Supplementary Material: Appendix 1

Table 4: Systematic Analysis of Literature Review

Research (Author/ Year), Location of the Research	**Research Design, Setting and Sample Age, Size**	**Design Intervention and Inclusion Criteria**	**Scale/ Tool/ Outcome Measures**	**Major Findings/ Results of the Research**	**Keywords**
Rooij, Luijki,Declercq & Schols (2011); Belgium and the Netherlands	Quasi-experimental design with a longitudinal comparative study. 179 residents over the age of 65 years and suffering from mild to severe dementia in 5 small-scale and traditional living LTCF.	Environmental characteristics, basic personal characteristics, behavioral characteristics, behavioral interventions, and social interaction.	Small-scale living on residents QoL, as measured by the QUALIDEM (QoL in dementia)	Determinants of QOL: Positive self-image, Restless behavior, Feeling at home, Caregiver relationship, Social interaction, Negative/ positive effect. The small-scale and traditional wards/LTCF in the two countries are not entirely comparable.	Small-scale home-like settings, Social interaction, QoL
Boer, Hamers, Beerens, Zwakhalen, Tan and Verbeek (2015); Netherlands	Observational longitudinal study. 176 residents in nursing care home environments. Age not specified but all participants were formally diagnosed with dementia.	Four types of nursing home care environments are included (1) large-scale nursing home ward, (2) small-scale living facility on the terrain of a larger nursing home (3) stand-alone small-scale living facility and (4) green care farm.	To explore the daily lives of residents at green care farms in comparison with other nursing home care environments. Daily lives of PwD living in a nursing home care facility based on – Activity, Physical environment, Social environment, Psychological well-being.	Care involves the provision of autonomy for residents, letting them make their own choices and encouraging social interaction and participation in activities. Previous research has shown that residents in small-sale, home-like care environments have better cognitive and functional abilities compared with residents in traditional large-scale nursing home wards and green care has also added benefit for residents due to close proximity to nature.	Activity, Physical environment, Social environment, Psychological well-being, Small-scale

Eika, Dale, Espnes & Hvalvik (2015); Norway	Ethnographic study with periodic participant observations and interviews in Southern rural settings. 10 older adults above the age of 67 and 17 nursing staff, age ranged from the early 20s to early 60s, and the length of employment varied from a few weeks to more than 30 years.	Interventions include continuous assessment, reminiscence, role supplementation, the creation of a healthy environment, and mobilization of resources.	The arrival of a new resident in the LTCF can change the work environment. Nursing staff interaction in LTCF may facilitate or impede healthy transition processes for older residents.	The continuous and spontaneous staff collaborations were key activities in supporting quality care in the transition period. The interaction among all staff categories influenced the new residents' transition processes. Staff interaction during the older residents' transition influenced by three main themes: The significance of formal and informal organization; interpersonal relationships and cultures of care; and professional hierarchy and different scopes of practice.	Spontaneous staff collaborations and interaction
Moyle, Fetherstonhugh, Greben, Beattie & AusQol group (2015); Australia (Brisbane and Melbourne)	Descriptive exploratory qualitative research design. 12 residents: 9 women and 3 men (age range 73–96 years with a diagnosis of dementia and in their current facility for at least 3 months).	Inclusion criteria (1) resident of an aged care facility in a sub-sample of four facilities, (2) resided in their current facility for at least 3 months, (3) aged over 65, and (4) with a recorded diagnosis of dementia. Intervention: QoL, having something to do and the Importance of social interaction.	Three themes related to the QoL: (a) maintaining independence, (b) having something to do, and (c) the importance of social interaction. Activities include; word finds, knitting and sewing, watching television, movies, and reading books. Several participants mentioned their enjoyment of music.	The findings highlight the importance of understanding individual resident needs and consideration of the complexity of living in a large group, in regard to resident decision-making and factors that support QOL. There is a clear need to research further the importance of social connection within LTC and to develop and test interventions that may assist the social connection of residents.	The importance of social interaction, Improved QoL
Kuiper, Zuidersma, Voshaar, Zuidema, Heuvel, Stolk & Smidt (2015); Netherlands	19 Longitudinal Cohort Study. Systematic review and meta-analysis with PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Over the age of 60 years with Dementia	Association between various social relationship factors and incident dementia. The frequency of social contact (e.g., visiting or receiving phone calls from friends, children or other relatives).	Social network size, social participation, the frequency of social contact, loneliness, the satisfaction of social network and other social relationship factors.	This meta-analysis shows that people with less social participation, less frequent social contact and more feelings of loneliness have an increased risk to develop dementia. Low satisfaction with social network seems to be associated with incident dementia, but results were not statistically significant.	Social relation, Interaction, Increased risk of dementia

Chenoweth, King, Jeon, Brodaty, Parbury, Norman, Haas & Luscombe (2009); Australia (Sydney)	Cluster randomized controlled trial. 15 care sites with 289 residents. Randomized comparison of person-centered care, dementia-care mapping, and usual care. Over the age of 60 years with Dementia	Cleanliness, familiarity, lighting, maintenance, noise, safety, and stimulation in nursing homes, with good environments, and quality interaction.	Agitation, psychiatric symptoms, the severity of dementia and impairment.	Person-centered care and dementia-care mapping both seem to reduce agitation in PwDin residential care. The most promising treatments seem to be individually tailored behavioral interventions. The implementation costs of person-centered care are lower than for dementia-care mapping, which requires more intensive training.	PCC and DCM, Reduced agitation, Severity in dementia
Samus, Johnston, Black, Hess, Lyman, Vavilikolanu, Pollutra, Leostsakos, Gitlin, Rabins & Lyketsos (2014); USA (Maryland)	18-month care coordination intervention, randomized controlled trial. Total 303 community-living elders over the age of 70 years, (265 with dementia, 38 with mild cognitive impairment)	Inclusion criteria: cognitive disorder, community-living, English-speaking, and having a study partner available. Participants were less likely to permanently leave their home or die compared with controls and remained in their home significantly longer.	Maximizing Independence (MIND) at Home, on delaying the transition from the home and reducing unmet care needs in community-residing elders with memory disorders.	The intervention group had significant reductions in the proportion of unmet needs in safety and had a significant improvement in the self-reported QoL relative to control participants. A home-based dementia care coordination intervention delivered by non-clinical community workers trained and overseen by geriatric clinicians led to delays in the transition from home, reduced unmet needs, and improved self-reported QOL.	Home-based dementia care, Improve self-reported QoL
Mitchelle, Long, Braithwaite & Brodaty (2016); Australia	9 peer-reviewed articles	Dementia residents	The environment of long-term residential care, dementia patients, social network and human network.	Higher-status nurses were found to have multiple formal and informal communication ties across all groups, which enabled them to act as bridges between groups. The adoption of an SNA (Social Network Analysis) to facilitate the improvement of care to residents in LTC has not yet made the same progress as in other health and clinical settings. Interventions using a network approach may improve care services in LTC.	Social network as interventions, Improved care services

Malderen, Mets & Gorus (2013); Belgium	Systematic review, 35 articles encompassing 3910 subjects: worldwide distribution (Asia: n = 11; Australasia: n = 3; Europe: n = 14; North-America: n = 7), with the exception of the African and South-American continent.	Older adults over the age of 65 years	QoL index, psychological factors, social environment determinants, economic determinants, behavioral determinants, physical environment.	The largest proportion of interventions regarding the physical activity level or the psychological factors of the residents. Self-contained dwellings for a small number of residents and a dining area that represents a family style could enhance the QoL.	QoL Determinate, Physical environment
Whear, Abbott, Thompson-Coon, Bethel, Rogers, Hemsley, Stahl-Timmins & Stein (2014); UK	11 peer-reviewed articles (Literature review)	Dining room environment interventions where changes were made to increase the lighting in the room and maximize the visual contrast of the place settings during meal time.	Mealtime interventions, Behavioral and psychological symptoms of dementia. Mealtime interventions were categorized into 4 types: music, food service, dining environment, group conversation.	PwDdisplay more agitated behaviors when they feel anxious and that mealtime can be particularly distressing. There is some evidence to suggest that mealtime interventions improve behavioral symptoms in elderly PwDliving in residential care, although weak study design limits the generalizability of the findings.	Mealtime interventions, Improved behavioral symptoms, Small-scale residential care
Whear, Thompson-Coon, Bethel, Abbott, Stein, Garside (2014); UK	17 Systematic review articles. 9 quantitative study articles, 7 qualitative articles, and 1 mixed-method. Fourteen included articles reported on gardens, 3 reported on horticultural therapy, and 1 reported on both interventions	Garden was designed with continuous wandering paths, scented but nontoxic plants, viewing platforms, a mixture of grass, concrete, and decking, raised beds (of flowers or vegetables), gazebos, fish ponds.	Outdoor environments as therapeutic in nature, providing an opportunity for multisensory stimulation through reminiscence, social interaction, proving physical and cognitive competence, and improving self-esteem and relaxation.	There are promising impacts on levels of agitation in care home residents with dementia who spend time in a garden. Specific attention should be paid to the physical environment where PwD live, including the design of and access to gardens, indicating that gardens may be a strong element of future care.	Therapeutic garden, Agitation, Improved QoL
Jing, Willis, Feng (2016); China	Literature Review. Total 56 articles. 47 from peer review and 9 from reference.	4 factors influencing QoL: Physical factors, Psychological and emotional factors, Social factors, Religious, environmental and other factors.	QoL of elderly PwD is determined by a range of factors rather than one single aspect of personal life that includes different settings, stages of dementia and people's perspective.	Gathering with family, friends or neighbors were associated with a higher level of QoL for elderly people with dementia. Having a single room and a window to look out of and fresh air could improve the level of QoL. Dementia-friendly environment, such as providing a familiar and comfortable living environment for elderly people with dementia.	Social factor, Physical Environment, QoL indicator

Barnes (2002); UK	Literature Review	Layout, wayfinding, special environments, sensory environments, privacy, space, and autonomy	Design of care environment and QoL of older people	The home-like environment with residents living in small groups of 10 with separate facilities. Buildings with well-articulated entrances, ample light, staircases, and landmarks are best for care environment.	Home-like environment, QoL
Casey, Low, Jeon & Brodaty (2016); Australia (Sydney)	Cross-sectional, multiple - method design. 36 residents ages 63 to 94 in 3 units of a 94-bed Australian nursing home, including an 18-bed dementia-specific unit (DSU)	Residents' positive and negative relationship networks in the nursing home.	Social network analysis to explore associations between resident engagement and social isolation.	Findings highlight Nursing Home residents' isolation and lack of engagement. Number and quality of relationships were associated with resident social withdrawal, perceived support, and isolation. Residents' level of social engagement and experiences of support or isolation were associated with the quantity and quality of their relationships with co-residents.	Social engagement, Experiences of support, QoL
Fleming & Purandares (2010); UK (Manchester)	A Literature review of 57 articles	Size of the care home, an optimum level of stimulation, unobtrusive safety features, availability of rooms to suit varying functions or specific purpose, social environment (homeliness, activities and outside space).	Intervention utilizing the physical environment to give environmental design guidelines.	Design features: safety and security of the residents by confining them within a secure perimeter, contain a variety of spaces that provide the residents with differing ambience, size and function, single, personalize room for each resident, visual access to features, optimize helpful stimuli with the periodic availability of high levels of illumination, small facility with home-like appearance, provide opportunities for engagement with the ordinary activities of daily living, outside accessible space.	Social environment, Homeliness, Physical activities, and Outside space
Geboy (2009); USA	Systematic review of design principles	Design principles are general "rules of thumb" within a person-centered care context,	Creating supportive physical environments that balance the physical and psychosocial accommodation of program participants/residents and programming requirements within a person-centered care context.	The paper spoke on ten design principles for elder and dementia care staff. These characteristics include 1. space as a resource, 2. seating at right angles, 3. conversation groupings, 4. personalize the space, 5. accessorizing the space with activity "props", 6. decentralized dining 7. Avoid "theater-style" (chairs in rows) seating 8. Avoid periphery (backs against the wall) furniture arrangements 9. planning	Improve social interaction, Design guidelines

				ahead regarding seating individuals in wheelchairs 10. flexible space.	
Hoof, Kort, Waarde & Blom (2010); Netherlands	Literature review and supplementary focus group sessions	Inclusion criteria: general design goals in relation to dementia and specific environmental modification practices at home. Functions that are supported through environmental interventions are (1) safety and security at home including wandering as well as (2) perception, orientation, and memory.	Design goals, environmental interventions and their impact on daily practice.	Falls and carpet design, signage, wayfinding, and distraction, modifying doors to manage behavior, closet modifications to support dressing, easy access, lighting, grab bars, guard rails, non-slip floor covering, remove locks and another design implementation.	Improved social interaction, Design intervention, Design guidelines
Hoof, Kort, Duijnstee, Rutten & Hensen (2010); Netherlands	A Literature review of the integrated design of the indoor environment	The literature study frameworks: (i) the International Classification of Functioning, Disability and Health (ICF) with its basis in health sciences, and (ii) the Model of Integrated Building Design (MIBD). To provide an overview of the indoor environmental parameters, as well as the integrated design and implementation of relevant building systems.	PwD are not just seemingly passive receptors of the indoor environment, but may actually respond to it in a very outspoken manner, and that technology installed may actually pose challenges to the provision of care and well-being.	Results are presented as indicators of the basic value, functional value and economic value, as well as a synthesis of building-related solutions, to help designers and building services engineers to create optimal environmental conditions inside the living environments for people with dementia.	Indoor environment, Social relationship

Mcgilton, Rivera & Dawson (2003); Canada (Ontario)	Randomized controlled trial. Four nursing home units in a geriatric center. 32 residents (mean age of 86 years) with Alzheimer's disease (17 in the treatment group and 15 in the control group)	The effect of the intervention on the residents' spatial orientation and agitation. The intervention consisted of the use of a location map and a behavioral training technique. Methods to reduce spatial disorientation for persons with dementia includes the physical environment, behavioral interventions, use of landmarks such as signs.	Wayfinding to dining room, residents' agitation, spatial orientation.	Results indicated that the residents' in the treatment group demonstrated an increased ability to find their way to the dining room one week after the intervention and showed a decline in their level of agitation. The intervention effect was not sustained three months later. The intervention was an attempt to assist the residents to adjust to their new environment by providing them with an intervention to help them learn to find their way.	Wayfinding, Dining room, Residents' agitation
Mitchell, Burton, Raman, Blackman, Williams (2003); UK	Literature review	Design guidelines for the outdoor environment: familiar, legible, distinctive, accessible, comfortable, safe.	Dementia-friendly outdoor environments.	Small-scale street blocks with Architectural facades and open spaces in designs, short streets with good visual access along the street, a variety of styles, materials, and colors of architectural features and street furniture. Wayfinding cues, Landmarks, avoid bright yellow color, Unavoidable level changes clearly marked and lit, doors and gates with lever-type handles, right-angle seating, street lighting which illuminates pavement edge without creating glare, changes in texture or color of paving to indicate potential hazards.	Outdoor Environments

Marquardt (2011); Germany	Literature review	Legibility, Familiarity, Autonomy, Sensory Stimulation, and Social Interaction are the Criteria of a Therapeutic Physical Environment.	Wayfinding in Dementia.	The floor plan design of a nursing home, in particular, has a significant influence on residents' spatial orientation and wayfinding. Environmental interventions that promote wayfinding can be implemented on two levels: the design of the floor plan typology and environmental cues, which comprise signage, furnishings, lighting, colors, etc. Decorating residents' bedroom doors with personal items, length of corridors, lighting intensity, architectural differentiation, natural light, views to the outside, and other sensory stimulation are important design features.	Social Interaction, Therapeutic Physical Environment
Parker, Barnes, McKee, Morgan, Torrington, Tregenza (2004); UK (Sheffield, Yorkshire)	Cross-sectional, multiple - method design. 38 Care Homes (11 small, 14 medium, 13 large)	Access to the indoor/outdoor environment, privacy, personalization, choice, safety, comfort to measure building domains.	Sheffield Care Environment Assessment Matrix (SCEAM)	QoL is a multi-dimensional construct that includes social relationships. A positive association between the physical environment and QoL.	QoL, Multi-dimensional construct, Social relationships
Torrington (2006); UK (Sheffield)	Cross-sectional, multiple - method design. 38 Care Homes in Sheffield and Rotterdam Small (<31 beds), medium (31-40 beds) and large (40+ beds)	To identify the effects of building design on residents' well-being. Physical Environmental Factors: form, layout, space, elements, furniture, services, environmental comfort, privacy, choice, spatial meaning.	Sheffield Care Environment Assessment Matrix (SCEAM). QoL outcome: active time, well-being, enjoyment of activities, positive/negative emotions, environmental control.	Overall well-being score was larger in small homes. Physical environment should be designed to support activity by providing good physical support.	Well-being score, Small-scale home
Chaudhury, Hung & Badger (2013); Canada (Vancouver)	Literature review. 22 journal articles, including 12 intervention studies	Inclusion criteria: (1) the article described the results of empirical research; (2) the physical environment of the dining rooms in long-term care was	Role of Physical Environment in Supporting Person-centered Dining.	The evidence indicates that well-designed physical settings play an important role in creating a person-centered dining environment to support the best possible mealtime experience. Supportive dining environment can foster (1) supporting functional ability,	Person-centered care, Dining experience, Role of Physical Environment

		explicitly addressed; and (3) the article was published in English from 1990 or later. Dining rooms were decorated with home-like items such as paintings, bookshelves, plants and appropriate background music. The tables were set with tablecloths, placemats, tableware, and centerpiece to invite the residents into the dining room.		(2) maximizing orientation, (3) providing a sense of safety and security, (4) creating familiarity and home-likeness, (5) providing optimal sensory stimulation, (6) providing opportunities for social interaction, and (7) supporting privacy and personal control.	
Chaudhury, Hung, Rist & Wu (2017); Canada (Vancouver)	Pre and post-renovation ethnographic observations. Two care units of a large long-term care facility in western Canada between 2012–2014 with 10 residents, 17 care aides, and nurses	Pre and post-renovation of the physical environment of dining room. Physical environmental interventions, such as adding an open kitchenette and creating a more home-like dining atmosphere with appropriate interior design changes.	Role of physical environment in any meaningful person-centered care. Tool: DEAP (dining environment audit protocol), 5 points Likert scale.	Five themes are notable from the renovations: (a) autonomy and personal control, (b) comfort of a home-like environment, (c) conducive to social interaction, (d) increased personal support, and (e) effective teamwork.	Autonomy, Environmental interventions, Comfort, Home-like environment, Social interaction, Teamwork
Jueng, Tsai & Chen (2016); Taiwan	104 LTCF residents, Aged 65 years and older. Face-to-face interviews and cross-sectional analysis using the Chinese version of Antonovsky's short 13-item sense of coherence (SOC) scale	Room type, natural windows, outdoor public space	Chinese version of Antonovsk'y short 13-item sense of coherence scale, activities of daily living, MMSE, geriatric depression scale.	Long-term care facility residents in Taiwan had a relatively low sense of coherence scores compared to their counterparts in Western countries. Among personal and environmental factors, we discovered that education level, activities of daily living score and number of long-term care facility staff were factors significantly associated with the sense of coherence status. Higher education level and higher activities of daily living scores with more LTCF staff had a stronger sense of coherence.	Higher education level, Higher activities of daily living scores, More LTCF staff, Sense of coherence

Chaudhury, Cooke, Cowie & Razaghi (2017); Canada (Vancouver)	Literature Review. 103 full-text, 94 empirical studies, 9 reviews, published after 2000.	Inclusion criteria: empirical research, relevant to the topic and published in English-language journals after 2000. Home-like Character, Sensory Stimulation, Unit Size, Spatial Layout, and Orientation Cues. Small-scale dining area that foster associations, privacy intrusions and outdoor areas for walking, gardening or group activities.	The physical environment in care settings in enhancing residents' QoL and quality of care practices.	Highlighted the influence of unit size, spatial layout, home-like character, sensory stimulation, and environmental characteristics of social spaces, dining, bathing and outdoor spaces on residents' behaviors and well-being in dementia care facilities.	Environmental characteristics, Social spaces, Social interaction
Young Lee, Chaundhury & Hung (2016); Canada (Vancouver)	Longitudinal study. Two dementia LTCF1) Maple Manor: traditional large-scale setting, 5 residents with mean age 77.6 (SD = 9.8 years) 2) Richmond Manor: small-scale, home-like setting, 7 residents with mean age 82.9 (SD = 8.9 years).	N/A	Traditional large-scale unit vs small-scale, home-like unit and Therapeutic Environment Screening Survey for the physical environment. Residents' behavioral assessments using Multidimensional Observation Scale for Elderly Subjects (MOSES), Minimum Data Set, Dementia Care Mapping.	Small-scale facilities have positive effects on health and behavior of residents in long-term care facilities. Richmond Manor as a small-scale care unit had more positive features in design, including quality of lighting and visual, tactile, and acoustic stimuli and offered a more home-like atmosphere to residents with dementia as compared to the physical environment of Maple Manor.	Small-scale home, Social interaction, QoL
Forsund & Ytrehus (2016); Norway	Qualitative study with interview and observation. 15 spouses, seven men and eight women with an average age of 79 years. Specialized care units (SCU) in four nursing homes and four sheltered housing units	Family pictures in individual rooms, decorating the room in a home-like style. The common area needs to be home-like.	Duties and tasks, usage of environments, roles-relations, and interaction	The individual room is an important feature in maintaining spousal contact and interaction throughout all phases of dementia, including the final phase. The physical environment must be accommodating by making anonymous rooms into meaningful places by decoration with furniture, photographs and familiar objects are important.	Privacy, Relationship with spouse

Calkins (2009); USA (Ohio)	Literature review	Household or group size, Building configuration, Non-institutional versus residential design, Wayfinding, Safety, Outdoor areas, Dining rooms, Bedrooms	Design of physical environment	Use of Bright light, color, temperature, wayfinding, outdoor areas, dining rooms with the inclusion of kitchens and residential scaled dining rooms. The strongest evidence supports the positive benefits of private bedrooms on outcomes such as the satisfaction of residents, families, and staff, QoL, preference and reduced neuro-disability.	Private bedrooms, Satisfaction of residents
Smit, Willemse, Lange & Pot (2014); Netherlands	Explorative Study. 57 residents in 10 dementia care facilities	Home-like décor and furniture in terms of colors, carpet, walls, tables, chairs, cabinets, lamp, presence of outdoor space, presence of walking path, presence of occupational stimuli like books, papers, magazines, games, stuffed animals, presence of meaningful objects (objects that have potential value to residents). Furniture should be arranged in a conversational pattern (to stimulate social interaction). Visual stimuli: the decoration of the wall, photographs, mobiles, fish tank, the presence of blinding glare on floors, furniture.	Staff to resident ratio, individual space, physical environment evaluation component of dementia care mapping	Reminiscence, leisure, expression, and vocational occupation had the greatest potential to enhance well-being. The physical environment and care organization might play a role, but the key factor seems to equip staff with skills to integrate well-being-enhancing occupation into care practice. LTCF with more home-like atmosphere supported social interaction through the environment and had no central activity program is preferable.	Furniture arrangement, Stimulated social interaction

Nordin, McKee, Wallinder, Koch, Wijk & Elf (2017); Sweden	Comparative Case Study with mixed-method, convergent analysis. 54 residents, 25 staff members, 4 relatives. Mean age was 87.	Open plans, automatic doors, smooth flooring and safety devices, and elevators in buildings facilitated resident movement for different types of activities, social interaction. Garden, large windows to access natural daylight allowed residents to follow daily life activities. The large size of the private apartments and dining areas facilitated activity, social interaction.	The quality of the physical environment, resident activities and affective states, the relationship between environmental aspects and resident activities.	The design of the physical environment influenced the residents' activities and interaction. Private accessible apartments, safety, and dining areas showed high environmental quality, whereas the overall layout had lower quality.	Residents' activities, Interaction, Relationship
Werezak & Morgan (2003);	Literature Review	Social, physical and psychological environment	Psychosocial versus physical environment	The psychosocial environment (also defined as meaningful events), especially those involving social interaction, and their resultant effect on psychological and emotional well-being are critical to high-quality institutional dementia care.	Psychosocial environment, Social interaction
Rooij, Luijkx, Schaafsma, Declercq, Emmerink & Schols (2012); Netherlands	Quasi-experimental, longitudinal research design in four traditional and twelve small-scale living units. 179 residents with dementia (age > 65 years).	Traditional versus small-scale long-term care settings	Instruments to measure the primary outcome QoL (QUALIDEM), secondary outcomes being QoL determinants and control variables	Residents in small-scale settings had higher mean scores on 'social relations', 'positive affect', and 'having something to do' than residents in traditional settings. Both small-scale and traditional settings appear to have beneficial effects on different domains of QoL of residents with dementia.	Small-scale settings, Social relations, Positive affect, QoL

Beerens, Boer, Zwakhalen, Tan, Ruwaard, Hamers & Verbeek (2016); Netherlands	An observational study with 115 participants. Mean age was 84 years old, (75%) were women.	Social interaction to promote good QoL	The MEDLO-tool, a tablet-based observational tool	The results underline the importance of social interaction and a positive mood for a higher QoL. Frequent social interaction is associated with higher QoL. PwD with higher QoL were more engaged in active, expressive, and social activities and did less passive/purposeless activities than PwD with lower QoL	Social interaction and QoL
Kontos (2011); Canada (Southern Ontario)	Ethnographic study. 79 residents (11 men and 68 women) in Orthodox Jewish long-term care facility	Inclusion criteria: medical diagnosis of probable Alzheimer's disease; a moderate or severe level of cognitive impairment as measured by the MMSE; 65 years of age or older; and two times more women than men.	Sociability and selfhood in dementia	Empathy, social etiquette, the power of gesture are major aspects of selfhood. Residents expressed empathy through kind words, touch, attentiveness, and responded to others' presence and feelings of sadness, loss, and fear. Sociability is an embodied dimension of selfhood and person-centered dementia care. A gesture is a phenomenon that often passes without notice, and yet in face-to-face interaction, it is an important resource for communication. Residents did not communicate with each other with words alone.	Sociability, Selfhood and Person-centered dementia care
Abbott, Sefcik, Haitsma, (2017); USA	Observation Study using 1) medical charts, 2) visitor logs, and 3) direct observations. 29 residents, mean age of 87 years (15 D-SCU and 14 TNH)	1) Location of interaction, 2) context of interaction (e.g. social, care related, or re-direction), 3) type of interaction (verbal or non-verbal and with whom), 4) quantity of interaction (frequency and duration), and 5) quality of interaction (resident affect).	1704 interaction over the course of 143 hours. 29 residents with cognitive impairment residing in both a D-SCU and a TNH	Interaction were brief, verbal and social in nature, and occurred in public areas. Casual living and activities areas in close proximity to bedrooms, kitchens, etc. enhance their social environment and integration through both design and staff involvement.	Activities areas, Close proximity, Social environment

Boer, Hamers, Zwakhalen, Tan Beerens, Verbeek (2017); Netherlands	Longitudinal observation study. 115 nursing home residents in green care farms, traditional nursing homes, and regular small-scale living facilities. Mean age of 82 years.	To investigates whether residents of green care farms are more engaged in (physical) activities and social interaction than are residents of other nursing homes.	Small-scale facilities, the environment involves unique features of green care farms include the presence of animals, stables, gardens, and outdoor areas.	Residents living at green care farms are more active, significantly more often participated in domestic activities, outdoor/nature-related activities and significantly less often engaged in passive/purposeless activities than the residents of the traditional nursing home. Green care farms can be a valuable alternative to traditional nursing homes. They provide an attractive, home-like environment and activities that positively influence engagement and social interaction.	Green care farms, Engaged in domestic activities, Interaction
Edvardsson, Sandman, Rasmussen (2011); Sweden	Grounded theory design, Interview & Observation in a psycho-geriatric hospital unit with 24 residents.	'Sharing place and moment', 'sharing place but not moment' and 'sharing neither place nor moment	Psychosocial climate and its influence on the well-being of people with dementia	Staff presence and absence emerged as the core concept influencing the psychosocial climate and the well-being of people in dementia in a psycho-geriatric setting. Staff was catalysts for the psychosocial climate and when being present and engaged they could create a climate interpreted as at-homeliness which supported patient well-being. When being absent, the climate quickly became anxious and this facilitated patient ill-being.	Staff presence, Psychosocial climate
Smit, Willemse, Lange, Pot (2014); Netherlands	The explorative study used the observation tool and 8th edition of Dementia Care Mapping (DCM) with 57 residents in 10 dementia care facilities	Home-like environment	Well-being-enhancing occupation	Reminiscence, leisure, expression, and vocational occupation had the greatest potential to enhance well-being. A more home-like atmosphere with décor and furniture in terms of colors, carpet, walls, tables, chairs, cabinets, lamps, supported social interaction through the environment and had no central activity program are an ideal setting.	Small-scale home, Social interaction, QoL

Garcia, H´ebert, Kozak, S´en´ecal, Slaughter Aminzadeh, Dalzie, Charles, Eliasziw (2012); Canada (Calgary, Toronto, and Ottawa)	Qualitative research, nominal focus groups with family and staff members. The mean age was 83 years with moderate to severe dementia. 15 nominal focus groups with 45 family and 59 staff members. 8 care units within 6 LTC homes in three Canadian cities	To reduce disruptive behaviors and facilitate QoL or encourage disruptive behaviors and impede the QoL of residents.	Elements from the physical and social environment that hinder and improve disruptive behaviors and the QoL of residents in LTCF.	Social/human environments were perceived to be more important than physical environments. Specialized physical design features can be useful for maintaining the QoL and reducing disruptive behaviors. Low ratio of staff to residents and noise was identified as one of the most important factors influencing behavior and QoL of residents. A mnemonic – C.A.R.E.F.U.L. – was developed: Consistency, Approach, Ratio of staff to residents, Environmental Design, Flexibility, Understanding, Level of Noise.	Social/human environments, Physical environments
Lee, Boltz, Algase (2017); USA (Michigan and Pennsylvania)	Multisite descriptive study. 110 persons with dementia in 17 nursing homes and 6 assisted living facilities. The average age of 84 years, 55% of participants had a severe cognitive impairment.	Psychological well-being, Social interaction and the quality of interaction	Personal factors related to dementia (eg, cognitive function), personal factors not related to dementia (eg, comorbidity, mobility), and the environment (eg, social environment)	Quality of residents' relationship with staff is an important determinant of QoL. Both verbal and nonverbal interaction showed a significant relationship with positive and negative emotional expressions. A positive interaction was significantly associated with a more positive emotional expression, whereas negative interaction was not. Quality staff interaction with residents plays an important role in promoting the psychological well-being of persons with dementia.	Quality staff interaction, Psychological well-being
Digby R. & Bloomer M.J. (2012); Australia (Melbourne)	Qualitative descriptive study, in-depth semi-structured interviews. Four family careers and seven people with mild-to-moderate dementia. Mean age of 85 years with an average length of stay is 23 days.	Care environments that priorities non-institutional design features assist in promoting well-being in the patient to give a sense of homeliness	Physical environment and quality of care practices	Participants described how the care received was more important than the physical environment; however, participants also valued homeliness and privacy. Spatial design feature such as ambiance in the ward environment, color, the use of familiar landmarks and furniture such as a home-like dining table, white noise, connection to nature, privacy and homeliness and the use of smaller spaces with simple decision points can impact patient’s mood and behavior.	Physical environment and Resident care

Nordin, McKee, Wallinder, Wijk, Elf (2017); Sweden	A mixed-method, convergent analysis in two residential care facilities. 83 people included (resident n = 54; staff member n = 25; relatives n = 4)	Relationships between the physical environment and activities. 1) Building design and fixtures are related to indoor and outdoor activities. 2) Building location is related to outdoor activities and contact with outdoor life. 3) Space size is related to indoor activities and atmosphere.	Environmental assessments: Swedish version of the Sheffield Care Environment Assessment Matrix (S-SCEAM), resident activities, interaction, and locations were assessed through an adapted version of the Dementia Care Mapping (DCM). The Observed Emotion Rating Scale (OERS) was used to assess residents' affective states.	Design of the physical environment influence the residents' activities and interaction. Private apartments and dining areas showed high environmental quality at both residential care facilities (RCFs), whereas the overall layout had lower quality. Resident well-being and independence are highly influenced by both organizational factors and environmental aspects. The physical environment, the care philosophy and the culture of care play major roles in the daily lives of the residents at RCF.	Design of the physical environment, Residents' activities, Interaction
Campo, Chaudhury (2011); Canada (Vancouver, British Columbia)	The ethnographic study, observations & interviews. 43 Residents (mean age of 82 years old) in two SCU's located in Vancouver, British Columbia (Meadowcrest Lodge and Guildwood Village)	Importance of Informal social interaction in LTCF. The framework of informal social interaction (1) the physical environment; (2) the organizational environment; (3) the individuals inhabiting the environment (human aggregate); and (4) social environments	Three social environmental factors and three physical environmental attributes (1) the philosophy of care and the role of care staff; (2) group size; (3) time of day; (4) home-like character and ambiance; (5) nursing station location; and (6) the presence of adequate seating and sightlines.	Design recommendations include seating areas in the hallways to maximize visual access, home-like decorations and furniture, adequate lighting, and attempt to reduce ambient noise to ensure congruence between the physical and social environments.	Physical environment and Social environment
Marioni, Proust-Lima, Amieva, Brayne, Matthews, Dartigues, Jacqmin-Gadda (2015); (Europe, France)	A longitudinal study in 20-years follow up prospective cohort study 2854 participants with mean baseline age 77 years	N/A	Social activity, cognitive decline, and dementia risk	Increased engagement in social, physical, or intellectual pursuits was related to a decreased risk of dementia. The variables that were included in the social, physical, and intellectual engagement measure might have been solitary activities - such as travelling, gardening, doing odd jobs and knitting.	Increased engagement, Socio-physical-intellectual pursuits, Decreased risk of dementia
Lee, Chaudhury, Hung (2016); Canada (Vancouver, British Columbia)	Mixed-method research that includes environmental assessments, comparisons, qualitative fieldwork &	Staff perceptions on the role of the physical environment. (a) supportive physical environment contributes positively to	Focus group participants included nurses, care aides, recreation staff, administrative staff, and family. Improve QoL for residents and a supportive	Small-scale home-like setting with comfort, familiarity, and organized space gives dementia care homes more resources to improve the QoL for residents and a supportive work environment for staff. A well-designed	Small-scale, home-like setting, Social interaction, QoL, Supportive work environment, Stuff

	group interviews. 15 staff members in two dementia care facilities (Edgewood Home and Marine Manor). Average service year 23.3 years (EH) and 14.4 years (MM)	both quality of staff care practice and residents' QoL and (b) an unsupportive physical environment contributes negatively to resident's QoL and thereby makes the work of staff more challenging.	work environment for staff	physical environment can lead to higher morale, closer relationship between staff and residents and work-effectiveness in staff, potentially resulting in better care to enhance the well-being of residents.	
Knight,Haslam, Haslam (2010); UK (Southwest England)	The longitudinal experiment includes a questionnaire and observational measures. 27 residents, aged from 67 to 92 years (17 women and 10 men) in two separate floors of the same residential care-home	Residents' behavior, QoL and use of social space	Liking for de´cor, comfort, identification with staff, identification with residents, life satisfaction, physical health.	The design of communal living space had several substantial positive consequences for both residents and care staff. The study explores empowering residents to make collective decisions about the de´cor of communal space that has a positive impact on: (a) their identification with others in their home, (b) their well-being and QoL, and (c) their social interaction with fellow residents.	Empowerment, Collective decision making, Social interaction, QoL and well-being, Older adults

Marquardt, Ing, Johnston, Black, Morrison, Rosenblatt, Lyketsos, Samus (2011); USA (North/Northwest Baltimore)	Cross-sectional data from a larger randomized controlled trial. Total 303 older adults, the mean age of participants was 84.5 years. The majority were women with 62%	Spatial Layout of the Home and space syntax variables intelligibility and convexity. The inclusion criteria for participants were as follows: (1) residence in the identified catchment area, (2) aged 70+, (3) met Diagnostic and Statistical Manual of Mental Disorders (4) a reliable study partner was available to serve as a proxy informant.	Maximizing Independence at Home (MIND at Home), Activities of Daily Living Scale (IADLS), Psychogeriatric Dependency Rating Scale (PGDRS), Mini-Mental State Examination (MMSE)	Higher convexity was associated with the worse performance of basic activities of daily living (ADL), Intelligibility was not associated with ADLs. Enclosed rooms with a clearly legible meaning and function might be better memorized and associated with the spatial layout of the home resulting in better basic ADL performance. Rooms associated with purpose may cue individuals in the performance of ADL. The participant lived with a spouse or another caregiver, also contributed to lower instrumental ADL.	Legible, Meaningful function of space, Memory care

Marquardt, Schmieg (2009); Germany	Empiric-qualitative exploration. 30 German nursing homes with 450 residents (mild dementia n=91, moderate dementia n=183, severe dementia n=176)	Five types of circulation system: 1) Straight circulation system 2) L-shaped circulation system with a change in direction 3) Continuous path around an inside courtyard 4) ‘‘Intermediate Element’’ dividing a corridor 5) Corridor ending. Architectural design guides suggest various strategies to enhance orientation, including improvements for wayfinding by using signage and by choosing a supportive building organization.	The architectural structure of a nursing home on the resident’s wayfinding abilities. Five characteristic routes within the living areas of the home: 1) live-in kitchen 2) resident’s individual bedroom 3) Toilet 4) Outside 5) common room	Social Interaction privacy, belonging and communication are important determinants. Architectural guidelines include a small number of residents per living area, the straight layout of the circulation system without any changes in direction, and the provision of a living/dining room. Residents’ orientation depends on the physical environment. Access to the outdoor area or balcony should be located in a central area within the living area. Architecturally legible—meaning that their function is evident through their size, proportion, materiality, and furnishing.	Residents’ orientation, Physical environment, Architecturally legible, Meaningful function
Andersson, Paulsson, Malmqvist, Lindahl (2015); Sweden (Gothenburg)	Explorative observation study. Total 199 residents (aged from 73 to 102 years) in five facilities. Six units for residents with dementia and in nine units with residents suffering from somatic disorders	The common spaces contain multi-purpose common spaces with integrated kitchens, dining rooms, and sitting rooms.	Use of common spaces in somatic and dementia units	The degree of use of common spaces differs between the somatic and dementia units. Common spaces were used more continuously over the day on dementia units, suggesting that the residents on somatic units spend more time alone in their apartments. Staff assume a great responsibility for the residents on the dementia units and expressing a strong desire to relocate the residents to common spaces on the dementia units.	Common spaces, Dementia units, Legible, Supportive design