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PHARMACOEPIDEMIOLOGY AND PRESCRIPTION

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Psychotropic drugs in nursing- and old-age homes: relationships between needs of care and mental health status

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Abstract *Objective*: The aim of the present study was to map out what kind of psychotropic drugs are prescribed for elderly residents in assisted-living homes and how they relate to age, sex, form of living, psychiatric diagnosis, care needs and mental health status, and to identify factors of importance for their use; and to study the indication for treatment and the evaluation of the effects of treatment.
Method: The study had a cross-sectional design and included one-third of all patients ($n = 175$) living in old-age homes or in nursing homes in a municipality in southern Sweden. Data concerning medication was obtained from medical records and included all psychotropic drugs prescribed the day the study started and the previous month. Need of care was assessed using Katz index, and mental health status was assessed using the Organic Brain Syndrome scale.
Results: Of the study population, 128 (73%) used one or more psychoactive drug. Prescribed drugs were neuroleptics (16%), anxiolytics (32%), hypnotics, (45%), and anti-depressants (33%). A greater prescription of neuroleptics than anti-depressants was seen for those showing signs of depression, and caution with prescription of benzodiazepines was seen for those showing signs of dementia. An indication and evaluation of treatment was lacking in half of the cases. Treatment with psychiatric drugs existed for approximately 50% of those without a determined psychiatric diagnosis.
Conclusion: We have found a frequent use of neuroleptics, anxiolytics and hypnotics in the elderly, but an underprescription of anti-depressants appears to exist. There is a lack of documentation of indications and evaluations of psychotropic medication.

Keywords Elderly · Nursing home · Old-age homes

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Introduction

The number of elderly individuals in Sweden has increased significantly in recent decades. The average life expectancy is 82.1 years for women and 77.6 years for men and, of the elderly population in Sweden, more than 120,000 individuals (7.8% of people older than 65 years) live in some kind of assisted-living arrangement [1]. Elderly individuals in assisted living constitute a group in great need of medical care. They often have several medical diagnoses, symptoms of age-related diseases and mental illness, and are prescribed many different medicines [2, 3, 4]. Several studies both from Sweden and other countries have shown that pharmaceutical therapy among elderly individuals, especially those in assisted-living arrangements, is dominated by psychiatric drugs [5, 6, 7, 8, 9, 10, 11].

Both pharmacokinetic and pharmacodynamic changes contribute to the increase in harmful reactions from drugs seen in the elderly. With increasing age, the level of circulating binding protein decreases, which may result in an increased concentration of freely circulating drugs and an increased risk of side effects [12]. The proportion of adipose tissue in relation to body weight increases and lipid soluble pharmaceutical agents, such as many psychoactive drugs, thereby obtains a larger volume of distribution, a longer time of action and, thus, an increased risk of side effects [13]. Increased age also leads to a decreased blood circulation in the kidneys and liver. Both kidney clearance and liver metabolism is reduced for many drugs leading to an increased circulation of the drug with an increased risk of side effects and harmful interactions. The interactions can be of different

kinds: drug–age-related interactions as a result of the use of drugs not recommended for the elderly [14] or drug–drug-related interactions from the use of two or more drugs in combination [15]. A study by Cooper showed that simultaneous treatment with several different psychiatric drugs resulted in the highest number of drug interactions with resulting harmful side effects [16].

With increased age, the sensitivity of the body to drugs is also altered (pharmacodynamic changes). The sensitivity of the brain to opioids and benzodiazepines increases, resulting in an increased risk of sedation and confusion [17]. Changes in the brain's cholinergic system make the elderly more sensitive to drugs with anti-cholinergic effects [18]. Such drugs can cause disturbances of cognitive functions, such as orientation to time and space, abstract thinking ability, including everything from minor memory lapses to confusion [19, 20]. They may also cause other negative effects, such as extrapyramidal symptoms and tardive dyskinesia, as well as an increased risk of falls and hip fractures [21, 22].

Previous studies have shown that hypnotic drugs are commonly used in elderly in assisted-living situations [23, 24]. A Norwegian study showed that 24% of 2802 individuals living in nursing homes or old-age homes used hypnotics in the form of long-acting benzodiazepines and that 98% of these cases had a standing prescription and often in higher doses than recommended. It was also shown that the prescription was higher for individuals in old-age homes than those living in nursing homes [25]. It has been shown that depression among individuals in nursing homes is common and manifests itself by, among other things, a loss of appetite, low spirits and withdrawal from social contact and is associated with a lowered quality of life [26]. This can result from serious mobility impairment or an increased frequency of disease in these individuals, but also from a greater requirement for care and a changed home environment [27]. Treatment of depression has increased in Sweden as well as in other countries after the introduction of selective serotonin re-uptake inhibitors (SSRI) [10, 28].

The aim of the present study was to map out what kind of psychotropic drugs are prescribed for anxiety, sleep disorders and low spirits in elderly individuals in assisted-living homes and how they relate to age, sex, form of living, psychiatric diagnosis, care needs, and mental health status, and to identify factors of importance for their use. The aim was further to study the indication for treatment and the evaluation of the effects of treatment.

Methods

Ethics

The study was approved by the ethics committee of Lund University, Sweden.

Design and setting

This study used an empirical, descriptive cross-sectional design comprising a retrospective mapping of psychotropic drug use in all nursing homes and old-age homes in Lund municipality in southern Sweden. The population of Lund municipality was 100,000 in the autumn of 2002. During year 2001, 12,564 individuals were above 65 years of age and approximately 1000 residents lived in some form of assisted living. The assisted-living facilities include 14 old-age homes, 7 nursing homes and 2 nursing homes for rehabilitation. In both old-age homes and nursing homes there are a number of beds for short stay.

Residents and selection

The study included a total of 225 individuals living in old-age homes ($n = 159$) or in nursing homes ($n = 66$). Data was collected during the autumn of 2001 and the spring of 2002. Inclusion criteria were residents living permanently in a nursing home or old-age home. Exclusion criteria were residents: spending time for short time care or rehabilitation in nursing homes or old-age homes; with advanced dementia living in separate group living arrangements; that due to long-term or advanced psychiatric illness were living in separate group living arrangements. To reach a representative sample, a stratified randomly selected group of residents were approached to participate in the study. A fourth of all residents in all nursing homes and old-age homes were asked to participate. The first author gave oral information and presented the written information to the residents who had been selected to participate. Decisions regarding participation were made either by the resident or his/her relative. The mapping included all psychotropic drugs prescribed on the day the study started and the previous 1-month period.

Procedures and instruments

In this study, a structured questionnaire and an evaluation protocol were used. Resident characteristics were obtained through medical records and questions related to need for care and mental health status were answered through interviews with the resident's key worker. The evaluation protocol was used for evaluating the pharmaceutical drug lists in the medical records.

Questionnaire

The questionnaire included questions related to sex, age, marital status, nationality, form of living, time living there, medical diagnoses, vision, hearing, sleeping habits and mental health status. Care need was evaluated according to Katz P-ADL index [29, 30]. This tool originates in the US but has been used in Scandinavian studies and has shown a good reliability of results between investigators and a good validity [31]. Evaluation of sleeping habits was performed with the help of four questions: sleeping problems, tiredness, sleepiness during the day and time going to bed at night. The questions were scaled from one to four, with one indicating no problem and four the worst problem. Information about mental health status was obtained with the help of the Organic Brain Syndrome (OBS) rating scale [32]. The OBS-scale is a combined interview and observation scale. Part one is an interview scale and provides information about the patient's present orientation ability and part two is an observation scale based on information from staff members and describes the patient from a longer time perspective. The complete OBS-scale questionnaire assesses nine different areas and is construed for the examination of elderly people with signs of confusion. It covers variations in clinical state, suspiciousness, emotional reactions, description of speech, delusions, neurological symptoms, spatial orientation/recognition ability, physical and practical ability and social ability. In the present

study, questions related to spatial orientation and recognition ability (six questions), emotional reactions (nine questions) and social ability (two questions) were used. Every question had four possible answers graded from "was not present" to "was very much present".

Evaluation protocol

The protocol was constructed specifically for this study and was tested in a pilot study followed by appropriate corrections. The registration included all psychotropic drugs and information on dosage, indication, and evaluation of effects. The drugs were registered according to the Anatomical Therapeutic Chemical Classification System (ATC) [33]. The psychotropic drugs were: neuroleptics (NO5A), anxiolytics (NO5B), hypnotics and sedatives (NO5C) and antidepressants (NO6A). Psychiatric diagnoses were coded according to the Swedish National Board of Health and Welfare's classification of diseases and health problems, which is a Swedish primary care-adapted version of the International Statistical Classification of Diseases, 10th revised version (ICD-10) [34]. In this study, psychiatric diagnosis F 00-F 69 and F 99 were included.

Statistical analysis

The compiled data were analysed using descriptive and analytical statistics using SPSS [35]. Proportions between groups were analysed using Chi-square comparisons. Differences between subgroups were analysed using the Mann-Whitney U test. Predictions for psychopharmacological treatment were analysed using multiple logistic regression analysis.

Results

The number of retirees approached to participate in the study was 225. Thus, the attrition rate was 22% ($n = 50$). Of these, nine died between the time for giving consent to participate and the interview, and 41 did not accept to be included. The attrition rate was equal in nursing homes and old-age homes. The characteristics of the study population are presented in Table 1.

Care need

Of the residents, 133 (76%) needed help with everything related to taking a bath. Ninety residents (50%) needed help getting dressed/undressed, help with bathroom visits and help with moving around. One hundred and six (61%) suffered incontinence in some form. In 157 (90%) cases, the residents could eat by themselves. Thirty-three residents (19%) had good mobility, and 11 (6%) were totally bedridden. Forty-eight residents (27%) had heavily impaired vision and 41 (23%) had decreased hearing, not compensated for by hearing aids. There was no correlation between age or sex and need of care. However, the care need was greater for individuals living in nursing homes ($P < 0.001$; Fig. 1).

Table 1 The socio-demographic characteristics of the residents ($n = 175$) living in a specific facility, i.e. 14 old-age homes and 7 nursing homes

		Nursing homes	Old-age homes
Total population	175	49	126
Women	126	32	94
Men	49	17	32
Average age (years)	87	84**	88**
Length of stay (years)	2.6	2.0	3.0

**$P < 0.01$

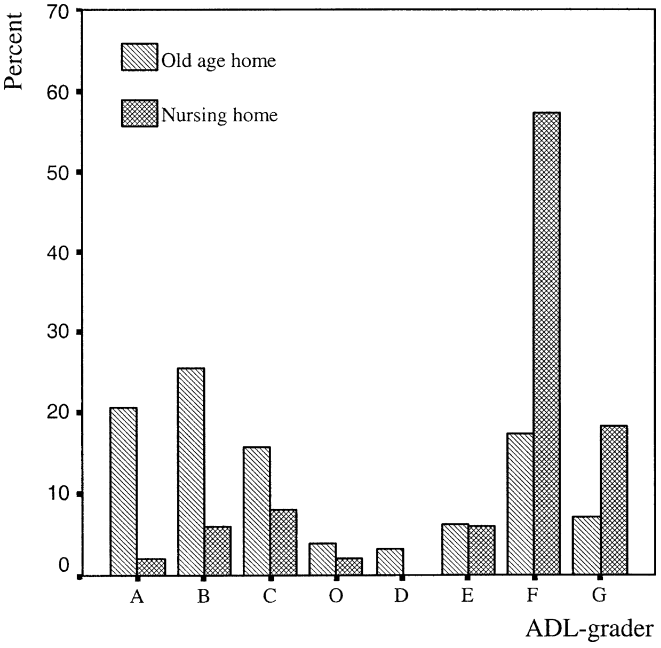

Fig. 1 Katz P-ADL index for residents ($n = 175$) in old-age homes and nursing homes. The P-ADL index is based on an evaluation of functional dependency or independency in six variables: bathing, dressing and undressing, bathroom visits, movement, continence and food intake. P-ADL index has a hierarchical structure and is presented according to ADL grading: grade A means independency for all six variables; grade B means independency for all variables except one; grade C means independency in all activities except bathing and one additional variable; grade D means independency in everything except bathing, dressing and undressing and one additional activity; grade E means independency in everything except bathing, dressing and undressing, bathroom visits and one additional activity; grade F means independency in everything except bathing, dressing and undressing, bathroom visits, movements, and one additional activity; grade G means dependency for all activities. Those that cannot be classified according to grades C, D, E or F are designated other (*O*)

Mental health status

Regarding social ability, 109 (62%) of the residents had a visitor coming once a week and 83 (47%) interacted with other residents. Most of the residents, 81 (46%) did not read a newspaper. Concerning emotional reactions, 70 (40%) were diagnosed as anxious and 29

Table 2 Treatment with psychiatric drugs according to drug type and patient characteristics in residents ($n=175$) living in nursing homes and old-age homes

	No. of individuals	Fraction treated, %			
		Neuroleptics NO5A	Anxiolytics NO5B	Hypnotics NO5C	Antidepressants NO6A
Total	175	16.6	32.0	44.6	32.6
Form of living					
Nursing home	49	24.5	42.9*	36.8	34.7
Old-age homes	126	13.5	27.8*	47.7	31.8
Sex					
Women	126	13.5	30.2	48.4	31.7
Men	49	24.5	36.7	34.7	34.7
Age (years)					
< 88	84	19.0	27.4	38.1	39.3
≥88	91	14.3	36.3	50.5	26.4
ADL-index					
< 2.5	92	15.2	30.4	53.3**	34.8
≥2.5	83	18.1	33.7	34.9**	30.1

Data were analysed with Chi-Square tests and presented as a percentage (%)
*$P<0.05$
**$P<0.01$

(17%) were recognised to suffer from severe anxiety. Sixty-five residents (37%) had psychomotor slowing and depression and a feeling of low-spiritedness varied from somewhat sad, 65 (37%) to severe low-spiritedness and hopelessness 13 (7%). Twenty residents (10%) had latency in their reactions and were agitated and restless. Fifty-seven residents (3%) were irritable and irritated, whereas 10 (6%) showed aggression and 18 (10%) were perceived as extremely elated with a heightened sense of self-esteem. Spatial orientation showed that 50 (30%) had difficulty finding their own room, a rest room, or their seat in the dining room. Ninety-six residents (55%) recognised the staff, 59 (33%) recognised residents but had difficulties remembering names, and 27 (15%) confused residents but were easily corrected. A majority of the residents 157 (90%) recognised their relatives.

Psychotropic drugs

Of the residents, 128 (73%) were using one or more psychotropic drugs. Thirty-seven (21%) of the residents had a psychiatric diagnosis in the case notes. Prescription of psychotropic drugs was greater among residents in the nursing homes, with the exception of hypnotics, which were more prevalent in old-age homes (Table 2).

Neuroleptics NO5A

A total of 29 (17%) residents used neuroleptics. Drugs used included haloperidol, risperidon, melperon, perphenazine, thioridazine and zuclopenthixol. The most common drugs used were haloperidol, thioridazine and risperidon.

Of the 29 residents prescribed neuroleptics, a documented indication for treatment was absent for 14 (48%). The attending care staff noticed severe manifestations of anxiety in 17 (59%) residents despite treatment, and another 41 (28%) showed some signs of anxiety but were untreated. Of those treated with neuroleptics, 19 (65%) had no evaluation reported in the medical records dated within the last month of treatment. Where an evaluation was present, 50% ($n=9$) were performed by nurses. Among those who were treated with neuroleptics 15 (52%) had a psychiatric diagnosis. There was no significant correlation between treatment with neuroleptics and age, sex, marital status, living in a nursing home or old age home, or whether the individuals were dependent or independent according to Katz' P-ADL-index (Table 2).

Anxiolytics NO5B

A total of 56 (32%) residents were treated with anxiolytics. The most prevalent drugs were benzodiazepine derivatives (diazepam and oxazepam). Twenty-three residents (41%) had no documented indication for treatment with these prescribed drugs. When indications for treatment were present, the most common symptom was anxiety (23 residents, 41%). Of the residents with severe manifestation of anxiety, 13 (45%) had ongoing treatment with anxiolytics and 16 (55%) showed symptoms of severe anxiety but were not treated. Of the residents that were treated with anxiolytics, 44 (79%) lacked an evaluation in the medical records. When an evaluation was present, it was in 79% ($n=11$) of the cases done by a nurse. Of the residents that were treated with anxiolytics 44 (79%) lacked a psychiatric diagnosis. There was no significant correlation between treatment with anxiolytics and age, sex, marital status, living in a nursing home or old age home, or whether the individuals were dependent or independent according to Katz' P-ADL-index. Those who lived in old age homes used fewer anxiolytics than those in nursing homes ($P<0.05$; Fig. 1).

Hypnotics and sedatives NO5C

A total of 78 residents (45%) were treated with hypnotics. Of those, 19 (11%) residents used benzodiazepine derivatives, and 40 (51%) used zolpidem or zopiclone. Of the treated residents, 44 (56%) had no documented indication for treatment, 3 (4%) were treated based on anxiety and 31 (40%) were treated based on sleeping problems. Of the residents treated with hypnotic drugs 42 (54%) still had sleeping problems and 8 (10%) generally slept poorly. Of those who took sleeping tablets, 52 (67%) had no documented evaluation in the medical records from the last month of treatment. When an evaluation was present, 82% (23 evaluations) were done by a nurse. No significant correlation was found between having a psychiatric diagnosis and being treated with hypnotics. A significant relationship was however found between hypnotics treatment and results from the Katz P-ADL-index. Residents who were less dependent were treated with sleeping pills to a higher extent. Further, there was no correlation between treatment with hypnotics and age, sex, marital status or form of living (Table 2).

Antidepressants NO6A

A total of 57 residents (33%) were treated with antidepressants. The most commonly used drugs were SSRI and were prescribed to 41 residents (72%), where the most common drug was citalopram. Of the residents prescribed drugs, 37 (65%) had no documented indication for treatment. The most common indication when present was low-spiritedness—11 residents (19%)—or depression—7 residents (12%). Of those determined as low-spirited or depressed by their key worker, 21 of 39 (54%) were treated, whereas 18 of 39 (46%) were not. Of those treated, their key workers felt that 21 of 57 (37%) were still depressed. There was a significant correlation between being treated with antidepressants and having sleeping problems ($P < 0.02$). There was no correlation between treatment with antidepressants and experiencing anxiety. Of the residents that experienced severe anxiety, 16 (14%) were not treated with antidepressants and 13 (45%) were experienced as anxious despite being treated. Of those being treated with antidepressants, 48 (84%) had no documented evaluation for the previous month of treatment. Of those evaluations that were performed, a nurse made 50%. There was no correlation between being treated with antidepressants and age, sex, marital status, form of living, physical mobility or whether the resident was dependent or independent according to Katz' P-ADL-index (Table 2).

To identify factors of importance for use of psychiatric drugs, multiple logistic regression analysis was used. Two models were tested: one containing age, sex, form of living, psychiatric diagnosis, and care need according to Katz' P-ADL-index and one containing the parts of the OBS-scale used for this study as well as data related to sleeping habits. Predicting factors for treatment with psychiatric drugs were variables from the OBS-scale and from the questions related to sleeping (Table 3).

Use of neuroleptics and antidepressants was primarily determined by the degree of depression, while sleeping problems initiated use of both anxiolytics and hypnotics. Latency in reactions predicted a decreased use of both anxiolytics and hypnotics. Decreased spatial orientation ability also predicted less treatment with hypnotics. Depression together with some degree of confusion, in the form of not being able to recognise staff members, predicted more frequent usage of neuroleptics (Table 3).

Discussion

Discussion of methods

By choosing all old-age homes and nursing homes within a geographic area and from that material making a

Table 3 Logistic regression of symptoms according to the organic brain syndrome (OBS) rating scale and sleeping questions versus use of psychiatric drugs

Dependent variable	Determinants	OR	CI	*P* value
Neuroleptics, NO5A	Depression	4.9	2.1–11.7	0.001
	Do not recognise staff-members	3.5	1.2–10.1	0.024
Antidepressants, NO6A	Depression	3.4	1.6–7.0	0.001
	Mix-up of individuals	3.7	1.0–14.2	0.055
Anxiolytics, NO5B	Sleeping problems	2.8	1.2–6.2	0.014
	Psychomotor slowing	2.1	1.0–4.3	0.038
	Latency in reactions	0.06	0.01–0.5	0.009
Hypnotics, NO5C	Sleeping problems	7.6	2.9–20	0.001
	Latency in reactions	0.2	0.06–0.98	0.046
	Decreased spatial orientation	0.3	0.1–0.7	0.01

Area of use according to the OBS scale, "Emotional" reactions (9 questions); Spatial orientation-recognition (6 questions); "Social ability" (2 questions): Sleeping problems (1 question)

random choice has contributed to an increased validity of the study. The staff at these facilities were unable to influence the selection of the study population and thereby unable to affect the results related to prescribed drugs, care need and mental health status. The participation, 78%, was high, and the frequency of non-participation was the same irrespective of whether the individuals were living in nursing homes or in old-age homes. Non-participation may be dependent on the fact that information regarding the study was communicated in a sequential fashion from manager to nurse to key worker to resident. This may have been of importance as the oral information to the residents may not have been entirely clear in all cases and misunderstandings may have occurred. The contact person was selected as informer as the resident knew this person well and would thus not feel any pressure to participate, which may have been the case, had the researcher presented the information. Many residents mentioned that their reason for not participating was that they thought their drug treatment would be affected. When mapping the drug prescription we used the medical record. By the introduction of the so-called Ädel-reform (Swedish National Board of Health and Welfare) the medical records have been the subject of review [36]. It was concluded that the lists had to be of good quality. It was shown, however, that the quality often was low. Indications for treatment were often missing; starting and ending dates were hard to interpret. This may mean that some information in the medical records has been misinterpreted.

The first author, together with the key worker for each resident, filled in the questionnaire. This meant that the questions could be explained clearly and misinterpretation could be avoided, which increased the validity of the responses.

Discussion of results

Descriptive data from 175 residents in old-age homes or nursing homes in Lund municipality in southern Sweden showed that the care need was higher for those living in nursing homes. The reason for this may be that individuals placed in a home directly from a hospital usually have a higher number of medical diagnoses and are more likely to be placed in a nursing home where there are nurses all hours of the day.

Results using the OBS-scale indicated that one-third of the residents showed signs of depression. Other studies have also shown that depression is common among elderly in assisted-living arrangements and that this is associated with a lower quality of life [26, 27]. Being depressed increases the risk for suicide and is the greatest risk factor for suicide when approaching advanced age in both men and women [37]. In this study, we found that residents with depression were treated with anti-depressants. Anti-depressants were used by one-third of the residents, and the most common drugs used were SSRI, which were used by more than two-thirds of the treated individuals. Many studies have shown that prescription of anti-depressants have increased since the introduction of SSRIs [10, 28, 38]. Brorson et al. showed that SSRIs were prescribed both to individuals with and without dementia in assisted-living circumstances [39]. This study showed that half of those showing signs of sadness or depression were treated with anti-depressants. Still, the other half were not treated despite being identified as sad or depressed by their key workers. Worth noting is the fact that among those that were treated about, one-third were still identified as depressed. Is this a case of too-restrictive treatment? Are the doses prescribed too low? Or are the individuals treated with the wrong drugs? These questions may not have appeared had the indication as well as an evaluation or the present drug regiments been better documented. Many other studies have pointed out insufficient treatment with anti-depressants [40, 41]. The reason, according to Burrows et al., may be that nurses working in special living facilities do not use tools to detect symptoms of depression, and that these symptoms are often misinterpreted as normal age-related characteristics [42].

It is worth noting that, in the present study, it seems to be more common to treat depression with neuroleptics than with anti-depressants when an individual shows signs of dementia in the form of difficulty with recognition. However, the assessment procedure does not allow firm conclusions. Side effects from neuroleptics, such as blunted affect may lead to increased observer rating of lowered mood/sadness. This may be the reason why approximately half of those identified by staff members as depressed were not treated with anti-depressants.

Treatment with neuroleptics was present in 16% of the study population. This is somewhat lower than results reported from other studies [7, 8]. This must be considered positive as changes in the brain's cholinergic system makes the elderly more sensitive to drugs with anti-cholinergic effects [2]. Recent studies have shown that treatment with neuropleptics can lead to disturbances of cognitive functions, such as orientation of time and space, memory disturbances and states of confusion [20] as well as an increased risk of falling and hip fractures [21, 22].

The most common sedatives were long-acting benzodiazepines. These drugs should be avoided in the elderly as the clearance of these drugs may decrease with increased age and result in tiredness during the day, cognitive disturbances and increased risk of falling [17].

It should also be pointed out that key workers noticed that 17% of the residents were anxious despite being treated with neuroleptics or sedatives. Seventy-eight residents (45%) were treated with hypnotics, a treatment that was used both as a daytime sedative and hypnotic. The prescription was standing for 82%. To get the best effect of hypnotic drugs, Lader [43] expressed the opinion that an intermittent use was preferable and suggested that, to avoid harmful effects, only short-term acting hypnotics should be used and at the lowest dose

possible [44]. For sleeping problems, both hypnotics and anxiolytics are prescribed, and these were primarily benzodiazepine derivatives. It is important to note that, for residents that showed signs of dementia, significant decrease of prescription of both hypnotics and anxiolytics were found. This is important as long-acting benzodiazepines can cause harmful effects in elderly as well as an increased risk of falling and hip fractures. It also might have a negative impact on cognitive functions [22]. The prescription rate was higher among those living in old age homes. This is identical to what was shown by Opedal et al. in their study [25]. The reason may be that individuals in old-age homes are more alert and can themselves regulate their treatment regimen with hypnotics. Another reason can be that the residents in old-age homes may have been prescribed hypnotics before moving into the home and that they presented willingness to continue this treatment.

In the majority of cases, psychiatric drug treatment was prescribed as a continuous medication despite the fact that both an indication for treatment and an evaluation was missing in half of the cases. When an evaluation was present it had in about 50% of the cases been documented by a nurse. Nurses working in special living facilities play a decisive role in pharmacological treatment. It is therefore important to further educate nurses in pharmacology and to evaluate effects and side effects where standardised objective instruments should be used [45]. Schmidt et al. [7] showed that increasing the resources for nurses or for interventions had no or small impact on the prescription of suitable drugs for residents in nursing homes. It was pointed out that suitable drug use is an important indication of the quality of care in special living facilities. The reasons why both indications and evaluations for the treatments were missing in half of the cases may be due to the fact that follow-up routines for drug treatment were missing and so was documentation within the residents' medical records.

In this study, as many as 73% of the study population used one or more psychiatric drugs. Several national as well as international studies have shown the same thing [7, 8, 9, 10]. Worth noting is the fact that research about treatment with psychiatric drugs and the elderly has been present for several decades and similar results are presented from year to year. Different strategies have been implemented to decrease the treatment with psychiatric drugs. In the U.S. a legal framework was introduced 1987, Omnibus Budget Reconciliation Act (OBRA), which implied that psychiatric drugs are only given when an individual has been diagnosed by a psychiatrist [46]. The intervention of clinical pharmacists in nursing home units has decreased inappropriate use of psychiatric drugs [47]. Also, education programs for physicians, nurses and care personnel have decreased the prescription of less suitable drugs [48, 49]. It would be interesting to perform a prospective study where the residents were followed for 1 year. This would give us fairer information on prescription as well as indication and evaluation of treatment.

Conclusion

Of the study population, 128 (73%) used one or more psychiatric drugs. Prescribed drugs were neuroleptics (16%), anxiolytics (32%), hypnotics (45%) and antidepressants (33%). Those who showed symptoms of anxiety, sadness, depression and sleeping problems were prescribed drugs, but the results suggest that underprescription existed. A greater prescription of neuroleptics than anti-depressants were seen for those showing signs of depression and caution with prescription of benzodiazepines was seen for those showing signs of dementia. An indication and evaluation of treatment was lacking in half of the cases. The care need was greater for individuals in nursing homes than in old-age homes. A significantly greater use of anxiolytics was seen in nursing homes and a significantly higher prescription of hypnotics were seen in old-age homes and for individuals that showed a lower care need according to Katz P-ADL index. Treatment with psychiatric drugs existed for approximately 50% of those without a determined psychiatric diagnosis.

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