



KEY POINT SUMMARY

OBJECTIVES

The present study aimed at examining the efficacy of gardening as a physical activity on sleep, agitation, and cognition of institutionalized dementia patients.

Effects of Indoor Gardening on Sleep, Agitation, and Cognition in Dementia Patients - A Pilot Study

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Key Concepts/Context

Pharmacological intervention including sedative hypnotics and neuroleptics is a common treatment for sleep and behavioral problems in dementia. However, the high risk of adverse effects of those drugs indicates that non-pharmacological interventions are needed as well. Among those non-pharmacological interventions physical activity is one approach that influences the circadian timing system and was suggested to be effective for sleep and behavioral disturbances of dementia patients. In addition, the positive effects of physical activities, especially exercise, on cognition were suggested. While desirable effects of physical activity on sleep, behavior, and cognition were suggested, the impact of low-intensity and less structured activity, such as gardening, is not yet known. Upon literature review and discussion with clinical experts the authors of the study selected gardening as a physical activity for dementia patients. Gardening was considered to: (1) have potential to maintain compliance among dementia patients; (2) provide a sense of accomplishment; (3) create no extra caregiving workload; (4) be easily integrated into environment; and (5) be enjoyable for both caregivers and dementia patients.

Methods

This repeated measures experiment study included 23 institutionalized dementia patients. The environment of the baseline (week 1) and treatment (following four weeks) period was identical except for the inclusion of indoor gardening during the treatment period. Every morning and afternoon during the 28-day treatment period subjects were asked or assisted by research assistants and nursing assistants (NAs) to grow their plants. Indoor gardening (one hour per session) in the present study involved activities that included beans, including setting roots and/or planting



DESIGN IMPLICATIONS

This study suggests that indoor gardening is therapeutic for patients with mild to moderate dementia, resulting in improved sleep patterns, agitation, and cognition in dementia patients. Hospital administrators, designers, and architects could consider providing a space where such gardening activities can occur.

beans; emptying containers; watering; touching; cleaning and arranging containers; wiping floors; harvesting; cutting and washing.

Dependent variables

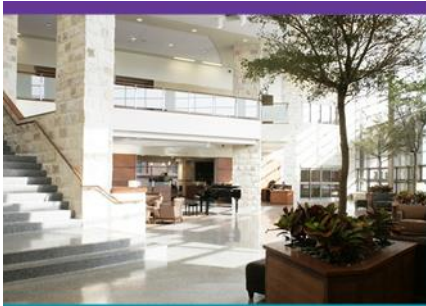
- Sleep. 24-hour sleep diaries were recorded during the first (baseline week) and fifth week of study period by registered nurses (RNs) or in-room nursing assistants (NAs). The parameters included in the sleep diary were sleep onset (pm), wake-up time (am), wake after sleep onset (WASO), and nap.
- Agitation. Agitation was evaluated once a day by research assistants upon direct observations and the reports of in-room NAs for seven days during each evaluation period utilizing the Modified Cohen-Mansfield Agitation Inventory (M-CMAI).
- Cognition. One-time measurement per each evaluation period was performed with the revised Hasegawa's dementia scale (HDS-R), a dementia screening tool. The scale consisted of five subscales: orientation, memory, calculation, attention, and semantic word fluency. Scores range from 0 to 30; scores of 15–19, 11–14 and 10 or lower represent mild, moderate, and severe dementia, respectively.

From the parameters listed in the sleep diary, nocturnal sleep time (NST), total sleep time (TST), and nocturnal sleep efficiency (NSE, $NST / [wake\ uptime - sleep\ onset] \times 100$) were calculated and utilized for further analysis. Descriptive statistics were used for the general characteristics. Paired t-tests were used to analyze sleep patterns, agitation, and cognition.

Findings

Indoor gardening was associated with improvements in sleep patterns in dementia patients. Indoor gardening produced significant improvements in WASO, nap, NST, NSE, agitation and cognition but

not in sleep onset, wake-up time, or TST. This study also suggested that indoor gardening is therapeutic for patients with mild to moderate dementia. The mechanism of treatment effect of indoor gardening could be multifactorial: (1) chronobiological property; (2) providing chances for physical movement; (3) providing chances to practice an old skill or hobby and to reminiscence; (4) providing opportunities for social interaction, sensory stimulation, and accomplishment. Gardening can be modified to suit a wide range of physical, cognitive, and social needs of dementia patients, which can empower its usage as intervention for these patients. The effects of gardening in dementia patients are worth studying further.



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Limitations

The authors of the study mentioned following limitations: 1) the results of the present study cannot be generalized because of small sample size, lack of appropriate controls, and randomization, and 2) reliability of M-CMAI of the present study was low, therefore, improvement in agitation was less convincing.