

Supplementary File 1. Charting characteristics of research included in the review

Author(s) and Publication Year	Country of Study	Research Design	Research Objectives	Key Facility-Level Predictors	Key Resident Outcomes	Key Findings	Data Sources
Alexander et al., 2015	United States	Mixed methods Social network analysis and focus groups	Evaluate how differences in information technology sophistication impact pressure injury care	Healthcare delivery supported by technology; level of internal and external integration across departments and clinical settings	Prevention of pressure injuries	Low information technology was linked to more discussion of risk assessment among RNs, LPNs, and CNAs	Primary data collection and MDS
Aloisio et al., 2021	Canada	Quantitative Cross-sectional	Determine the relationship between health care aide reporting practices and resident outcomes	Care aide reporting supervisor as LPN, RN, or DON	Antipsychotic use without psychosis; decline in mood; behavioural symptoms; falls; feeding tube; catheter; ADL decline; restraint use; pressure injuries; delirium; unexplained weight loss; UTIs; and worsening pain	Higher proportion of aides reporting to a RN was linked to fewer behavioural symptoms	Translating Research in Elder Care and RAI-MDS
Anderson and Blair, 2020	Australia	Mixed methods Longitudinal Observational	Examine associations between QoC and QoL for residents with dementia	Staffing ratios; autonomy; attitudes toward care; self-efficacy; burnout; use of restraints; and stress	QoL rating related to pain; depression; engagement with staff; and fluid and food intake	Higher staffing related QoC linked to reduction in pain, depression, low QoL ratings,, as well as an increase in fluid intake over time	Primary data collection
Anderson and Blair, 2021	Australia	Mixed methods Cross-sectional Survey, interview, observations, and file audits	Examine associations between staff and organization variables, QoC, and broadly defined QoL for residents with dementia	Staffing-related care as reported by residents	Residents' perceptions of staffing factors linked to QoC and QoL	Residents preferred care characterized as empathetic, had open communication, reduced use of restraint, had a mixture of permanent and rotating shifts, prioritized recreational activities, and increased meal assistance	Primary data collection
Antwi and Bowblis, 2018	United States	Quantitative Cross-sectional	Investigate how employee turnover relates to QoC and mortality	Percent of staff turnover for all employees and nursing staff	QoC, QoL, and other regulatory deficiencies; pressure injuries; contractures; catheters; restraints; and mortality	Nurse turnover was related to an increase in number of total deficiencies and mortality	OSCAR, Office of Statewide Health Planning and Development, Bureau of Labor Statistics, and AHRF
Arling et al., 2007	United States	Quantitative Cross-sectional	Determine the relationship between staffing level and resident functional outcomes	Number of licensed and unlicensed HPRPD	Restraints; toileting program; range of motion; ADL and mobility decline; worsening incontinence; worsening behaviour	Residents receiving more unlicensed minutes of care had larger ADL decline	Primary data collection and MDS

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Barsanti et al., 2021	Italy	Quantitative Cross-sectional	Examine the association between organizational characteristics and resident quality of care	Sum of total work hours for nursing and rehabilitation staff and type of staff training	Satisfaction with care; falls; UTIs; antidepressant use; and days of recreational activities	Presence of staff trained in end-of-life support was linked to resident satisfaction	Tuscany Performance Evaluation System of Nursing Homes and primary data collection
Bergland and Kirkevold, 2006	Norway	Qualitative Descriptive exploratory	Understand cognitively intact residents' views of contributors to wellbeing	Residents' perspective of facility care contributors to well-being	Residents' self-reported well-being	Residents preferred opportunities for socialization, meaningful activities, ability to go outdoors, and quality of the physical environment (e.g., attractive, tidy, private)	Primary data collection
Boscart et al., 2018	Canada	Quantitative Cross-sectional	Examine the relationship between staffing characteristics and residents' quality of care indicators	Nursing staff's HPRPD; late to shift; stayed late; and length of employment	ADL decline; behavioural symptoms; catheter use; UTIs; delirium; antipsychotic use; falls; mood; worsening pain; pressure injuries; restraint use; unexplained weight loss	NA HPRPD and length of employment were positively linked to overall resident care	Primary data collection and MDS
Bowblis and Roberts, 2020	United States	Quantitative Longitudinal	Examine how staffing level affects number of deficiencies and overall deficiency score	HPRPD for RNs, LPNs, CNAs; nonmedical and social services staff capacity	Number of QoC and QoL deficiency citations and the deficiency score from NHC	Higher staffing consistently yielded better quality. The largest quality improvements were linked to higher administrative RN and social services staffing hours	OSCAR/CASPER and NHC
Brauner et al., 2018	United States	Quantitative Cross-sectional	Explore the relationship between CMS five-star quality ratings and patient safety	CMS five-star ratings for overall and health inspections	Falls with injury; UTIs; pressure injuries; and medication errors	The relationship between rating and patient safety was weak and inconsistent	CASPER and NHC
Campbell et al., 2016	United States	Quantitative Longitudinal	Examine the linkages between facility concentration of racial/ethnic minorities and QoL deficiencies	Percentage of racial/ethnic minority residents and case-mix payment rates	Average number of QoL deficiencies across 19 categories	Facilities with a larger concentration of racial/ethnic minority residents saw a higher number of deficiencies. Higher Medicaid per diem payment was linked to small increase in deficiencies	OSCAR, Long Term Care Focus, and primary data collection

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Caspar et al., 2021	Canada	Qualitative In-depth interviews	Understand residents' perspective on consistent staff assignments	Staff consistent assignment	Self-reported experience	Residents described personal and meaningful care relationships as positive aspects of consistent assignment	Primary data collection
Castle and Lin., 2010	United States	Quantitative Cross-sectional	Understand the relationship between top management turnover and QoC	Turnover of NHAs and DONs over the last year	Fourteen quality measures (e.g., restraint use, pressure injuries) from NHC	High NHA turnover was linked to higher rates of pain, pressure injuries, and physical restraint use, while high DON turnover was linked to less depression	Primary data collection, NHC, OSCAR, and ARF
Castle et al., 2011	United States	Quantitative Longitudinal	Investigate the link between facility characteristics and deficiency citations	QoC deficiencies and Medicaid resident occupancy and reimbursement; number of RNs, LPNs, and NAs per resident	Care safety citations: (F-332, F-333, F-389, F-431, and F-441)	Low staffing levels and high Medicaid occupancy with low reimbursement were linked to deficiency citations for safety violations	OSCAR and Medicaid claims
Castle, 2011	United States	Quantitative Cross-sectional	Examine the association between NA staff assignment and resident QoL	Consistent staffing assignment; nursing staff levels; and turnover	QoL deficiency citations (resident) measured as the sum of nine different deficiency citations (F-Tags are 240, 241, 242, 243, 244, 245, 246, 247, and 248)	QoL deficiency citations (resident), were significantly lower in facilities with the highest levels of consistent NA assignment	Primary data collection, OSCAR, and AHRF
Cho et al., 2020	South Korea	Quantitative Cross-sectional	Investigate the effects of RN staffing on quality of care and resident outcomes	Number of RNs employed	Deaths; ADLs; cognitive abilities; behavioural and psychological symptoms of dementia; rehabilitation needs; nursing care needs; and regulatory quality evaluations	Increase of one RN was linked with a decrease in the odds of resident deaths and higher quality scores across domains	Long-Term Care Facility Evaluation and National Health Insurance Service
Cole, 2017	Canada	Qualitative Case study	Explore the relationship between having a NP present and resident care outcome	NP present	ED visits and hospitalisations	The presence of a NP reduced ED visits and hospitalisations	Primary data collection
Cooney et al., 2009	Ireland	Qualitative Semi-structured interviews	Explore determinants of QoL in relation to institutional level factors	Facility factors linked to better QoL according to residents	Residents' report of QoL predictors	Residence preferred environments that promoted autonomy and independence, social relationships, engagement in meaningful activities and therapies	Primary data collection

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Cranley et al., 2020	Canada	Qualitative Focus groups	Explore shared decision-making to determine relevant strategies to support shared decision-making in long-term care	Residents' views of facilitators and challenges to a collaborative approach to decision making	Resident involvement in decision-making	Residents preferred engagement and the inclusion of personal support workers to promote shared decision making and person-centred care	Primary data collection
Decker, 2008	United States	Quantitative Longitudinal	Explore the link between Medicaid census, Medicaid reimbursement rate, occupancy, and care performance	Ownership (for-profit, not-for-profit); Medicaid resident census; Medicaid reimbursement rate; and occupancy	Percent of residents with restraints and RN HPRPD	Restraint use increased among for-profit and not-for-profit facilities when the Medicaid census increased, and Medicaid payment decreased	OSCAR and AHRF
Drageset, et al., 2017	Norway	Qualitative In-depth interviews	Identify crucial aspects promoting nursing home residents' experience of meaning and purpose in everyday life	Residents' view of opportunities for meaningful and purposeful aging	Experience of meaning and purpose in everyday life	Residents reported preference for belonging and recognition; personally treasured activities; spiritual closeness and connectedness	Primary data collection
Dyck, 2007	United States	Quantitative Cross-sectional	Study the relationship between nurse staffing hours and resident weight loss and dehydration	RN, LPN, and NA HPRPD	Weight loss and dehydration	Facilities with at least 3 daily hours of NA care were associated with a decreased likelihood of resident weight loss	OSCAR and MDS
Forbes-Thompson and Gessert, 2005	United States	Qualitative Interviews and observations	Examine how the structure and process of care influence resident satisfaction and QoL at the end of life	Residents' report of facility mission; staffing; and philosophy of care	Satisfaction with care and QoL	Residents in facilities with a more person-centred and decentralized model of care reported more satisfaction and better QoL	Primary data collection
Friedman et al., 2019	United States	Quantitative Cross-sectional	Investigate the association between type of residence (for-profit, not-for-profit) on clinical signs of neglect	Ownership (not-for-profit and for-profit)	Neglect determined from Clinical Signs of Neglect Scale including malnutrition, dehydration, pressure injuries, and other indicators of neglect	Residents in for-profit facilities had higher neglect scores than those in not-for-profit facilities or in the community	Medical records and NHC

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Gucer et al., 2013	United States	Quantitative Cross-sectional	Examine the relationship between the use of powered mechanical lifts and residents' mobility-related indicators	Number of full lifts and sit-lifts per 100 residents and Safe Lift Index covering staff knowledge with use of mechanical lifts	Percent of residents with physical restraints; inadequate receipt of antipsychotic drugs; residents confined to bed; pressure injuries; falls; and fractures	Residents were less likely to be confined to bed and had fewer pressure injuries in facilities with greater availability of either type of lift. Lift use was linked to more frequent falls, while compliance with safe lifting policies was linked to fewer falls	Primary data collection and MDS
Hall et al., 2014	United Kingdom	Qualitative Descriptive	Explore residents', family members', and staff's views on how to maintain dignity in care	Residents' views of care that promotes dignity	Dignity of care as described by residents	Residents preferred autonomy and freedom of choice, privacy, respect from staff, clear communication	Primary data collection
Haugan, Hanssen, and Moksnes, 2013	Norway	Quantitative Cross-sectional	Investigate the associations between nurse–patient interaction and multidimensional well-being	Care style as reported by residents	Self-reported well-being across several domains such as physical, emotional, functional, and spiritual	Positive nurse–patient interactions were related to physical well-being, along with emotional and functional well-being	Primary data collection
Haugan, Innstrand, and Moksnes, 2013	Norway	Quantitative Cross-sectional	Investigate the relationships between nurse-patient interactions, anxiety, and depression among cognitively intact residents	Care style as reported by residents	Anxiety and depression scores	Residents' views of more positive interactions with nurses were negatively associated with depression, but not anxiety	Primary data collection
Havig, et al., 2011	Norway	Quantitative Cross-sectional	Assess the relationship between leadership style, staffing characteristics, and QoC	Staff perception of task and relationship-oriented leadership style; ratio of RNs; ratio of unlicensed staff; staff to resident ratio; resident acuity	Quality of care as measured by medical, general, social activities, and social interactions with staff as reported by residents	Task-oriented leadership style had a positive relationship with quality; ratio of unlicensed staff was negatively related to quality as assessed by family and observers	Primary data collection
Holt et al., 2021	Canada	Quantitative Cross-sectional	Investigate whether the quality of the facility environment is linked to responsive behaviours	Environmental quality measured by the Observable Indicators of Nursing Home Care Quality tool, which includes care delivery; accessibility; cleanliness; and homelike environment	Responsive behaviour defined based on RAI-MDS Aggressive Behavior Scale, which include verbal and physical abuse, socially disruptive behaviours, and resisting care	Homelike environments were linked to fewer responsive behaviours (e.g., wandering), while decluttered spaces were linked to more responsive behaviours	Primary data collection and MDS

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Hurtado et al., 2016	United States	Quantitative Cross-sectional	Examine whether workers' ability to determine working schedule is linked to resident outcomes	Staff ability to choose when to take time off, start and end time, time to take breaks, and number of hours to work in the day	Percent of residents with pressure injuries; increased need for assistance with ADL; and unintended weight loss	Care staff's ability to set own schedule was associated with fewer pressure injuries in residents	Primary data collection and NHC
Jaye et al., 2016	New Zealand	Qualitative Ethnography	Explore staff, family members', and residents' views on what constitutes quality of care	Facility factors linked to better quality of care according to residents	Quality of care as reported by residents	Residents reported a preference for home-like environment (e.g., privacy), feeling safe and secure, socializing and friendships, competent and compassionate staff	Primary data collection
Jin et al., 2018	Japan	Quantitative Longitudinal	Determine the facility characteristics associated with residents' care-need level deterioration	Years in business; size, rurality; availability of 24-hour nursing staff; number of staff in different specialties per 100 users; and type of rooming arrangements (private vs. shared)	Care need level deterioration if on-year level of care change was greater than zero	Residents in the following facilities were less likely to deteriorate: metropolitan, more private rooming, higher proportion of RNs and dietitians, with fewer years in the business	Primary data collection and long-term care insurance claims
Johnson et al., 2007	United States	Quantitative Cross-sectional	Examine whether presence of per-diem veterans in the facility is linked to quality outcomes	The presence of any veteran per-diem resident in a facility and the presence of at least 3.5% per-diem veteran occupancy	Use of feeding tubes; new indwelling catheters; mobility restraints; new pressure injuries; and QoC, QoL, and total deficiencies	Facilities with any veterans were more likely to have residents with feeding tubes, catheters, mobility restraints, citations for new pressure injuries, and total deficiencies	OSCAR and MDS
Joyce et al., 2018	United States	Quantitative Cross-sectional	Compare the quality of care following admission to a facility with and without a dementia special care unit for residents with dementia	Availability of one or more special care unit and percent of beds designed special care unit	Inappropriate antipsychotic drug use, physical restraints, and a combination of both; use of feeding tubes; urinary catheters; pressure injuries; and avoidable hospitalisations	Special care units were linked to less use of inappropriate antipsychotics and physical restraints; pressure injuries; feeding tubes; and hospitalisations	OSCAR, MDS, and Medicare claims
Keays et al., 2009	Canada	Quantitative Cross-sectional	Investigate administrator and facility related predictors of QoC	Size; accreditation; ownership (for-profit, not-for-profit); chain affiliation	Number of unmet QoC standards reported by the Ontario Ministry of Health and Long-Term Care	Smaller facilities were linked to fewer unmet standards	Primary data collection and Public Reporting on Long Term Care Homes

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Kennedy, 2022	United States	Quantitative Cross-sectional	Study how CNA retention is associated with resident care experience	One-year CNA retention	Satisfaction survey covering seven domains: moving in, care and services, environment, caregivers, facility culture, spending time, and meals and dining	CNA retention was only weakly associated with care experience, with some evidence of retention not being uniformly beneficial	Ohio Biennial Survey of Long-Term Care Facilities and Ohio Nursing Home Resident Satisfaction Survey
Kim et al., 2009	United States	Quantitative Cross-sectional	Examine the relationships between nursing staffing levels and deficiencies	Total staffing hours; meeting state standard HPRPD for RNs, LPNs, and NAs	Number of all federal and state deficiencies in mistreatment and QoC. Severity of deficiencies	Total nursing staffing and RN levels were negatively related to total deficiencies, QoC deficiencies, and serious deficiencies	Automated Certification and Licensing Information and Management System, OSCAR, MDS, and California Long Term Care Annual Cost Report Data
Kim et al., 2014	United States	Quantitative Cross-sectional	Explore whether NHC five-star rating reflects the overall QoL in cognitively intact residents	Overall and domain specific NHC five-star ratings	Self-reported QoL covering domains such as personal relationships, community integration, and comfort	NHC five-star rating was not linked to QoL	NHC and primary data collection
Konetzka et al., 2008	United States	Quantitative Longitudinal	Assess whether change in RN staffing and skill mix contributes to change in the incidence of pressure injuries and UTIs	RN HPRPD and staffing hours as a proportion of total staffing hours (RN, LPN, and NA combined).	Pressure injuries and UTIs	Greater RN staffing significantly decreased the likelihood of pressure injuries and UTIs. Increasing staffing skill mix only reduced the incidence of UTIs	MDS and OSCAR
Lerner et al., 2014	United States	Quantitative Cross-sectional	Examine nurse turnover in relation to numbers of deficiencies	CNA and licensed nurse three-month turnover	Deficiencies from QoC, QoL, and resident behaviour categories	High licensed nurse turnover was significantly associated with QoC deficiencies	National Nursing Home Survey and OSCAR
Leung et al., 2013	China	Quantitative Cross-sectional	Investigate the link between quality of facility management and disease risk in residents	Residents' view of space planning; privacy; lighting; fixtures and finishes; ventilation; noise; temperature; signage; cleanliness; staffing; recreation; safety; and catering	Presence or perceived risk of eight precipitating factors (e.g., falls, infection, getting lost), and 18 conditions (e.g., dementia, stroke)	Space planning, noise, signage, and catering were correlated with precipitating factors	Primary data collection

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Li et al., 2019	United States	Quantitative Cross-sectional	Examine the association between staff's perceptions of safety culture with QoC	Perceived patient safety culture among staff	Healthcare-related deficiency citations; number of substantiated complaints; and NHC five-star ratings	Staff's perception of safety culture was linked to fewer health care deficiencies; fewer substantiated complaints; and higher odds of being designated four or five stars	Primary data collection, MDS, and NHC
Liu et al., 2014	Taiwan	Quantitative Longitudinal	Determine if institutional level factors influence changes in resident level outcomes over a one-year period	Sector (public, private, foundation-based); ownership (hospital-affiliated, free standing); size; average occupancy rate	Self-rated health (mental and physical); ADL and IADL disabilities; and cognitive status	Residents in smaller facilities with less occupancy had better mental and physical self-rated health; private facilities had most significant growth rates in mental health	Primary data collection
Livingstone., 2019	United States	Quantitative Cross-sectional	Examine the relationship between PT and OT staffing levels and QoC	PT and OT HPRPD	Increase in percentage of residents with need for assistance with ADLs and those who had a major fall with injury; NHC five-star quality measure	Higher PT and OT staffing was associated with a decreased percentage of ADL decline and falls, as well as higher average rating	NHC, CASPER, HRSF, and Long-term Care: Facts on Care in the US (LTCFocus)
Livingstone., 2022	United States	Quantitative Longitudinal	Examine the link between PT and OT HPRPD and resident function, falls, and regulatory quality rating	PT and OT HPRPD	Increased need for help with ADLs; falls resulting in major injury; NHC five-star quality measure	Higher proportion of certified staff was positively associated with all three outcome measures	NHC, CASPER, Long Term Care: Facts on Care in the U.S., and AHRF
McGarry et al., 2019	United States	Quantitative Cross-sectional	Determine the association between the proportion of residents with severe mental illness and the QoC provided	Proportion of residents with severe mental illness (>10% of residents with bipolar disorder or schizophrenia)	Use of physical restraints; feeding tubes; or catheters; avoidable hospitalisations; presence of pressure injuries	Facilities with a high concentration mentally ill residents were linked to higher use of feeding tubes, catheters, and hospitalizations	MDS, OSCAR, and Medicare claims
McGregor et al., 2006	Canada	Quantitative Cross-sectional	Investigate the association between ownership status and hospital admissions and mortality in residents	Ownership (not-for-profit and for-profit); divided by hospital association; linked to regional health authority; number of sites, and chain affiliation	Six types of hospitalizations (i.e., falls, pneumonia, anemia, UTI, dehydration, pressure injuries, or gangrene) or death; residents' report of QoL	For-profit ownership was linked to higher pneumonia, anemia, and dehydration incidents; lower hospitalisation rates in not-for-profit facilities	British Columbia Linked Health Database, Vital Statistics Canada, and primary data collection

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McKinley and Adler, 2005	United States	Qualitative Focus groups	Assess residents' views on ability to participate in decision making as well as factors related to QoL	Factors linked to QoL according to residents' views		Residents report of QoL related to decision-making opportunities, activities, physical space concerns, and interactions with other residents and staff	Primary data collection
McKinney et al, 2016	United States	Quantitative Cross-sectional	Examine the association between DON leadership and QoC deficiencies	DON's leadership style (consensus vs. consultative, autocrat, or shareholder); DON intent to quit	Deficiencies related to resident restraint or abuse, resident QoL, or QoC	Consensus leadership was associated with lower likelihood of deficiencies for resident behaviour and facility practices. DON intent to quit was linked to increased likelihood of resident and facility-related deficiencies	OSCAR and primary data collection
Milne, 2011	United Kingdom	Qualitative Interviews and observations	Understand the care experiences of residents with dementia	Factors identified by residents as meaningful for QoC	Resident experience with care	Residence preferred meaningful relationships; home-like personal surroundings; meaningful daily activities; personalized care and support; and autonomy	Primary data collection
Milte et al., 2016	Australia	Qualitative In-depth interviews	Describe the meaning of quality residential care from the perspective of people with cognitive impairment	Residents' views of care that promotes quality	Residents' report of quality of care	Residents preferred care that emphasized and supported personhood (i.e., choice, freedom and self-determination); meaningful activities; feeling useful and valued; and respect for possessions and personal space	Primary data collection
Milte et al., 2017	Australia	Qualitative In-depth interviews and focus groups	Describe the food and dining experience of people with cognitive impairment	Residents' reported dietary factors linked to QoL	Reported QoL as related to facility dietary factors	Residents reported preference for choice and freedom to choose diet, continuity in meal times from community	Primary data collection
Moyo et al., 2020	United States	Quantitative Cross-sectional	Examine facility-level predictors of pneumonia and influenza hospitalisations	Rurality; number of beds; for-profit status; HPRPD; staffing type (e.g., RN's PAs); antipsychotic use; restraints; and pressure injuries	Pneumonia and influenza hospitalisations; antipsychotic use; restraints; and pressure injuries	Residents in for-profit facilities and those with greater use of antipsychotics and restraints had a higher risk of hospitalisations	Medicare enrollment, claims, and MDS

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Murphy et al., 2007	Ireland	Mixed methods Focus groups, quantitative survey, and qualitative interviews	Explore factors predicting QoL in residents	Resident views of factors linked to better QoL	Residents' report of QoL predictors	Residence preferred environments that promoted autonomy and independence, personal identity, engagement in meaningful activities and therapies	Primary data collection
Nakrem, 2015	Norway	Qualitative Ethnography	Describe how residents understand QoC	Residents' view of structure and corporate culture	Perceived QoC	Residents preferred home-like environments, autonomy, meaningful activity, meeting of personal needs	Primary data collection
Netten et al., 2012	United Kingdom	Quantitative Cross-sectional	Investigate the relationship between regulator ratings of the facility and resident outcomes	Three-star regulator ratings based on 38 quality standards; time in business; registration as a nursing home	Social care QoL tool covering: accommodations, safety, care, meals, control, and social environment	Nursing facility ratings were not linked to QoL resident outcomes	Primary data collection
Nordin et al., 2017	Sweden	Quantitative Cross-sectional	Study the association between the quality of the physical environment and residents' psychological and social well-being	Environmental assessment of eight domains thought to support the needs of frail adults: cognitive support; physical support; safety; normalness; openness and integration; privacy; comfort; and choice	Psychological and social well-being scores	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	Primary data collection
Palm et al., 2019	Germany	Quantitative Observational longitudinal	Investigate whether the observed QoL of residents with dementia differs depending on the type of care unit	Care unit types described as large integrated, large segregated, small integrated, and small segregated, where integrated means the facility has both residents with and without dementia	Observed QoL in six domains: care relationships, positive affect, negative affect, restless tense behaviour, social relations, social isolation	There was no relationship between unit type and QoL	Primary data collection
Pekkarinen et al., 2008	Finland	Quantitative Cross-sectional	Examine the association between nursing staff conditions and resident outcomes	Number of RN, LPN, and NA by number of beds; self-reported pressure in the working environment and perceived unfairness	Prevalence of antianxiety or hypnotic drug use and pressure injuries	Unit time pressure increased the prevalence of both quality problems; perceived unfair management was related to increased drug use	MDS and primary data collection

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Sandsdalen et al., 2017	Norway	Quantitative Cross-sectional	Investigate the relationships between the combination of person- and organization-related conditions and patients' perceptions of palliative care quality	Number of staff across key areas (e.g., nursing, nutritional); size; staff competence with palliative care; staff performance (e.g., documentation, care plans)	Residents' perceptions of care for various life-threatening illnesses	Residents of facilities with higher number of physicians reported higher QoC	Primary data collection
Shin and Hyun, 2015	South Korea	Quantitative Cross-sectional	Investigate the relationship between nurse staffing and quality of care	HPRPD for RN and CNAs; skill-mix ratio of RN to CN to care worker HPRPD; and staff turnover	Falls; aggressive behaviours; depression; cognitive decline; pressure injuries; incontinence; UTI; weight loss; dehydration; tube feeding; bed rest; ADL; range of motion; use of antidepressants and restraints	Higher RN HPRPD was related to fall prevention, decreased tube feeding, numbers of residents with deteriorated range of motion, and decreased aggressive behaviour; higher RN turnover was linked to dehydration, bed rest, and use of antipsychotics	Primary data collection
Shin et al., 2021	South Korea	Quantitative Longitudinal	Estimate how much resident outcomes can improve with an increase in RN HPRPD	Nursing staff's HPRPD	Cognitive impairment; incontinence; antidepressant use; bed rest; restraint use; tube feeding; aggressive behaviour; depression; falls; ADL	One unit of RN HPRPD corresponded to a decrease in residents with deteriorated QoC outcomes	Primary data collection and Korean National Health Insurance Corporation Herfindahl–Hirschman Index
Shin., 2018	South Korea	Quantitative Longitudinal	Examine the relationship between nurse staffing mix, turnover, and QoC	Skill mix as proportion of RNs, CNAs, as well as turnover rates	Fifteen quality indicators (e.g., depression, feeding tube use, restraint use) reflective of the MDS clinical measures	Higher rates of RNs and fewer CNAs linked to less aggressive behaviours, depression, weight loss, and bed rest; higher nursing staff turnover linked to use of antidepressants	Primary data collection and Korean National Health Insurance Service
Shin, 2019	South Korea	Quantitative Cross-sectional	Investigate the association between nurse-led nursing homes, staff turnover, and resident outcomes	RNs on staff/no RNs on staff; DONs on staff/no DONs on staff; and tenure and turnover of nursing staff	Falls; aggressive behavior; depression; cognitive impairment; incontinence; UTI; weight loss; dehydration; tube feeding; bed rest; ADL; range of motion; use of antidepressant or sleeping pills; and restraint use	RN turnover was linked to fewer falls, tube feeding, and incontinence; administrative staff turnover was linked to depression, dehydration, range of motion, and use of antidepressants or sleeping pills	Primary data collection
Shippee et al., 2015	United States	Quantitative Cross-sectional	Examine facility and resident-level correlates of	Association with a hospital; ownership type	Self-reported QoL spanning across six	Residents in the following facilities had lower QoL	Primary data collection, MDS,

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			different QoL domains in residents	(for-profit, not-for-profit, government); rurality; number of beds; chain status; staff unionization; percent private room; and resident acuity; Medicaid as percent of payer; activity and nursing staff HPRPD	domains: environment, personal attention;, food, personal engagement, negative mood, and positive mood	across one or more domains: larger, higher percent of Medicaid patients, fewer activity staff HPRPD, fewer social workers, and more LPN HPRPD	Minnesota Department of Human Services
Shippee et al., 2022	United States	Mixed methods Cross-sectional survey and focus group interviews	Identify how facility ethnic composition relates to resident QoL	Racial/ethnic composition of resident population	QoL capturing eight domains: activity engagement, food enjoyment, environment, dignity, autonomy, relationships, caregiving, and mood	Minority residents reported lower QoL than White residents in high-minority facilities	Primary data collection and MDS
Shippee et al., 2020	United States	Quantitative Cross-sectional	Examine the role of facility racial/ethnic composition and resident QOL.	Racial/ethnic composition of resident population	QoC rating covering six domains such as social engagement, attention from staff, and meal enjoyment	Residents of facilities with higher proportion of minorities reported lower QOL scores; minority residents had significantly lower adjusted QOL than White residents, whether they are in low- or high-minority facilities	Minnesota QOL data, MDS, and Certification and Survey Enhanced Provider Reporting
Stevenson, 2006	United States	Quantitative Longitudinal	Evaluate what facility characteristics are associated with consumer complaints and whether consumer complaints are predictive of QoC	Ownership status (for-profit, not-for-profit); chain affiliation; RN and NA staffing capacity; occupancy; and payer mix	Number and nature of consumer complaints (e.g., substantiated)	Complaints were higher for facilities that were for-profit, chain, higher occupancy, and relied primarily on Medicare and Medicaid as a payer; complaints were linked to serious survey deficiencies	OSCAR
Temkin-Greener et al., 2010	United States	Quantitative Cross-sectional	Investigate the relationship between work environment attributes and facility deficiencies	Percent of staff working in self-managed vs. assigned teams, staff with primary resident assignments, work effectiveness as rated by staff	Regulatory QoC and QoL deficiencies, as well as severity of deficiencies	Staff self-rated effectiveness was linked to fewer deficiencies across all three domains; primary assignment was linked to fewer QoC and high severity deficiencies, while self-management was linked to fewer QoC deficiencies	Primary data collection and OSCAR

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Temkin-Greener et al., 2012	United States	Quantitative Cross-sectional	Examines urban–rural differences in end-of-life QoC provided to residents	Urban vs. rural facilities	In-hospital death, hospice referral before death, and presence of severe pain	Residents in facilities in smaller towns and in isolated rural areas had worse end-of-life quality for in-hospital death and hospice	Rural-Urban Commuting Area Codes, MDS and Medicare claims
Thomas et al., 2012	United States	Quantitative Cross-sectional	Examine the association between patient safety culture, process of care, and resident falls	Patient safety culture as rated by Administration and DON	Use of physical restraints and falls	Higher patient safety culture scores were linked to less use of restraints and resident falls	Primary data collection, OSCAR, and MDS
Thompson et al., 2021	Canada	Qualitative Ethnography	Examine residents' experience with receiving intimate personal care	Residents' perspective of contributors to quality intimate care	Report of quality intimate personal care	Residents identified quality person-centred intimate care that promotes integrity	Primary data collection
Towers et al., 2019	United Kingdom	Quantitative Cross-sectional	Explore whether quality ratings were associated with residents' quality of life	Regulator ratings by Care Quality Commission	Social care QoL tool covering control in daily life, personal comfort, food and drink, safety, social engagement, activities, comfort, and dignity;	Residents in highly rated facilities had better social care QoL	Primary data collection and Care Quality Commission
Trinkoff et al., 2013	United States	Quantitative Cross-sectional	Examine the link between nurse staff turnover and resident outcomes	CNA and licensed nurse three-month turnover	catheter use, low control of bowel and bladder, pain management, and pressure injuries	High CNA turnover was linked to higher odds of pressure injuries, pain, and UTIs in residents	National Nursing Home Survey and NHC
Trinkoff et al., 2015	United States	Quantitative Cross-sectional	Examine associations of education and certification among NHAs and DONs with resident outcome	Level of education as well as certification type for NHAs and DONs	Percent of residents with pressure injuries, increased pain, catheter, or UTI	Facilities led by NHAs with Master's degree or higher and certification had significantly better outcomes for pain, while those led by DONs with a Bachelor's degree or higher and certification had lower pain and catheter use	National Nursing Home Survey and NHC
Trinkoff et al., 2017	United States	Quantitative Cross-sectional	Estimate the number of CNA training hours linked to optimal resident outcomes	CNA total training hours, clinical training hours, and the ratio of clinical to didactic training hours	ADL decline, frequent pain, and falls with injuries	Higher CNA training hours were linked to less ADL decline, falls, and pain	NHC and Paraprofessional Healthcare Institute

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Troyer and Sause, 2011	United States	Quantitative Cross-sectional	Examine facility-level predictors of consumer complaints	Ownership status (for-profit, not-for-profit, government); percent Medicare and Medicaid, chain affiliation, ADL index; and number of beds	Long-Term Care Ombudsman Program Complaints and Division of Health Services Regulations complaints per 100 residents	Having a higher proportion of Medicare residents was associated with higher complaint levels	Long-Term Care Ombudsman Program Complaints, Division of Health Services Regulations, and OSCAR
Van Hoof et al., 2016	Netherlands	Qualitative In-depth interviews	Understand what aspects of the social and built environment create a sense of home for residents	Facility social and physical environment as reported by residents	Report of personal meaning and sense of home	Residents preferred home-like environments, autonomy and freedom of choice for meals and activities, opportunities for social engagement	Primary data collection
Van Malderen et al., 2016	Belgium	Quantitative Cross-sectional	Examine the relationship between residents' experience of active aging in the facility and their reported quality of life	Residents' view of opportunities for active aging, covering six domains such as cultural, behavioural, psychological, physical environment, social environment, economic, care, meaningful leisure, and participation	Self-reported QoL based on self-anchored rating scale measuring subjective well-being, including relationships, psychological well-being, health, and received care	Psychological (e.g., memory training, staff involvement) and participation related factors (e.g., opportunities for engagement) were positively to QoL	Primary data collection
Vossius et al., 2019	Norway	Quantitative Longitudinal	Evaluate how organizational factors are associated with direct care	Number of beds, type of facility (general, special care unit, short stay, and other); number of residents; number of staff during days and evenings; physician minutes per resident per week; ward relocation	Total direct care hours received per month; direct care time for personal ADL, IADL; and need for supervision in the last four weeks	There were no significant associations between organizational characteristics and direct care hours received	Primary data collection
Wagner, et al., 2012	United States	Quantitative Cross-sectional	Examine the association between The Joint Commission accreditation and deficiency citations over time	The Joint Commission Accreditation	Four categories of F tag deficiency citations (i.e., resident behaviour and facility practices; QoL; QoC; J, K, or L deficiencies)	Accreditation was associated with fewer deficiency citations at time of accreditation and over time	The Joint Commission Accreditation and OSCAR
Wan et al., 2006	United States	Quantitative Longitudinal	Explore how staffing and nursing care deficiency citations influence resident outcomes	HPRPD for RNs and LPN; care deficiencies and total rehabilitative services per 100 residents	Incidence rate of pressure injuries, physical restraints, indwelling catheters	Facilities with a high level of nurse staffing had less use of restraints, catheters, and pressure injuries	OSCAR and MDS

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Wellard et al., 2013	Australia	Mixed methods Cross-sectional survey and focus group interviews	Identify staffing and organizational factors influencing the quality of diabetes care	Staff knowledge of diabetes care based on survey covering eight domains	Glucose monitoring; nutrition; physical activity based on need; medications; foot examination; blood pressure and weight	There were significant gaps in staff knowledge of preventive care practices, which hindered resident care	Primary data collection and resident charts
Willemse et al., 2015	Netherlands	Quantitative Cross-sectional	Explore how staff resident interactions relate to residents' psychological needs and how such interactions are associated with residents' well-being	Observed type of interaction (i.e., personal detraction, personal enhancers)	Observed mood and engagement	Well-being increased most often after staff addressed residents' need for identity, attachment, and inclusion	Primary data collection
Williams et al., 2016	United States	Quantitative Cross-sectional	Determine the association between the NHC five-star rating and resident and family satisfaction	NHC five-star rating-overall and domain-specific ratings for: health inspections, quality indicators, and staffing levels	Overall satisfaction with care, covering domains such as activities, administration, choices, staff, environment	Facility star ratings were not reflective of residents' satisfaction	NHC and Ohio Nursing Home Resident and Family Satisfaction Surveys
Yang et al., 2021	United States	Quantitative Cross-sectional	Estimate the impact of nurse staffing patterns on rehospitalisations and ED visits by residents	HPRPD for RNs; LPNs, CNAs, as well as proportion of each	Rehospitalisations and ED visits	Residents in facilities with higher RN had lower hospitalizations and ED visits	CASPER and NHC
Yong et al., 2021	Australia	Quantitative Longitudinal	Examine the linkages between facility ownership status and resident quality of care	Ownership status (government, private not-for-profit, for-profit)	Use of antipsychotics, ED visits, falls, premature mortality, dementia hospitalisations, pressure injuries, adverse medication events, complaints, assaults, hours of care, RN hours	Government-owned facilities perform better in a majority of measures, including less antipsychotic use, pressure injuries, and number of complaints	Royal Commission into Aged Care Safety and Quality
Yuan et al., 2019	United States	Quantitative Cross-sectional	Examine the association between the five-star rating and onset of depression in residents	NHC five-star rating - overall and domain-specific ratings for: health inspections, quality indicators, and staffing levels	New diagnosis of depression and severity of symptoms	Star rating was inversely related to more severe depressive symptoms and not related to new onset of depression	NHC and MDS

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Zhang et al., 2013	United States	Quantitative Cross-sectional	Identify facility-level characteristics linked to obesity in residents	Proportion of residents by payer source; for-profit vs. not-for-profit; ratio of RNs to LPNs and CNAs combined; and HPRPD provided by paraprofessional staff; QoC and QoL deficiencies	Three facility-level rates of risk-adjusted obesity (BMI ≥ 30 ; $30 < 40$; ≥ 40)	Higher staffing and QoL deficiencies were positively related to higher obesity rates	MDS, OSCAR, and NHC

Note: ADL- activities of daily living; AHRF- Area Health Resources Rile; CASPER- Certification and Survey Provider Enhanced Reporting; CMS- Centers for Medicare & Medicaid Services; CNA- Certified Nurse Assistant; CNA- Certified Nursing Assistant . DON- Director of Nursing; ED- emergency department; HPRPD- hours per resident day; IADL- instrumental activities of daily living; LPN- Licensed Practical Nurse; MDS- Minimum Data Set; NHA- Nursing home administrator NHC- Nursing Home Compare; NP- Nurse Practitioner; OSCAR- Online Survey Certification and Reporting; OT- occupational therapist; PA- Physician's assistant; PT- physical therapist; QoC- quality of care; QoL- quality of life; RAI- Resident Assessment Instrument; RN- Registered Nurse; UTI – urinary tract infection