arling et al., 2007; Boscart et al., 2018; Cho, et al., 2020; Hurtado et al., 2016; Shin, 2019; Jin et al., 2018; Liu et al., 2014; Livingstone et al., 2019; Shin & Hyun, 2015; Shin et al., 2021; Trinkoff et al., 2017; Vossius et al., 2019
Clinical interventions	Restraint use, indwelling catheter, tube feeding	Aloisio et al., 2021; Antwi & Bowblis, 2018; Arling et al., 2007; Boscart et al., 2018; Decker, 2008; Gucer et al., 2013; Johnson et al., 2007; Joyce et al., 2018; McGarry et al., 2019; Moyo et al., 2020; Shin & Hyun, 2015; Shin et al., 2021; Shin, 2019; Thomas et al., 2012; Trinkoff et al., 2013; Trinkoff et al., 2015; Wan et al., 2006
Hours of care	Hours of care	Decker et al., 2008; Vossius et al., 2019; Yong et al., 2021
Care perceptions	Autonomy, complaints, pain, QoL ratings, QoC ratings, self-rated health, feeling at home	Aloisio et al., 2021; Anderson & Blair, 2020; Anderson & Blair, 2021; Antwi & Bowblis, 2018; Barsanti et al., 2021; Bergland & Kirkevold, 2006; Boscart et al., 2018; Caspar et al., 2021; Cooney et al., 2009; Cranley et al., 2020; Drageset, et al., 2017; Forbes-Thompson & Gessert, 2005; Hall et al., 2014; Haugan, Hanssen & Moksnes, 2013; Havig et al., 2011; Jaye et al., 2016; Kennedy, 2022; Kim et al., 2014; Leung et al., 2013; Liu et al., 2014; McGregor et al., 2006; McKinley & Adler, 2005; Milne, 2011; Milte et al., 2016; Milte et al., 2017; Murphy et al., 2007; Nakrem, 2015; Netten et al., 2012; Nordin et al., 2017; Sandsdalen et al., 2017; Shippee et al., 2015; Shippee et al., 2022; Shippee et al., 2020; Stevenson, 2006; Temkin-Greener et al., 2012; Thompson et al., 2021; Towers et al., 2019; Trinkoff et al., 2015; Trinkoff et al., 2017; Troyer & Sause, 2011; Van Hoof et al., 2016; Van Malderen et al., 2016; Williams et al., 2016; Yong et al., 2021
Clinical markers	Delirium, obesity, weight loss, diabetes monitoring, blood pressure monitoring, fluid intake, food intake	Aloisio et al., 2021; Anderson & Blair, 2020; Boscart et al., 2018; Dyck, 2007; Hurtado et al., 2016; Shin, 2019; Towers et al., 2019; Wellard et al., 2013; Zhang et al., 2013
Mental health	Depression, anxiety, mood, disruptive behaviour	Aloisio et al., 2021; Anderson & Blair, 2020; Arling et al., 2007; Boscart et al., 2018; Haugan et al., 2013; Holt et al., 2021; Lerner et al., 2014; Palm et al., 2019; Shin, 2019; Shin & Hyun, 2015; Shin et al., 2021; Willemse et al., 2015; Yuan et al., 2019
Medication management	Unnecessary use of antipsychotics, antidepressant use, medication errors	Aloisio et al., 2021; Barsanti et al., 2021; Boscart et al., 2018; Brauner et al., 2018; Gucer et al., 2013; Joyce et al., 2018; Pekkarinen et al., 2008; Shin et al., 2015; Shin et al., 2021; Shin, 2019; Yong et al., 2021
Regulatory outcomes	Regulatory deficiencies, fines, facility rating	Antwi & Bowblis, 2018; Bowblis & Roberts, 2020; Campbell et al., 2016; Castle & Lin, 2010; Castle et al., 2011; Castle, 2011; Cho et al., 2020; Johnson et al., 2007; Keays et al., 2009; Kim et al., 2009; Lerner et al., 2014; Li et al., 2019; Livingstone et al., 2019; Livingstone et al., 2022; McKinney et al, 2016; Shin, 2018; Temkin-Greener et al., 2010; Wagner et al., 2012

**Table 2** Nursing facility characteristics and resident outcomes by category and subcategory.

ADL, activities of daily living; ED, emergency department; HPRPD, hours per resident day; IADL, instrumental activities of daily living; QoC, quality of care; QoL, quality of life; UTI, urinary tract infection.

The examination of functional outcomes focused on activities of daily living (ADL) and instrumental activities of daily living (IADL), range of motion, physical activity, incontinence, and cognitive performance (e.g., Cho et al., 2020; Hurtado et al., 2016; Trinkoff et al., 2017; Vossius et al., 2019). Clinical intervention outcomes captured the use of restraints, indwelling catheters, and feeding tubes (e.g., Moyo et al., 2020; Shin & Hyun, 2015; Shin et al., 2021; Thomas et al., 2012), while a number of studies focused on hours of care as an outcome (Decker, 2008; Vossius et al., 2019; Yong et al., 2021).

Studies that examined care perceptions as resident outcomes did so by focusing on resident autonomy, complaints, pain, QoC or quality of life (QoL) ratings, self-rated health, and feelings of belonging (Havig et al., 2011; Jaye et al., 2016; Kennedy, 2022; Kim et al., 2014; Shippee et al., 2020; Stevenson, 2006). Those studies that measured clinical markers focused on delirium, obesity, weight loss, diabetes, blood pressure, and fluid intake (e.g., Aloisio et al., 2021; Anderson & Blair, 2020; Boscart et al., 2018; Dyck, 2007). Mental health outcomes examined in this research included depression, anxiety, mood, and disruptive behaviours (Aloisio et al., 2021; Palm et al., 2019; Shin & Hyun, 2015). Finally, medication management was primarily conceptualised as unnecessary use of antipsychotics, antidepressant use, and medication errors (e.g., Brauner et al., 2018; Shin et al., 2021; Yong et al., 2021) while regulatory outcomes focused on regulatory deficiencies (e.g., fines related to resident care) and facility ratings (e.g., star rating on resident-level measures from CMS) (Antwi & Bowblis, 2018; Bowblis & Roberts, 2020; Johnson et al., 2007; Keays et al., 2009).

## EVIDENCE OF ASSOCIATION BETWEEN FACILITY CHARACTERISTICS AND RESIDENT OUTCOMES

### Staffing environment

Higher staffing capacity, skill mix, and hours of care were consistently linked to better resident outcomes. For instance, a higher number of registered nurses (RNs) was associated with a decrease in the odds of resident deaths and fewer regulatory citations (Cho et al., 2020; Konetzka et al., 2008) while also significantly decreasing the likelihood of pressure injuries, UTIs, hospitalisations, and ED visits (Yang et al., 2021). Facilities with high nurse staffing levels had less use of restraints, catheters, and pressure injuries (Wan et al., 2006) while higher total nursing staffing and RN levels were related to fewer total deficiencies, QoC deficiencies, and serious deficiencies (Kim et al., 2009). Higher HPRPD by an RN was linked to fewer falls and a decrease in use of tube feeding, numbers of residents with deteriorated range of motion, use of antipsychotics, and aggressive behaviours (Boscart et al., 2018; Shin & Hyun, 2015; Shin et al., 2021). Similarly, facilities with at least three daily hours of nursing assistant (NA) care were associated with a lower likelihood of resident weight loss

(Dyck, 2007), while higher rates of RNs and fewer NAs were linked to less aggressive behaviours, depression, weight loss, and bed rest (Shin, 2018). An increase in certified occupational therapist (OT) and physical therapist (PT) HPRPD was associated with improved ADL capacity, fewer falls, and higher five-star quality ratings (Livingstone et al., 2019; Livingstone et al., 2022). Residents in facilities with higher numbers of physicians reported higher QoC (Sandsdalen et al., 2017). Low staffing levels combined with high Medicaid occupancy (indicating lower reimbursement) were linked to more deficiency citations for safety violations (Castle et al., 2011). Increasing staffing skill mix reduced the incidence of UTIs (Konetzka et al., 2008), while the presence of a nurse practitioner (NP) reduced ED visits and hospitalisations (Cole, 2017).

Staff training, autonomy on the job, and retention were also staffing factors linked to resident outcomes. Higher certified nursing assistant (CNA) training hours were associated with less ADL decline, falls, and pain (Arling et al., 2007; Trinkoff et al., 2017). Psychological (e.g., memory training, staff involvement) and participation-related factors (e.g., opportunities for engagement) were positively related to QoL (Van Malderen et al., 2016). Facilities led by nursing home administrators (NHAs) with master's degree or higher certifications, or a director of nursing (DON) with a bachelor's degree, had residents with less pain, (Trinkoff et al., 2015). Care staff's ability to set their own schedule was associated with fewer pressure injuries in residents (Hurtado et al., 2016). A higher proportion of health care aides reporting to an RN was linked to fewer behavioural symptoms (Aloisio et al., 2021). Perceived time pressure by nursing staff increased the prevalence of quality problems, while perceived unfair management was related to increased medication use (Pekkarinen et al., 2008). DON intention to quit was linked to an increased likelihood of both resident care and facility-related deficiencies (McKinney et al., 2016). Staff's favourable perception of a positive safety culture was linked to fewer health care deficiencies, fewer substantiated complaints, and higher odds of being designated four or five stars in CMS' quality rating system (Li et al., 2019).

Rates of turnover for a variety of staff were associated with several resident outcomes. For example, higher RN and NA turnover was linked to dehydration, bed rest, and use of antipsychotics (Shin & Hyun, 2015); higher rates of pain, pressure injuries, physical restraint use, fewer falls, tube feeding, and incontinence (Castle & Lin, 2010), and an increase in number of total deficiencies and mortality (Antwi & Bowblis, 2018), respectively. High licenced nurse turnover was significantly associated with more QoC deficiencies (Lerner et al., 2014), while NA retention was only weakly associated with care experience, with some evidence of retention not being uniformly beneficial (Kennedy, 2022). Administrative staff turnover was linked to higher rates of depression, dehydration, poor range of motion, and use of antidepressants or sleeping pills (Shin,

2019). Finally, high CNA turnover was linked to higher odds of pressure injuries, pain, and UTIs in residents (Trinkoff et al., 2013).

### Physical environment

Residents exhibited the best outcomes in facilities with physical environments that were conducive to socialisation and resembled home-like settings. For instance, Bergland and Kirkevold (2006) found that residents consistently preferred facility physical environments that provided opportunities for socialisation, meaningful activities, ability to go outdoors, and had attractive, tidy, and private spaces. Home-like environments were linked to fewer responsive behaviours (e.g., wandering), while decluttered spaces were linked to more responsive behaviours (Holt et al., 2021). Smaller facilities were linked to fewer unmet standards (Keays et al., 2009), while poor space planning, noise, and excessive signage were correlated with disruptive behaviours and functional decline (Leung et al., 2013). Residents in facilities with less occupancy had better mental and physical self-rated health, and private facilities had residents with improved mental health compared to residents in public facilities (Liu, Weng & Wu, 2014). Residents in metropolitan facilities with more private rooms were less likely to experience functional deterioration (Jin et al., 2018). Conversely, residents in facilities in smaller towns and in isolated rural areas had worse end-of-life quality for in-hospital death and hospice (Temkin-Greener, Zheng & Mukamel, 2012).

### Industry environment

Studies generally showed that residents in for-profit facilities had poorer outcomes than those in not-for-profit facilities. For-profit ownership was linked to a higher likelihood of neglect, pneumonia, anaemia, and dehydration (Friedman et al., 2019; McGregor et al., 2006). Lower hospitalisation rates in not-for-profit nursing facilities with five-star CMS quality ratings were not linked to QoL (Kim et al., 2014). The relationship between quality rating and patient safety was weak and inconsistent (Brauner et al., 2018). Residents in for-profit facilities and those with greater use of antipsychotics and restraints had a higher risk of hospitalizations (Moyo et al., 2020). Restraint use increased among for-profit and not-for-profit facilities when the Medicaid census increased and Medicaid reimbursement decreased (Decker, 2008). Nursing facility five-star ratings were not linked to QoL outcomes in residents (Netten et al., 2012). Residents in the facilities with the following characteristics had lower QoL across one or more domains: high census; higher percent of Medicaid-insured residents; fewer activity staff HPRPD; fewer social workers; and more licenced practical nurse (LPN) HPRPD (Shippee et al., 2015). Complaints were higher for facilities that were for-profit, chain, higher occupancy, and relied primarily on Medicare and Medicaid as payers. Nursing home consumer complaints were linked to serious

deficiencies in compliance with regulatory standards (Stevenson, 2006). Residents in highly rated facilities had better social care QoL (Towers et al., 2019). Accreditation was associated with fewer deficiency citations at time of accreditation and over time of operation (Wagner et al., 2012). Facility star ratings were not always reflective of residents' satisfaction (Williams, Straker & Applebaum, 2016). Government-owned facilities perform better in a majority of measures, including less antipsychotic use, pressure injuries, and number of complaints (Yong et al., 2021). Star rating was inversely related to more severe depressive symptoms and not related to a new onset of depression (Yuan et al., 2019). Finally, higher prevalence of obesity among residents increased the likelihood of higher staffing and QoL deficiencies (Zhang et al., 2013).

### Social environment

Few studies focused explicitly on the facility social environment. In those that did, residents overwhelmingly reported a preference for the following: home-like environments and personal surroundings (e.g., privacy), feeling safe and secure, socialising and friendships, and access to competent and compassionate staff to meet their personal needs (Jaye et al., 2016; Milne, 2011; Nakrem, 2015). Another key trend centred around autonomy with access to meaningful daily activities and relationships with peers (Jaye et al., 2016; Milne, 2011; Nakrem, 2015).

### Resident characteristics

The nursing facility environment was sometimes conceptualised in terms of the resident population. For instance, facilities with a larger concentration of racial/ethnic minority residents received a higher number of deficiencies, while a higher Medicaid per diem payment was linked to small increases in deficiencies (Campbell et al., 2016). Facilities with any veterans were more likely to have residents with feeding tubes, catheters, mobility restraints, citations for new pressure sores, and total deficiencies (Johnson et al., 2007). Facilities with a high concentration of mentally ill residents were also found to have higher use of feeding tubes, catheters, and hospitalisations (McGarry et al., 2019). Racial/ethnic minority residents reported lower QoL than White residents in high-minority facilities (Shippee et al., 2022). Having a higher proportion of Medicare residents was associated with higher complaint levels (Troyer & Sause, 2011). Finally, racial/ethnic minority residents had significantly lower adjusted QoL than White residents, whether they were in low- or high-minority facilities (Shippee et al., 2020).

### Care environment

Low use of communication technology in care was linked to more discussion of pressure injury risk assessment among RNs, LPNs, and CNAs (Alexander et al., 2015). Higher resident-reported QoC provided by staff was linked to reduction in pain, depression, and low QoL ratings, as



well as an increase in fluid intake over time (Anderson & Blair, 2020). Residents preferred care characterised as empathetic; with open communication; with a mixture of permanent and rotating shifts along with consistent assignment; supported personhood, privacy and respect; prioritised meaningful and recreational activities and therapies; and increased meal assistance (Anderson & Blair, 2021; Caspar et al., 2021; Hall, Dodd & Higginson, 2014; Milte et al., 2016). Additionally, residents reported a preference for choice and freedom to choose a diet, continuity in mealtimes from community, autonomy and independence, personal identity, and home-like environments (Milde et al., 2017; Murphy, O'Shea & Cooney, 2007; Thompson et al., 2021; Van Hoof et al., 2016).

Resident QoL deficiency citations were significantly lower in facilities with the highest levels of consistent NA assignment (Castle, 2011). The largest quality improvements were linked to higher administrative RN and social services staffing hours (Bowblis & Roberts, 2020). Residents preferred engagement and the inclusion of personal support workers to promote shared decision-making, person-centred care, belonging and recognition, personally treasured activities, and spiritual closeness and connectedness (Cranley et al., 2020; Drageset, Haugan & Tranuag, 2017). Residents in facilities with a more person-centred and decentralised model of care reported higher satisfaction and better QoL (Forbes-Thompson & Gessert, 2005). Positive nurse-resident interactions were related to physical, emotional, and functional well-being, and also being negatively associated with depression but not with anxiety (Haugan, Hanssen & Moksnes, 2013; Haugan, Innstrand & Moksnes, 2013). Resident-reported QoL was related to more decision-making opportunities, activities, physical space, and interactions with other residents (McKinley & Adler, 2005). Special care units were linked to less use of inappropriate antipsychotics and physical restraints, pressure injuries, feeding tubes, and hospitalisations while the level of cognitive support in the facility environment explained a significant amount of the variance in residents' social well-being, but not the psychological well-being (Joyce et al., 2018; Nordin et al., 2017). Well-being increased most often after staff addressed residents' need for identity, attachment, and inclusion (Willemse et al., 2015). Finally, higher patient safety culture scores were linked to less use of restraints and resident falls (Thomas et al., 2012). Lift use was linked to more frequent falls but lower levels of pressure injuries and bed confinement, while compliance with safe lifting policies was linked to fewer falls (Gucer et al., 2013).

## DISCUSSION

To our knowledge, this is the first comprehensive review to examine empirical research encompassing a broad range of facility and resident indicators. Previous

reviews have primarily focused on a single domain or indicator, while this review was inclusive of research studies spanning across all existing domains related to facility and resident outcomes. This scoping review highlights the growing body of empirical research linking nursing facility characteristics to resident outcomes. In particular, our review shows that a vast majority of this research originates in the United States, uses a quantitative approach, and focuses on staffing-related factors and their association with predominantly clinical indicators of resident care. Evidence from this body of research suggests that facilities with higher nursing and rehabilitative staffing capacity, a greater skill mix and more hours of care per resident are linked to fewer adverse outcomes such as pressure injuries, UTIs, and hospitalisations. These findings hold true in both cross-sectional (e.g., Cho et al., 2020; Konetzka et al., 2008; Livingstone et al., 2022) and longitudinal (e.g., Anderson & Blair, 2020; Castle et al., 2011) research studies. Higher staff educational attainment and training, autonomy on the job, and lower rates of turnover were also linked to fewer adverse outcomes, as well as higher resident QoL and QoC ratings, and fewer regulatory deficiencies (Antwi & Bowblis, 2018; Hurtado et al., 2016; Van Malderen et al., 2016).

Beyond indicators of the staffing environment, the care and industry environments received the most attention in this area. Studies focused on the care environment were more likely to be mixed methods or qualitative in nature and rely on residents' views of care and their interactions with staff (Cranley et al., 2020; Drageset, et al., 2017; Forbes-Thompson & Gessert, 2005). Residents consistently preferred care environments that support person-centred care and promote autonomy, personhood, privacy, and respect (Caspar et al., 2021; Hall et al., 2014; Milte et al., 2016). Pertaining to the industry environment, a vast majority of research studies focused on facility ownership and regulatory ratings and deficiencies, with an overwhelming majority of these studies finding better resident outcomes in not-for-profit facilities and those with fewer regulatory deficiencies (Decker, 2008; McGregor et al., 2006). Fewer studies identified in this review focused on physical and social environmental factors or residential characteristics. The few that did so found support for improved QoL and QoC indicators in smaller facilities with emphasis on home-like environments and opportunities for socialisation (Bergland & Kirkevold, 2006; Holt et al., 2021; Jaye et al., 2016). These select findings highlight the need for further investigation into physical and social environment attributes as they relate to resident care outcomes.

Our findings support existing frameworks of nursing facility quality of care by emphasizing the complex and multidimensional aspects of facility characteristics and how they influence resident outcomes (Glass, 1991; Kane et al., 1983; Rantz et al., 1998). Yet, we observe

a segmentation of the majority of empirical research studies, which largely focus on single and discrete facility or resident domains without considering the interplay among these factors. This likely reflects the methodological challenges in assessing the complex contexts in which care takes place and what is personally meaningful to nursing facility residents. To overcome these challenges, researchers should embrace mixed-methods study designs that leverage existing sources of data in combination with primary data collection. Moreover, research should go beyond mere associative relationships to focus on the modifiable aspects of the care environment and the mechanisms through which these factors influence residents' health and well-being. Using Donabedian's structure, process, and outcome framework, there is a need for the empirical assessment of mechanisms and pathways through which structural characteristics can promote or hinder processes of care and, ultimately, care resident outcomes. Though excluded from this review, non-traditional models of care (e.g., Green House) can provide opportunities for these assessments.

## CONCLUSION

This scoping review demonstrates the continued recognition that characteristics of the long-term care environment are important contributors to resident outcomes. Yet, our findings confirm that this area of research continues to be largely segmented given the many potential predictors and outcomes thought to be at play, making the endeavour of synthesising these findings challenging. Based on our observations, there are significant gaps in this research that require the investigation of facility-level predictors of outcomes beyond the already recognised staffing and industry environment predictors. We advocate for a more comprehensive and systematic approach informed by existing or emerging theoretical frameworks, and the use of mixed methods research studies focused on modifiable aspects of the facility environment and mechanisms through which these factors influence key resident outcomes. A better understanding of the multidimensional aspects of the long-term care environment and the influence that these aspects exert on residents is imperative to support data-driven decision-making.

## ADDITIONAL FILE

The additional file for this article can be found as follows:

- **Supplementary File 1.** Charting characteristics of research included in the review. DOI: <https://doi.org/10.31389/jltc.235.s1>

## ACKNOWLEDGEMENTS

This research was supported by the Maryland Department of Health (MDH). The views expressed in this manuscript are those of the authors and not those of MDH. The authors would like to thank Cynthia Woodcock, Alice Middleton, Sanya Clark, Lars Mathiassen, and Katy Sullivan for their various contributions to this manuscript.


## COMPETING INTERESTS

The authors have no competing interests to declare.


## AUTHOR CONTRIBUTIONS


RJM conceptualized the research, and led efforts to design it, conduct analyses, interpret findings, and draft this manuscript. CD, EB, DF, and NK all contributed significantly to the analysis, interpretation of findings, and drafting of this manuscript.


## AUTHOR AFFILIATIONS

**Roberto J. Millar, MA, PhD**  [orcid.org/0000-0002-1047-6825](https://orcid.org/0000-0002-1047-6825)  
Policy Analyst Advanced, The Hilltop Institute at the University of Maryland, Baltimore County, Sondheim Hall, Third Floor, 1000 Hilltop Circle, Baltimore, MD 21250, USA

**Christin Diehl, MA**  
Director, Aging & Disability Studies, The Hilltop Institute at the University of Maryland, Baltimore County, Sondheim Hall, Third Floor, 1000 Hilltop Circle, Baltimore, MD 21250, USA

**Elizabeth Blake, MA**  [orcid.org/0009-0001-3625-2571](https://orcid.org/0009-0001-3625-2571)  
Senior Policy Specialist, The Hilltop Institute at the University of Maryland, Baltimore County, Sondheim Hall, Third Floor, 1000 Hilltop Circle, Baltimore, MD 21250, USA

**Oludolapo Fakeye, MA, PhD**  [orcid.org/0000-0001-8519-6708](https://orcid.org/0000-0001-8519-6708)  
Principal Policy Analyst, The Hilltop Institute at the University of Maryland, Baltimore County, Sondheim Hall, Third Floor, 1000 Hilltop Circle, Baltimore, MD 21250, USA

**Nancy Kusmaul, MSW, PhD**  [orcid.org/0000-0003-2278-8495](https://orcid.org/0000-0003-2278-8495)  
Associate Professor, School of Social Work, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250, USA

## REFERENCES

- Alexander, G, Steege, L, Pasupathy, K and Wise, K.** 2015. Case studies of IT sophistication in nursing homes: A mixed method approach to examine communication strategies about pressure ulcer prevention practices. *International Journal of Industrial Ergonomics*, 49: 156–166. DOI: <https://doi.org/10.1016/j.ergon.2012.12.002>

- Aloisio, L, Varin, M, Hoben, M, Baumbusch, J, Estabrooks, C, Cummings, G and Squires, J.** 2021. To whom health care aides report: Effect on nursing home resident outcomes. *International Journal of Older People Nursing*, 16(6). DOI: <https://doi.org/10.1111/opn.12406>
- Anderson, K and Blair, A.** 2020. Why we need to care about the care: A longitudinal study linking the quality of residential dementia care to residents' quality of life. *Archives of Gerontology and Geriatrics*, 91. DOI: <https://doi.org/10.1016/j.archger.2020.104226>
- Anderson, K and Blair, A.** 2021. What have staff got to do with it? Untangling complex relationships between residential aged care staff, the quality of care they provide, and the quality of life of people with dementia. *Archives of Gerontology and Geriatrics*, 94. DOI: <https://doi.org/10.1016/j.archger.2021.104378>
- Antwi, Y and Bowblis, J.** 2018. The impact of nurse turnover on quality of care and mortality in nursing homes: Evidence from the great recession. *American Journal of Health Economics*, 4(2): 131–163. DOI: [https://doi.org/10.1162/ajhe\\_a\\_00096](https://doi.org/10.1162/ajhe_a_00096)
- Arling, G, Kane, RL, Mueller, C, Bershadsky, J and Degenholtz, H.** 2007. Nursing effort and quality of care for nursing home residents. *The Gerontologist*, 47(5): 672–682. DOI: <https://doi.org/10.1093/geront/47.5.672>
- Armijo-Olivo, S, Craig, R, Corabian, P, Guo, B, Souris, S and Tjosvold, L.** 2020. Nursing staff time and care quality in long-term care facilities: A systematic review. *The Gerontologist*, 60(3): e200–e217. DOI: <https://doi.org/10.1093/geront/gnz053>
- Barsanti, B, Bunea, A and Colombini, G.** 2021. What counts in nursing homes' quality and efficiency? Results from data envelopment analysis in Italy. *Inquiry: A Journal of Medical Care Organization, Provision and Financing*, 58. DOI: <https://doi.org/10.1177/00469580211059730>
- Bergland, Å and Kirkevold, M.** 2006. Thriving in nursing homes in Norway: Contributing aspects described by residents. *International Journal of Nursing Studies*, 43(6): 681–691. DOI: <https://doi.org/10.1016/j.ijnurstu.2005.09.006>
- Boscart, V, Sidani, S, Poss, J, Davey, M, d'Avernas, J, Brown, P, et al.** 2018. The associations between staffing hours and quality of care indicators in long-term care. *BMC Health Services Research*, 18(750). DOI: <https://doi.org/10.1186/s12913-018-3552-5>
- Bowblis, J and Roberts, A.** 2020. Cost-effective adjustments to nursing home staffing to improve quality. *Medical Care Research and Review*, 77(3): 274–284. DOI: <https://doi.org/10.1177/1077558718778081>
- Brauner, D, Werner, R, Shippee, T, Cursio, J, Sharma, H and Konetzka, R.** 2018. Does nursing home compare reflect patient safety in nursing homes? *Health Affairs*, 37(11): 1770–1778. DOI: <https://doi.org/10.1377/hlthaff.2018.0721>
- Campbell, L, Cai, X, Gao, S and Li, Y.** 2016. Racial/ethnic disparities in nursing home quality of life deficiencies, 2001 to 2011. *Gerontology & Geriatric Medicine*, 2. DOI: <https://doi.org/10.1177/2333721416653561>
- Caspar, S, Brassolotto, J and Cooke, H.** 2021. Consistent assignment in long-term care homes: Avoiding the pitfalls to capitalize on the promises. *International Journal of Older People Nursing*, 16(1). DOI: <https://doi.org/10.1111/opn.12345>
- Castle, N.** 2011. The influence of consistent assignment on nursing home deficiency citations. *The Gerontologist*, 51(6): 750–760. DOI: <https://doi.org/10.1093/geront/gnr068>
- Castle, N and Lin, M.** 2010. Top management turnover and quality in nursing homes. *Health Care Management Review*, 35(2): 161–174. DOI: <https://doi.org/10.1097/HMR.0b013e3181c22bcb>
- Castle, N, Wagner, L, Ferguson, J and Handler, S.** 2011. Nursing home deficiency citations for safety. *Journal of Aging & Social Policy*, 23(1): 34–57. DOI: <https://doi.org/10.1080/08959420.2011.532011>
- Castle, NG and Ferguson, JC.** 2010. What is nursing home quality and how is it measured? *The Gerontologist*, 50(4), 426–442. DOI: <https://doi.org/10.1093/geront/gnq052>
- Centers for Medicare & Medicaid Services.** 2016. Five star changes to nursing home compare. <https://www.cms.gov/newsroom/fact-sheets/five-star-changes-nursing-home-compare>
- Cho, E, Kim, I, Lee, T, Kim, G, Lee, H and Min, D.** 2020. Effects of registered nurse staffing on quality of care and resident outcomes in nursing homes. *Geriatric Nursing*, 41(6): 685–691. DOI: <https://doi.org/10.1016/j.gerinurse.2020.04.001>
- Clemens, S, Aelick, K, Babineau, J, Bretzlaff, M, Edwards, C, Gibson, JL, et al.** 2022. Home- and community-level predictors of social connection in nursing home residents: A scoping review. *Health Sciences Research*, 5(743). DOI: <https://doi.org/10.1002/hsr2.743>
- Cole, M.** 2017. Case study: Realizing the value of nurse practitioners in long-term care. *Nursing Leadership*, 47(2): 39–44. DOI: <https://doi.org/10.12927/cjnl.2017.25450>
- Cooney, A, Murphy, K and O'Shea, E.** 2009. Resident perspectives of the determinants of quality of life in residential care in Ireland. *Journal of Advanced Nursing*, 65(5): 1029–1038. DOI: <https://doi.org/10.1111/j.1365-2648.2008.04960.x>
- Cranley, L, Slaughter, S, Caspar, S, Heisey, M, Huang, M, Killackey, T and McGilton, K.** 2020. Strategies to facilitate shared decision-making in long-term care. *International Journal of Older People Nursing*, 15(3). DOI: <https://doi.org/10.1111/opn.12314>
- Decker, F.** 2008. Nursing home performance in resident care in the United States: Is it only a matter of for-profit versus not-for-profit. *Health Economics, Policy, and Law*, 3(2): 115–140. DOI: <https://doi.org/10.1017/S1744133107004410>
- Donabedian, A.** 2005. Evaluating the quality of medical care. *The Milbank Quarterly*, 83(4): 691–729. DOI: <https://doi.org/10.1111/j.1468-0009.2005.00397.x>
- Drageset, J, Haugan, G and Tranvag, O.** 2017. Crucial aspects promoting meaning and purpose in life: Perceptions of nursing home residents. *BMC Geriatrics*, 17: 254. DOI: <https://doi.org/10.1186/s12877-017-0650-x>

- Dyck, M.** 2007. Nursing staffing and resident outcomes in nursing homes: Weight loss and dehydration. *Journal of Nursing Care Quality*, 22(1): 59–65. DOI: <https://doi.org/10.1097/00001786-200701000-00012>
- Easton, T, Milte, R, Crotty, M and Ratcliffe, J.** 2017. Where's the evidence? A systematic review of economic analyses of residential aged care infrastructure. *BMC Health Services Research*, 17(226). DOI: <https://doi.org/10.1186/s12913-017-2165-8>
- Forbes-Thompson, S and Gessert, C.** 2005. End of life in nursing homes: Connections between structure, process, and outcomes. *Journal of Palliative Medicine*, 8(3): 545–555. DOI: <https://doi.org/10.1089/jpm.2005.8.545>
- Friedman, L, Avila, S, Friedman, D and Meltzer, W.** 2019. Association between type of residence and clinical signs of neglect in older adults. *The Gerontologist*, 65(1): 30–39. DOI: <https://doi.org/10.1159/000492029>
- Gerritsen, DL, Steverink, N, Ooms, ME and Ribbe, MW.** 2004. Finding a useful conceptual basis for enhancing the quality of life of nursing home residents. *Quality of Life Research*, 13(3): 611–624. DOI: <https://doi.org/10.1023/B:QURE.0000021314.17605.40>
- Glass, AP.** 1991. Nursing home quality: A framework for analysis. *Journal of Applied Gerontology*, 10(1): 5–18. DOI: <https://doi.org/10.1177/073346489101000102>
- Gucer, P, Gaitens, J, Oliver, M and McDiarmid, M.** 2013. Sit-stand powered mechanical lifts in long-term care and resident quality indicators. *Journal of Occupational and Environmental Medicine*, 55(1): 36–44. DOI: <https://doi.org/10.1097/JOM.0b013e3182749c35>
- Hall, S, Dodd, R and Higginson, I.** 2014. Maintaining dignity for residents of care homes: A qualitative study of the views of care home staff, community nurses, residents and their families. *Geriatric Nursing*, 35(1): 55–60. DOI: <https://doi.org/10.1016/j.gerinurse.2013.10.012>
- Haugan, G, Hanssen, B and Moksnes, U.** 2013. Self-transcendence, nurse–patient interaction and the outcome of multidimensional well-being in cognitively intact nursing home patients. *Scandinavian Journal of Caring Sciences*, 27(4): 882–893. DOI: <https://doi.org/10.1111/scs.12000>
- Haugan, G, Innstrand, S and Moksnes, U.** 2013. The effect of nurse–patient interaction on anxiety and depression in cognitively intact nursing home patients. *Journal of Clinical Nursing*, 22(15–16): 2192–2205. DOI: <https://doi.org/10.1111/jocn.12072>
- Havig, A, Skogstad, A, Kjekshus, L and Romoren, T.** 2011. Leadership, staffing and quality of care in nursing homes. *BMC Health Services Research*, 11(327). DOI: <https://doi.org/10.1186/1472-6963-11-327>
- Hawes, C and Phillips, C.** 1986. The changing structure of the nursing home industry and the impact of ownership on quality, cost, and access. In: Gray, BH (ed.), *For Profit Enterprise in Health Care*. Washington DC: National Academies Press. <https://www.ncbi.nlm.nih.gov/books/NBK217907/>
- Holt, K, Hoben, M, Weeks, L and Estabrooks, C.** 2021. Relationship between environmental factors and responsive behaviours in long-term care homes: a secondary data analysis. *BMJ OPEN*, 11(10): e047364. DOI: <https://doi.org/10.1136/bmjopen-2020-047364>
- Hurtado, D, Berkman, L, Buxton, O and Okechukwu, C.** 2016. Schedule control and nursing home quality: Exploratory evidence of a psychosocial predictor of resident care. *Journal of Applied Gerontology*, 35(2): 244–253. DOI: <https://doi.org/10.1177/0733464814546895>
- Jaye, C, Tordoff, J, Butler, M, Hale, B, McKechnie, R, Robertson, L and Simpson, J.** 2016. Quality in residential care: Exploring residents, family members, managers and staff perspectives. *Quality in Ageing: Policy, Practice and Research*, 17(4): 253–262. DOI: <https://doi.org/10.1108/QAOA-03-2016-0015>
- Jin, X, Tamiya, N, Jeon, B, Kawamura, A, Takahashi, H and Noguchi, H.** 2018. Resident and facility characteristics associated with care-need level deterioration in long-term care welfare facilities in Japan. *Geriatrics and Gerontology International*, 18(5): 758–766. DOI: <https://doi.org/10.1111/ggi.13248>
- Johnson, C, Weech-Maldonado, R, Jia, H, Reker, D, Buchanan, R and Laberge, A.** 2007. Characteristics of community nursing homes serving per diem veterans, 1999 to 2002. *Medical Care Research and Review*, 64(6): 673–690. DOI: <https://doi.org/10.1177/1077558707304740>
- Joyce, N, McGuire, T, Bartels, S, Mitchell, S and Grabowski, D.** 2018. The impact of dementia special care units on quality of care: An instrumental variables analysis. *Health Services Research*, 53(5): 3657–3679. DOI: <https://doi.org/10.1111/1475-6773.12867>
- Kane, RA.** 2001. Long-term care and a good quality of life: Bringing them closer together. *The Gerontologist*, 41: 293–304. DOI: <https://doi.org/10.1093/geront/41.3.293>
- Kane, RA.** 2003. Definition, measurement, and correlates of quality of life in nursing homes: toward a reasonable practice, research, and policy agenda. *The Gerontologist*, 43(Spec No 2): 28–36. DOI: [https://doi.org/10.1093/geront/43.suppl\\_2.28](https://doi.org/10.1093/geront/43.suppl_2.28)
- Kane, RL, Bell, R, Riegler, S, Wilson, A and Kane, RA.** 1983. Assessing the outcomes of nursing-home patients. *Journal of Gerontology*, 38(4): 385–393. DOI: <https://doi.org/10.1093/geronj/38.4.385>
- Kane, RL, Rockwood, T, Hyer, K, Desjardins, K, Brassard, A, Gessert, C and Kane, R.** 2005. Rating the importance of nursing home residents' quality of life. *Journal of the American Geriatrics Society*, 53(12): 2076–2082. DOI: <https://doi.org/10.1111/j.1532-5415.2005.00493.x>
- Keys, S, Wister, A and Gutman, G.** 2009. Administrators and quality of care in long-term care facilities. *Journal of Housing for the Elderly*, 23(3): 243–260. DOI: <https://doi.org/10.1080/02763890903035621>
- Kennedy, K.** 2022. The effect of nurse aide retention on Ohio's nursing home resident care experience scores: A facility-level analysis. *Journal of Applied Gerontology*, 42(1): 37–48. DOI: <https://doi.org/10.1177/07334648221124918>

- Kim, H, Kovner, C, Harrington, C, Greene, W and Mezey, M.** 2009. A panel data analysis of the relationships of nursing home staffing levels and standards to regulatory deficiencies. *The Journals of Gerontology. Series B*, 64(2): 269–278. DOI: <https://doi.org/10.1093/geronb/gbn019>
- Kim, S, Park, E, Kim, S, Nakagawa, S, Lung, J, Choi, J,** et al. 2014. The association between quality of care and quality of life in long-stay nursing home residents with preserved cognition. *Journal of American Medical Director Association*, 15(3): 220–225. DOI: <https://doi.org/10.1016/j.jamda.2013.10.012>
- Konetzka, R, Stearns, S and Park, J.** 2008. The staffing–outcomes relationship in nursing homes. *Health Services Research*, 43(3): 1025–1042. DOI: <https://doi.org/10.1111/j.1475-6773.2007.00803.x>
- Kusmaul, N and Tucker, GG.** 2020. Person-Centered Care in Nursing Homes: Many Stakeholders, Many Perspectives. *Journal of gerontological nursing*, 46(5): 9–13. DOI: <https://doi.org/10.3928/00989134-20200327-01>
- Lawton, MP and Nahemow, L.** 1973. Ecology and the aging process. In: Eisdorfer, C, and Lawton, MP (eds.), *The Psychology of Adult Development and Aging*. Washington, DC: American Psychological Association, pp. 619–674. DOI: <https://doi.org/10.1037/10044-020>
- Lee, SK, Shin, JH, Ahn, J, Lee, JY and Jang, D.** 2021. Identifying the risk factors associated with nursing home residents' pressure ulcers using machine learning methods. *International Journal of Environmental Research and Public Health*, 18(6): 2954. DOI: <https://doi.org/10.3390/ijerph18062954>
- Lerner, N, Johantgen, M, Trinkoff, A, Storr, C and Han, K.** 2014. Are nursing home survey deficiencies higher in facilities with greater staff turnover. *Journal of the American Medical Directors Association*, 15(2): 102–107. DOI: <https://doi.org/10.1016/j.jamda.2013.09.003>
- Leung, M, Chan, I and Olomolaiye, P.** 2013. Relationships between facility management, risks and health of elderly in care and attention homes. *Facilities*, 31(13): 659–680. DOI: <https://doi.org/10.1108/f-10-2011-0080>
- Li, Y, Cen, X, Cai, X and Temkin-Greener, H.** 2019. Perceived patient safety culture in nursing homes associated with “Nursing Home Compare” performance indicators. *Medical Care*, 57(8): 641–647. DOI: <https://doi.org/10.1097/MLR.0000000000001142>
- Liu, L, Weng, R and Wu, J.** 2014. Exploring factors influencing residents' health outcomes in long-term care facilities: 1-year follow-up using latent growth curve model. *Quality of Life Research*, 23(9): 2613–2627. DOI: <https://doi.org/10.1007/s11136-014-0710-z>
- Livingstone, I, Hefele, J and Leland, N.** 2022. Physical and occupational therapy staffing patterns in nursing homes and their association with long-stay resident outcomes and quality of care. *Journal of Aging and Social Policy*, 34(5): 723–741. DOI: <https://doi.org/10.1080/08959420.2020.1824544>
- Livingstone, I, Hefele, J, Nadash, P, Barch, D and Leland, N.** 2019. The relationship between quality of care, physical therapy, and occupational therapy staffing levels in nursing homes in 4 years follow-up. *Journal of the American Medical Directors Association*, 20(4): 462–469. DOI: <https://doi.org/10.1016/j.jamda.2019.02.002>
- Lorini, C, Porchia, BR, Pieralli, F and Bonaccorsi, G.** 2018. Process, structural, and outcome quality indicators of nutritional care in nursing homes: A systematic review. *BMC Health Services Research*, 18(1): 43. DOI: <https://doi.org/10.1186/s12913-018-2828-0>
- McGarry, B, Joyce, N, McGuire, T, Mitchell, S, Bartels, S and Grabowski, D.** 2019. Association between high proportions of seriously mentally ill nursing home residents and the quality of resident care. *Journal of American Geriatrics Society*, 67(11): 2345–2352. DOI: <https://doi.org/10.1111/jgs.16080>
- McGregor, M, Tate, R, McGrail, K, Ronald, L, Broemeling, A and Cohen, M.** 2006. Care outcomes in long-term care facilities in British Columbia, Canada: Does ownership matter? *Medical Care*, 44(10): 929–935. DOI: <https://doi.org/10.1097/01.mlr.0000223477.98594.97>
- McKinley, K and Adler, G.** 2005. Quality of life in nursing homes involving elders in policy making for their own care and life satisfaction. *Social Policy Journal*, 4(4): 37. DOI: [https://doi.org/10.1300/J185v04n03\\_03](https://doi.org/10.1300/J185v04n03_03)
- McKinney, S, Corazzini, K, Anderson, R, Sloane, R and Castle, N.** 2016. Nursing home director of nursing leadership style and director of nursing-sensitive survey deficiencies. *Health Care Management Review*, 41(3): 224–232. DOI: <https://doi.org/10.1097/HMR.0000000000000072>
- Millar, RJ, Diehl, C, Blake, E, Kusmaul, N and Fakeye, O.** 2023. Nursing home characteristics and resident quality of care outcomes: A scoping review protocol. DOI: <https://doi.org/10.17605/OSF.IO/X2WBG>
- Milne, A.** 2011. Living with dementia in a care home: Capturing the experiences of residents. *Quality in Ageing and Older Adults*, 12(2): 76–85. DOI: <https://doi.org/10.1108/14717791111144687>
- Milte, R, Shulver, W, Killington, M, Bradley, C, Miller, M and Crotty, M.** 2017. Struggling to maintain individuality – Describing the experience of food in nursing homes for people with dementia. *Archives of Gerontology and Geriatrics*, 72: 52–58. DOI: <https://doi.org/10.1016/j.archger.2017.05.002>
- Milte, R, Shulver, W, Killington, M, Bradley, C, Ratcliffe, J and Crotty, M.** 2016. Quality in residential care from the perspective of people living with dementia: The importance of personhood. *Archives of Gerontology and Geriatrics*, 63: 9–17. DOI: <https://doi.org/10.1016/j.archger.2015.11.007>
- Moyo, P, Zullo, A, McConeghy, K, Bosco, E, Van Aalst, R, Chit, A and Gravenstein, S.** 2020. Risk factors for pneumonia and influenza hospitalizations in long-term care facility residents: A retrospective cohort study. *BMC Geriatrics*, 20(1): 47. DOI: <https://doi.org/10.1186/s12877-020-1457-8>
- Murphy, K, O'Shea, E and Cooney, A.** 2007. Quality of life for older people living in long-stay settings in Ireland. *Journal of Clinical Nursing*, 16(11): 2167–2177. DOI: <https://doi.org/10.1111/j.1365-2702.2006.01865.x>

- Nakrem, S.** 2015. Understanding organizational and cultural premises for quality of care in nursing homes: An ethnographic study. *BMC Health Services Research*, 15: 1–13. DOI: <https://doi.org/10.1186/s12913-015-1171-y>
- Netten, A, Trukeschitz, B, Beadle-Brown, J, Forder, J, Towers, A and Welch, E.** 2012. Quality of life outcomes for residents and quality ratings of care homes: Is there a relationship? *Age and Ageing*, 41(4): 512–517. DOI: <https://doi.org/10.1093/ageing/afs050>
- Nordin, S, McKee, K, Wijk, H and Elf, M.** 2017. The association between the physical environment and the well-being of older people in residential care facilities: A multilevel analysis. *Journal of Advanced Nursing*, 73(12): 2942–2952. DOI: <https://doi.org/10.1111/jan.13358>
- Palm, R, Trutschel, D, Sorg, C, Dichter, M, Haastert, B and Holle, B.** 2019. Quality of life in people with severe dementia and its association with the environment in nursing homes: An observational study. *The Gerontologist*, 59(4): 665–674. DOI: <https://doi.org/10.1093/geront/gny017>
- Pekkarinen, L, Sinervo, T, Elovainio, M, Noro, A and Finne-Soveri, H.** 2008. Drug use and pressure ulcers in long-term care units: Do nurse time pressure and unfair management increase the prevalence. *Journal of Clinical Nursing*, 17(22): 3067–3073. DOI: <https://doi.org/10.1111/j.1365-2702.2008.02445.x>
- Plaku-Alakbarova, B, Punnett, L and Gore, R.** 2018. Nursing home employee and resident satisfaction and resident care outcomes. *Safety and Health at Work*, 9(4): 408–415. DOI: <https://doi.org/10.1016/j.shaw.2017.12.002>
- Rantz, MJ, Mehr, DR, Popejoy, L, Zwygart-Stauffacher, M, Hicks, LL, Grando, V, Conn, VS, Porter, R, Scott, J and Maas, M.** 1998. Nursing Home Care Quality: A Multidimensional Theoretical Model. *Journal of Nursing Care Quality*, 12(3): 30–46. DOI: <https://doi.org/10.1097/00001786-199802000-00007>
- Rantz, MJ, Zwygart-Stauffacher, L, Popejoy, VT, Grando, DR, Mehr, DR, Hicks, LL, et al.** 1999. Nursing home care quality: A multidimensional theoretical model integrating the views of consumers and providers. *Journal of Nursing Care Quality*, 14(1): 16. DOI: <https://doi.org/10.1097/00001786-199910000-00004>
- Sandsdalen, T, Høye, S, Rystedt, I, Grøndahl, V, Hov, R and Wilde-Larsson, B.** 2017. The relationships between the combination of person- and organization-related conditions and patients' perceptions of palliative care quality. *BMC Palliative Care*, 16(66): 1–13. DOI: <https://doi.org/10.1186/s12904-017-0240-x>
- Schnelle, JF.** 2003. Improving nursing home quality assessment: Capturing the voice of cognitively impaired elders. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 58(3): 238–239. DOI: <https://doi.org/10.1093/gerona/58.3.M238>
- Schweighart, R, O'Sullivan, JL, Klemmt, M, Teti, A and Neuderth, S.** 2022. Wishes and needs of nursing home residents: A scoping review. *Healthcare*, 10(854). DOI: <https://doi.org/10.3390/healthcare10050854>
- Shin, J.** 2018. Why do we require registered nurses in nursing homes? Using longitudinal hierarchical linear modeling. *Journal of Nursing Scholarship*, 50(6): 705–713. DOI: <https://doi.org/10.1111/jnu.12412>
- Shin, J.** 2019. Nursing staff characteristics on resident outcomes in nursing homes in Taiwan. *The Journal of Nursing Research*, 27(1): 1–9. DOI: <https://doi.org/10.1097/jnr.000000000000269>
- Shin, J and Hyun, T.** 2015. Nurse staffing and quality of care of nursing home residents in Korea. *Journal of Nursing Scholarship*, 47(6): 555–564. DOI: <https://doi.org/10.1111/jnu.12166>
- Shin, J, Renaut, R, Reiser, M, Lee, J and Tang, T.** 2021. Increasing registered nurse hours per resident day for improved nursing home residents' outcomes using a longitudinal study. *International Journal of Environmental Research and Public Health*, 18(2): 402. DOI: <https://doi.org/10.3390/ijerph18020402>
- Shippee, T, Davila, H, Ng, W, Bowblis, J, Akosionu, O, Skarphol, T, et al.** 2022. Evidence to inform policy and practice: Mechanisms to address racial/ethnic disparities in nursing home quality of life. *Innovations in Aging*, 6(4): igac037. DOI: <https://doi.org/10.1093/geroni/igac037>
- Shippee, T, Henning-Smith, C, Kane, R and Lewis, T.** 2015. Resident- and facility-level predictors of quality of life in long-term care. *The Gerontologist*, 55(4): 643–655. DOI: <https://doi.org/10.1093/geront/gnt148>
- Shippee, T, Ng, W and Bowblis, J.** 2020. Does living in a higher proportion minority facility improve quality of life for racial/ethnic minority residents in nursing homes? *Innovations in Aging*, 4(3): igaa014. DOI: <https://doi.org/10.1093/geroni/igaa014>
- Stevenson, D.** 2006. Nursing home consumer complaints and quality of care: A national view. *Medical Care Research and Review*, 63(3): 347–368. DOI: <https://doi.org/10.1177/1077558706287043>
- Temkin-Greener, H, Zheng, N, Cai, S, Zhao, H and Mukamel, D.** 2010. Nursing home environment and organizational performance: Association with deficiency citations. *Medical Care*, 48(4): 357–364. DOI: <https://doi.org/10.1097/MLR.0b013e3181ca3d70>
- Temkin-Greener, H, Zheng, N and Mukamel, D.** 2012. Rural-urban differences in end-of-life nursing home care: Facility and environmental factors. *The Gerontologist*, 52(3): 335–344. DOI: <https://doi.org/10.1093/geront/gnr143>
- Thomas, K, Hyer, K, Castle, N, Branch, L, Andel, R and Weech-Maldonado, R.** 2012. Patient safety culture and the association with safe resident care in nursing homes. *The Gerontologist*, 52(6): 802–811. DOI: <https://doi.org/10.1093/geront/gns007>
- Thompson, G, McClement, S, Peters, S, Hack, T, Chochinov, H and Funk, L.** 2021. More than just a task: Intimate care delivery in the nursing home. *International Journal of Qualitative Studies on Health & Well-Being*, 16(1): 1–10. DOI: <https://doi.org/10.1080/17482631.2021.1943123>

- Towers, A, Palmer, S, Smith, N, Collins, G and Allan, S.** 2019. A cross-sectional study exploring the relationship between regulator quality ratings and care home residents' quality of life in England. *Health and Quality of Life Outcomes*, 17. DOI: <https://doi.org/10.1186/s12955-019-1093-1>
- Tricco, AC, Lillie, E, Zarin, W, O'Brien, KK, Colquhoun, H, Levac, D, et al.** 2018. PRISMA extension for scoping reviews (PRISMA-ScR). *Annals of Internal Medicine*, 169(7): 467. DOI: <https://doi.org/10.7326/M18-0850>
- Trinkoff, A, Han, K, Storr, C, Lerner, N, Johantgen, M and Gartrell, K.** 2013. Turnover, staffing, skill mix, and resident outcomes in a national sample of US nursing homes. *The Journal of Nursing Administration*, 43(12): 630–636. DOI: <https://doi.org/10.1097/NNA.0000000000000004>
- Trinkoff, A, Lerner, N, Storr, C, Han, K, Johantgen, M and Gartrell, K.** 2015. Leadership education, certification and resident outcomes in US nursing homes: Cross-sectional secondary data analysis. *International Journal of Nursing Studies*, 52(1): 334–344. DOI: <https://doi.org/10.1016/j.ijnurstu.2014.10.002>
- Trinkoff, A, Yang, B, Storr, C, Zhu, S, Lerner, N and Han, K.** 2017. Determining the CNA training-hour requirement for quality care in U.S. nursing homes. *Journal of Nursing Regulation*, 8(1): 4–10. DOI: [https://doi.org/10.1016/S2155-8256\(17\)30069-8](https://doi.org/10.1016/S2155-8256(17)30069-8)
- Troyer, J and Sause, W.** 2011. Complaints against nursing homes: Comparing two sources of complaint information and predictors of complaints. *The Gerontologist*, 51(4): 516–529. DOI: <https://doi.org/10.1093/geront/gnr023>
- Van Hoof, J, Verbeek, H, Janssen, B, Eijkelenboom, A, Molony, S, Felix, E, et al.** 2016. A three perspective study of the sense of home of nursing home residents: The views of residents, care professionals and relatives. *BMC Geriatrics*, 16(169). DOI: <https://doi.org/10.1186/s12877-016-0344-9>
- Van Malderen, L, De Vriendt, P, Mets, T and Gorus, E.** 2016. Active ageing within the nursing home: A study in Flanders, Belgium. *European Journal of Ageing*, 13(3): 219–230. DOI: <https://doi.org/10.1007/s10433-016-0374-3>
- Vossius, C, Selbæk, G, Šaltytė Benth, J, Wimo, A and Bergh, S.** 2019. The use of direct care in nursing home residents: A longitudinal cohort study over 3 years. *International Journal of Psychiatry*, 34(2): 337–351. DOI: <https://doi.org/10.1002/gps.5026>
- Wagner, L, McDonald, S and Castle, N.** 2012. Impact of voluntary accreditation on deficiency citations in U.S. nursing homes. *The Gerontologist*, 52(4): 561–570. DOI: <https://doi.org/10.1093/geront/gnr136>
- Wan, T, Zhang, N and Unruh, L.** 2006. Predictors of resident outcome improvement in nursing homes. *Western Journal of Nursing Research*, 28(8): 974–993. DOI: <https://doi.org/10.1177/0193945906289331>
- Wellard, S, Rasmussen, B, Savage, S and Dunning, T.** 2013. Exploring staff diabetes medication knowledge and practices in regional residential care: Triangulation study. *Journal of Clinical Nursing*, 22(13–14): 1933–1940. DOI: <https://doi.org/10.1111/jocn.12043>
- Willemse, B, Downs, M, Arnold, L, Smit, D, De Lange, J and Pot, A.** 2015. Staff-resident interactions in long-term care for people with dementia: The role of meeting psychological needs in achieving residents' well-being. *Aging & Mental Health*, 19(5): 444–452. DOI: <https://doi.org/10.1080/13607863.2014.944088>
- Williams, A, Straker, J and Applebaum, R.** 2016. The nursing home five star rating: How does it compare to resident and family views of care? *The Gerontologist*, 56(2): 234–242. DOI: <https://doi.org/10.1093/geront/gnu043>
- Winblad, U, Blomqvist, P and Karlsson, A.** 2017. Do public nursing home care providers deliver higher quality than private providers? Evidence from Sweden. *BMC Health Services Research*, 17(1): 487. DOI: <https://doi.org/10.1186/s12913-017-2403-0>
- Xu, D, Kane, RL and Shamliyan, TA.** 2013. Effect of nursing home characteristics on residents' quality of life: A systematic review. *Archives of Gerontology and Geriatrics*, 57(2): 127–142. DOI: <https://doi.org/10.1016/j.archger.2013.03.015>
- Yang, B, Carter, M, Trinkoff, A and Nelson, H.** 2021. Nurse staffing and skill mix patterns in relation to resident care outcomes in US nursing homes. *Journal of the American Medical Directors Association*, 22(5): 1081–1087. DOI: <https://doi.org/10.1016/j.jamda.2020.09.009>
- Yong, J, Yang, O, Zhang, Y and Scott, A.** 2021. Ownership, quality and prices of nursing homes in Australia: Why greater private sector participation did not improve performance. *Health Policy*, 125(11): 1475–148. DOI: <https://doi.org/10.1016/j.healthpol.2021.09.005>
- You, K, Li, Y, Intrator, O, Stevenson, D, Hirth, R, Grabowski, D and Banaszak-Holl, J.** 2016. Do nursing home chain size and proprietary status affect experiences with care? *Medical Care*, 54(3): 229–234. DOI: <https://doi.org/10.1097/MLR.0000000000000479>
- Yuan, Y, Lapane, K, Baek, J, Jesdale, B and Ulbricht, C.** 2019. Nursing home star ratings and new onset of depression in long-stay nursing home residents. *Journal of the American Medical Directors Association*, 20(10): 1335–1339. DOI: <https://doi.org/10.1016/j.jamda.2019.05.004>
- Zhang, M, Brown, S, Tang, W and Tucker-Seeley, R.** 2022. A scoping review of how nursing home staffing levels and quality of care are measured. *Innovation in Aging*, 6(1): 638. DOI: <https://doi.org/10.1093/geroni/igac059.2364>
- Zhang, N, Li, Y and Temkin-Greener, H.** 2013. Prevalence of obesity in New York nursing homes: Associations with facility characteristics. *The Gerontologist*, 53(4): 567–581. DOI: <https://doi.org/10.1093/geront/gnt011>

---

**TO CITE THIS ARTICLE:**

Millar, RJ, Diehl, C, Blake, E, Fakeye, O and Kusmaul, N. 2024. Nursing Home Characteristics and Resident Quality of Care Outcomes: A Scoping Review of Recent Empirical Research. *Journal of Long-Term Care*, (2024), pp. 171–186. DOI: <https://doi.org/10.31389/jltc.235>

**Submitted:** 18 July 2023    **Accepted:** 29 February 2024    **Published:** 01 May 2024

**COPYRIGHT:**

© 2024 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported International License (CC BY-NC-ND 3.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by-nc-nd/3.0/>.

*Journal of Long-Term Care* is a peer-reviewed open access journal published by LSE Press.