‘**There’s no place like home’ - A scoping review on the impact of home-like residential care models on resident-, family- and staff-related outcomes**

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**Conflict of Interest**   
No conflict of interest has been declared by the authors.

**Abstract**

**Background:** There is increasingemphasis on promoting ‘home-like’ residential care models enabling care-dependent people to continue living in a self-determined manner. Yet, little is known about the outcomes of home-like residential care models.

**Purpose:** We aimed to (1) identify home-like residential care models for older care-dependent people with and without dementia and (2) explore the impact of these models on resident-, family- and staff-related outcomes.

**Design and Methods:** We applied a scoping review method and conducted a comprehensive literature search in PubMed, Embase and CINAHL in May, 2015.

**Results:** We included 14 studies, reported in 21 articles. Studies were conducted between 1994 and 2014, most using a quasi-experimental design and comparing the Eden Alternative (n=5), non-dementia specific small houses, e.g. Green House® homes (n=2), and dementia specific small houses (n=7) with usual care in traditional nursing homes. The studies revealed evidence of benefit related to physical functioning of residents living in dementia-specific small houses and satisfaction with care of residents living in non-dementia-specific small houses compared with those living in traditional nursing homes. We did not find other significant benefits related to physical and psychosocial outcomes of residents, or in family- and staff-related outcomes.

**Implications:** The current evidence on home-like residential care models is limited. Comparative-effectiveness research building on a clear theoretical framework and/or logic model and including a standardized set of resident-, family- and staff-related outcomes, as well as cost evaluation, is needed to provide a stronger evidence base to justify the uptake of more home-like residential care models.

**Keywords:** Long-term care, home-like, small-scale, residential facilities, scoping review

# Background

Healthcare systems worldwide are facing challenges in providing long-term care for an increasing population of older care-dependent peoplewith complex health needs including multiple chronic diseases and functional and/or cognitive impairment.1 Between 2000 and 2013, in OECD countries the average proportion of older-care dependent people receiving long-term care increased from 1.9% to 2.3%. By 2050, the percentage of the population aged over 80 is expected to have risen from 4% to 10%, linked to a projected increase in the prevalence of people living with dementia from 14.5 to 22.5 per 1000 population by 2035.2 Consequently, the average proportion of gross domestic product spent on long term care is projected to increase, such as, from 2.0% to 3.6% between 2015 and 2060 in European countries.3 The majority of care-dependent people are cared for in their own homes by informal caregivers.4 Yet, about one-fifth receive care in residential care facilities such as nursing homes, and by 2060, this population is estimated to nearly triple (from 2.9 to 8.3 million) in OECD countries.4

Nursing homes (NHs) provide 24-hour-a-day nursing care for persons who are typically physically and/or cognitively impaired.5 The quality of care and quality of life in NHs has been a long-standing concern of consumers, care providers and policy makers.6 7 An increasing body of evidence show that NH residents commonly experience preventable negative outcomes (e.g., adverse drug events, pressure ulcers, falls with injuries, physical and pharmacological restraint use, delirium and elder abuse) associated with higher morbidity and mortality.8-14

The World Health Organization, the International Association of Gerontology and Geriatrics and the Institute of Medicine in the United States (US) emphasize the pressing need for innovative care models to improve the quality of care in NHs. There is an urgent need for residential care models that are ‘fit for the future’, e.g. to transform NHs into more ‘home-like environments’, and enable care-dependent people to continue living in a self-determined manner.15

A ‘model of care’ is a multifaceted concept that broadly defines the way health services are delivered, outlining best practice care delivery through the application of a set of service principles across identified clinical streams and flow continuums.16 In the US, the Green House®  and Eden Alternative are examples of residential care models, designed to look and feel like a home-like environment that returns control, dignity, and a sense of well-being to care-dependent people, while providing high-quality, personalized care.17 18 Indeed, over the years there has been greater emphasis to promote Green House® homes, with currently more than 260 homes in 32 states open or under development.19 In Europe, there is an increasing emphasis on providing residential care for older people with dementia in small-scale living arrangements. In their literature review, Verbeek, et al.20 described the types and care characteristics of such small-scale and home-like environments, but did not examine outcomes.20

Although we identified a recently published review on culture change in NHs, we were unable to identify any published review that included a synthesis of research findings related to outcomes of small-scale home-like residential facilities.21 Yet such evidence is necessary to inform health policy-makers, NH providers and consumers about the potential benefit of fostering small-scale home-like residential facilities instead of traditional NHs. We therefore conducted a scoping review to (1) identify home-like residential care models for older care-dependent people with and without dementia and (2) explore the evidence about the impact of these care models on resident-, family- and staff-related outcomes.

**Methods**

*Design*

To map and summarize the existing literature on home-like residential care models, a scoping review was conducted based on the framework outlined by Arksey and O'Malley. 22 The aim of a scoping review is ‘summarizing a range of evidence in order to convey the breadth and depth of a field’.23 Some key differences from a systematic literature review include formulating broad research aims (i.e. no narrowly focused question), developing and refining selection criteria for papers during the review process (i.e. post hoc instead of a priori) and omitting critical appraisal of risk of bias of the included studies.22 24-26

*Study identification*

A comprehensive literature search on home-like residential care models was conducted in May 2015 by two authors (SE and DA) using the PubMed, Embase and CINAHL databases. A combination of Medical Subject Heading [MeSH] terms and free text terms was used in the search string: “Small-scale housing” [Keyword], “Home-like” [Keyword], “Shared housing arrangements” [Keyword], “Green House” [Keyword], “Eden Alternative” [Keyword], “Homes for aged” [Keyword], "Residential facilities"[MeSH], "nursing homes"[MeSH], “Family caregivers” [Keyword], and “Long-term care” [MeSH]. The search was limited to articles in English and included residents aged 65+, without applying restrictions for publication date. The reference lists of potentially relevant studies were hand-searched for additional references.

*Study selection*

Two researchers (SE and DA) screened the titles and abstracts based on the following pre-defined inclusion criteria: (i) quantitative (interventional and observational) studies; (ii) published in a peer reviewed journal; (iii) aims explicitly addressing home-like residential care models (settings designed specifically to resemble home-like environment, including small-scale units or houses); and (iv) studies describing at least one resident-, family- or staff-related outcome.

Since a priori defining strict selection criteria is not suitable for scoping reviews with broad research questions, the initial criteria were further refined during the study selection process. Studies were excluded if they investigated only one specific intervention to achieve cultural change in traditional NHs (e.g. ‘relaxing music at mealtime’) and if they did not perform any comparative analysis (e.g., pre-post comparison or comparison with traditional NH care settings). Studies exploring the effect of home-like environments on staffing and skill mix levels only, and those examining resident-, family- or staff-related outcomes only in traditional NH settings were excluded. If the same findings were reported in more than one article from the same study, we included the most recent article.

*Data charting*

Data from the included studies were extracted and summarized by one reviewer (SE) and checked for accuracy by a second reviewer (DA). The extracted data included study design, setting and sample; purpose or aims; type of residential care model; and outcome variables and their measurement (Table 1). To synthesize and report meaningful findings, the heterogeneous outcomes and measures were categorized and summarized by type of setting: (1) Eden Alternative; (2) small, home-like settings not focusing specifically on residents with dementia (included Green House® settings); and (3) small, home-like settings specifically designed for residents with dementia. In absence of a conceptual framework or core outcome set, outcomes were classified within three clusters: resident-, family- and staff-related outcomes (Tables 2, 3 and 4). Resident-related outcomes were included only if they were reported in more than one study. Given the small number of studies examining outcomes for family and professional caregivers, we included outcomes that were measured in only one study. For each outcome, findings were classified as significant, non-significant or mixed based on the main findings (group by time effects in repeated measures analyses and overall group comparisons). Findings were classified as mixed if there were significant differences (1) in relation to only one but not both comparison traditional NHs (i.e. in studies were there were two comparison traditional NHs), (2) in some but not all of the domains measured for an outcome, or (3) at some but not all time points that were compared.

**Findings**

**Study selection**

Fourteen studies (corresponding to 21 articles), related to home-like care models’ effects on resident-, family- or staff-related outcomes, were included. The studied models of care were described as the Eden Alternative (n=5), small group houses not specifically for persons with dementia (n=2), and various types of small-scale living arrangements for individuals with dementia (n=7). The Eden Alternative is “a set of principles overlaid on existing NHs to flatten hierarchies, invest decision-making in residents and frontline staff, and normalize NH life, address psychosocial problems of residents, such as loneliness, boredom, helplessness, and lack of meaning”.27, pg. 832 Plants, animals, and contact with children are incorporated into the environment to create more home-like settings. One of the two studies of non-dementia specific small group houses examined outcomes for residents a Green House®. This setting differs from a traditional NH in terms of facility size, interior design, organizational structure, staffing patterns, and methods of delivering skilled professional services. Green House® homes are self-contained dwellings for 7-10 people needing NH levels of care. The physical environment offers residents opportunities for privacy and participation in community life with a residential-style kitchen where meals are prepared on site, a dining area with a communal dining table, a living room with fireplace, a sunroom, and accessible patio and outdoor space. In the Green House® frontline care staff members, who are Certified Nursing Assistants assigned to a single Green House®, have broad roles, including, cooking, housekeeping, personal laundry, personal care of residents, implementation of care plans, and assisting residents to spend time according to their preferences.28

The small-scale living arrangements for care-dependent people with dementia were all examined in European studies, yet varied by care concepts and characteristics.29-41 Most were separate houses or apartments with one study investigating household units within a traditional NH. They also varied in relation to the number of residents with most housing 6 to 12 residents. In six out of seven studies of small-scale living facilities for people with dementia, houses that are designed to resemble a typical home with a maximum of 8 residents per house were examined.29-41 Residents, family and a small, fixed team of staff performing multiple tasks including medical and personal care, organized activities and domestic tasks for one household. Activities center on daily life and meals are prepared in and by the household. For instance, Wolf-Ostermann, et al. investigated shared-housing arrangements for people with dementia living in large apartments in mostly urban settings, served by at least one community care service and being completely disconnected from traditional NHs.41 In contrast, Nakanishi, et al. investigated group-living units within traditional NHs, where frail older people lived in single-rooms.42 These group-living units were characterized by a common area, such as a dining room, for interaction among residents and stable staff assignments. Although the average number of residents per unit (average of 24 residents) was reported to be lower than in traditional NH units, compared to the other six studies it was relatively high (Table 1).

**Study setting and design**

Half of the 14 studies were conducted in the USA, one in Japan and the remaining six in European countries, i.e., the Netherlands, Belgium, Sweden and Germany (Table 1). Six studies used a quasi-experimental design, i.e. a pre-post-test with a usual NH care control group or a one-group pre-posttest design. The eight remaining studies used a prospective, retrospective or cross-sectional observational design. In the quasi-experimental studies, outcomes were measured at baseline and at 6, 12, 18 and 24 months follow-up. In the observational studies, outcomes were measured at baseline and 1, 3, 6 and 12 months after residents moved to the small home settings. The retrospective observational study used data from pre-implementation and 1 year post-implementation. In all comparative studies the same outcomes were measured in traditional NH settings at an equivalent time point.

**Resident-related outcomes**

Thirteen studies examined resident-related outcomes, including physical (e.g., activities of daily living (ADL), accidental falls, pressure ulcers) and psychosocial (e.g., cognitive status, mood, behavior, social activities, quality of life) outcomes (Table 2).

***Physical outcomes***

Nine studies examined physical outcomes (Table 2). These outcomes were studied more often in Eden Alternative settings and non-dementia specific small group houses than in dementia-specific settings. The outcomes examined most often reflected some aspect of *physical functioning.* Three of the five studies focusing on Eden Alternative settings examined a physical functioning outcome and found no significant effects compared to traditional NH settings.18 43 44 One of two studies in non-dementia specific small houses reported that residents in the small, home-like settings had or maintained functioning better than those in traditional NHs.27 Kane, et al. reported mixed findings with no significant differences in self-reported ADLs or instrumental ADLs among residents in the home-like compared with two traditional NHs, while based on MDS quality indicators, residents in the home-like setting had less decline in the late loss of ADLs than residents in the comparison NHs.45 In the four studies of small scale living facilities for residents with dementia that examined some aspect of physical functioning, in three of the studies functioning was significantly better in the small house residents than those in traditional NH settings 29 32 42 while there were no significant differences between settings in the fourth study.41 None of the other physical outcomes were examined in dementia-specific small, home-like facilities. Three studies examined *nutrition-related outcomes* 18 44 45 with one study in an Eden Alternative setting 44 and one in non-dementia specific small houses 45 reporting no significant differences in residents in home-like versus traditional NHs. In another Eden Alternative setting, Coleman, et al. reported more nutritional problems among residents in the home-like setting than in the traditional NH, but without significant differences in weight or BMI.18 O*verall medication use* was examined in two studies in Eden Alternative settings and two in non-dementia specific small houses.18 27 44 45 None of the studies reported significant differences in *overall medication use* compared to traditional NH settings. One Eden Alternative study 44 and one non-dementia-specific small house study 45 found no differences in the prevalence of *pressure ulcers* compared to traditional NH settings*.* Of the three studies describing *accidental* *falls* as an outcome, both studies in Eden Alternative settings reported mixed findings with significantly more falls in the home-like environments during one of the two timeframes measured.18 44 One of these studies also examined fall-related fractures and reported no significant difference by setting.44 Kane, et al. compared falls in non-dementia-specific small houses (Green Houses®) and traditional NH settings are reported no significant differences.45

***Psychosocial outcomes***

Twelve studies examined behavioral or quality of life outcomes (Table 2). Studies in all three types of settings examined aspects of *cognitive function* with most reporting no significant differences in home-like and traditional settings.18 29 32 41 43-45 In contrast, the Japanese study reported a significantly smaller deterioration in dementia (reported by direct care workers) between the first and second assessment (timeframe not reported) in residents in the home-like dementia-specific units compared with those in the traditional NH units.42 Outcomes related to *social activities/activation* were measured in three Eden Alternative settings with significant beneficial effects relative to comparison NHs in one study  44 no difference in one study 43 and mixed findings in one study.46 Kane, et al. reported a positive effect of the Green House® in relation to one comparison NH but not the other.45 In the two studies in dementia-specific settings, *social activity/activation* outcomes were significantly better than in the comparison NHs.32 36 Outcomes related to *mood* were measured in seven studies with significant benefits in the home-like settings relative to traditional NHs in two of the three Eden Alternative studies that examined this outcome.46 48 There was no significant difference in the third Eden Alternative study.44 Findings were mixed relative to traditional NHs in the one study of non-dementia-specific small house settings 45 and in one of the three dementia-specific settings that examined this outcome.39 There were no significant differences in the *mood*-related outcome relative to traditional NH residents in the other two dementia-specific settings that measured this outcome.29 36 *Resident satisfaction* was examined only in the two studies of non-dementia-specific small group houses. In both studies residents in home-like settings were significantly more satisfied than those in traditional NH settings.27 45 These two studies also compared *self-rated health* of the small house and traditional NH residents with no significant differences.27 45

The ten studies investigating differences residents’ *behavioral symptoms,* prescription of *psychotropic medications* and/or physical *restraint use* reported mixed findings. Two of the five studies examining outcomes in Eden Alternative settings and one of two studies in non-dementia-specific small houses compared *behavioral* symptoms in these settings to traditional NH settings and did not find any significant difference between the settings.32 39 41 43 45 The other two studies examining this outcome reported mixed findings. In one of these studies, residents in the home-like setting had fewer dementia-related behavioral symptoms than those in the traditional NH at one measurement time point but not the other.29 In the other study, there were significant group by time effects on one of the measures of behavioral symptoms but not the other.36 Both of the studies in Eden Alternative settings that examined *physical restraint use* reported significantly lower frequency of restraint use rates compared to traditional NH care.43 44 In two of the three studies in dementia-specific small house settings, there were no significant differences in restrain use 36 39, while in the third study, restraints were ordered for significantly fewer small house than traditional NH residents.32 *Quality of life* (resident-, family-, or staff-reported) was an outcome in one non-dementia-specific 45 and five dementia-specific small house studies.32 35 39 41 42 Kane, et al. reported significantly better quality of life among residents in non-dementia-specific small houses than residents in traditional NH settings for some but not all domains.45 Findings were mixed in the studies of dementia-specific small houses. Verbeek, et al. reported no significant group by time differences in staff and family ratings of residents’ quality of life for residents living in small scale dementia units and those living in traditional NH settings.35 Nakanishi, et al. reported that according to the staff, quality of life was higher for residents in home-like versus traditional NH units.42 In the remaining studies, findings were mixed, with significant improvements in some but not all domains measured 32 39 41, in relation to one comparison NH but not the other 39 45 and/or better in some domains but worse in others compared to traditional NH settings.39

**Family-related outcomes**

Family-related outcomes were measured most frequently in the studies of dementia-specific small houses. Only one of the Eden Alternative studies and one of the two studies in non-dementia-specific small home-like settings examined family-related outcomes (Table 3). Rosher and Robinson reported a significant improvement in total family satisfaction scores after the implementation of the Eden Alternative in a nursing home.47 In the study in a non-dementia-specific small house (Green house®), Lum, et al. measured five domains of family satisfaction with resident care.28 Families of residents in the home-like setting reported significantly higher satisfaction in three domains (physical environment, autonomy and health care) than families in both comparison NHs, while they reported significantly higher satisfaction in the other two domains (general amenities and family experience) than families from one but not the other NH. Global satisfaction with the setting as a place to live and receive care was significantly greater in the home-like setting than in one of two comparison NHs. In this study, there were no significant differences in reported caregiver burden, while Green House® families reported providing lower overall family assistance than those in one of the comparison NHs but not the other.28

Four studies (reported in six articles) compared family-related outcomes in dementia-specific home-like and traditional NH settings. Family *satisfaction* was measured in one study and was significantly higher in families of residents in the home-like settings than those of residents in traditional NHs in one study.37 Verbeek, et al. compared families’ reports of the *amount of assistance* they provided with resident care in small house and traditional NH settings and reported no significant differences.35 Three studies compared *family burden* in dementia-specific home-like and traditional NH settings. Andrén and Elmståhl reported significant lower total burden in the families of residents of the small-scale dementia units compared with those of residents of traditional NH units.30 In contrast, te Boekhorst 34 found no differences in informal caregiver burden in small scale and traditional NH settings and Verbeek and colleagues 35 found no group by time interaction effects in family burden in these two settings. C*ontact* between the family and the resident after the institutionalizationwas investigated in two studies; neither of them found significant differences between home-like and traditional NH settings.35 40 te Boekhorst, et al. reported no significant difference for *feeling of caregiver competence* by setting.34 Family’s *interaction with staff* was reported to be significantly better in home-like than in traditional NHs in one study 40, but not significantly different in the other study.35

**Staff-related outcomes**

Three studies examined staff-related outcomes in home-like and traditional NH settings (Table 4). Robinson and Rosher examined *staff-reported quality of work-life* before and 2 years after implementation of the Eden Alternative and reported that there was no significant difference although only one-third of the original staff members were still employed at the post-implementation assessment.48 Verbeek et al. reported that there was no significant difference in *job satisfaction* of staff working in dementia-specific home-like settings and those working in traditional NHs.35  Verbeek, et al. also measured *staff motivation* in the two types of facilities and reported no significant overall group differences.35 Staff-reported *work-related mental health problems* and *burnout* were investigated by de Rooij, et al. 38 Burnout was measured by three subscales (emotional exhaustion, depersonalization, and personal accomplishments) of the Dutch version of the Maslach Burnout Inventory. Staff working in dementia-specific home-like settings had significantly higher emotional exhaustion scores than staff working in traditional NH settings but there were no significant differences in scores on the other two subscales. Moreover, there were no significant differences in work-related mental health problems among staff in the two types of settings.38

### Discussion

This scoping review revealed a limited number of studies comparing the effects of three types of home-like residential care models and traditional NHs with regard to resident-related outcomes, with very few studies investigating family- and staff-related outcomes. We found evidence that people with dementia living in dementia-specific small houses might benefit in terms of physical functioning. Care-dependent people living in non-dementia-specific small houses are more satisfied with care compared to residents in traditional NHs. We did not find any other consistently significant benefits related to physical and psychosocial outcomes for people living in any of the three home-like residential care models. There is limited research examining family- and staff-related outcomes in home-like environments compared to traditional NHs and we did not find evidence for better outcomes in home-like environments.

The small number of studies that investigated the effects of home-like residential care models demonstrated that the evaluation of such models has received little attention. The three types of home-like residential care models we identified in the literature (i.e., the Eden Alternative, non-dementia- and dementia-specific small-scale living arrangements) are complex interventions.49 They use different approaches to create more home-like environment for residents, yet a more detailed description of the different intervention components is needed in future studies. In the Eden Alternative an existing NH setting undergoes a cultural transformation through application of a wider set of principles and intervention components with limited environmental changes to make it more ‘home-like’. In non-dementia and dementia-specific small living arrangements, care is usually provided in a home-like structure (e.g. house, apartment) for a limited number of residents. Despite the differences in view of structural elements and the population cared for, a clear theoretical framework and/or logic model is lacking and our understanding of the benefits that should be expected and the negative effects that can be avoided by these home-like residential care models in comparison to traditional NHs is limited. Despite the increased emphasis on Green House® in the US and similar small-scale living facilities in European countries (e.g., the Netherlands, Germany) methodologically sound studies building on a more solid theoretical ground and applying health services and comparative effectiveness research methods are needed to provide evidence on why and how these models impact on resident-, family- and staff-related outcomes. Moreover, evaluating the economic impact of home-like residential care models in comparison to traditional NHs and in relationship to each other is crucial to inform long-term care and health policy decision-makers.

We found evidence that residents with dementia living in small houses seem to benefit with regard to physical functioning and resident in non-dementia-specific small-scale living arrangements with regard to satisfaction with care compared to residents living in traditional NHs. This is not surprising given that the philosophical background of these models is based on reversing the “enforced dependency” that commonly occurs in a traditional NH.50 Providing resident-centered care, which takes a holistic care approach and gives both physical and psychosocial care needs high priority, is the backbone of home-like residential care models.51 However, further studies are needed to gain a better understanding on possible differences between traditional NHs and home-like residential care facilities in providing safe and high-quality care. A major challenge in traditional NHs and more home-like residential care settings remains balancing competing priorities when addressing residents’ physical and psychosocial care needs, e.g. the prevention of falls and reducing physical and/or pharmacological restraint use. For instance, in two out of three studies on the Eden alternative residents experienced more accidental falls than residents in traditional NHs, yet fall-related injuries – investigated in one study - did not differ between the two settings. In the quasi-experimental study on the Eden alternative, Coleman, et al. argued that this finding was related to the greater degree of cognitive and functional impaired residents in traditional NHs, resulting in residents who were less mobile and less likely to fall.18 This is supported by Chang, et al. who found that residents of household units had better physical functioning including mobility at baseline than those on traditional NH units.44 Although self-selection bias with residents with higher mobility being in the home like environments is likely, it can be hypothesized that the greater emphasis on maximizing the independence of residents in home-like settings than in traditional NHs may also contribute to higher risk for falls and thus higher fall rates. Thus, guided by a theoretical framework it will be crucial to develop a “core outcome set”, i.e. a minimum set of outcome measures for future studies evaluating the existing and innovative new home-like residential care model.52 To our knowledge new residential care models, such as “dementia villages” (see <http://www.alzheimers.net/2013-08-07/dementia-village/)>, “ExtraCare Villages” (<http://www.aston.ac.uk/lhs/research/centres-facilities/archa/extracare-project/>) or “Green Care Farms” 53 might be promising approaches to improve resident-, family- and staff-related outcomes. However, the characteristics and outcomes of these care models have not been examined. In preparing for future studies in this field applying Delphi or other consensus finding techniques may help to reach consensus among residents, families and experts on meaningful resident-, family- and staff-related outcomes and their measures that should be included in the evaluation of such models 54.

We did not find evidence that any of the three home-like residential models improved family- and staff-related outcomes, such as increased satisfaction with care or reduced caregiver burden/distress compared to traditional NH settings. Previous studies found that informal caregiver burden was a strong factor in seeking respite care and the institutionalization of care-dependent people in traditional NHs.55 56 As the majority of informal caregivers visit their relative on a regular basis and are involved in care activities similar to those carried out when the care-dependent person was living at home (e.g., feeding, grooming, managing money, etc.) 57, informal caregiver burden might only slowly decrease over time in both home-like and traditional residential care facilities.58

**Limitations**

# We conducted a literature search in the three major electronic databases in the biomedical field, but did not search relevant psychology, behavioral, and social science databases (e.g., PsycINFO®) or the grey literature. We, therefore, might have missed relevant studies. The inclusion of non-experimental and observational studies limits the ability to make causal inference about the outcomes measured. Lastly, for the purpose of this review, variables, particularly for resident outcomes, were clustered into categories to make broad comparisons across studies. The validity and reliability of this categorization was only assessed through face validity.

**Conclusion**

With this scoping review we explored the impact of three different types of home-like residential care facilities (i.e., Eden Alternative, non-dementia- and dementia-specific small houses) on resident-, family- and staff-related outcomes in comparison to traditional NHs. We found a small number of heterogeneous studies highlighting a need for more high quality research in this field. There was some evidence that people with dementia living in dementia-specific small-scale living arrangements benefit with regard to physical functioning and people living in non-dementia-specific small houses benefit with regard to their satisfaction compared to traditional NHs. We found very few studies comparing family- and staff-related outcomes in home-like and traditional NH settings and no evidence that family- (satisfaction, caregiver burden) and staff-related (higher job satisfaction) outcomes differed between home-like environments and traditional NH settings. Comparative-effectiveness research, including cost evaluation is urgently needed to provide a stronger evidence base to justify the uptake of more home-like residential care models.

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**Table 1:** Summary of methods, outcomes and measures

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Study** | | **Author/year of publication** | **Design** | **Setting** | **Sample** | **Outcomes** | **Measures** | |
| **Eden Alternative Settings** | | | | | | | | |
| 1 | Coleman et al., 200218 | | Quasi-experimental (pretest-posttest control group) design | 2 nursing homes (1 (Eden Alternative), 1 control (traditional nursing home) site in the U.S.A. | 174 residents (95 Eden site group and 79 control group) | Resident outcomes; measured at baseline and after 1 year:  Cognition | | Minimum Data Set (MDS) |
|  |  | |  |  |  | Functional status | | MDS |
|  |  | |  |  |  | Nutrition problems | | MDS |
|  |  | |  |  |  | Weight (men and women) | | MDS |
|  |  | |  |  |  | BMI | | MDS |
|  |  | |  |  |  | Nutritional problems | | MDS |
|  |  | |  |  |  | Oral problems | | MDS |
|  |  | |  |  |  | Percent of residents who fell within last 30 days and within past 31-180 days | | MDS and medical record review |
|  |  | |  |  |  | Number of hypnotic prescriptions/ month | | Medical record review |
|  |  | |  |  |  | Number of anxiolytic prescriptions/ month | | Medical record review |
|  |  | |  |  |  | Number of antidepressant prescriptions/ month | | Medical record review |
|  |  | |  |  |  | Number of antipsychotic prescriptions/ month | | Medical record review |
| 2 | Hinman and Heyl, 200243 | | Mixed methods with quasi-experimental, one-group pre-posttest design | 1 newly implemented Eden Alternative in a nursing home in the U.S.A. | 135 residents | Outcomes assessed at pre- and post-implementation:  Physical (6 ADL items), mental (6 items on memory, awareness, restlessness and lethargy), emotional (7 items on anger, anxiety, worry, restraint use and use of psychotropic medications),  and social function (8 items on interaction with others, self-initiated activities) | | MDS (randomly sampled pre and post Eden intervention) |
| 3 | Bergman-Evans, 200446 | | Quasi-experimental (pre-test post-test control group) design | 1 nursing home in the U.S.A. | 34 cognitively intact residents (21 intervention group and 13 control group) completed follow up; | Outcomes measured at baseline and after 1 year:  Hopelessness | | One item on the Geriatric Depression Scale (GDS) |
|  |  | |  |  |  | Boredom | | One item of GDS |
|  |  | |  |  |  | Loneliness | | UCLA Loneliness Scale (Version 3) |
| 4 | Rosher and Robinson 200547 | | Quasi-experimental (One group, Pretest-Posttest) design | 1 nursing home in the U.S.A. | 37 family caregiver  resident sample size not reported | Outcomes measured at baseline and after 2 years:  Family satisfaction | | Family Questionnaire |
|  | Robinson & Rosher, 200648 | |  |  |  | Depressive symptoms | | GDS for cognitively intact residents and  Cornell Depression in Dementia Screen in cognitively impaired residents |
|  |  | |  |  |  | Staff satisfaction | | Quality of Work- Life Questionnaire |
| 5 | Chang et al, 201344 | | Retrospective observational design | Two care units in 1 large urban nursing home in the U.S.A  One Eden Alternative household unit and one comparison traditional nursing home unit | 35 residents in household units and 33 residents in traditional units | Outcome data collected retrospectively for a 1-year period after implementation of the household:  Mood | | MDS |
|  |  | |  |  |  | Cognition | | MDS |
|  |  | |  |  |  | Behavioral symptoms | | MDS |
|  |  | |  |  |  | Psychotropic drug use | | MDS |
|  |  | |  |  |  | Unintentional weight loss | | MDS |
|  |  | |  |  |  | Physical functioning | | MDS |
|  |  | |  |  |  | Falls | | MDS |
|  |  | |  |  |  | Nutritional status | | MDS |
|  |  | |  |  |  | Number of medications | | MDS |
|  |  | |  |  |  | Psychotropic medications (antipsychotics, antianxiety, antidepressants, hypnotics) | | MDS |
|  |  | |  |  |  | Pressure ulcers | | MDS |
|  |  | |  |  |  | Hospitalizations | | MDS |
|  |  | |  |  |  | Emergency Department visits | | MDS |
|  |  | |  |  |  | Restraint use | | MDS |
|  |  | |  |  |  | Sleep | |  |
| **Small Group Homes not Specifically for Residents with Dementia** | | | | | | | | |
| 6 | | Kane et al, 200745 | Quasi-experimental (Pre-test Post-test control group) design | One Green House and 2 control nursing home sites in the U.S.A. | 140 residents (39 intervention group, 101 control group) | Resident outcomes measured at baseline, and 6, 12 and 18 month later:  Eleven domains of quality of life: physical comfort, functional competence, privacy, dignity, meaningful activity, relationship, autonomy, food enjoyment,  spiritual well-being, security, and individuality | Investigator-developed quality of life measure | |
|  | |  |  |  |  | Self-reported health | One single item (5-point scale from excellent to poor) | |
|  | |  |  |  |  | Instrumental ADLs | 6 self-reported items on taking medicine, using the telephone, preparing food, light housekeeping managing money and doing laundry | |
|  | |  |  |  |  | ADLs | 5 self-reported items on bathing, dressing, transferring from bed, using the toilet and eating | |
|  | |  |  |  |  | Satisfaction with the NH as a place to live | One item (4-point scale: very satisfied to very dissatisfied) | |
|  | |  |  |  |  | Satisfaction with NH as a place for care | One item (4-point scale: very satisfied to very dissatisfied) | |
|  | |  |  |  |  | Likelihood of recommending the setting to others | One item (4-point scale: very likely to very unlikely) | |
|  | |  |  |  |  | Emotional well-being | The Dementia Quality of Life Instrument (DQoL) | |
|  | |  |  |  |  | Quality indicators | MDS | |
|  | | Lum et al., 200928 |  |  | 122 family members (36 intervention group, 86 control group) | Outcomes measured at baseline, and 6, 12 and 18 month later:  Satisfaction with resident care | Investigator-developed questionnaire measuring 5 domains: general amenities, social environment, physical environment, privacy, autonomy, and health care | |
|  | |  |  |  |  | Family assistance with resident care | Investigator-developed questionnaire | |
|  | |  |  |  |  | Family burden | Adapted Montgomery, Stull and Borgatta burden scales | |
|  | |  |  |  |  | Global satisfaction | 3 investigator developed items asking about satisfaction with the site as (1) a place to live and (2) a place to receive care and (3) likelihood of recommending the setting to others | |
|  | | Molony et al., 201127 | Descriptive, longitudinal mixed-methods design | 1 nursing home in the U.S.A. | 15 residents in small house units compared to 10 residents in traditional nursing home units | Outcomes were measured at baseline, 1, 3 and 6 months later:  Social support | Norbeck Social Support Questionnaire (NSSQ) | |
|  | |  |  |  |  | Comorbidities | Charlson Comorbidity Index | |
|  | |  |  |  |  | Self-rated health | Not reported | |
|  | |  |  |  |  | Number of daily medications | Not reported | |
|  | |  |  |  |  | At-homeness | Experience of Home (EOH) Scale | |
|  | |  |  |  |  | ADL function | Katz ADL | |
| **Small House Settings for Residents with Dementia** | | | | | | | | |
|  | | Annerstedt (1994)29 | Prospective observational (case-control) design | Group Living Care and nursing home wards in Sweden | 28 patients in group living care (GLC); 29 from traditional nursing home wards (matched to GLC residents) all with dementia | Outcomes were measured at baseline (prior to move the GLC setting) and 6 and 12 months later; physical and social dependence was reassessed at 36 months:  Dementia symptoms:   * Intellectual | Gottfries-Brane-Steen (GBS) scale | |
|  | |  |  |  |  | * Emotional |  | |
|  | |  |  |  |  | * Motor function |  | |
|  | |  |  |  |  | * Other dementia symptoms |  | |
|  | |  |  |  |  | Physical dependence at 0, 12 and 36 months | Katz ADL scale | |
|  | |  |  |  |  | Survival | Medical record | |
|  | | Andren & Elmstahl, 200230 | Observational (cross-sectional) design | Group living facilities for persons with dementia – home-like (GLC) and with 6-8 residents  Comparison nursing homes in Sweden | 26 caregivers in GLC and 17 caregivers of persons with dementia in nursing homes | Caregiver burden | 22 item scale – referenced but not named | |
| 10 | | te Boekhorst et al. (2008)34 | Comparative prospective observational design | 19 group living homes (GLH: 56 units) (maximum of 6 residents/unit and 6 units/home) for residents with dementia and 7 nursing homes (17 wards) (>20 residents/unit) in the Netherlands | Informal caregivers of newly admitted residents with dementia (67 from group living homes and 97 from nursing homes) | Outcomes measured at baseline and 6 months later:  Psycho-pathology | 12-item version of the General Health Questionnaire (score of >2 indicates psychopathology) | |
|  | |  |  |  |  | Feelings of caregiver competence | Caregiver Competence Scale (higher scores = higher competence) | |
|  | |  |  |  |  | Caregiver burden | Self-Perceived Pressure from Informal Care Questionnaire (higher scores = greater stress) | |
|  | | te Boekhorst et al. (2009)32 |  |  | 97 newly admitted NH residents with dementia and 67 newly admitted GLH residents with dementia | Cognitive function | Standardized Mini-Mental State Exam | |
|  | |  |  |  |  | Assistance needed with ADLs | The Interview for the Deterioration of Daily Living Activities in Dementia (IDDD) (higher scores = need for greater assistance) | |
|  | |  |  |  |  | Behavioral problems | Revised Memory and Behavior Problems Checklist (RMBPC) subscales (higher scores = more problems):   * Memory-related behavioural problems * Depression * Disruptive behaviour   Neuropsychiatric Inventory-Questionnaire (NPI-Q) (higher scores = greater symptom severity) | |
|  | |  |  |  |  | Social engagement | Revised Index for Social Engagement (RISE) (higher scores = higher social engagement) | |
|  | |  |  |  |  | Staff-reported quality of life | Dementia Quality of Life Instrument (DQoL) (completed by CNA); measures 6 dimensions of QoL (higher scores = higher QoL):   * Sense of Aesthetics * Self-esteem * Positive affect * Negative affect * Sense of Belonging * Overall Quality of Life   And  QUALIDEM (completed by CNA 6 moths post-admission); measures 9 dimensions of QoL – 6 included:   * Care Relationship * Positive affect * Negative affect * Restless Tense Behaviour * Social Relations * Having Something to do | |
|  | |  |  |  |  | Prescribed psychotropic drugs | Reported by physician or psychologist | |
|  | |  |  |  |  | Prescribed restraints | Reported by physician or psychologist | |
|  | | Smit et al., 201131 |  |  | Sample: 37 informal caregivers of GLH residents and 49 informal caregivers of NH residents | Psychological distress | 12-item version of the General Health Questionnaire  Self-Perceived Pressure from Informal Care (SPPIC)  Caregiver Competence Scale | |
| 11 | | Verbeek et al, 201035 | Quasi-experimental (Pre-test Post-test control group) design | 28 small-scale living facilities (SSL) and 21 traditional nursing home units in the Netherlands | 259 residents with dementia (124 intervention site and 135 control group) matched on cognitive and functional status | Outcomes measured at baseline, 6 and 12 months later:  Nurse-rated resident quality of life (QoL | QUALIDEM | |
|  | |  |  |  |  | Family caregivers’ ratings of residents QoL | QUALIDEM | |
|  | |  |  |  |  | Neuro-psychiatric symptoms | Neuro-psychiatric inventory, nursing home version (NPI-NH) | |
|  | |  |  |  |  | Agitation | Cohen-Mansfield Agitation Inventory (CMAI) | |
|  | |  |  |  | 229 family caregivers | Burden | Self Perceived Pressure From Informal Caregiving (SPPIC | |
|  | |  |  |  |  | Satisfaction with nursing staff | Investigator-developed items | |
|  | |  |  |  |  | Involvement in resident care | Investigator-developed items | |
|  | |  |  |  |  | Visit frequency and duration | Investigator-developed items | |
|  | |  |  |  | 305 staff members | Job satisfaction | Investigator-developed questionnaire | |
|  | |  |  |  |  | Motivation | Investigator-developed questionnaire | |
|  | | Verbeek et al., 201237 |  |  | 67 family caregivers from SSL and 63 from nursing homes | Family caregiver experiences | Questionnaire included questions asking perceptions about care was consistent with small-scale and homelike approach (higher scores = better adherence to principles) | |
|  | | Verbeek et al., 201436 |  |  | 125 residents in SLLs and 135 controls in nursing homes; all with dementia | Outcomes measured at baseline, and 6 and 12 months later:  Neuropsychiatric symptoms | Neuro-psychiatric Inventory – Nursing Home Version (NPI-NH)  (higher scores = more symptoms)  Cohen-Mansfield Agitation Inventory (CMAI) (higher scores = more agitated) | |
|  | |  |  |  |  | Depressive symptoms | Cornell Scale for Depression in Dementia (CSDD)  Subscale | |
|  | |  |  |  |  | Social engagement | Index of Social Engagement – subscale of the RAI-MDS | |
|  | |  |  |  |  | Restraint use | Questionnaire type and number of times physical restraints were used | |
|  | |  |  |  |  | Psychotropic drug use | Prescriptions including PRN | |
| 12 | | de Rooij, Luijkx, Schaafsna et al., 2012a39 | Comparative prospective observational design | 4 traditional (nursing home) and 12 small scale living units (SLU) in the Netherlands and Belgium | 179 residents, > age 65, with dementia | Resident quality of life; measured at baseline, and 6 and 12 month later | Quality of Life in Dementia scale (QUALIDEM) completed by unit staff (1-2 nurses of nursing assistants) who knew the resident well. Assesses nine domains: (1) caregiver relations, (2) positive affect, (3) negative affect, (4) restless behavior, (5) positive self-image, (6) social relations, (7) social isolation, (8) feeling at home, (9) having something to do. | |
|  | |  |  |  |  | Restraint use | Not reported | |
|  | |  |  |  |  | Prescription of # of psychotropic meds | Medical record review | |
|  | |  |  |  |  | Behavioral problems | The Neuro-psychiatric Inventory - Nursing Home version (NPI-NH) | |
|  | |  |  |  |  | Depressive symptoms | Cornell Scale for Depression in Dementia (CSDD) completed by nurses\* | |
|  | | de Rooij, Luijkx, Spruytte, et al, 2012b40 |  |  | 44 family caregivers from 4 SSUs and 20 from 2 traditional nursing homes | Interactions with resident | Investigator-developed survey at baseline and 12 months (6 items reported at item level) | |
|  | |  |  |  |  | Perceptions of interactions between professional caregiver (staff) and resident | Measured by 8 investigator-developed items | |
|  | |  |  |  |  | Interactions between professional caregivers (staff) and family | Measured by 11 investigator-developed items | |
|  | | de Rooij, Luijki, Declercq et al., 2012c38 |  |  | 37 professional caregivers from traditional nursing home units and 43 from SLUs | Work-related mental health problems measured at baseline and 12 months | General Health Questionnaire (GHQ-12) | |
|  | |  |  |  |  | Burnout | Dutch translation of Maslach Burnout Inventory (3 subscale scores: ‘emotional exhaustion’, ‘depersonalization’ and ‘personal accomplishment’ | |
| 13 | | Nakanishi et al., 201242 | Prospective observational design | Group-living units (GLU; n=173) (Average of 24 or fewer residents) home-like and with stable staff vs. traditional nursing homes units (n=174 ) | Randomly selected residents from each settings; all with dementia (n=197 from GLU and 195 from nursing home units | Measurements at 2 time points (interval not reported):  Level of physical dependence | Level of physical dependence – ranged from 1 (independent) to 4 (bedbound) | |
|  | |  |  |  |  | Level of dementia | Level of dementia was rated from 1 (independent) to 6 (usually required medical supervision | |
|  | |  |  |  |  | Staff-reported resident quality of life | Quality of life instrument for Japanese elderly with dementia (QLDJ); measures QoL related to:   * Interaction with surroundings * Self-expression * Experiencing minimum negative behaviours | |
| 14 | | Wolf-Ostermann et al., 201241 | Prospective observational design | 89 shared housing arrangements (SHA) (small home-like settings and 23 special care units in nursing homes (SCU-NH) in Berlin, Germany | Newly admitted residents to both settings with a diagnosis of dementia (56 in SHAs and 22 in NHs with 26 SHA available at 12 months and 12 in SCUs | Resident outcomes measured at baseline, and 6 and 12 month:  ADL functioning | Barthel Index | |
|  | |  |  |  |  | Cognitive function | MMSE | |
|  | |  |  |  |  | Neuro-psychiatric symptoms | NPI-NH | |
|  | |  |  |  |  | Quality of life | QUALIDEM | |

Table 2: Summary of findings on resident-related outcomes

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome and Variables** | **Eden Alternative (n=5 studies)** | | | | **Small House: Not Dementia Specific (n=2 studies)** | | | | **Small House: Dementia Specific (n=7 studies)** | | | |
|  | **Studiesa** | **Sign. Effectb** | **Mixed Effectc** | **No Sign. Effect** | **Studiesa** | **Sign. Effectb** | **Mixed Effectc** | **No Sign. Effect** | **Studiesa** | **Sign. Effectb** | **Mixed Effectc** | **No Sign. Effect** |
| **Physical Outcomes** | | | | | | | | | | | | |
| Physical functioning:   * ADLs * Functional competence * PADLs * IADLs * ADL function * Self-feeding * Physical functioning * Physical dependence | **3** | 0 | 0 | 318, 43, 44 | **2** | 127 | 145 | 0 | **4** | 329, 32, 42 | 0 | 141 |
| Nutritional status:   * Body Mass Index * Weight * Nutritional problems * Oral problems * Weight loss * Tube feedings * Use of nutritional supplements | **2** | 0 | 118 | 144 | **1** | 0 | 0 | 145 | 0 | 0 | 0 | 0 |
| Falls:   * Number of falls * Fall rates | **2** | 0 | 2[more falls: 18,44 | 0 | **1** | 0 | 0 | 145 | **0** | 0 | 0 | 0 |
| Pressure ulcer:   * Pressure ulcers * Stage 4 pressure ulcers | **1** | 0 | 0 | 144 | **1** | 0 | 0 | 145 | **0** | 0 | 0 | 0 |
| Overall medication use:   * Number of medications * >9 medications/ day | **2** | 0 | 0 | 218,44 | **2** | 0 | 0 | 227, 45 | **0** | 0 | 0 | 0 |
| **Psychosocial outcomes** | | | | | | | | | | | | |
| Cognitive function:   * Cognition * Cognitive impairment * Recall ability * Level of dementia | **3** | 0 | 0 | 318, 43, 44 | **1** | 0 | 0 | 145 | **4** | 142 | 0 | 329, 32, 41 |
| Social activities/social activation:   * Meaningful activities * Little or no activity * Daytime sleepiness * Boredom * Loneliness | **3** | 144 | 146 | 143 | **1** | 0 | 145 | 0 | **2** | 232, 36 | 0 | 0 |
| Mood:   * Depression * Depressive symptoms * Mood * Negative affect * Hopelessness * Emotional blunting/ labiality/motivation | **3** | 246, 48 | 0 | 144 | **1** | 0 | 145 | 0 | **3** | 0 | 139 | 229, 36 |
| Resident quality of life (often rated by staff or family):   * Resident-reported * Staff-reported * Family-reported | **0** | 0 | 0 | 0 | **1** | 0 | 145 | 0 | **5** | 142 | 332, 39, 41 | 135 |
| Resident satisfaction:   * Satisfaction with nursing home as place to live and receive care * At-homeness | **0** | 0 | 0 | 0 | **2** | 227, 45 | 0 | 0 | **0** | 0 | 0 | 0 |
| Self-rated health | **0** | 0 | 0 | 0 | **2** | 0 | 0 | 227, 45 | **0** | 0 | 0 | 0 |
| Psychotropic medications:   * + Anti-anxiety   + Hypnotics   + Antipsychotics   + Psychotropic | **3** | 0 | 118 | 243, 44 | **1** | 0 | 0 | 145 | **3** | 0 | 0 | 332, 39, 41 |
| Behavior symptoms:   * Behavioral problems * Agitation * Neuro-psychiatric symptoms | **2** | 0 | 0 | 243, 44 | **1** | 0 | 0 | 145 | **5** | 0 | 229, 36 | 332, 39, 41 |
| Restraint use | **2** | 243, 44 | 0 | 0 | **0** | 0 | 0 | 0 | **3** | 132 | 0 | 236, 39 |
| a: Number of studies that examined the variable  b: Positive benefits unless otherwise noted  c: Significant in relation to only 1 or 2 comparison sites, on only a portion of domains measured, or not significant during all timeframes compared | | | | | | | | | | | | |

Table 3: Summary of findings on family-related outcomes

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome and Variables** | **Eden Alternative** | | | | **Small House: Not Dementia Specific** | | | | **Small House: Dementia Specific** | | | |
|  | **Studiesa** | **Sign. Effectb** | **Mixed Effectb** | **No Sign. Effect** | **Studiesa** | **Sign. Effect** | **Mixed Effectb** | **No Sign. Effect** | **Studiesa** | **Sign. Effect** | **Mixed Effectb** | **No Sign. Effect** |
| Satisfaction | **1** | 147 | 0 | 1 | **1** | 0 | 128 | 0 | **1** | 137 | 0 | 0 |
| Burden | **0** | 0 | 0 | 0 | **1** | 0 | 0 | 128 | **3** | 130 | 0 | 234, 35 |
| Assistance with resident care | **0** | 0 | 0 | 0 | **1** | 0 | 128 | 0 | **1** | 0 | 0 | 135 |
| Contract with resident | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **2** | 0 | 0 | 235, 40 |
| Psychological distress | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **2** | 131 | 0 | 134 |
| Feeling of caregiver competence | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **1** | 0 | 0 | 034 |
| Interaction with staff | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **2** | 140 | 0 | 135 |
| a: Number of studies that examined the variable  b: Significant in relation to only 1 or 2 comparison sites, on only a portion of domains measured, or not significant during all timeframes compared | | | | | | | | | | | | |

Table 4: Summary of findings on staff-related outcomes

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome and Variables** | **Eden Alternative** | | | | **Small House: Not Dementia Specific** | | | | **Small House: Dementia Specific** | | | |
|  | **Studiesa** | **Sign. Effectb** | **Mixed Effectb** | **No Sign. Effect** | **Studiesa** | **Sign. Effect** | **Mixed Effectb** | **No Sign. Effect** | **Studiesa** | **Sign. Effect** | **Mixed Effectb** | **No Sign. Effect** |
| Quality of work life / Job satisfaction | **1** | 0 | 0 | 148 | **0** | 0 | 0 | 0 | **1** | 0 | 0 | 135 |
| Burnout | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **1** | 0 | 138 | 0 |
| Work-related mental health problems | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **1** | 0 | 0 | 138 |
| Motivation | **0** | 0 | 0 | 0 | **0** | 0 | 0 | 0 | **1** | 0 | 0 | 135 |
| a: Number of studies that examined the variable  b: Significant in relation to only 1 or 2 comparison sites, on only a portion of domains measured, or not significant during all timeframes compared | | | | | | | | | | | | |