Nursing Students’ Perception of Healing Environmental Factors in Long-Term Elderly Care Facilities

In-Young Yoo*

Department of Nursing, Jeonju University, 303 Chonjam-Ro Wansan-Gu, Jeonju, Chunbuk, 560-759, Korea; yiny@jj.ac.kr

Abstract

Background/Objectives: The aim of this study was to investigate nursing students’ perception of healing environmental factors in elderly care facilities and to provide basic data for the development of a curriculum for gerontological nursing.

Methods/Statistical Analysis: The research participants were 194 nursing college students in Korea. The data was collected using a structured questionnaire and was analyzed using descriptive statistics, an independent t-test, and a stepwise multiple regression with SPSS/Windows 22.0. Findings: The means score of the perception of the importance of a healing environment in elderly care facilities was 4.78±0.43. The main reasons for considering a healing environment important were that it “fosters psychological stability” (53.1%), “improves the quality of life” (40.7%) and is “helpful in healing” (18.6%). Among the essential features of the healing environment in elderly care facilities, the mean perceived importance score was the highest for comfort (4.50±0.36), followed by sociality (4.41±0.52), territoriality (4.36±0.56), stability (4.20±0.52), and livability (4.19±0.63). The factors influencing the importance of a healing environment were having a place to communicate, a place for families and visitors, and hygiene (R²=15.2). There were significant differences in the perceived importance of a healing environment (t=-2.86, p=.004), and of the essential features of stability (t=-2.68, p=.008) and territoriality (t=-2.23, p=.027) based on the gerontological nursing education experience of the participants.

Improvements/Applications: It is important to develop a gerontological nursing curriculum that includes information about creating a healing environment in elderly care facilities, which can contribute to the improved quality of life and psychological stability of the residents.

Keywords: Healing Environment, Long-term Elderly Care Facilities

1. Introduction

In 2001, the population of the elderly aged 65 years and over accounted for over 7.1% in the entire population of Korea, making it an aging society. This proportion reached up to 13.1% in 2015. With the improved quality of life and the gradual increase in life expectancy, Korea is expected to be a super aging society by 2060, by when the elderly population is expected to reach 40% of the population and households with elderly people are expected to reach 20.6%. This means that one household out of 5 would represent the elderly, among which, the elderly living alone would account for 7.4%. With the regard to the parent filial obligation, the opinion that the parents...
Nursing Students’ Perception of Healing Environmental Factors in Long-Term Elderly Care Facilities

have to support themselves accounted for 23.8% in 2014, which is rising steadily. Further, the medical expenses of the elderly accounted for 35.5% of the total medical expenses, which is showing a sharp rise in recent times. The elderly consider diseases to be the biggest obstacle to leading an independent life, as they do not expect to tackle this problem by themselves. Therefore, the health management system, rather than the traditional health care delivery system, needs to solve the existing health issues of the elderly.

To keep up with this trend, Korea introduced the long-term care system for the aged in August 2008. In accordance with the Law of Long-Term Care Insurance for the Elderly (2015) and the Elderly Welfare Act (2011)\textsuperscript{14,15}, long-term care facilities for the aged, such as elderly care facilities, refer to medical welfare facilities that aim to provide food and nursing to the aged, and to provide daily life conveniences for the aged with mental and physical disabilities caused by aging, including dementia and cerebrovascular accidents. As of 2015, there are 2,933 long-term care facilities for the aged in Korea, with 141,479 inpatients. This is more than three and a half times the number of facilities in 2006, i.e., before the enforcement of the long-term care system for the aged\textsuperscript{1}. Indeed, the number of long-term care facilities for the aged being set up by nurses has been increasing rapidly. However, a holistic management system for long-term senior patients is needed because it would emphasize on the physical, psychological, and spiritual aspects of their life, rather than solely focusing on the treatment of the health issues of the elderly. Indeed, their health issues are different from those of other age groups because they mainly comprise chronic diseases, including dementia. In addition, the role of the nurse as a manager and leader in the nursing practice for the elderly has been further emphasized. Therefore, a course on gerontological nursing is necessary to provide nurses the professional knowledge regarding the theories and techniques in nursing for long-term senior patients, to cultivate relevant nursing competencies, and to encourage entrepreneurship\textsuperscript{5}.

Most of the senior patients are hospitalized in nursing facilities for the aged or in elderly care facilities, which, for some of them, may be the final place of residence. Therefore, it is important for them to enjoy a better life while they are in the elderly care facilities. A healing environment refers to a comprehensive concept encompassing the physical, psychological, socio-cultural environments. It is a super ordinate concept that includes the concept of providing medical treatment through which patients in a state of disease are allowed to restore their health in the therapeutic environment. The therapeutic purposes of the elderly care facilities include safeguarding physical safety and psychological stability, introducing aesthetic appearance, maintaining functional abilities through a variety of activities, maximizing self-awareness and direction/way-finding, maintaining the past life, providing opportunities for social interaction, protecting privacy and individualized space, encouraging family participation, and deinstitutionalization\textsuperscript{4}. Treatment refers to the medical means by which patients are helped to overcome their illness, whereas healing approaches health by providing environmental, psychological, and socio-cultural support. The latter may be applied to the prevention and promotion of health, as well as to the recovery from illness.

Therefore, it is important for nursing interventions to include the elements of a healing environment. In many previous studies, a variety of elements of the healing environment have been reported to contribute to the improvement of health-related outcomes\textsuperscript{16-18}. However, gerontological nursing accounts for an insignificant percentage of the nursing course despite the increasing and varied nursing needs of senior patients in Korea\textsuperscript{14}. In particular, the curriculum for nursing for senior patients is insufficient regarding the qualitative healing environment that takes into account the quality and emotional aspects of the life of the elderly who may need long-term care. An analysis of the nursing curriculum in Korea revealed that the course pertaining to caring for senior patients covered the issues and trends in the health problems of the elderly, health assessment and health promotion of the elderly, and management of complex health problems, including chronic diseases\textsuperscript{14,15}. This confirms that the curriculum does not include content pertaining to nursing for senior patients focusing on improving their quality of life and fostering a healing environment, which leaves much to be desired\textsuperscript{14,15}.

It is necessary to develop a positive attitude regarding nursing for the elderly, and the knowledge and nursing practice for the elderly should be promoted through imparting education related to creating a healing environment in elderly care facilities for the long-term senior patients. Additionally, nurses as managers in long-term care facilities for the elderly should be provided training in the nursing department in the university using such a curriculum.
Accordingly, the purpose of this study was to investigate nursing students’ perceptions regarding healing environmental factors in long-term elderly care facilities and to provide basic data for the development of a curriculum on gerontological nursing in Korea.

2. Method of Research

2.1 Data Collection
The research participants were 194 nursing students in Korea. A structured questionnaire was used to explore their perceptions of healing environmental factors.

2.2 Research Instrument
The tool to assess their perceptions of healing environmental factors was drawn from Woo’s (2010) research on the factors related to the healing environment in geriatric hospitals\(^\text{16}\). A total of 23 items were used to assess the participants’ perception regarding the healing environment in terms of its physical, psychological, and social characteristics. A five-point Likert scale was used: 5=very important, 4=somewhat important, 3=average, 2=somewhat unimportant, and 1=totally unimportant. The reliability, i.e., the Cronbach’s \(\alpha\) for the total scale was 0.91, while those for the physical, psychological, and social sub-scales were 0.84, 0.78, and 0.77, respectively.

2.3 Data Analysis
Data were analyzed using descriptive statistics, an independent t-test, and a stepwise multiple regression with SPSS/Windows 22.0.

3. Results

3.1 General Characteristics
Among the participants, 171(88.1%) respondents were female and 23(11.9%) were male; the mean age was 22.1 years. Further, 52(26.8%) of them were freshmen, 47(24.2%) were sophomores, 53(27.3%) were juniors and 42(21.6%) were seniors. Additionally, 95(48.9%) of respondents had experienced gerontological nursing education, as shown in Table 1.

### Table 1. General Characteristics of Participants.

| Variables | N (%) or Mean (SD) |
|-----------|-------------------|
| Gender | | |
| Male | 23(11.9) |
| Female | 171(88.1) |
| Grade | | |
| Freshmen | 52(56.8) |
| Sophomore | 47(24.2) |
| Junior | 53(27.3) |
| Senior | 42(21.6) |
| (Mean Age) | 22.06(2.84) |
| Gerontological nursing education experience | | |
| Yes | 95(48.9) |
| No | 99(51.1) |
| Economy | | |
| Low | 32(16.5) |
| Middle-High | 162(83.5) |
| Religion | | |
| Christian | 92(47.4) |
| Catholic | 19(9.8) |
| Buddhism | 3(1.5) |
| Etc. | 80(41.2) |
| Total | 194(100.0) |

3.2 Participants’ Perceived Importance of the Healing Environment in Elderly Care Facilities
The participants’ mean score on the perception of the importance of a healing environment in elderly care facilities was 4.78±0.43. The main reasons for considering the healing environment as important were that it “fosters psychological stability” (53.1%), “improves quality of life” (40.7%), and is “helpful in healing” (18.6%), as shown in Table 2.

Additionally, the participants reported that the following spaces were necessary for creating a healing environment in elderly care facilities: “place for walking in ample sunshine” (18.0%), “resting room” (16.5%), “healing garden” (16.5%), “place for personal play and hobbies” (15.5%), “program room” (12.9%), “place for family counseling” (12.4%), “treatment room” (5.2), “religious room” (2.1%), and “lobby” (1.0%), as shown in Table 3.
Table 2. Participants’ perception of the importance of a healing environment in elderly care facilities.

| Variables                                           | Mean (SD) or n (%) |
|-----------------------------------------------------|--------------------|
| Perception of the importance of a healing environment | 4.78(0.43)         |
| Main reasons for considering healing environment as import |                   |
| - Fosters psychological stability                    | 103(53.1)          |
| - Improve quality of life                            | 79(40.7)           |
| - Helpful in healing                                 | 36(18.6)           |

Table 3. Necessary spaces for creating a healing environment in elderly care facilities.

| Necessary Spaces for creating a Healing Environment | n(%)             |
|-----------------------------------------------------|------------------|
| Place for walking in ample sunshine                 | 35(18.0)         |
| Resting room                                        | 32(16.5)         |
| Healing garden                                      | 32(16.5)         |
| Place for personal play and hobbies                 | 30(15.5)         |
| Program room                                        | 25(12.9)         |
| Place for family counseling                         | 24(12.4)         |
| Treatments room                                     | 10(5.2)          |
| Religious room                                      | 4(2.1)           |
| Lobby                                                | 2(1.0)           |

3.3 Essential Features of the Healing Environment in Elderly Care Facilities, as Perceived by Participants

Among the essential components of the healing environment factors in elderly care facilities, the highest mean score on their perceived importance was observed for comfort (4.50±0.36), followed by sociality (4.41±0.52), territoriality (4.36±0.56), stability (4.20±0.52), and livability (4.19±0.63), as shown in Table 4.

Table 4. Essential features of the healing environment in elderly care facilities.

| Variables                                           | Mean(SD)                  |
|-----------------------------------------------------|---------------------------|
| **Physical characteristics**                         |                           |
| Comfort                                             |                           |
| - Temperature                                       | 4.50(.36)                 |
| - Noise                                             | 4.51(.65)                 |
| - Air/Ventilation                                   | 4.55(.62)                 |
| - Sunshine/Lighting                                 | 4.77(.46)                 |
| - Hygiene                                           | 4.30(.73)                 |
| - Comfort                                           | 4.93(.28)                 |
| - Natural view                                      | 4.73(.53)                 |
| - Convenienace                                      | 4.22(.75)                 |
| - Walk                                              | 4.31(.74)                 |
| Stability                                           |                           |
| - The simple flow of human movement                 | 4.20(.52)                 |
| - Furniture and seat arrangement                     | 4.25(.80)                 |
| - Organization of space                             | 3.60(.86)                 |
| - Safety/Security                                   | 4.08(.77)                 |
| - Way finding                                       | 4.81(.45)                 |
| Psychological characteristics                       |                           |
| Territoriality                                      | 4.36(.56)                 |
| - Privacy                                           | 4.58(.63)                 |
| - Place for personal play and hobby                 | 4.22(.69)                 |
| - Independence/liberty                              | 4.27(.79)                 |
| Livability                                          | 4.19(.63)                 |
| - Intimacy                                          | 4.48(.62)                 |
| - Color/Finishing material                          | 3.89(.89)                 |
| Social characteristics                              |                           |
| Sociality                                           | 4.41(.52)                 |
| - Communication place                               | 4.65(.60)                 |
| - Resting place                                     | 4.37(.69)                 |
| - Education place                                   | 4.12(.77)                 |
| - Place for families and visitors                   | 4.51(.66)                 |

3.4 Factors Influencing the Participants’ Perceived Importance of the Healing Environment

In terms of the factors affecting the participants’ perceptions of importance of the healing environment, the stepwise multiple regression found that those attaching greater importance to three factors—place for communication, place for families and visitors, and hygiene—considered the healing environment as more important. These three factors accounted for 15.1% of the variance, as shown in Table 5.
Table 5. Factors influencing the participants’ perceived importance of the healing environment

| Variables                          | B   | B  | t   | sig |
|------------------------------------|-----|----|-----|-----|
| Communication place                | .169| .232| 3.302| .001 |
| Place for families and visitors    | .116| .177| 2.505| .013 |
| Hygiene                            | .227| .150| 2.198| .029 |
| Constant                           | 2.358| 4.455| <.001|     |

R²=.151, F(5,188)= 11.274(.001)

3.5 Differences in the Perceived Importance and Essential Features of the Healing Environment in Elderly Care Facilities based on the Gerontological Nursing Education Experience of Participants

As shown in Table 6, there were significant differences in the perceived importance of the healing environment (t=-2.86, p=.004), and in the essential features of stability (t=-2.68, p=.008), and territoriality (t=-2.23, p=.027) based on the gerontological nursing education experience of the participants.

Table 6. Differences in the perceived importance and essential features of the healing environment in elderly care facilities based on the gerontological nursing education experience of participants.

| Variables                          | Gerontological nursing education experience | t (p)   |
|------------------------------------|--------------------------------------------|--------|
|                                   | No(n=99) | Yes(n=95) |       |
|                                   | Mean(SD) | Mean(SD) |       |
| Perceived importance of the healing environment | 4.69(0.50) | 4.87(0.33) | -2.866(.004) |
| Physical characteristics           |          |          |       |
| - Comfort                          | 4.28(0.41) | 4.42(0.41) | -2.346(.02) |
| - Stability                        | 4.46(0.35) | 4.54(0.37) | -1.406(.16) |
| Psychological characteristics      |          |          |       |
| - Territoriality                   | 4.10(0.52) | 4.30(0.52) | -2.681(.01) |
| - Livability                       | 4.19(0.58) | 4.36(0.47) | -2.258(.025) |
| Social characteristics             |          |          |       |
| - Sociality                        | 4.35(0.53) | 4.47(0.52) | -1.558(.12) |

4. Discussion

In this study, the mean score on nursing students’ perceptions of the importance of a healing environment was 4.78±0.43. Half of the participants reported that it had a positive impact on mental stability and improved the quality of life of the elderly. These results are similar to those reported in a study on healthcare professionals in nursing facilities for the elderly and geriatric hospitals (4.76)22. With the increasing number of elderly care facilities for the long-term care of senior patients, the healing environment is considered very important in terms of the physical, psychological, and therapeutic domains, as it is acknowledged that patient-oriented care is necessary for senior patients6. Recently, following the example of American specialized geriatrics hospitals, the importance of a healing environment that emphasizes on improving the quality of life of senior patients is under the spotlight in Korea. This has contributed to the development of new nursing facilities such as assistive living, continuing care retirement communities, and the Eden Alternative, in addition to existing nursing homes. These new nursing facilities focus on providing the senior patients with a home-like environment where they can maintain their lifestyle5. The present study revealed that the gerontological nursing education needs to be improved in terms of the provision of comprehensive nursing care for the elderly and the management of the healing environment in elderly care facilities. However, though the present participants considered the healing environment in the nursing facilities for the elderly as important, gerontological education comprises only a small part of the nursing curriculum5,15.

The participants responded that having a “place to walk, with ample sunshine” (18.0%), “resting room” (16.5%), “healing garden” (16.5%), “place for personal play and hobbies” (15.5%), “program room” (12.9%), “place for family counseling” (12.4%) were the essential features of healing spaces in elderly care facilities. In previous studies, nurses at long-term elderly care facilities responded that outdoor gardens, place to walk in sunshine, and indoor gardens were a desperate need.22 However, outdoor gardens have not been set up in most of the small and medium-sized elderly care facilities, as the most of them are located and operated in isolated or multipurpose buildings.23 Additionally, places for family counseling rarely provide domestic elderly care facilities.
Therefore, it is important to set up an environment in which the family can visit more frequently, to provide a psychological sense of well-being. Further, it is important to include these details in the curriculum for nursing for the elderly, so that these aspects would be considered while designing and utilizing the space in the facility. It is considered necessary to set up a program for nursing planning to help the optimal utilization of outdoor spaces, as such an environment, including a space to walk in sunshine and a garden, is important for promoting the health and recovery of senior patients. Previous studies have shown that the environmental elements, including outdoor gardens, covered outdoor paths, and daylight could contribute to a reduction in stress and increase in physical activity in normal senior patients, reduction in anxiety in senior patients with dementia, and an overall improvement in their quality of life, with enhanced quality of sleep and reduced in drug use.

In this study, the research participants considered the domain of comfort as an important element of the healing environment in the elderly care facilities, followed by sociality, territoriality, stability, and livability. This finding is consistent with the results of the study conducted by Yoo (2005) on healthcare professionals. The comfort domain comprises hygiene, natural ventilation, lighting, size of the space, and natural elements that can be felt through the human senses. These aspects cater to the physical and psychological needs of the elderly. The sociality domain is important in the elderly care facilities, as the lack of social contact leads to a sense of loneliness and alienation in the long term, which may lead to mental health problems in the elderly. The territoriality domain refers to the degree to which the personal privacy of the elderly is ensured, which affects their sense of self and self-esteem. One of the most difficult aspects of managing a public facility is to strike a balance between communal living and personal living, to protect the territoriality of the elderly. The stability domain is an important factor in preventing accidents, including furniture arrangement, way-finding, and moving lines. The livability domain is an important factor affecting the psychological sense of security of the elderly, which reduces the environmental gap between the facility and their home by creating a homelike atmosphere. This is achieved by designing an intimate space that uses familiar furniture. In this study, with reference to the comfort domain, the hygiene factor was considered the most important by the participants (4.93), while place for communication was considered the most important in the area of sociality (4.65). Similarly, privacy (4.58), safety/security (4.81), and intimacy (4.48) were identified as the most important factors with reference to territoriality, stability, and livability, respectively.

In the present study, nursing students perceived the importance of the healing environment in proportion to the perceived importance of three factors, place for communication, place for families and visitors, and hygiene. This finding is different from those of Yoo’s (2015) study on healthcare professionals, in which the natural view, safety/security, and privacy were perceived as important. According to the findings of a study on nurses in long-term elderly care facilities, the participants considered it necessary to have a spacious lounge for patients and their caregivers, preferably in the middle of the elderly care facilities. In light of these results, it is important to set up facilities with an environment that fosters sociality. Therefore, it is necessary to educate nurses regarding this, in order to include these issues while designing a nursing plan for the elderly. Indeed, it is important to provide a space for communication, and for visitors and caregivers, so that interactions can be facilitated.

Further, in the present study, those who had received gerontological nursing education recognized the importance of the healing environment and had a higher tendency to consider stability and territoriality to be important aspects of the healing environment in elderly care facilities. Senior citizens are the target of elderly care facilities. A healing environment should be planned to safeguard their health based on the characteristics of the elderly. It is necessary to carefully plan the healing environment in hospitals and elderly care facilities, such that they reflect the characteristics of the long-term senior patients. This can be achieved by improving the gerontological nursing curriculum by including information about the planning and management of a healing environment.

Findings of this study cannot be generalized as it only targeted nursing students from one specific region in Korea.

5. Conclusion

This study was conducted in order to provide basic data for the development of a gerontological nursing curriculum based on nursing students’ perceptions regarding the importance and essential features of the healing environment in the long-term elderly care facilities. The participants considered the healing environment highly important, which was higher in students who had
received gerontological nursing education. Further, they considered stability and territoriality to be more important than the other domains of a healing environment. Additionally, the participants considered comfort as the most important element of the healing environment in the elderly care facilities, followed by sociality, territoriality, stability, and livability. Finally, it was found that having a place for communication, a place for families and visitors, and optimum hygiene were factors that affected the students' perceived importance of a healing environment.

Considering that more elderly care facilities are being set up by nurses, owing to the rapid increase in the number of elderly people, the results of this study imply that it is very important to include gerontological education in the nursing curriculum. Therefore, it is necessary to develop and conduct courses on gerontological nursing, which can contribute to the improved quality of life and, physical and psychological stability of long-term senior patients by creating a healing environment in elderly care facilities. It is also necessary to offer such courses for nursing professionals working with senior patients through graduate programs.

6. References

1. Statistics Korea. Statistical Report on the Aged. 2015. Crossref
2. Korea Ministry of Government Legislation. Act of Long-term Care Insurance. 2015; 3. Crossref
3. Korea Ministry of Government Legislation, Welfare of the Aged Act. 2011. Crossref
4. Ministry of Health and Welfare, Statement Report of Welfare Facilities for the Aged, 2016. Crossref
5. Yang SH, Chon SJ, Lee, MR. Development of Curriculum for Health Care Manager of Elderly, Journal of Korean Gerontology Nursing. 2005; 7(1):28–36.
6. Song HJ, Choi SH. A Study on the Evaluation of Treatment Conditions of the Nursing Homes based on the Characteristics of the Elderly, Journal of Korean Institute of Healthcare Architecture. 2009; 15(3):31–39.
7. Choi YS. A Study on Healing Environmental Factors that Promote Safety, Quality of Life, and Health of Elderly Patients, Journal of Korean Institute of Healthcare Architecture. 2013; 19(3):7–19.
8. Kane RA, Lum TY, Cutler LJ, Degenholtz HB, Yu TC. Resident Outcomes in Small-House Nursing Homes: A Longitudinal Evaluation of the Initial Green House Program, Journal of the American Geriatrics Society. 2007; 55(6):832–39.
9. Barnes S. Space, Choice and Control, and Quality of Life in Care Settings for Older People, Environment and Behavior. 2006, 38(5):589-604.
10. Rappe E, Kivela SL. Effects of Garden Visits on Long-Term Care Residents as Related to Depression, Hort Technology. 2005; 15(2):298–303.
11. Lovell BB, Ancoli-Israel S, Gevirtz R. Effect of Bright Light Treatment on Agitated Behavior in Institutionalized Elderly Subjects, Psychiatry Research. 1995; 57(1):7–12.
12. Benedetti F, Colombo C, Barbini B, Campori D, Smeraldi E. Morning Sunlight Reduces Length of Hospitalization in Bipolar Depression, Journal of Affective Disorders. 2001; 62(3):221–23.
13. Epstein M, Hansen V, Hazen T. Therapeutic Gardens: Plant Centered Activities Meet Sensory, Physical and Psychosocial Needs, Oreg. J. Aging. 1991; 9:8–14.
14. Yun ES. Study on the Curriculum of Gerontological Nursing-Baccalaureate Degree Programs (BSN) in Korea, Journal of Korean Acad. Soc. Nurs. Edu. 2008; 14(2):188–94.
15. Yeom HE. Review of Educational Strategies to Facilitate Desirable Attitudes Toward Gerontological Nursing, Journal of the Korean Academia-Industrial Cooperation Society. 2016; 17(1):561–71.
16. Woo KS. A Study on the Healing Environment of the Geriatric Hospital, Master Dissertation, Wonkwang University at Iksan, 2010.
17. Yoo IY. A Study on Healing Environmental Factors in the Elderly Patients with Long-Term Care, International Journal of Bio-Science and Bio-Technology. 2015; 7(5):267–76.
18. Oh CO. Nurses' Needs for the Spatial Composition of Geriatric Hospital, Journal of Korean Institute of Healthcare Architecture. 2014; 20(4):7–16.
19. National Health Insurance Service, Study on Direction of Future in Long-Term Care Infra. 2015. http://www.longtermcare.or.kr/
20. Tak YR, An JY, Jung SY. A Study on Correlation between Therapeutic Outdoor Environments and Health Outcomes in Geriatric Hospital, Journal of Korean Institute of Healthcare Architecture. 2012; 18(1):45–52.
21. Algase DL, Beattie ERA, Antonakos C, Beel-Bates CA, Yao L. Wandering and the Physical Environment, American Journal of Alzheimers Disease and other Dementias. 2010; 25(4):340–46.
22. Detweiler MB, Murphy PF, Kim KY, Myer LC, Ashai A. Scheduled Medications and Falls in Dementia Patients Utilizing a Wander Garden, American Journal of Alzheimers Disease and Other Dementias. 2009; 24(4):322–32.
23. Collier L, Mcherson K, Ellis-Hill C, Staal MS, Bucks R. Multisensory Stimulation to Improve Functional Performance in Moderate to Severe Dementia-Interim Results, American Journal of Alzheimer's Disease and Other Dementias. 2010; 25(8):698–703.