Research Article
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Impact of behavioral and psychological symptoms of dementia (BPSD) in institutionalized people

Abstract

Background & aims: The behavioral and psychological symptoms associated with dementia are very disruptive and take on more and more relevance given the problem they pose to the people who suffer from them and their environment. In many cases these symptoms can be the trigger for caregivers to use physical or chemical restraints to alleviate the intrinsic and extrinsic damage they can cause. This work aims to evaluate the appearance of these symptoms, the prescription of psychotropic drugs, and other psychofunctional variables that may be related, such as the cognitive, functional or emotional state, in institutional settings.

Methods: The relationship between these variables and age and gender has also been evaluated. The sample consisted of 450 institutionalized elderly people.

Results: The data obtained indicate a large percentage of people who present behavioral alterations and an over-prescription of psychotropic drugs. The majority of the sample is made up of women which present moderately severe fall rates, functional levels of dependence, cognitive impairment and emotional states. With regard to the relationships found, age is related to greater consumption of psychotropic drugs and worse gait stability. In terms of gender, women are the most medicated, with the worst cognitive, functional status and worse gait stability. The presence of BPSD is directly related to the consumption of psychotropic drugs and other psychofunctional variables such as greater cognitive impairment, functional dependence or worse mood.

Conclusion: It is necessary to design non-pharmacological interventions in institutional settings that influence the analyzed variables to improve people's well-being and quality of life.

Keywords: behavioural alterations, psychotropic drugs, dementia, institutionalized people

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Introduction

One of the main challenges of aging is neurodegenerative diseases, specifically dementias. Within this complex clinical picture, the "Behavioral and Psychological Symptoms of Dementia" (BPSD) are fundamental characteristics of the disease, and despite this, for years they have been poorly recognized and studied.[1]

The set of symptoms includes agitation, depression, apathy, repetitive questioning, psychosis, aggression, sleep problems, wandering and a variety of socially inappropriate behaviors.[2] Due to their characteristics, BPSD have a significant impact on both the person who suffers them and their close environment. The effects of BPSD are so devastating that they become one of the main causes of a person's institutionalization.

Several studies offer data on the prevalence of BPSD in people with dementia,[3–5] and although the prevalence is very variable from one study to another, most of the authors state that apathy is the most prevalent symptom[6,7] General BPSD data show a high prevalence with a 50-90% affectation of patients with dementia.[8–10] A work carried out in Spain with institutionalized people, concludes that 72.6% of people with dementia have some type of BPSD.[11]

Some authors claim that the dementia phase probably influences the data obtained. Between 70-90% of people with moderate or severe dementia have some level of BPSD throughout their illness, while in people with mild cognitive impairment the prevalence of BPSD is 35-85%.[12–18] Some authors such state that the increase in cases of Alzheimer's disease and the greater degree of cognitive impairment is related to an increase in the different BPSD except in the case of affective symptoms (for example, anxiety or depression) and, in addition, it is very likely that symptoms such as delusions, apathy, agitation or irritability increase during the course of the disease, while symptoms such as depression occur more in the prodromal and early stages of the pathology.[19]

However, despite its high incidence and impact, BPSD have not been thoroughly studied until almost a decade ago. Therefore, there are still few studies that report data on the prevalence of BPSD and those that exist show some heterogeneity.[20] In addition, another interesting aspect in relation to prevalence is the issue of gender, as there is some controversy in the literature about whether or not there are gender and dementia development differences, given that some works report that cognitive impairment is more frequent in women,[21] while others point out that there are no such differences.[22] The same debate exists surrounding the influence of gender in BPSD.

On the other hand, and in relation to the intervention for BPSD, the most commonly used treatment is the prescription of psychotropic drugs (anxiolytics, antidepressants, antipsychotics ...) that alter a person's consciousness, increase the risk of falls and their social isolation and in the case of antipsychotics - due to the sedative effects they produce- can also carry a higher risk of cardiovascular accidents and a higher mortality rate.[23,24] However, the use of drugs has not decreased in recent years.[25] The effects of pharmacological treatments warn us of the new challenges in addressing the BPSD, which should be more oriented to non-pharmacological therapies in the first place.

In terms of psychotropic drugs, institutionalized people are reported to consume as much as double the amount and the relationship between the existence of BPSD and the use of antipsychotics has been confirmed;[26] specifically, 44% of people with some type of BPSD take one antipsychotic or more, although they aggravate the risk of cardiovascular problems and death.[8,11,27]

To add to all this, a total of 85% of the elderly are polymedicated and contrary to what we might think, this polypharmacy is not related to higher survival rates but rather by contrast, these people are more exposed to negative factors such as falls, weight loss, cognitive and functional impairment and a higher probability of hospitalization.[28] In this way, this situation leads to a worsening of their functional level, higher risk of falls, and an increase in their level of dependence.

Thus, it is worthwhile to analyze certain variables such as medication, the level of cognitive impairment, affective and emotional state, the level of dependence and some sociodemographic data that can directly influence the person's quality of life and aggravate the BPSD, and vice versa, given that BPSD could aggravate any of these variables. Paradoxically, BPSDs are not always diagnosed, despite the enormous relevance they have in the dementia process,[29] and although we have found studies that analyze these variables separately, neither correlational analyses are found nor any prediction between these variables.

For this reason, this study aims to analyze and describe the different types of behavioral alterations existing in people with dementia in institutional settings, their degree of appearance and the prescription of psychotropic drugs, and other clinical variables of interest (mood, cognitive impairment and functional status), its relationship with sociodemographic variables, and the relationship between these variables.

A first objective was raised, which was to understand and describe different clinical variables such as the different types of BPSD, the use of psychotropic drugs, mood, cognitive impairment and other variables of functional status in a sample of institutionalized elderly people. Secondly, different clinical variables and their relationship with sociodemographic variables such as age and gender were analyzed. Thirdly, the relationships between the different clinical variables of the sample were studied, given that some of these variables may offer relevant information on the use of psychoactive drugs and the management of BPSD.

Materials and methods

Participants

A total of 450 institutionalized elderly people participated in the study. The sample belonged to two private centers. The average age of the total sample was 86.82 (SD=8.22). A total of 73.6% of the sample were women. The mean time of admission of the patients was 18.51 months (SD=31.90).

The inclusion criteria were that people had to already be admitted at the time of the study and had to provide the corresponding medical report.

Instruments

To carry out the study, both sociodemographic variables (age, sex, and date of admission) and clinical variables were collected. Part of the clinical variables included the psychoactive drugs prescribed at the time of the study, which were categorized as recorded by other authors, into 9 categories:[25,30] 1. Typical neuroleptics; 2. Atypical neuroleptics; 3. Antidepressants; 4. Short-acting benzodiazepines; 5. Intermediate-acting benzodiazepines; 6. Long-acting benzodiazepines; 7. Other hypnotic, sedative or anxiolytic drugs; 8. Cholinesterase inhibitors and memantine; and 9. Antiepileptics.

To assess the BPSD, the Cummings Neuropsychiatric Inventory (NPI)[31] was administered. This instrument contemplates the intensity and frequency with which behavioral alterations occur and offers a total score that is the sum of the intensity and frequency of occurrence of all BPSD. Additionally, to have a qualitative view of this variable, the symptoms reported by each person were recorded.

Cognitive status was assessed using the Mini-Mental Status Examination (MMSE), in its adapted Spanish version by Lobo, el Mini-Examen Cognoscitivo (MEC) [Cognitive Mini-Examination].[32] This scale provides a brief and standardized analysis of mental status and quantitatively estimates the existence and severity of cognitive impairment without providing a diagnosis of any specific nosological entity. The version adapted to the Spanish population has scores that vary between 0 and 35, with the following ranges: 0-14 points, severe cognitive impairment; 15-19 points, moderate cognitive impairment; 20-24 points, mild cognitive impairment; 25-35 points, absence of cognitive impairment.

In regard to depressive symptomatology, two instruments were used: The Geriatric Depression Scale[33] and the Cornell scale.[34] The Yesavage's scale, being a self-completed test, was applied to people who, according to the scores obtained by the MEC, presented mild cognitive impairment (score higher than 20). The Cornell scale was applied to people diagnosed with moderate and even severe cognitive impairment (score below 20). Both scales differentiate between absence of depressive symptomatology, mild, and severe depressive symptomatology. For the Yesavage scale, the following scores were taken into account: 0-5 points, absence of depressive symptomatology; 6-10 points, mild depressive symptomatology; 10-15 points, severe depressive symptomatology; whereas for the Cornell scale the cut-off scores were: 0-8 points, absence of depressive symptomatology; 9-11 points, mild depressive symptomatology; 12-38 points, severe depressive symptomatology.

Functional capacity was measured with the Barthel index.[35] This tool is easy to apply and to interpret, has a high degree of reliability and validity, and is capable of detecting changes. The Barthel Index measures the level of independence of the person with respect to the performance of some basic activities of daily living (ADL). Its score ranges from 0 to 100 and its results are categorized into four degrees of dependency in regards to ADL: 0-15 points, total dependence on the performance of ADL; 20-40 points, severe dependence on the performance of ADL; 45-55 points, moderate dependence on

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the performance of ADL; 60-95 points, slight dependence on the performance of ADL. 100 points, independent on the performance of ADL.

With regard to the fall index, the Tinetti Gait and Balance Examination was administered.[36,37] The scale consists of 17 items (8 of gait and 9 of balance) and the answers are coded in four degrees of affectation: 0-6 points, total instability; 7-11 points, severe instability; 12-18 points, moderate instability; 19-22 points, slight instability; 23-25 points, absence of instability.

The risk of falls was measured with the Downton Fall Risk Index instrument.[38] This scale is based on five dimensions that are: previous falls, drug use, sensory deficits, mental state and wandering. Based on these dimensions, a score between 0 and 5 points is obtained. When the total score is equal to or greater than 4, a high risk of falling is considered. If it is equal to or less than 3, no significant risk of suffering a fall is considered.

Procedure

The participants in this study were from residential homes, so the management team of each center was contacted, and after approval of the ethical committee, informed consent was obtained from institutionalized residents or legal guardians.

The data collection was obtained from the clinical records and the person's reports as well as the individual evaluation which took place in the form of individual interviews conducted in the centers' enabled room. Each evaluation lasted approximately one hour and a half.

Analysis

In regard to the analyses carried out, descriptive statistics (means, standard deviations and percentages) of the different variables were calculated, and chi-square was used to analyze the differences according to age, sex, and duration of stay in the center and t-tests were employed for independent samples, depending on the type of variable. Finally, and to understand the relationships between the variables, Pearson correlations were applied. All statistical analyses were performed with the statistical program SPSS 23.

Results

The most prevalent type of behavioral disorder in institutionalized elderly people was analyzed. Figure 1 shows the percentages of each BPSD measured through the NPI.

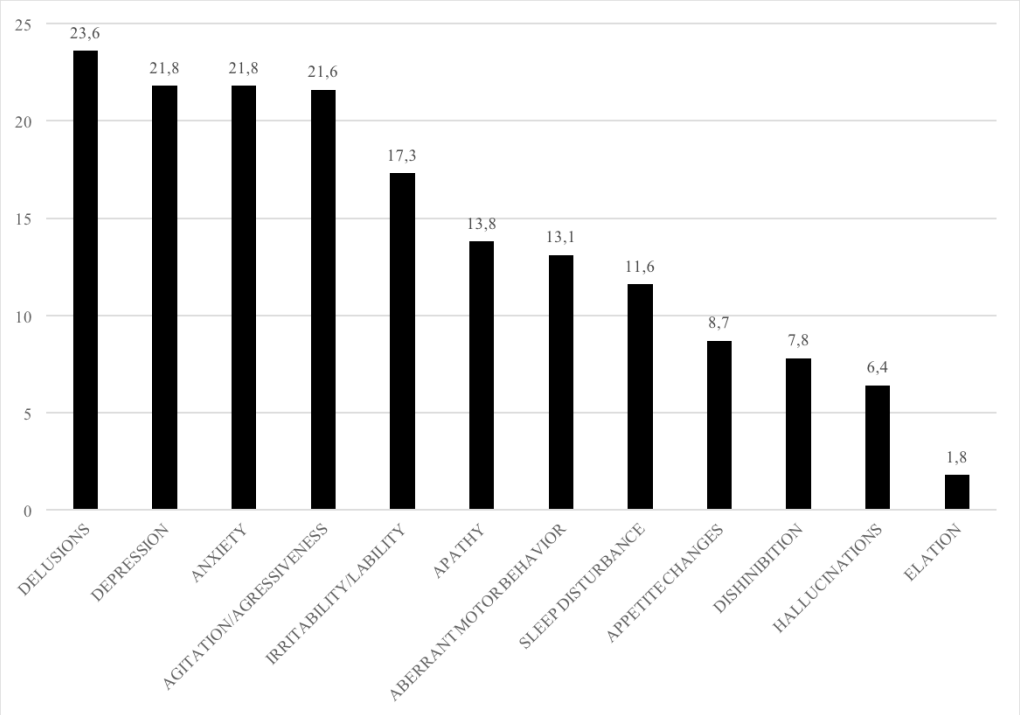

Figure 1 Percentages according to the type of BPSD.

Figure 2 shows the consumption of each of the psychotropic drugs, showing what type of psychotropic drugs are the most used in the contexts of residential home care.

Table 1 shows the functional capacity (Barthel scale), the gait and balance examination (Tinetti scale), the level of cognitive impairment (MEC), and the level of depression (Yesavage and Cornell scales), offering an understanding of the different clinical variables.

Regarding the Downton fall rate, a total of 86.7% of institutionalized elderly people with a high risk of falls were observed.

With regard to the analysis of the different clinical variables in relation to age, Pearson correlations were applied, observing a significant and positive correlation with the consumption of psychotropic drugs (r=.136; p =.004), finding a higher consumption of psychotropic drugs at an older age. There was also a significant and positive correlation with the fall index (r=.186; p<.001), with older people being more likely to fall. A significant and negative correlation was found with the Barthel scale of functional capacity (r=-.166; p< .001), observing that the older the person, the lower the score on the scale, implying a higher level of dependence. A

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significant and negative correlation was also found with the Tinetti scale (r=-.120;p=.011), given that at an older age, gait and balance tend to be less stable. Lastly, a significant and negative correlation was observed with the MEC (r=-.107; p=.023), indicating that at an older age there is a lower score on the scale which results in greater cognitive impairment.

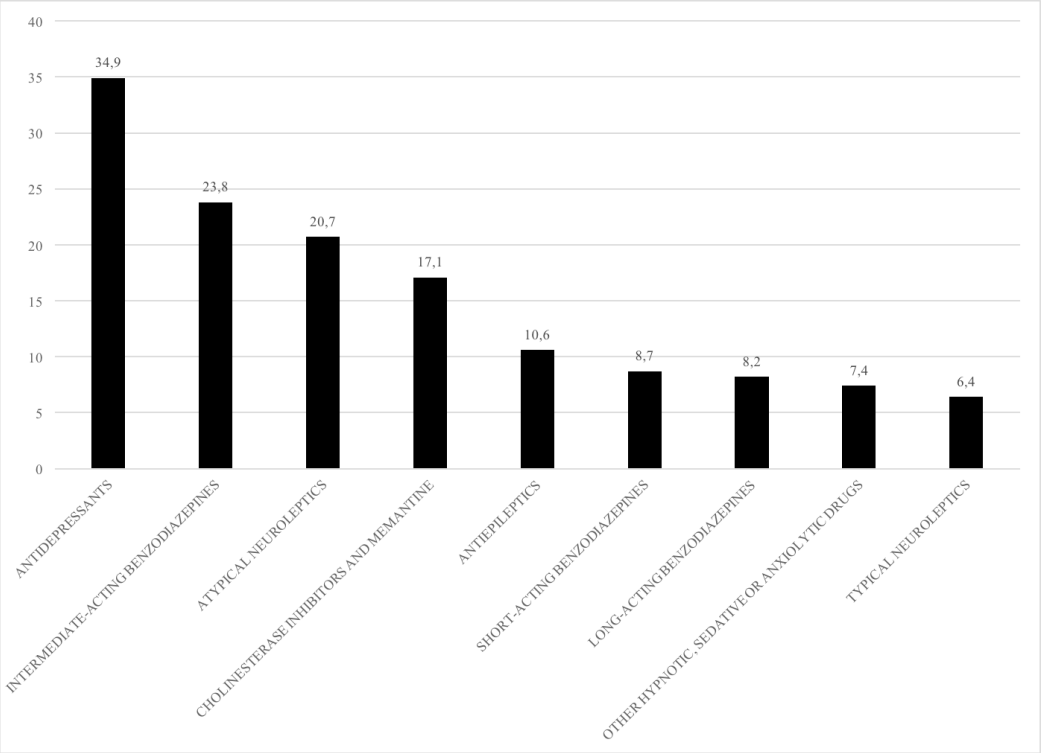

Figure 2 Percentages according to the type of psychoactive drug.

Table 1 Mean and standard deviation in the different scales of clinical variables

Scale	Mean	SD
Barthel	45,46	31,08
Tinetti	14,1	8,54
MEC	16,14	10,95
Yesavage	3,1	3,21
Cornell	4,33	5,29

Regarding gender, when applying the t-test, differences were found between men and women in the amount of psychotropic drug consumption (t (448)= -2.427;p=.016), functional capacity (t (448)=3.55; p<.001), loss of gait and balance (t (447)= 2.81; p=.005), and cognitive impairment (MEC) (t (448)=4.14; p<.001). The differences can be observed in Table 2.

Table 2 Gender differences

Scale	Men		Women	
	Mean	SD	Mean	SD
Psychotropic drug consumption	1,25	1,13	1,54	1,12
Barthel	54,03	31,42	42,37	30,41
Tinetti	15,97	8,37	13,43	8,51
MEC	19,65	10,98	14,88	10,67

Furthermore, and in relation to the fall index, significant differences were observed (χ^2 (1) = 3.719; p = 0.054), with a higher percentage of women at risk of falling (65.11%).

In addition, the relationships between the different clinical variables was analyzed, given that some of these variables may offer relevant information in terms of the use of psychotropic drugs.

First, and with regard to the use/consumption of drugs, there was a positive correlation with the BPSD measured through the NPI (r=.200;p< .001).

BPSD correlated negatively with the functional capacity (r=-.190; p<.001), indicating that the more BPSD, the less functional capacity, and with the level of cognitive impairment (r=-.310; p<.001), showing that the more BPSD, the lower the MEC score, which implies a higher level of deterioration. BPSD correlated positively with the depressive symptomatology in both the Cornell (r=.446; p<.001) and the Yesavage (r=.293;p< .001) scales, indicating that the higher the BPSD, the more negative or depressive the emotional state.

The level of cognitive impairment correlated positively with the functional capacity (r =.469; p< .001) and with the Tinetti scale's risk of falls (r=.317;p< .001), implying that the lower the MEC score, that is, worse cognitive state, the lower the Barthel scale score and worse functional capacity, and also the lower the Tinetti scale score, which indicates a worse balance and gait. Furthermore, the level of cognitive impairment correlated negatively with the Downton fall index (r=-.223;p<.001), which shows that the lower the scale score or the worse cognitive status the greater the risk of falling.

Regarding the functional capacity measured through the Barthel scale, it positively correlated with the Tinetti scale's fall index (r=.806;p<.001), that is, the lower the Barthel score (more loss of autonomy), the lower the Tinetti scale score (worse balance and gait); and negatively correlated with the Downton fall index (r=-.358; p <.001), which implies that, the lower the Barthel score and the lower the functional capacity, the higher the fall rate.

The depressive symptomatology measured through the Yesavage scale correlated positively with the Downton fall rate (r=.169; p=.024), which implies that higher levels of depression are found at higher fall rates, and negatively with the Tinetti scale (r=-.182;p=.015), which means that, at a worse state of balance and gait, higher levels of depression.

In regard to the risk of falls, a negative correlation was observed between the Tinetti scale and the Downton fall index (r=-.384;p< .001); given that a higher Tinetti score means worse gait and balance and more falls.

Discussion

The data obtained on the prevalence of BPSD in institutional settings support the results of other epidemiological studies. According to our work, two thirds of people present behavioral alterations, a very high number that supports the conclusions regarding institutionalized populations in some works who found that between 72.6-78% of the people in the sample had at least one BPSD.[5,11]

With respect to the most present symptoms, the literature determines that apathy, agitation and delusions are the symptoms that occur to a greater extent and hallucinations and elation are the least recorded,[39] which seconds the data obtained by our work. However, it is striking that in our results apathy is present in little more than a tenth of the sample. Given that the symptom of apathy appears in situations of low stimulation and that it is a lesser disruptive symptom for professionals working in the centers[3], it is possible that it may be less registered than other more stressful symptoms and may pass by unnoticed because professionals normalize it[40] without giving this much present and disabling symptom the attention it deserves.[41] Data on the presence of depressive symptomatology should be highlighted given that it is the second most registered symptom. A person's admittance into residential home care, in combination with factors associated with this vital stage, such as the combination of loss experiences or the increase in health concerns or functional dependence, are risk factors that lead to the development of this symptom and it is necessary to take them into account and design interventions according to these results.[42]

The percentage regarding the prescription of psychoactive drugs is very high, with more than 75% of the institutionalized residents consuming one or more psychoactive drugs. These data support those some results which indicated that in Europe, 37-78% of institutionalized people consumed at least one psychoactive drug.[43]

The most prescribed psychoactive drugs in our study are benzodiazepines followed by antidepressants. The prescription of this group of drugs has skyrocketed in recent years in Europe.[44]

It is important to keep in mind that the adverse effects of antipsychotics outweigh the benefits they can bring in patients with Alzheimer's.[45] Therefore, the results obtained by our research seem high, although they support the data of other similar investigations.[11]

It should be noted that the use of typical antipsychotics is less than the use of atypical antipsychotics as recommended by the main guidelines on the rational use of these drugs in the elderly population.[46] Even so, given the side effects they may cause and the recommendations of the WHO, we consider these figures to be very high and to indicate that non-pharmacological interventions should be encouraged in this area.[47]

With respect to the rest of the psychofunctional variables, the results indicate the existence of home care centers with a higher percentage of women which present moderately severe fall rates, functional dependence levels, cognitive impairment and emotional states. These data resemble those found by other studies who state that the majority of institutionalized people in Spain are women and that approximately half (55%) have moderate cognitive and functional impairment with a high risk of falls.[48] Other studies indicated that 47% of institutionalized elderly people had severe cognitive impairment, compared to 8% of non-institutionalized people.[49] Therefore, institutionalization implies a social change and a psychological burden that could affect the cognition and functionality of the people who are admitted. It therefore becomes a stressful life event which can directly influence not only the physical and cognitive level but also the well-being, emotional state and quality of life of people.[42]

The relationships of these variables with age and gender also provide interesting results. First, with respect to age, previous studies have shown that age is related to greater cognitive impairment,[21] an increased risk of Alzheimer's disease,[50] and a higher level of dependence[51] as our work confirms. However, other studies found no relationship between age and psychotropic drug use.[22]

With regard to gender there is more controversy, some studies found no relationship between gender and psychotropic drug prescription or between gender and the development of dementia,[22] while others found that women consumed more benzodiazepines[44] or that cognitive impairment was more frequent in women.[21]

Regarding the risk of presenting BPSD, our research has not found differences between sexes, however, one study found that men were at greater risk of presenting BPSD[52] and other work added that institutionalized men had greater agitation or disruptive behaviors, while women have affective symptoms such as depression or anxiety to a greater extent.[53] However, both genders had the same percentage of BPSD in general. That is, they found qualitative but not quantitative differences, which supports the data obtained by our work.

The significant relationship between the presence of BPSD and the prescription of psychotropic drugs is supported by other studies. Some concluded that for the treatment of BPSD, the drugs that were most prescribed were antipsychotics and cholinesterase and memantine inhibitors.[39] Others concluded that more antipsychotics are prescribed to people with BPSD but not other psychotropic drugs.[11,22]

The consumption of antipsychotics in the elderly population is associated with adverse effects on the central nervous system (sedative or extrapyramidal effects) that can have an impact at the cognitive and functional level,[29] which would explain the relationship found between these variables in our research. In addition, antipsychotics in people with dementia are related to an increased risk of cardiovascular accidents[46] and a higher mortality rate,[29] so it is extremely important to control over-prescription of this type of drugs.

Ultimately, the influence of BPSD on cognitive and functional impairment has been supported by several studies but there is some controversy over whether BPSD are the cause of cognitive impairment or rather its consequence.[54,55]

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Conclusion

The data obtained in this cross-sectional descriptive study can contribute to a better understanding of the needs of older people living in residential homes and can provide reference values for future work.

Therefore, an excessive prescription of psychotropic drugs to this age group does not imply greater physical well-being but rather it implies a greater probability of suffering falls or weight loss and also cognitive and functional losses which leads to a worse quality of life.[28]

Therefore, the high percentage of BPSD and psychotropic drug prescriptions and their relationship with other psychofunctional variables highlight the need for residential homes to understand the connections and to have the necessary tools to manage BPSD without resorting to pharmacological treatments as the first line of intervention.[56]

It is essential to raise awareness about symptoms such as apathy and depression that are less disruptive to the environment but cause much discomfort and incapacitation to people who suffer from them.

In general, the fact that age and gender affect the studied variables is something controversial in the literature, which leads us to think that it is possible that there are other variables with greater weight that are having an impact such as the stage of deterioration or dementia or the type of dementia In future research, it would be interesting to define the criteria for observing the NPI scale more specifically and to have external staff register the BPSD, due to the observational nature of the scale which can skew the results to some extent given that the professionals at the home care centers may not be always sufficiently trained in BPSD. It would also be useful to have a more reliable measure regarding the prescription of psychotropic drugs. It would be equally interesting to have different types of residential centers (public and/or private) and from different geographical areas in order to increase and generalize the results.

Acknowledgments

None.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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