Abstract

Objectives: Research shows that nursing home residents are largely inactive. This inactivity negatively influences physical fitness, and participation in daily activities is known to have a positive influence on physical function and quality of life. Existing research does not provide sufficient insight into the daily activities in which nursing home residents participate. This insight is needed to develop future interventions so as to encourage nursing home residents to participate in daily activities and, thereby, decrease inactivity. The purpose of this study was to obtain insight into daily (in)activities of psychogeriatric and somatic nursing home residents during the day and their body positions during these (in)activities.

Design: Cross-sectional observation study.

Setting: Nursing homes in the Netherlands (19 psychogeriatric and 11 somatic wards).

Participants: Participants were 723 home residents in 7 nursing homes.

Measurements: Observations were conducted using a self-developed observation list. Residents were observed in their wards during 5 random observation times between 7:00 AM and 11:00 PM, in which the daily activity and position of the resident during this activity were scored. Percentages of activities and positions were calculated for each observation time.

Results: In total, 3282 observations (91% of the intended 3615 observations) were conducted. Nursing home residents of both psychogeriatric and somatic wards were mainly observed partaking in inactivities, such as sleeping, doing nothing, and watching TV (range: 45%–77% of the 5 observation times). Furthermore, residents were engaged in activities of daily living (ADLs) (range: 15%–38%) that mainly comprised activities related to mobility (range: 10%–19%) and eating and drinking (range: 2%–17%). Engagement of residents in instrumental ADLs (IADLs) was rarely observed (up to 3%). Residents were largely observed in a lying or sitting position (range: 89%–92%).

Conclusion: Most of the psychogeriatric and somatic nursing home residents spend their day inactive in a lying or sitting position in the ward. To encourage nursing home residents in daily activities in the wards, interventions are needed that (1) focus on increasing ADLs and IADLs, and (2) encourage standing and walking.

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nursing staff. Even in healthy older people, 10 days of bed rest has disastrous effects on muscle function and aerobic capacity, and leads to an overall reduction of physical activity. Therefore, and because of the known benefits of physical activity on physical fitness, physical performance and quality of life, diverse exercise interventions (eg, resistance, flexibility, balance, and/or functional training), have been developed. However, physical activity does not need to be vigorous to have positive effects, as participation in daily activities already contributes to maintaining physical functioning and is associated with a higher quality of life.

Insight into the current level of daily activities of nursing home residents is necessary to tailor interventions to increase these daily activities. However, it is challenging to obtain valid and reliable information about daily activities among nursing home residents. Different measurement methods are available to measure physical activity, such as questionnaires, activity monitors, and observations. Not all of these methods are appropriate to obtain insight into daily activities. Questionnaires, as used in Edvardsson et al., could be biased by proxy ratings, have limited reliability and validity, show floor effects, and suffer from recall bias in low levels of physical activity. Activity monitors, as used in Ikezoe et al. and Egerton and Brauer, could identify body positions, but cannot provide detailed information about the kind of daily activity in which residents were partaking. Even though they are time-consuming, observations seem to be the best measurement method to obtain detailed information about daily activities.

Different observation studies collected data only during specific time slots, such as meal times and organized activities, which does not provide insight into the kind of activities that occur during the whole day. To our knowledge, in the past 20 years, only 2 observation studies provided insight into the activities and/or positions of nursing home residents over the whole day. MacRae et al. observed the positions of ambulant nursing home residents (n = 95) in 5 nursing homes from 7:00 AM to 7:00 AM. Positions were defined as lying, sitting, standing, walking, or wheelchair propelling. This study found that nursing home residents were observed lying or sitting in 83.5% to 93.8% of the observations. Harper Ice provided information about activities and positions during the activities of nursing home residents (n = 27) at one nursing home. The observations took place from 8:00 AM to bedtime. Activity categories were personal care, social and expressive activities, doing little or nothing, and movement; positions were classified as reclining, sitting, or upright. The results showed that residents were mainly lying (29%) or sitting (69%) during the day. Furthermore, it showed that residents spent 66% of their day doing little or nothing, doing social activities (12%), handling personal care (18%), or 3% moving (walking and moving in a wheelchair).

The aforementioned studies provide important information about the level of physical activity in nursing home residents and recommend residents partake in activities throughout the day to prevent further decline. However, these studies included only small sample sizes and were both conducted in the United States, and demographic changes have most likely occurred during the past 2 decades. These demographic changes could influence the possibilities for residents’ activities and positions. This study purposes to include a larger sample of nursing homes and nursing home residents outside the United States. Furthermore, previous studies did not distinguish between psychogeriatric and somatic residents. The main admission reason of psychogeriatric residents is dementia, and somatic residents are mostly admitted to the nursing home because of cerebrovascular accidents, neurological disorders, mobility problems, and malignancies. Based on the admission reasons for these wards, differences in care dependency and mobility and, therefore, activities and positions could be expected. Thus, the aim of this study was to gain insight into the daily (in)activities of psychogeriatric and somatic nursing home residents during the day and their positions during these (in)activities.

Methods

Study Design and Sample

An explorative, cross-sectional, observation study was conducted in June and July of 2014. The sample consisted of nursing home residents living in psychogeriatric (n = 19) and somatic (n = 11) wards (long-stay) in 7 nursing homes in the southern part of the Netherlands. These wards housed 723 (383 psychogeriatric and 340 somatic) residents. Rehabilitation (short-stay) wards were excluded.

Measures

Residents’ gender, age, mobility, functioning in activities of daily living (ADLs) and cognitive functioning were assessed. The residents’ mobility was scored as mobile or immobile (wheelchair dependent or bedridden). ADL functioning was scored with the Barthel Index, which ranges from 0 to 20; a lower score indicates a higher dependency in ADL functioning. Cognitive functioning was assessed using the Cognitive Performance Scale (CPS) ranging from 0 (no cognitive impairment) to 6 (very severe cognitive impairment).

The focus of this study was to report on the daily activities residents were engaged in during the times of observation. Furthermore, the positions of the residents during the performance of these activities were scored. No standard observation list was found to score daily activities and positions; therefore, a self-developed observation list was used.

The development of the observation list consisted of the following steps. First, a pilot observation study was conducted without a predefined list of activities and positions. During this pilot study, 9 nursing home residents (4 psychogeriatric and 5 somatic residents) were observed for 1 minute every 15 minutes (16 hours in total). The observation list was composed based on the observed daily activities during this pilot study. Based on the observation study of de Bruin et al., games, crafts, and domestic activities were added. In the next step, face and content validity of the observation list were checked by 5 observers (5 nurses, 1 research assistant, and 1 researcher). They checked whether the list was complete (any activities missing that could be observed in the nursing home ward) and appropriate for the nursing home setting. After this check, minor adjustments to the observation list were made (ie, 3 daily activities were added: physiotherapy, nonverbal communication, and putting on a hearing aid). Eventually, the observation list consisted of 33 different daily activities plus the options “resident not present in the ward” and “comments” (comments could be made; for example, if the activity did not fit into one of the predefined activities, the observer could describe the observed activity).

The observations were conducted by 5 individual observers who received training before the start of the observations. The aim of this 3.5-hour training was to explain the observation manual and to practice observations using 20 video fragments of older people performing daily activities. The observers scored the daily activity and position during this activity for each fragment independently. After this exercise, differences in scores were discussed together until an agreement was reached with all observers.

To test the reliability of the observation list, the extent of agreement between observers during observations in the nursing home was calculated with the intraclass correlation coefficient (ICC). The ICC was 0.859 for the activities and 0.873 for the positions.
The daily activities were clustered into 4 categories: “inactivity,” “ADL” “instrumental ADL” (IADL), and “communication and hobbies.” The category “inactivity” was scored when the resident was observed sleeping, doing nothing, watching TV, or smoking, based on the observation list of passive activities found in Harper Ice. The categories “ADL” and “IADL” were based on the Barthel Index17 and the Groningen Activity Restriction Scale.20 These instruments are reliable and valid for measuring physical functioning.17,20 “ADL” consisted of personal care, going to the bathroom, eating and drinking, mobility, dressing, and bathing. Domestic activities (eg, setting the table) and preparing food were categorized as “IADL.”20 The last category was “communication and hobbies,” which consisted of activities such as verbal communication and reading. The categories do not indicate whether the resident was actively or passively engaged in the activity. Detailed information on categories and corresponding activities on the observation list is provided in Table 1.

Table 1
(Sub)Categories of Activities and the 33 Corresponding Activities of the Observation List in Which Residents Could Be Engaged

<table>
<thead>
<tr>
<th>Categories</th>
<th>Subcategories</th>
<th>33 Activities of the Observation List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactivity</td>
<td>- No activity</td>
<td>Doing nothing, smoking</td>
</tr>
<tr>
<td></td>
<td>- Watching TV</td>
<td>Watching TV</td>
</tr>
<tr>
<td></td>
<td>- Sleeping</td>
<td>Sleeping</td>
</tr>
<tr>
<td>ADL</td>
<td>- Personal care</td>
<td>Personal hygiene, putting on glasses or hearing aid, taking medication, wiping off hands</td>
</tr>
<tr>
<td></td>
<td>- Going to the bathroom</td>
<td>Going to the bathroom</td>
</tr>
<tr>
<td></td>
<td>- Eating and drinking</td>
<td>Drinking, eating with hands, eating with cutlery</td>
</tr>
<tr>
<td></td>
<td>- Mobility</td>
<td>Walking, moving forward in a wheelchair with arms, moving forward in a wheelchair with legs, moving forward in an electric wheelchair, moving with arms, changing positions, transferring, physiotherapy</td>
</tr>
<tr>
<td></td>
<td>- Dressing</td>
<td>Dressing</td>
</tr>
<tr>
<td></td>
<td>- Bathing</td>
<td>Washing, showering</td>
</tr>
<tr>
<td>IADL</td>
<td>- Domestic activities</td>
<td>Setting table, cleaning</td>
</tr>
<tr>
<td></td>
<td>- Preparing food/drinks</td>
<td>Preparing food, pouring a drink</td>
</tr>
<tr>
<td>Communication and hobbies</td>
<td>- Communication</td>
<td>Verbal communication, nonverbal communication, visits</td>
</tr>
<tr>
<td></td>
<td>- Hobbies</td>
<td>Reading, crafts, games</td>
</tr>
</tbody>
</table>

In this study, daily activities were defined as all activities residents engaged in during a day. Being engaged in an activity did not necessarily mean that the resident was physically active (eg, dressing or walking around), because daily activities also include passive activities (eg, getting dressed by a nurse).

To observe residents for 1 complete day, observations were conducted over a 16-hour period. Because observations in a ward were completed by 1 observer, observations were conducted over 2 days. To obtain an overview of the whole day, the observations were divided into 5 time blocks. Each ward was randomly observed once during each of the 5 time blocks: 7:00 to 10:00 AM (observation time 1), 10:00 AM to 1:00 PM (observation time 2), 1:00 to 4:00 PM (observation time 3), 4:00 to 7:00 PM (observation time 4), and 7:00 to 11:00 PM (observation time 5). All wards were visited in a random sequence during each observation time. Randomization was conducted using the Web site http://www.randomizer.org/. The observer walked around the ward, observed each resident for 1 minute and registered the daily activity and position of the resident. If residents were observed performing more than 1 activity, the main daily activity was reported. The main activity was defined as the most relevant or meaningful activity for the resident. Comments were processed and, if needed, the described activity was redefined in 1 of the 33 activities. Only nursing home residents who were present in the ward were observed.

Ethical Considerations

The medical research ethics committee of Atrium-Orbis-Zuyd approved the study protocol (14-N-84). The management of each nursing home signed research declaration to obtain the observations anonymously and to gather background characteristics of the residents. The privacy of the residents was considered during all

The management of the nursing home or the contact person within the nursing home provided information about the nursing home and the wards, and they informed the nursing staff about the observations. Nursing staff members in the wards assessed the background characteristics of each resident using an inventory consisting of different questionnaires. The information needed for the questionnaires was gathered using the residents’ records and nurses’ knowledge about the resident. This inventory was sent to the contact person of the nursing home, and this person spread the inventory to the nursing staff in the wards and collected the completed inventories.

Observations were scored on a handheld tablet (Samsung Galaxy Tab 3, Suwon, Korea) using the e-Droid-cell Pro app to open and adjust the observation list. The observation list was integrated into an Excel file and included the random sequence and observation times in each ward (see Figure 1).

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Procedure

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observations; for example, when the resident was in the bathroom with the door closed, the door was not opened by the observer.

Data Analyses

The data from the Excel files were transferred to SPSS version 22, which was used to conduct the analyses (SPSS, Inc., Chicago, IL). Descriptive statistics were performed for all wards together and separately for the psychogeriatric and somatic wards. Due to the anonymous observations, it was not possible to follow a single resident over time. Therefore, percentages of activities and positions were calculated for each observation time separately based on all individual observations. To compare the different types of wards, an independent t-test was used for the continuous variables and a χ² test was used for the categorical variables. Additional analyses were conducted to compare the activities and positions of residents in psychogeriatric and somatic wards. Percentages of activity categories and positions were estimated and analyzed based on the expected percentage of each ward. A linear, mixed-effects, regression model was used to calculate the differences in activity categories and positions between psychogeriatric and somatic wards for each observation time.

Results

Study Population

All 30 wards (19 psychogeriatric and 11 somatic) at 7 nursing homes were observed. The nursing home wards housed 723 residents in total. The nursing homes varied in size from 2 to 10 wards. Per ward, the number of residents ranged from 10 to 47 residents. Demographic characteristics of the nursing home residents are presented in Table 2. The mean age of all nursing home residents was 83.0 (SD 8.9) years, and 68% of the residents were women. Compared with somatic residents, on average, the psychogeriatric residents were older, were more often mobile, were less severely dependent in ADLs, and had more severe cognitive impairments. Ninety-one percent (n = 3282) of the intended (n = 3615) observations were completed, which equates to an average of 4.5 observations per resident.

Daily Activities in the Wards

Table 3 presents the percentages of the observed daily activities residents were engaged in during the 5 observation times based on all individual observations. Most nursing home residents were observed to be inactive, that is, watching TV, sleeping, or doing nothing (range: 45%–77% for the 5 observation times). When engaged in ADLs (range: 15%–38%), nursing home residents were most often engaged in activities related to mobility (range: 10%–19%) and eating and drinking (range: 2%–17%), such as walking or eating, respectively. ADLs, like dressing, bathing, and personal care, were mostly observed in the morning between 7:00 and 10:00 AM. Mobility activities were observed during all observation times, but most mobility activities were observed during the early afternoon between 1:00 and 4:00 PM. IADLs, like setting the table, were rarely observed (up to 3%). Residents were observed in communication activities, like chatting with others, during 4% to 10% of the observations. Engagement in hobbies (eg, painting, reading, or knitting) was particularly observed between 10 AM and 4 PM. Based on the additional regression analysis at the ward level, no significant differences between psychogeriatric and somatic wards were found with regard to the activity categories.

Positions During the Activities

Table 4 presents the positions of the nursing home residents during the observation times. During all observation times, residents were observed primarily sitting or lying (range: 89%–92%). Lying was...
especially observed in the early morning and late evening when residents slept in their beds. However, during the daytime (10 AM–7 PM), between 16% and 24% of the residents were observed in a lying position. Transfers, in which the resident changed position, were rarely observed (up to 1%). Both psychogeriatric and somatic residents were mainly sedentary (lying or sitting) during the day (psychogeriatric range: 85%–91% versus somatic range: 91%–93%). No significant differences were found in positions between the different types of wards based on the additional regression analysis at the ward level.

Discussion

The results of this study show that most nursing home residents spend their day inactive (sleeping, watching TV, or doing nothing). If psychogeriatric and somatic residents were engaged in ADLs, it mainly consisted of activities related to mobility, eating, and drinking. Findings indicate that residents were rarely engaged in IADL-related activities, like preparing food or setting the table. Most residents were observed in a lying or sitting position during daily activities. Ninety-one percent of the residents were present in the ward during all observations.

The large amount of inactivity observed in this study is in line with the previous studies of MacRae et al.2 and Harper Ice.3 Despite a different country-specific context, the comparable degree of inactivity from US nursing homes indicates that the large amount of observed inactivity observed in the current study is not unique to the Dutch nursing home setting. In addition, it indicates that, almost 20 years later, there is still a relatively unchanged nursing home situation with regard to inactivity.

The fact that residents were mainly inactive could be explained by patient-related, organizational, or environmental aspects. Different patient-related aspects, such as care dependency, mobility problems, chronic diseases, fatigue, cognition, and habitual inactivity of the resident, could have influenced the large amount of observed inactivity and sedentary positions. As indicated by the low score on the Barthel Index, both psychogeriatric and somatic residents are largely dependent in ADL functioning. This high level of dependency could have influenced the number of observed activities.

The observed inactivity could be also possibly influenced by organizational aspects, for example, a potential lack of relevant and meaningful activities offered in the nursing home. Meaningful activities are defined as enjoyable activities for nursing home residents.21 If they engage in meaningful activities, residents improve their emotional well-being, cognitive status, and physical functioning, while reducing problematic behaviors.21 Research shows that if activities are not relevant or meaningful to residents, residents prefer to do nothing or to watch TV.22 Residents could be encouraged in activities they prefer, and, especially mobile residents, could be encouraged to perform activities in which they stand or walk during the day. Other organizational aspects that could possibly influence residents’ activities are staff-related such as attitude toward activities, workload, amount of staff, work experience, and education level. Environmental aspects are the facilities of the ward and the nursing home; for example, facilities that make it possible for nursing home residents to walk around the ward or nursing home, to set the table, or to perform other household activities.

Increasing daily activities in nursing home residents will become of greater importance in the near future because there is a change occurring in the care system in the Netherlands. This change will result in a longer stay at home, with more severe cases admitted to the nursing home. Therefore, the nursing home residents will have more complex care problems, will be more severely disabled, and will be more care dependent. It will become increasingly important to encourage residents in their daily activities and to maintain their physical capacity as much and as long as possible.

Research shows that older people who spend more time doing daily and household activities have a lesser decline in mobility.23 Participation in daily activities can positively influence physical functioning23–25 and quality of life.2 Sparling et al.24 argued that it is more important for older adults to increase light activities during the day and to decrease sedentary time rather than to exercise. Therefore, future interventions should focus on increasing the daily activities of nursing home residents (especially ADLs and IADLs) and tailoring these activities to each individual.

It is important to give residents the opportunity to be physically active in the ward during the day, in which nursing staff play an important role. Nursing staff can help residents by tailoring daily activities to the functional abilities, interests, and prospects of each individual, and fitting these tailored activities to daily routines while taking into account the possible cognitive impairments. For example, a nurse could encourage a resident to walk to the dining room, or they could walk together instead of the nurse pushing the wheelchair.23 To understand how nursing staff members could encourage nursing home residents in daily activities, it would be necessary to gain insight into the role of nursing staff during daily activities of nursing home residents. Moreover, it is essential to know which activities the residents prefer. This preference of the residents could, for example, be identified by the MIBBO (Dutch acronym for “Measure to Identify Meaningful Physical Activities in the Elderly”).26 The MIBBO is a photo-interview conducted to investigate the preferences of residents. A previous study using the MIBBO found that residents’ preferred activities were gymnastics, orchestra, preparing food, walking, watering plants, and feeding pets.26 Aside from nursing staff, informal caregivers can be involved in encouraging residents to perform daily activities. Prospective studies should focus on feasible interventions to encourage daily activities among nursing home residents.

To our knowledge, this is the first study to distinguish between psychogeriatric and somatic wards. Based on different admission reasons26 and differences found in age, mobility, ADL, and cognitive functioning, differences in activities and positions between

### Table 4

<table>
<thead>
<tr>
<th>Observation Time</th>
<th>Total</th>
<th>Psychogeriatric Wards, n = 19</th>
<th>Somatic Wards, n = 11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
<td>T3</td>
</tr>
<tr>
<td>No. observations</td>
<td>705</td>
<td>657</td>
<td>588</td>
</tr>
<tr>
<td>Lying</td>
<td>48</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Sitting</td>
<td>40</td>
<td>74</td>
<td>69</td>
</tr>
<tr>
<td>Standing</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Walking</td>
<td>6</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Transferring</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<1 = percentages less than 0.5%, variation in sum of percentages (around 100%) exist due to rounding.

Observation time blocks: T1: 7:00–10:00 AM, T2: 10:00 AM–1:00 PM, T3: 1:00–4:00 PM, T4: 4:00–7:00 PM, T5: 7:00–11:00 PM.
psychogeriatric and somatic wards could be expected. For example, somatic residents were mainly observed in a lying or sitting position (range: 91%–93%), which could be partly because most of the somatic residents were immobile (73%). Even though more psychogeriatric residents were mobile (61%), they were mainly observed in a lying or sitting position as well (range: 85%–91%). Additional multilevel analyses did not find significant differences in activities or positions between the different types of wards. Future interventions in nursing home residents should take a different approach to focusing on the psychogeriatric and somatic residents’ daily activities. For the psychogeriatric residents especially, their cognitive impairments should be taken into account, as for the somatic residents their somatic impairment should be taken into account.

The strength of this study is the large number of observed nursing home residents. Although previous observation studies performed more observations per resident, these studies observed smaller groups. MacRae et al. completed 64 to 96 observations per individual (n = 95). Harper Ice, on average, completed 146 observations per individual (n = 27), and the current study completed a maximum of 5 observations per individual (n = 723). Observing a large group of residents anonymously provided insight into daily activities (in general) instead of individual activity patterns, and reduced the intensity of the observation method. Furthermore, the anonymous observations made it possible to observe all residents in the ward. During a pilot observation study in which individual informed consent was obtained, it was noticed that participating residents were not representative of the whole ward regarding their activity level. By observing all residents anonymously without individual consent for participation, no selection bias could arise based on willingness to participate.

There are also limitations to using anonymous observations. Observations could not be linked to previous observations or to individual characteristics of a resident. This made it impossible to calculate correlations between residents’ characteristics and activities. Bias could arise in this study if all active residents were outside their ward and only inactive residents stayed in the ward. However, the findings showed that, on average, more than 90% of the residents were present in their ward during the day, which means that most residents spent their day in the ward, and the group of observed residents probably did not largely change between the observation times. Despite using only nursing home residents in the southern part of the Netherlands, the study population is expected to be representative of the nursing home population in the Netherlands as a whole. Residents of different organizations, different nursing homes, and different types of wards were observed. The observer did not monitor the residents while they were in the bathroom and respected privacy at all times. Therefore, up to 2% of the activities and positions were missing. Nursing staff were informed of the observations. Because wards were visited in a random sequence and the residents in the wards were randomly observed, it is not presumable that this influenced the observations by, for example, nurses providing extra encouragement for residents to perform activities.

Conclusion

This study shows that most psychogeriatric and somatic nursing home residents spend their day inactively (doing nothing, watching TV, or sleeping) in the ward. When nursing home residents were engaged in ADLs, it mainly consisted of activities related to mobility, eating, and drinking. Engagement in IADLs was rarely observed. Both psychogeriatric and somatic residents were mainly observed sitting and lying during the day, whereas most psychogeriatric residents were mobile. Future interventions to prevent further decline should focus on encouraging residents in ADLs and IADLs in the nursing home ward and increasing the activities in which mobile residents are encouraged to stand and walk during the day.

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