

The Effects of Covid-19 Lockdown on Persons with Dementia

Lucija Grkman, Barbara Lovrečič, Mercedes Lovrečič

National Institute of Public Health, Ljubljana, Slovenia

ABSTRACT

The COVID-19 pandemic has had a profound impact on the lives of all, especially vulnerable groups, like persons with dementia. During lockdown, access to healthcare was limited, loneliness and the burden of caregivers increased. We reviewed the literature, using PRISMA methodology, on dynamic of dementia symptoms after the beginning of the pandemic and lockdown. According to the studies included in the results in our research, the proportions of worsening neuropsychiatric symptoms ranged from 14% to 72%, cognitive decline ranged from 19% to 60% and the need for pharmacological adjustment of treatment ranged from 7.2% to 27.6%. The most common symptoms that worsened during the pandemic were apathy, agitation, anxiety, depressive symptoms and sleeping disorders. On the other hand, few researches have not shown a link between the pandemic and worsening of dementia symptoms. For a more holistic view of the impact of the pandemic on persons with dementia, future monitoring of the change in dementia symptoms, for example at the end of the pandemic, would be necessary.

Key words: lockdown, COVID-19, pandemics, dementia, symptom worsening

Introduction

Dementia is not a normal process in the elderly but a disease of the brain and was declared by the World Health Organisation (WHO), already before the COVID 19 pandemic, as public health priority that will continue to increase due to the population aging and longevity¹ According to International Alzheimer by 2050 the number of people with dementia in the world is expected to triple and exceed 150 million² Dementia is the third leading cause of disability in the world³. According to WHO, it contributes significantly to disability, more than disability due to stroke, musculoskeletal and cardiovascular diseases, and all cancers together⁴. Dementia is becoming an increasingly important public health problem and has economic, social and political dimensions^{1,5,6}. Dementia was also specifically recognised as a global health priority by G20 leaders (the participants are leaders from 19 countries and the EU) in the declaration of the Osaka Summit in 2019⁷. On the hand, the WHO on March 11, 2020 declared the novel coronavirus (COVID-19) outbreak a global pandemic⁸. COVID-19 had an unprecedented effect all over the world, especially in older individuals⁹.

Humans are social beings and the tenor of someone's social life is one of the important influences on their men-

tal and physical health. On the other side, the problem of social isolation has been identified as a risk factor for poor health and reduced well-being. More and more older persons are living alone and they are more at risk of being socially isolated. Social isolation also appears due to decreasing economic and social resources and functional limitations¹⁰. Decrease in economic and social resources and functional limitations can occur as a result of chronic diseases, especially in case of dementia. Social interactions have a major impact on quality of life for persons with dementia, especially in the form of support, social integration and personal relationships. They are also important to their caregivers, especially in terms of taking a break from the role of a caregiver of a person with dementia. The COVID-19 pandemic has affected the quality of life of persons with dementia in several ways, from limited social interactions, less support, decline in cognitive and physical health, more stress among caregivers, additional difficulty in understanding COVID-19 limitations, fillings of loss of control, insecurity to reduced trust between nursing homes and relatives. Of these, the reduction in social interactions has the greatest impact, as persons with dementia need support and help¹¹.

Age and dementia are risk factors for morbidity and mortality for COVID-19 disease, especially during the

first wave of pandemic. During the COVID-19 pandemic, most countries accepted measures to prevent the spread of SARS-CoV-2 virus, such as isolations, quarantine and lockdowns. During the lockdown the limited access to many health providing services affected persons with dementia and their caregivers, in addition long-term care homes had visiting restrictions. Persons with dementia depend on the care and assistance of others, need continuous medical care and maintenance of a daily routine. They cannot perform isolation or quarantine properly, due to the fact, that persons with dementia are dependent on the care and assistance of others. All this is making population of persons with dementia more at risk and is increasing the burden of the caregivers¹². Concerns about the possible risks of infection have led to social isolation and avoidance of social life even after the expiration of the most stringent measures, such as lockdown².

The COVID-19 pandemic represents unique risks to people with dementia and neuropsychiatric disturbances as a result of lockdown measures and social isolation were worsening and in literature there is an increase of evidence regarding the neuropsychiatric and cognitive manifestations COVID-19 related, especially among persons with dementia¹³. The purpose of this review was to synthesize the existing literature regarding effects of lockdown measures on the persons with dementia in a way to assess vulnerability during pandemic, in terms of dynamics of neuropsychiatric symptoms and other symptoms of dementia.

Methods

We performed systematic review of the literature in the PubMed database, with the guidelines of the PRISMA methodology (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)¹⁴. In the selection of articles, we took into account the chronological criteria from the time of the beginning of the pandemic in Europe (01.03.2020) to the time of the writing of the article (15.10.2021). Firstly, we searched for articles with the key words “COVID-19” and “dementia” and hit 901 articles. We narrowed them down with additional key word “neuropsychiatric symptoms”. There were 54 articles left for further review. We excluded three articles that were in other language than English. We set the content criteria for the articles included in the results of this review.

We set the following criteria for the selection of the publications included in the results:

- A) Chronological criteria: contributions published between 1.3.2020 and 15.10.2021,
- B) Content criteria: additional key word “neuropsychiatric symptoms”,
- C) Technical criteria: publications in English language,
- D) Content exclusion criteria: case studies and scientific papers with qualitative data that do not include the prevalence of neuropsychiatric symptoms in

persons with dementia, due to secondary consequences of the pandemic (lockdown),

- E) Content exclusion criteria: papers dealing with other reasons for neuropsychiatric symptoms in persons with dementia than secondary consequences of the pandemic and papers dealing with the COVID-19 consequences in other group than persons with dementia such as general population, caregivers of persons with dementia or patients with a condition other than dementia and researches involving animal models.
- F) Content exclusion criteria: papers on different interventions, treatment strategies and support guidelines for healthcare staff.

The results include studies about secondary consequences of the pandemic, in more detail the dynamics of neuropsychiatric symptoms in groups of persons with dementia during the lockdown due to the COVID-19 pandemic. The literature review was supplemented by an overview of the sources cited in the selected contributions. Other forms of contributions were provided when appropriate.

Results

We identified 20 publications in our process of selecting the papers. Figure 1 schematically shows the course of search and inclusion of articles in the literature review. One publication regarding the cognitive and neuropsychiatric effects of COVID-19 in older persons with dementia included five publications on the impact of lockdown on persons with dementia¹⁵, from this we excluded three publications (two due to weak concordance newly with our results and one case study) and included two new identified publications^(16,17).

The dynamics of neuropsychiatric and other symptoms of dementia during COVID-19 pandemic/lockdown in patient with dementia is presented in Table 1.

We identified publications that addressed persons with dementia and the effects of the COVID-19²⁹ pandemic measures such as lockdown, quarantines, isolation and other secondary effects on this vulnerable group in terms of neuropsychiatric symptoms. The majority of authors used structured questionnaires for assessing clinical, behavioural, cognitive and motor changes in persons with dementia during the COVID-19 pandemic/lockdown compared to the pre-pandemic period^{16,17,21-31}. Most of them used the Neuropsychiatric Inventory (NPI) to assess neuropsychiatric symptoms. The NPI examines 12 sub-domains of behavioural functioning: delusions, hallucinations, agitation/aggression, dysphoria, anxiety, euphoria, apathy, disinhibition, irritability/lability, aberrant motor activity, night-time behavioural disturbances and appetite abnormalities^{22,24-34}. Other authors, in addition to the NPI, have used the Clinical Dementia Rating Scale (CDR) to determine the severity of symptoms / stages of dementia^{32,34}, one while one compared clinical diagnosis before and after one year from the start of the pandemic³³.

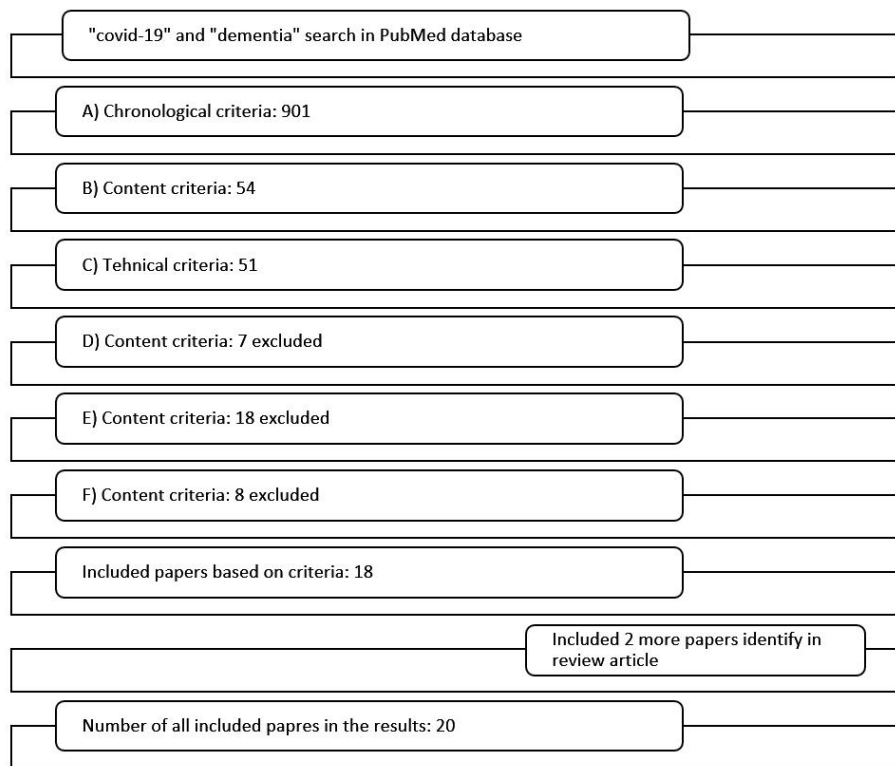


Fig. 1. Flowchart of the literature review process.

Several authors reported pandemia lockdown during the first wave of COVID-19 and social isolation with an increase in neuropsychiatric, behavioral and cognitive symptoms in patients with dementia.^{21-23,25,26,29,30,32,33} Major causes were identified as levels of stress and burden among caregivers^{21,32}, lack of guidelines to support caregivers³², changes in everyday routine, lack of social contacts, cognitive therapies, exercise^{19,25} and limited access to health centers/facilities²⁹. Neuropsychiatric symptoms were already present in the majority of persons with dementia before the pandemic³⁰, and lockdown has contributed to an increase in agitation, anxiety, depressive symptoms, apathy, and irritability^{16,18,21,23,25,30,33}. The most common symptoms were: irritability ranking between 15%¹⁶ and 21%²³ to 40%²⁵, apathy ranking between 18%¹⁶ and 24%²³ to 35%²⁵, agitation ranking between 21%^{16,23} and 23%²¹ to 31%²⁵ – 37%²⁸, anxiety from 10%¹⁶ to 22%²³ up to 29%²⁵, depressive symptoms ranking from 16%¹⁶ and 25%^{23,25,28} to 31%²¹, sleep disorders around 25%^{25,28}, appetite disorders around 12%, delusions around 19%, aggression around 17%, hallucinations around 16%³¹ and delirium around 15%³². A Study that included patients with Alzheimer's dementia, noted higher proportion of sleep disturbances (72%) and delusions (75%) and higher proportion of new onset of agitation (69%) and depressive symptoms (53%), after the beginning of the pandemic and measures for preventing the spread of the virus²⁸. Altered motor activity (12%)²⁸ may be reflected as an increased incidence of falls (13%)³². Newly emerging symptoms were

sleep disturbances (ranking from 21%²⁵ to 71%²⁸), irritability (21%), agitation (18%), apathy (17%) and appetite disorders (16%)²⁵. Mood changes such as increased levels of anxiety (37%), loneliness (16%), and obsessive-compulsive symptomatology (18%) were also reported²¹. Anxiety symptoms were more common in persons with mild to moderate dementia, while symptoms of agitation were more common in individuals with severe dementia²¹. According to the studies included in the results in our research, the proportions of worsening neuropsychiatric symptoms ranged from 14% to 72%^{16,17,21-25,28,30-33}, and cognitive decline ranged from 19% to 60%^{16,17,21-23,32-34}. Some authors reported neuropsychiatric symptoms as anxiety, agitation and apathy already present in more than half (58%) before the pandemic³¹, which is not surprising as those symptoms are among the main behavioral and psychological symptoms of dementia. However, majority of authors reported increase in neuropsychiatric symptoms during pandemia/lockdown. Studies have found statistically significant increases in behavioral deviance²⁹, apathy^{29,30}, agitation^{29,30,32}, anxiety^{30,32}, depression³² and appetite disturbances³².

French researchers monitored the health of 38 patients with Alzheimer's disease who faced a two-month lockdown. Around one third of patients developed changes in neuropsychiatric symptoms. On average, patients and caregivers faced 27.4 days of lockdown, with no significant differences in lockdown duration between patients with worsening neuropsychiatric symptoms and patients with-

TABLE 1
THE DYNAMICS OF NEUROPSYCHIATRIC AND OTHER SYMPTOMS OF DEMENTIA DURING COVID-19 PANDEMIC/LOCKDOWN

Number of persons observed	Methods / environment of persons observed	Decline in abilities during pandemic	The dynamics of behavioural and neuropsychiatric symptoms during pandemic	Adjustment of pharmacological treatment during pandemic	Source
139 (96 dementia, 37 mild cognitive impairment, 6 subjective cognitive impairment).	Telephone survey (April 9, 2020, to April 15, 2020) of a sample of patients attending the Center for Cognitive Disturbances and Dementia, Department of Human Neuroscience, Sapienza University of Rome / home environment during lockdown	Cognitive decline: 31,65 % (memory and orientation). Decline in functional abilities: 13,67 %	Worsening of behavioural and neuropsychiatric symptoms: 54.7% (agitation/aggression, apathy, and depression representing the most commonly observed manifestations).	7.2 %	6
32 persons with FTD.	Multidisciplinary assessment of patients with FTD using telehealth during the COVID-19 pandemic / home environment	Decline in cognitive abilities: 53%.	Worsening of behavioural symptoms: 56%. Decline in speech skills: 47%. Sleep disturbances: 25%.	/	7
4,913 persons with dementia (3,372 AD, 360 DLB, 415 FTD, 766 VD).	Structured telephone interview for family caregivers of patients with diagnosis of dementia followed regularly at 87 Italian memory clinics / home environment	/	Increase and / or new incidence of behavioural and / or psychological symptoms at 59.6%: - 51.9% worsening of existing symptoms, - 25.9% new onset of symptoms.	27.6 %	15
787 (371 AD, 90 other form of dementia, 226 mild cognitive impairment, 47 subjective memory loss, 53 other causes of cognitive problems).	Telephone interviews for patients and their caregivers registered from 2010 to 2019 in Memory Clinic, The First Affiliated Hospital of Chongqing Medical University / home environment	/	Presence of neuropsychiatric symptoms in 57.9% More than 70% of patients showed no changes in symptoms.	/	21
321 persons with dementia (50.2% mild, 23.1% moderate, 26.8% severe).	Telephone questionnaires for family caregivers of people diagnosed with dementia in three cities in Argentina, Brazil, and Chile / home environment	Decline in memory functions: 53.0%. Decline in functional abilities: 28.3%.	Increase or new onset of symptoms: 37.4% anxiety, 31.2% depressed mood, 23.1% agitation, 19% delusions, 16.8% aggressive behaviour, 16.2% loneliness, 15.9% hallucinations, 18.1% obsessive-compulsive symptoms, 23.1% sleep disturbances.	/	11
205 patients with cognitive impairment observed during the pandemic (131 AD and 131 patients with AD observed before the pandemic as control group).	Descriptive and retrospective study based on medical records from the memory clinic of Tianjin Dementia Institute collected through face-to-face evaluations / majority living with spouse or children-home environment	Rapid cognitive decline in 19.1% of patients (25) in the pandemic group and in 36.6% of patients (48) in the control group. Patients with AD during the COVID-19 pandemic were 0.408 less likely to have a rapid cognitive decline.	A lower proportion of neuropsychiatric symptoms (delusions, agitation, irritability, and appetite disturbances) were observed among those who experienced the COVID-19 pandemic.	/	24

TABLE 1
Continued

Number of persons observed	Methods / environment of persons observed	Decline in abilities during pandemic	The dynamics of behavioural and neuropsychiatric symptoms during pandemic	Adjustment of pharmacological treatment during pandemic	Source
177 (105 AD, 22 DLB, 50 mild cognitive impairment).	Assessment of changes in physical activity, social contact, cognitive function and neuropsychiatric symptoms of patients who received outpatient memory care before the COVID-19 pandemic and followed-up with them after 1 year by face-to-face during the COVID-19/home environment	Cognitive decline in 72.7% of patients with DLB, 54.3% of patients with AD and 42% of patients with mild cognitive impairment.	Worsening of neuropsychiatric symptoms noted in: - 54.5% of persons with DLB, - 43.8% of persons with AD, - 22% of persons with mild cognitive impairment.	/	23
96 (34 Parkinson's disease without cognitive impairment, 31 Parkinson's disease with mild cognitive impairment, 31 mild cognitive impairment)	Face-to-face examination at baseline vs. telephone interview after quarantine. Telephone interviews were carried out with the patients and their caregivers immediately after the end of the COVID-19 lockdown in Italy (May 20–30, 2020) / home environment	Worsening of cognitive symptoms observed in 39.6%. Of these, a decline in cognitive abilities is observed in 45% of persons with Parkinson's disease with mild cognitive impairment and 41% of persons with mild cognitive impairment.	Worsening of existing behavioural symptoms in 37.5%. New onset of behavioural symptoms in 26%.	/	12
94 (78 AD, 16 other form of dementia).	Interview with a telephone-based questionnaire for caregivers of the community-dwelling patients with dementia who had their follow-up visit scheduled from March 9 to May 15 and cancelled due to lockdown between April 30 and June 8, 2020 / community-dwelling	/	Worsening of existing behavioural symptoms: 37.5%. Onset of new behavioural symptoms in 26%.	14.9%	20
91 with AD	Evaluation of neuropsychiatric symptoms in patients with AD from a memory clinic and their association with cognition and functionality during lockdown of the COVID-19's first wave / home environment	/	The most common symptoms that appeared for the first time: 71.1% sleep disturbances, 68.6% agitation and 53.3% depressive symptoms. The most common worsening of pre-existing symptoms: 75% delusion, 71.7% sleep disturbance. Increased number of: agitation (36.8%), sleep disorders (26.3%) depressive symptoms (23%), appetite disorders (12.1%) and altered motor activity (12%).	/	18
60 (41.7% AD, 25% mild cognitive impairment, 33.3% other form of dementia).	Telephone ad-hoc questionnaire for patients with clinical follow-up before and after confinement / Before lockdown 6 patients were institutionalized (10%), 30 (50%) were independent at home and 24 (40%) supervised at home.	Cognitive decline observed in 60% (reported by caregivers).	Worsening of neuropsychiatric symptoms: 65%. Onset of episodes of delirium: 15%	21%	22

TABLE 1
Continued

Number of persons observed	Methods / environment of persons observed	Decline in abilities during pandemia	The dynamics of behavioural and neuropsychiatric symptoms of dementia during pandemia	Adjustment of pharmacological treatment during pandemia	Source
58 with dementia (50% AD)	A structured telephone interview for caregivers of dementia patients following in the outpatient clinic/home environment	Cognitive decline observed in 53.4% (46.6% decrease in memory, 29.3% decrease in attention and / or orientation).	Worsening of: - Behavioural symptoms (48.3%), - Apathy or depressive symptoms (24.1%), - Anxiety (22.4%), - Agitation (20.7%) and irritability (20.7%).	/	13
40 (20 mild form of AD, 20 mild cognitive impairment)	Evaluation of patients from the Cognitive Stimulation Program of the Cognitive Disorders Unit which had undergone a previous evaluation during the month before the lockdown, and were re-evaluated after 5 weeks of lockdown / home environment.	/	- Deterioration of health: at 30% (patient self-report), or at 40% (reporting by caregivers) (EuroQol-5D) - Significant worsening in neuropsychiatric symptoms: 33.7 vs. confinement: 39.05 (NPI score)	/	19
38 persons with probable AD	Conduction of reports of changes in neuropsychiatric symptoms form caregivers of patients who were confined to their homes for nearly two months (using the Neuropsychiatric Inventory-Questionnaire)/ home environment.	/	Worsening of neuropsychiatric symptoms: 26.31%. Deterioration is associated with a decline in cognitive function before (2 to 4 months) lockdown.	/	14
35 persons with dementia (17.1% AD, 37.1% VD, 60% combined or other type of dementia) (62.8% of mild to moderate dementia, 37.1% advanced dementia).	Phone interview for caregivers of patients who attended formal healthcare services before the COVID-19 lockdown. Caregivers completed the NPI after lockdown/ home environment.	/	The frequency and severity of behavioural and psychological symptoms: - in 14.3% worsened, - In 74.3% of cases unchanged and in 11.4% improved. There were no statistically significant differences in symptoms before the pandemic and during the lockdown.	/	16
34 (73,5 % AD)	After the COVID-19 lockdown, a phone interview was made to compare neuropsychiatric symptoms, functional status, and caregiver's burden with the previous evaluation. Caregivers had attended a family support course before the COVID-19 lockdown/ home environment.	/	On average, there were no significant changes in neuropsychiatric symptoms in persons with dementia before and after lockdown.	/	17

Legend:

/ No data

AD: Alzheimer disease

FTD: frontotemporal dementia

DLB: dementia with Lewy bodies

VD: vascular dementia

EuroQol-5D: an instrument for measuring quality of life

NPI: the Neuropsychiatric Inventory (asses 12 symptoms of dementia)

out changes. They found a statistically significant association between overall lower cognitive function in patients before lockdown with worsening neuropsychiatric symptoms during lockdown²⁴.

In five studies, authors reported the need for pharmacological adjustment of treatment, due to changes in dementia symptoms during the pandemic, ranging from 7% to 28%^{16,18,25,30,32}.

Some authors have not shown a link between the pandemic and worsening of dementia symptoms^{26,27,34}. Spending more time with relatives and using appropriate guidelines for caregivers of persons with dementia can have a positive impact. Two Italian studies found no statistically significant differences in dementia and neuropsychiatric symptoms before the pandemic and during the lockdown. In both cases, caregivers of patients with dementia were involved in support groups, received training, meetings and information on disease, patients with dementia were treated in cognitive stimulation sessions, neuropsychiatric symptom management, with community resources and services available for persons with dementia. Caregivers of patients with dementia had formal support from health services and were familiar with strategies for the day-to-day care of the person with dementia^{26,27}. A Chinese study found lower cognitive decline in group of patients with Alzheimer disease during the pandemic (19%) than in the observed pre-pandemic group (37%). However, in those cases patients with dementia were less lonely during the pandemic, as they spent more time with their relatives at home³⁴. In some cases, the level of dementia symptoms at higher proportion remained unchanged, as the cognitive decline may influence perception for threatening situations like pandemic in term of possible infection and not living in epicenters of spreading of infectious disease at the time of the pandemic could maintain unchanged clinical picture³¹.

Discussion and Conclusion

Similarly as in our review other authors reported cognitive decline related to COVID-19 pandemic in persons with dementia in range of 12% to 80%, while the most commonly reported impairments were in concentration, memory, orientation and communication skills¹⁸. Persons with dementia who lived alone and those with more severe dementia were more vulnerable to neuropsychiatric symptoms worsening due to lockdown¹⁹. However, dementia symptoms worsened in persons with dementia in residential care and in nursing homes, too²⁰. Studies have reported both worsening and new onset of behavioral and psychological symptoms, ranging from 22% to 75%¹⁸. Anxiety, agitation and apathy are the main behavioral and psychological symptoms of dementia most frequently mentioned in studies conducted during COVID-19²⁰. In addition to these, depressive symptoms, agitation, sleep and appetite disturbances¹⁸⁻²⁰, irritability and agitation due to lack of understanding of measures like wearing masks are also often mentioned¹⁹. In 7% to 27% of cases the need occurred

to adjust pharmacological treatment due to worsening behavioral and psychological symptoms of dementia¹⁸.

The COVID-19 pandemic affected persons with dementia, firstly with acute infection with SARS-CoV-2 and COVID-19 disease, which can also trigger neuropsychiatric and neurological symptoms per se and secondly with measures to prevent the spread of the virus and its consequences. Based on the reviewed articles we can point out that the COVID-19 pandemic seems to worsen the symptoms of dementia not only with infections, but also with measures and its consequences on the other hand.

During the pandemic, changes in everyday living habits occurred and loneliness increased among elderly population, especially during the period of the most stringent measures. In long-term care institutions, lockdown prevented visitors to see their relatives and loved ones, which negatively affected especially persons with dementia. In addition, also group activities and some other forms of treatment were cancelled to prevent spreading of infections³⁵. Similar restrictions were experienced by persons with dementia who live at home. In addition, many hygiene measures, such as wearing masks and unfamiliar situations brought by the pandemic, can be upsetting for persons with dementia because of decline in cognitive capacities and impossibility to clearly understand their meaning, which can cause them distress^{19,32}. Because of the pandemic and lockdown, health services providing the care for persons with dementia were limited. During this period, there was a significant dropout from cognitive therapies and physical exercise, along with changes in normal daily routine and socializing. Maintaining a daily routine is essential for the well-being of the persons with dementia³². Reduced physical activity and lack of social contact during lockdown have had a long-term impact on neuropsychiatric symptoms in patients with dementia³³. Negative effects of lockdown in the cognitive, behavioral and motor functions were reported²⁵. Symptoms of apathy, anxiety, agitation, lack of appetite, sleep disturbances and psychotic disorders in persons with dementia were highlighted²⁰ or anxiety, apathy, agitation, depressive symptoms^{18,19} and sleep disorders^{16,19,22}.

Data showed that neuropsychiatric symptoms worsened in at least one third of patients with cognitive impairment or dementia during the pandemic/lockdown^{20,23,26,29-33}. Comparison in neuropsychiatric symptoms prevalence and cognitive function decline during the first wave of the pandemic and two or six months before the pandemic, showed a statistically significant increase in levels of agitation, depressive symptomatology, appetite/feeding disorder, nighttime behavioral disturbances, and increased motor activity. Authors were unable to find a biological cause, a psychosocial or other environmental factor to explain these changes; therefore, this is most likely due to a secondary consequence of the pandemic²⁸. Study assessing dynamic of symptoms in persons with dementia during quarantine reported that sleep disturbances, apathy, agitation, and delusions were prevalent in more than one-fifth of cases, mostly in patients with Alz-

heimer's disease³¹. Other study observed and compared pre-pandemic situation with one year after the start of the pandemic in which the subjects with cognitive disorder experienced at least 4 months of lockdown. The highest cognitive decline was seen in patients with dementia with Lewy bodies (almost three-quarters of patients), followed by patients with Alzheimer's disease (more than half patients) and patients with mild cognitive impairment (four in ten patients). The average one-year decline is the same for Alzheimer's disease patients as before the pandemic, while patients with dementia with Lewy bodies have twice the rate of decline as before the pandemic³³.

Mostly caregivers of persons with dementia reported changes in dementia symptoms during the pandemic. They had to spend more time caring for persons with dementia and had less time for their own activities, which caused them additional stress and could lead to burnout. These factors may affect their perception for changes in dementia symptoms in the person they are taking care of. Higher levels of neuropsychiatric symptoms in persons with dementia lead to higher levels of psychological distress for caregivers²³.

This review was limited to English-language, peer-reviewed literature published between March 2020 and October 2021. The advantage of this scientific review paper is methodological comparability (the use of same or comparable methods in studies included, use of the same instruments/standardized questionnaires compiled by clinicians or caregivers of patients with dementia) and the possibility of comparability of results. Limitations of the study include the subjective perception of stress levels by caregivers of persons with dementia, which affects the perception of the level and change of symptoms in patients with dementia. Among limitations there were also differences in reviewed studies (e.g. participants' sample size, living environment, study control). Another limitation of our study is the relatively short follow-up period (this review's timeframe especially during the first wave of pandemic) and use of one electronic database on peer-reviewed journal articles. In the future, it would be useful to mon-

itor the change in dementia symptoms over time, for example at the end of a pandemic, and compare it with the change in dementia symptoms over the same time period in the time before the pandemic, or when the impact of the pandemic is no longer of this magnitude. This would give a more holistic view of the impact of the pandemic on persons with dementia.

According to the findings of the review paper, persons with dementia are one of the most vulnerable groups in this pandemic. They belong to several groups at increased risk of infection at the same time – such as the elderly population, persons in social care, persons with multiple chronic diseases, persons who find it difficult to adapt to and even understand new situations, persons affected by treatment absenteeism, and others³⁶⁻³⁸ – so tailored approaches to treatment are particularly important. Dementia is a disease that progresses towards increasing dependence on the help of others. This need only increases during times like pandemic, leading to a faster progression of the disease³⁸. In emergency situations, we should not forget prevention, such as a healthy lifestyle with adapted physical activity and cognitive stimulation (playing cards, solving crosswords, etc.). Older persons need to be introduced to telecommunications, meditation, relaxation exercises and psychological counselling to reduce feelings of loneliness and stress. The pandemic has highlighted the important role of telemedicine in health care system. It is important to bring this way of using health services closer to caregivers of persons with dementia. The use of appropriate dementia care guidelines is also effective in coping with increased burden^{39,40}.

Authors' contributions

ML, LG and BL contributed to the scientific literature review and wrote the draft manuscript. ML and BL supervised the study, contributed to the conception, design, execution and interpretation of the reported study, and have critically revised and approved the final version of the manuscript.

REFERENCES

1. WHO. Dementia: a public health priority. Geneva: WHO, 2012. — 2. World Alzheimer Report, (2018). — 3. HORTON R. *The Lancet* 380 (2012) 2053. doi: 10.1016/S0140-6736(12)62133-3. — 4. WHO. World Health Report, 2003-Shaping the future. Geneva: WHO, 2003. — 5. WHO (2012). Alzheimer's Disease International and World Health Organization: London, UK. — 6. WORLD ALZHEIMER REPORT (2015). The Global Impact of Dementia: An analysis of prevalence, incidence, cost and trends. Alzheimer's Disease International 2015. — 7. G20 OSAKA LEADERS' DECLARATION (2019) https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/en/documents/final_g20_osaka_leaders_declaration.html. — 8. WHO (2020) <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-Covid-19--11-march-2020> — 9. SAYIN KASAR K, KARAMAN E, Geriatr Nurs, 42 (2021) 1222. doi: 10.1016/j.gerinurse.2021.03.010. — 10. COURTIN E, KNAPP M, Health Soc Care Community, 25 (2017) 799. doi: 10.1111/hsc.12311. — 11. DALEY S, AKARSU N, ARMSBY E, FARINA N, FEENEY Y, FINE B, HUGHES L, POOLEY J, TABEL N, TOWSON G, BANERJEE S, *BMJ Open*, 12 (2022) e053563. doi: 10.1136/bmjopen-2021-053563. — 12. XIA X, WANG Y, ZHENG J, *Transl Neurodegener* 10 (2021) 15. doi: 10.1186/s40035-021-00237-2. — 13. NUMBERS K, BRODATY H. *Nat Rev Neurol*, 17 (2021) 69. doi: 10.1038/s41582-020-00450-z. — 14. PAGE MJ, MOHER D, BOSSUYT PM, BOUTRON I, HOFFMANN TC, MULROW CD, SHAMSEER L, TETZLAFF JM, AKL EA, BRENNAN SE, CHOU R, GLANVILLE J, GRIMSHAW JM, HRÓBJARTSSON A, LALU MM, LI T, LODER EW, MAYO-WILSON E, McDONALD S, MCGUINNESS LA, STEWART LA, THOMAS J, TRICCO AC, WELCH VA, WHITING P, MCKENZIE JE, *BMJ*, 372 (2021) n:160. doi: 10.1136/bmj.n160. — 15. ALONSO-LANA S, MARQUIE M, RUIZ A, BOADA M, *Front Aging Neurosc*, 12 (2020) 588872. doi: 10.3389/fnagi.2020.588872. — 16. CANEVELLI M, VALLETTA M, TOCCACELLI BLASI M, REMOLI G, SARTI G, NUTI F, SCIANCELEPORE F, RUBERTI E, CESARI M, BRUNO G, *J Am Geriatr Soc*, 68 (2020) 1673. doi: 10.1111/jgs.16644. — 17. CAPOZZO R, ZOCCOLELLA S, FRISULLO ME, BARONE R, DELL'ABATE MT, ROSARIA BARULLI MR,

- MUSIO M, ACCOGLI M, LOGROSCINO G, J Alzheimers Dis, 76 (2020) 481. doi: 10.3233/JAD-200589. — 18. SUAREZ-GONZALEZ A, RAJA-GOPALAN J, LIVINGSTON G, ALLADI S, EClinicalMedicine, 39 (2021) 101047. doi: 10.1016/j.eclinm.2021.101047. — 19. BACSU JR, O'CONNELL ME, WEBSTER C, POOLE L, WIGHTON MB, SIVANANTHAN S, Can J Public Health, 112 (2021) 400. doi: 10.17269/s41997-021-00500-z. — 20. SIMONETTI A, PAIS C, JONES M, CIPRIANI MC, JANIRI D, MONTI L, LANDI F, BERNABEI R, LIPEROTI R, SANI G, Front Psychiatry, 11 (2020) 579842. doi: 10.3389/fpsy.2020.579842. — 21. AZEVEDO LVDS, CALANDRI IL, SLACHEVSKY A, GRAVIOTTO HG, VIEIRA MCS, ANDRADE CB, ROSSETTI AP, GENEROSO AB, CARMONA KC, PINTO LAC, SORBARA M, PINTO A, GUAJARDO T, OLAVARRIA L, THUMALA D, CRIVELLI L, VIVAS L, ALLEGRI RF, BARBOSA MT, SERRANO CM, MIRANDA-CASTILLO C, CAMELLELI P, J Alzheimers Dis, 81 (2021) 607. doi: 10.3233/JAD-201580. — 22. BASCHI R, LUCA A, NICOLETTI A, CACCAMO M, CICERO CE, D'AGATE C, DI GIORGI L, LA BIANCA G, LO CASTRO T, ZAPPIA M, MONASTERO R, Front Psychiatry, 11 (2020) 590134. doi: 10.3389/fpsy.2020.590134. — 23. BORELLI WV, AUGUSTIN MC, DE OLIVEIRA PBF, REGGIANI LC, BANDEIRA-DE-MELLO RG, SCHUMACHER-SCHUH AF, CHAVES MLF, CASTILHOS RM, J Alzheimers Dis, 80 (2021) 1705. doi: 10.3233/JAD-201513. — 24. BOUTOLEAU BRETONNIERE C, POUCKET-COURTEMANCHE H, GILLET A, BERNARD A, DERUET AL, GOURAUD I, MAZOUÉ A, LAMY E, ROCHER L, KAPOGIANNIS D, EL HAJ M, J Alzheimers Dis, 76 (2020) 41. doi: 10.3233/jad-200604. — 25. CAGNIN A, DI LORENZO R, MARRA C, BONANNI L, CUPIDI C, LAGANA V, RUBINO E, VACCA A, PROVERO P, ISELLA V, VANACORE N, AGOSTA F, APPOLLONIO I, CAFFARRA P, PETTENUZZO I, SAMBATI R, QUARANTA D, GUGLIELMI V, LOGROSCINO G, FILIPPI M, TEDESCHI G, FERRARESE C, RAINEIRO I, BRUNI AC, SINDEM COVID-19 STUDY GROUP, Front Psychiatry, 11(2020), 578015. doi: 10.3389/fpsy.2020.578015. — 26. CARBONE E, PALUMBO R, DI DIOMENICO A, VETTOR S, PAVAN G, BORELLA E, Front Aging Neurosci, 13 (2021) 652833. doi: 10.3389/fnagi.2021.652833. — 27. CARVELLO L, MARTINI E, VITI N, CAMPANELLO C, ASSOGNA F, PEROTTA D, Front Psychiatry, 12 (2021) 590104, doi: 10.3389/fpsy.2021.590104. — 28. CUSTODIO N, CASTRO-SUAREZ S, MONTESINOS R, FAILOC-ROJAS VE, CRUZ DEL CASTILLO R, HERRERA-PEREZ E, Am J Alzheimers Dis Other Dement, 36 (2021) 1. doi: 10.1177/15333175211039089. — 29. LARA B, CARNES A, DAKTERZADA F, BENITEZ I, PINOL-RIPOLL G, Eur J Neurol, 27 (2020) 1744. doi: 10.1111/ene.14339. — 30. MANINI A, BRAMBILLA M, MAGGIORE L, POMATI S, PANTONI L, Neurol Sci, 42 (2021) 825. doi: 10.1007/s10072-020-05035-8. — 31. YUAN S, ZHANG W, LU WENGLI, YU W, ZGONH F, XIONG L, WAN T, HU C, YANG W, CHEN C, LUO D, TAN B, HUANG C, YU W, LU Y, Aging Clin Exp Res, 33 (2021) 2317. doi: 10.1007/s40520-021-01911-1. — 32. BARGUILLA A, FERNANDEZ-LEBRERO A, ESTRAGUES-GAZQUEZ I, GARCIA-ESCOBAR A, NAVALPOTRO-GOMEZ I, MANERO RM, PUENTE-PERIZ V, ROQUER J, PUIG-PIJOAN A, Front Neurol, 11 (2020), 589901. doi: 10.3389/fneur.2020.589901. — 33. CHEN ZC, LIU S, GAN J, MA L, DU X, ZHU H, HAN J, XU J, WU H, FEI M, DOU Y, YANG Y, DENG P, WANG XD, JI Y, Front Psychiatry, 12 (2021) 711658. doi: 10.3389/fpsy.2021.711658. — 34. GAN J, LIU S, WU H, CHEN Z, FEI M, XU J, DOU Y, WANG X, JI Y, Front Psychiatry, 12 (2021) 703481. doi: 10.3389/fpsy.2021.703481. — 35. NUMBERS K, BRODATY H, Nat Rev Neurol, 17 (2021), 69. doi: 10.1038/s41582-020-00450-z. — 36. BIANCHETTI A, ROZZINI R, GUERINI F, BOFFELLI S, RANIERI P, MINELLI G, BIANCHETTI L, TRABUCCHI M, J Nutr Health Aging, 24 (2020) 560. doi: 10.1007/s12603-020-1389-1. — 37. MOK VCT, PENDLEBURY S, WONG A, ALLADI S, AU L, BATH PM, BIESSELS GJ, CHEN C, CORDONNIER C, DICHGANS M, DOMINGUEZ J, GORELICK PB, KIM S, KWOK T, GREENBREG SM, JIA J, KALARIA R, KIVIPELTOM, NAE-GANDRAN K, LAM LCW, LAM BYK, LEE ATC, MARKUS HS, O'BRIEN J, PAI MC, PANTONI L, SACHDEV P, SKOOG I, SMITH EE, SRIKANTH V, SUH GH, WARDLAW J, KO H, BLACK SE, SCHELTENS P, Alzheimers Dement, 16 (2020) 1571. doi: 10.1002/alz.12143. — 38. XIA X, WANG Y, ZHENG J, Transl Neurodegener, 10 (2021) 15. doi: 10.1186/s40035-021-00237-2. — 39. ROACH P, ZWIERS A, COX E, FISCHER K, CHARLTON A, JOSEPHSON CB, PATTEN SB, SEITZ D, ISMAIL Z, SMITH EE, Dementia (London), 20 (2021) 2007. doi: 10.1177/1471301220977639. — 40. ROY D, GHOSH R, DUBEY S, DUBEY MJ, BENITO-LEON J, KANTI RAY B, Can J Neurol Sci, 48 (2021) 9. doi: 10.1017/cjn.2020.173]

M. Lovrečić

National Institute of Public Health, Trubarjeva 2, 1000 Ljubljana, Slovenia

e-mail: mercedes.lovrecec@nijz.si

UČINCI RESTRIKTIVNIH MJERA ZBOG COVIDA-19 NA OSOBE S DEMENCIJOM

SAŽETAK

COVID-19 pandemija duboko je utjecala na živote svih, a posebno ranjivih skupina, poput osoba s demencijom. Tijekom karantene ograničen je pristup zdravstvenoj skrbi, povećali su se usamljenost i opterećenje njegovatelja. Pregledali smo literaturu, korištenjem PRISMA metodologije, o dinamici simptoma demencije nakon početka pandemije i karantene. Prema studijama uključenim u rezultate našeg istraživanja, udjeli pogoršanja neuropsihijatrijskih simptoma bili su u rasponu od 14% do 72%, kognitivnih funkcija u rasponu od 19% do 60%, a potreba za farmakološkom prilagodbom liječenja u rasponu od 7,2% do 27,6%. Najčešći simptomi koji su se pogoršali tijekom pandemije bili su apatija, agitacija, anksioznost, simptomi depresije i poremećaji spavanja. S druge strane, malo je istraživanja koja nisu pokazala vezu između pandemije i pogoršanja simptoma demencije. Za cjelovitiji prikaz utjecaja pandemije na osobe s demencijom bilo bi potrebno buduće praćenje promjene simptoma demencije, primjerice na kraju pandemije.

