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THE IMPACT OF NURSING CARE ENVIRONMENT ON BEHAVIOURAL DISTURBANCES IN DEMENTIA: A LITERATURE REVIEW

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ABSTRAK

Abstract:
Most of the dementia population will suffer from behavioral and psychological symptoms of dementia (BPSD), causing them to undergo progressive disturbances such as agitation, depression, elation, delusions, and hallucinations. Most evidence favors non-pharmacological intervention, including managing the physical environment settings, to tackle this issue. Adjusting the physical environment care will massively support people with dementia to continue their daily living. Providing a better nursing care environment has a significant impact on their orientation. Giving them a home-like and social opportunity allows them to regain their sense of normal life. Access to sensory stimulation will aid them to feel comfortable and promote better sleep. The green neighborhood creates reciprocity feelings among people with dementia toward their environment. Tailoring the physical environment design can help lessen the behavioural symptoms of people with dementia, including their agitation, apathy, and depressive complaints. More high-quality trials and interventions with bigger sample sizes are required.

***Abstrak*:**
Sebagian besar penderita demensia akan mengalami gejala perilaku dan psikologis dari Demensia (BPSD) yang menyebabkan penderita mengalami gangguan perilaku progresif seperti agitasi, depresi, kegembiraan, delusi, dan halusinasi. Sebagian besar bukti mendukung intervensi non-farmakologis, termasuk pengelolaan lingkungan fisik, untuk mengatasi permasalahan ini. Penyesuaian perawatan lingkungan fisik akan sangat mendukung penderita demensia untuk melanjutkan kehidupan sehari-hari. Menyediakan lingkungan asuhan keperawatan yang lebih baik memiliki dampak yang signifikan terhadap orientasi mereka. Memberi mereka kesempatan seperti di rumah dan bersosialisasi memungkinkan mereka mendapatkan kembali kehidupan normal. Akses terhadap rangsangan sensorik akan membantu mereka merasa nyaman dan meningkatkan kualitas tidur. Lingkungan yang hijau menimbulkan perasaan timbal balik di kalangan penderita demensia terhadap lingkungannya. Menyesuaikan desain lingkungan fisik dapat membantu mengurangi gejala perilaku penderita demensia, termasuk kegelisahan, sikap apatis, dan keluhan depresi. Diperlukan lebih banyak uji coba dan intervensi berkualitas tinggi dengan ukuran sampel yang lebih besar.

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INTRODUCTION

Dementia is defined as a chronic, acquired, decline in two or more cognitive abilities, which consists of impairment in memory, comprehension, calculation, learning, language, and judgment [1]-[3]. The loss of these abilities in dementia patients occurs simultaneously with the change of motivation, social behaviour, and emotional changes that significantly interfere with occupational, domestic, or social functioning [2][3]. Dementia is generally described as a clinical syndrome rather than a disease as it comprises a collection of symptoms and features. The causes behind dementia are myriad, ranging from neurologic, and neuropsychiatric to various underlying medical conditions [2]. Alzheimer's disease remains the most prevalent cause of dementia that accounts for more than 75% of global cases. The second common type of dementia is Vascular dementia and the less common type of it includes dementia with Lewy bodies, frontotemporal dementia, mixed dementia, dementia caused by Parkinson's disease, Huntington's disease, and Creutzfeldt-Jakob disease [3]. The risk of someone in developing dementia is associated with advanced age, followed by other determinants such as genetic, socioeconomic, and environmental factors including nutrition and physical activities [4]. One study has estimated the global number of people with dementia in 2050 would increase from 57.4 million cases globally in 2019 to around 152.8 million cases in 2050 [5].

The majority of the dementia population will suffer from BPSD or Behavioural and Psychological Symptoms of Dementia, which are defined as signs and symptoms of disturbed behaviour, mood, thought, or perception. Aberrant motor behaviour, agitation, and irritability were the three common BPSD symptoms that can be found [6][7]. Dementia patients generally experience progressive disturbances (agitation, depression, elation, delusions, and hallucinations), leading them to rely on the support of caregivers in order to maintain their daily living. This sense of dependency cause distress in families and subsequently those families who cannot afford assistance at home will transfer the patients to nursing homes [7]-[9]. Options for treating BPSD include pharmacological therapies (such as antipsychotics, antidepressants, cholinesterase inhibitors, etc), and non-pharmacological interventions [7][10]. In recent days, there is growing evidence that shows the impacts of environment modification in affecting BPSD symptoms [10][11].

Most evidence show positive effects of adjusting the residential facilities for people with dementia. A study exploring the modifiable factors of BPSD found that a poor home environment setting was associated with an exacerbated BPSD symptoms [12]. However, there appeared to be a lack of research exploring the impact of adjusting nursing care environment, considering that many people who reside in care facilities are more likely to have a lower quality of life than those who live in the community [13]. Through this paper, the researcher aims to further explore the potential environmental barriers and facilitator of people with dementia and to fill the knowledge gap in understanding the environmental features and strategies to support daily activities as well as the quality of life of people with dementia.

RESEARCH METHOD

Researcher conducted a comprehensive search through internet databases: Google Scholar, PubMed, ScienceDirect, and Cochrane. The terms that the researcher used were ("Impacts" OR "Association") AND "Physical Environment" AND "Behavioural Disturbances" AND "People with Dementia". The following inclusion criteria were applied: a publication date from 2015 to 2022; English language; and Unlimited article type such as Systematic Reviews,

Clinical Trials, Randomized Controlled Trial, Reviews, etc. The researcher included all publications that covered the effects of physical environment settings in affecting and determining the behavioural disturbance among people with dementia in nursing care. The flow diagram of the article selection process is provided in Figure 1.

RESULTS

Search results

A total of 189 articles were retrieved; however, 33 items were eliminated during duplicates removal, yielding 156 articles. 144 items were eliminated throughout the screening process as they failed to meet the inclusion criteria. This includes non-English articles, full-text articles that are inaccessible to author, and irrelevant topics.

Twelve articles were included in the screening process. There were two articles with qualitative study design, two articles with cross-sectional study design, three literature review articles, two scoping review articles, two systematic review articles, and one meta-analysis article. Data extraction of the included articles showed in Table 1.

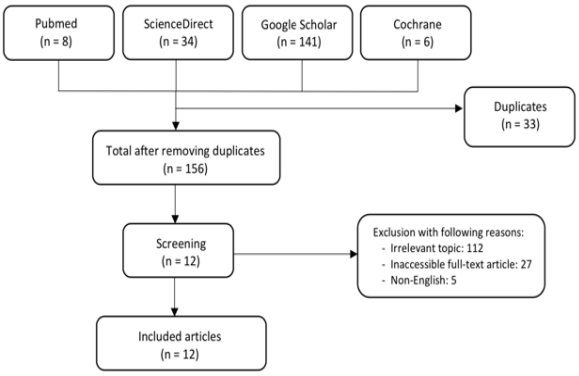

Figure 1. Flow diagram of the article selection process

Characteristic of Study

Table 1.
Included Articles

Author/Year	Subjects	Outcomes
De Boer et al, 2018 [14].	People with dementia living in two types of nursing homes (traditional nursing home wards and small-scale living facilities).	Small-scale living facilities for people with dementia potentially beneficial for resident's daily life.
Seetharama et al, 2020 [15].	People with dementia living in long term care (LTC) services in the province of British Columbia.	The familiar, homelike, accessible, safe, comfortable, and navigable physical environment of dementia people needs to be ensured for the optimal people with dementia's QOL and care experiences.
Røsvik et al, 2020 [16].	People with cognitive impairment and/or dementia in hospital setting.	Physical design of the hospital ward seldom facilitates is not tuned in to the special needs of patients with dementia.
Chaudhury et al, 2016. [17].	Residents With Dementia in Long-Term Care Settings	Unit size, spatial layout, homelike character, sensory stimulation, and specific spaces (i.e., dining, bathing, and outdoor spaces) influence residents' behaviours and well-being in care facilities.
Arai et al, 2016 [18].	Residents with dementia in 10 selected LTC facilities in Hokkaido, Japan.	The imbalance between activities of daily living and cognitive function, poor relationships with other residents, and persistent requests in daily life were associated with residents having BPSD.
Lee et al, 2021[19].	Nursing care staffs who worked with the dementia residents.	Environmental settings, such as ambience and space arrangements, offer substantial effects which enables care interaction and facilitate effectiveness of dementia care delivery.
Calkins, 2018 [20].	People living with dementia.	The importance of turning on a light, or closing curtains to reduce glare, or eliminating unnecessary background noise contribute to excess disabilities or support more

		independent functioning in individuals with dementia.
Kolanowski et al, 2016 [21].	Adults with dementia and BPSD who resided in community, assisted living, or nursing home setting.	Environmental determinants such as balanced sensory stimulation and music were significantly decrease agitation in adults with dementia.
Ludden et al, 2016 [22].	People with dementia.	An experience handrail (aimed at facilitating wayfinding by providing meaningful sensory experiences) and a virtual nature installation (aimed at providing relaxation and stimulating social engagement) designs may promote social engagement, reduce restlessness, and facilitate wayfinding.
Prins et al, 2020 [23].	People with dementia living in nursing-home.	Sensory stimulation was shown to improve nocturnal behavioural restlessness as well as sleep duration and continuation in people with dementia.
Buist et al, 2018 [24].	Professionals from green care farms (GCFs) for people with dementia in the Netherlands.	Several characteristics of GCFs (e.g. homelike aspects, domestic activities, and access to outdoor environments) can be applied in dementia care settings.
Gan et al, 2022 [25].	People living with dementia (PLWD) in urban, suburban, and rural care settings.	Interventional design that address specific cognitive challenges are needed to help PLWD reorient themselves in neighbourhood.

DISCUSSION

Behavioural and psychological symptoms of dementia (BPSD), also known as neuropsychiatric symptoms of dementia, is a group of challenging non-cognitive symptoms and behaviours that occur in dementia patients. There are four categories of BPSD: mood disorders (depression, apathy, euphoria), sleep disorders (insomnia, hypersomnia), psychotic symptoms (hallucinations, delusions), and agitation [26],[27]. These symptoms often vary according to the type of dementia in patients. Findings showed different symptoms occur in different types of dementia. The predominance of hallucinations is mainly found in dementia with Lewy bodies (DLB) meanwhile depression and apathy complaints are more likely to occur in vascular dementia (VaD). Apathy, elation, appetite, or eating changes is common in frontotemporal dementia (FTD) case while agitation, depression, anxiety, irritability, and sleep disorders for Alzheimer's disease (AD) [28]. Dementia patients with BPSD symptoms often require medication and intense in-patient monitoring. Therefore, they become more likely to be admitted to a care facility [26].

Nonpharmacological approaches are recommended as the first choice of treatment for BPSD. Pharmacological medication should only be started at times when the symptoms are not the result of somatic causes, the symptoms do not respond to any non-pharmacological interventions, and the symptoms are not caused by the prior medication [29]. These non-pharmacological approaches comprise various types of intervention, including sensory stimulation, cognitive and emotion-oriented approaches, behaviour management, and other therapies such as exercises and animal-assisted therapy [30]. Environmental factors, both physical and social elements, can exacerbate or alleviate the behavioural changes in dementia people. Preserving dementia patients' well-being is related to protecting its environmental characteristics through providing unpretentious safety features, serving small-sized facilities, and optimizing stimulation [31]. The purpose of this study was to identify environmental factors and their influences on behavioural disturbances in people with dementia. The findings resulted in the inclusion of six articles and the identification of four main topics.

Orientation and Wayfinding

Proper physical environment settings may forestall agitated behaviour, which might cause unnecessary harm in the future. The right surroundings can support people with dementia to achieve their full

potential by positively affecting their autonomy and promoting independence patient [14]. Regarding the settings, the building blueprint should also be created based on a simple arrangement that is intuitive enough so the dementia residents can memorize it easily. It is recommended to involve a minimum number of path choices to avoid confusion among residents. Corridor lengths should be designed in short lengths so that residents are not required to take a long distance or walk only to access common spaces in care homes [15]. Limited-light areas and unnecessary patterns or glare on the floor can increase the risk of falling. Overcrowd layout filled with equipment stacked up on the corner of corridors also made it difficult for residents to utilize the handrails on the wall. This may induce feelings of danger among dementia people as well as put their safety at risk [16].

Home-like and The Presence of Social Network

People living in more homelike environments (like living areas with open plans and furniture, and flooring that is not carpeted) tend to be less aggressive, agitated, and anxious. Similarly, people who feel comfortable and safe in an environment will be less likely to have walking or pacing episodes. This happens because the environment is more comfortable and inviting, which leads to a reduced need to move around. Thus, nursing staff and family members discover that creaing an environment that feels like home is as notable as taking care of their health generally as it aids the residents to develop fewer behavioural issues and ultimately acquiring a better quality of life [17].

People who have difficulty forming relationships with other residents or who make lots of requests in their daily life are more likely to experience depression. Expanding social networks beyond care facilities can be a quite challenging task for dementia people but gaining new social networks can be a top point to reducing their BPSD symptoms as well as maintaining their cognitive functions [18].
People with dementia are inclined to value closeness and amity in care facilities. This means they will prefer design features that enhance their chances to meet, connect and interact with other people with the purpose to create new companionship. The small group seating arrangement in the care unit seemed to encourage staff in nursing home to spend time to talk with residents, meeting residents' emotional and social needs, which is crucial to person-centered care. The existence of outdoor ambience is also noted to be important to bolster social interaction among people with dementia [19].

The ideal environment should also have a small population (ideally 10–20 residents), live in rooms that are typical of a house (such as the yard, kitchen, dining room, and living room), and be separate from other homes or living areas (in this case, have all the necessities to function on its own). A growing body of research demonstrates that designs that reflect these characteristics are associated with a wide range of positive outcomes, including less distress or agitation, broaden social engagement, maintenance of functional abilities, and more individualized care (honoring residents' preferences). This contrasts with larger, conventional units, which are associated with greater agitation, more rapid cognitive decline, and increased resident conflicts. Improved social interaction between the caregiver and care recipient was linked to less agitation at the caregiver level [20], [21].

Sensory Stimulation

The sensory environment of care facilities may evoke both positive and negative effects on dementia residents. Findings suggest that adequate sensory stimulation in the care environment may increase overall brain activity and alertness among people with dementia. Various textures, colors, and sounds, for example,

implicitly inform dementia people of their location in a specific setting without requiring any cognitive effort. Age-related sensory declines can be mitigated by combining stimuli from various natural objects, based on the observation that older adults without cognitive impairments have shorter reaction times to multisensory stimuli compared to the unisensory stimuli [22].

Likewise, by making their surroundings more coherent, sensory information aids dementia patients in perceiving and orienting themselves. Variations in terms of color and texture may pique residents' curiosity and lead them to approach the stimulus or continue exploring it [23]. However, overly stimulating environments can be overwhelming for some people. Incorporating high noise reduction as well as controlling glare from direct sunlight may be beneficial in several condition. Since some people with dementia experience stress in unfamiliar environments, providing smaller, quieter spaces that accommodate only a few people will be extremely useful and better support their participation [24].

When dementia patients obtained the proper interventions, nursing staffs will likely to notice reduction in behavioural restlessness during the night. Disrupted sleep-wake cycles is associated with the behavioural issues and hasten the progressivity of dementia. The duration of nocturnal awakenings and sleep onset latency are also influenced by sensory stimulation (especially visual and tactile stimulation), which will also elevate the quantity and quality of total sleep. Increasing daytime arousal combined with an elevation of circadian amplitude may result in longer periods of uninterrupted sleep at night. Nocturnal awakenings, in particular, can serve as an early sign of later confusion, anxiety, night-time wandering, and waking up other dementia patients at care facilities [23].

Outdoor and Neighborhood

Numerous studies have found that increasing social engagement among dementia patients can both promote relaxation and lessen restlessness, in line with environmental psychology studies that support the value of spending time in nature [22]. According to recent studies, implementing Green Care Farms (GCF) presents a welcome opportunity to improve dementia patients' meaningful engagement in care settings. Through GCFs, people with dementia will be exposed to intimate, familiar settings where care and support services are combined with agricultural activities that are offered on a small scale. There are many worthwhile and stimulating activities that people with dementia are encouraged to partake in (e.g. They were centered on their regular daily activities and were incorporated into the farm's daily schedule. These activities included gathering eggs, cooking, gardening, sweeping, watching, and feeding the animals. GCF professionals claimed that these pursuits can foster feelings of commitment and accountability in dementia patients as well as feelings of reciprocity with their surroundings. In addition to receiving care, those who have dementia also contribute to the environment and are thus actively involved. As opposed to highlighting the medical aspects of care facilities, this reciprocity promotes daily life [22].

Designing a neighborhood with mini parks and benches will drive interactions between neighbors that indirectly support those who are experiencing cognitive decline, like dementia residents. Longer and shorter walking paths as well as socio-environmental stimulation can be included in environmental features. Compared to standard high-traffic roads, pedestrian-oriented streets will provide distinctive sensory experiences. Street sign that is visually accessible help people with dementia to find their way and reduces potential disorienting stimuli [25].

Aside from merely providing places, one thing that every nursing care needs to take into account is providing easy access for everyone. One study found that residents in some nursing homes might appear to have access to outdoor space, but turns out unable to use it independently due to their poor physical or cognitive function or need staff permission to use the outdoors. Unable to use the outdoor space due to uneven paths, steep steps, few handrails, inadequate shade, and poor seating were also reported by some residents which complicate their needs to go outside. This may negatively affect residents' perceptions of autonomy and their mood [19].

CONCLUSION

This review shows that adjusting physical environment play a crucial role in lessening behavioural disturbances (including agitation, apathy, depressive mood) and improving care quality for individuals with dementia. By considering the environmental factors, we can ensure safer, more supportive, and more effective environments to better cope with their turbulence behaviour. Any practices and interventional activities that stimulate their social life have a good impact on their overall quality of life. More high-quality trials and interventions with bigger sample sizes are required.

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