


# Do Nursing Home Residents With Dementia Receive Pain Interventions?

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## Abstract

This study compares pain interventions received by nursing home residents with and without dementia. Secondary data analyses of cross-sectional data from 50,673 nursing home residents in New York State were collected by the Minimum Data Set 3.0. Frequency distributions and bivariate analyses with  $\chi^2$  tests were used to organize and summarize the data. Logistic regression analyses were performed to quantify the relationship between dementia and pain interventions. Our results show that residents with dementia had significantly fewer pain assessments and less reported pain presence than their counterparts. After adjusting for covariates, the results indicate that residents with dementia were significantly less likely to receive pro re nata and non-medication pain intervention. However, there were no significant differences in scheduled pain medication between the 2 groups. To address the gap, we need more research to design a pain assessment tool that can differentiate severity of pain so that appropriate interventions can be applied.

## Keywords

dementia, pain assessment, pain intervention, nursing home, Minimum Data Set 3.0

## Introduction

Depending on the study designs, it is estimated that between 41.5% and 80% of nursing home residents have dementia.<sup>1-4</sup> Individuals with dementia have trouble communicating meaningfully because of memory loss and difficulties in thinking and problem-solving. This declined cognition greatly reduces their self-care ability (activities of daily living [ADL]) including daily routines (eg, grooming, dressing) and their ability to express their care needs. In addition to loss of functional independence, residents with dementia also experience the higher burden of disease.

Nursing home residents frequently have chronic conditions and cognitive impairments, and the prevalence of pain is high (45%-80%) among older adults with or without dementia.<sup>5,6</sup> The burdens of disease among nursing home residents include depression, arthritis, hypertension, a composite of vascular diseases, gastroesophageal reflux disease, congestive heart failure, dementia, and anemia.<sup>7</sup> More specifically, health problems among residents with advanced dementia include skin problems (95%), nutrition/dehydration (85%), psychiatric/behavioral problems (85%), gastrointestinal problems (81%), and infections (80%).<sup>8</sup> Sixty-three percent of residents with advanced dementia recognized pain and 95% of those received medication.<sup>8,9</sup> As diseases progress, Lyketos and associates found that 80% of residents with dementia experience neuropsychiatric symptoms<sup>10</sup> such as physical aggression, agitation, disruptive vocalizations, anxiety, and

depression. Residents with dementia having a pain experience with neuropsychiatric symptoms may also engage in challenging behaviors such as psychosis, apathy, or hyperactivities.<sup>9</sup> In order to manage challenging symptoms and behaviors, pharmacological intervention may be required, for example, antipsychotics for agitation or psychosis,  $\beta$ -adrenergic blockers for aggression, and cholinesterase inhibitors for behavioral symptoms.<sup>10</sup>

Depending on study design, the prevalence of pain has been estimated to vary from 29% to 83% among residents in long-term care facilities.<sup>11-14</sup> This pain prevalence is higher than that of older adults living in the community (20%-50%).<sup>12</sup> A previous study indicated that more than 40% of nursing home residents endure persistent pain. Of these, as many as 6.4% were untreated and 32% undertreated.<sup>15</sup> If pain is not properly addressed, there are negative consequences such as depression,

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insomnia, anxiety, loss of appetite, change in activity, and a lower quality of life.<sup>16</sup>

Pain assessment in people with dementia is challenging. Pain is a subjective experience and pain tolerance varies by person. Three methods used to evaluate levels of pain are self-reported, observational, and/or proxy; each has its own challenges.<sup>5</sup> For example, self-reported pain is often problematic for people with dementia as it relates to the level of cognitive impairment.<sup>17</sup> As dementia and other coexisting conditions progress, the individual's ability to report pain and articulate sites of pain may become more difficult.<sup>5</sup> Consequently, their pain is often undertreated or inadequately treated.<sup>11,18-20</sup> Other studies examined different aspects of pain and medication management-related issues. For example, Nakanishi and her colleagues reported that residents with dementia in nursing homes were less likely to receive pain management in the last month of life.<sup>21</sup> Neumann and associates examined trends in the administration of "as-needed" medication to inpatients in psychiatric facilities<sup>22</sup> and found residents were more likely to receive pro re nata (PRN, or as needed) medication if they were younger and the afternoon and night shifts changed. Stokes and associates examined factors influencing the use of PRN medication in nursing homes<sup>23</sup> and found higher PRN medication use among residents with lower care needs, recent hospitalizations, and more frequent doses of regularly scheduled medications. In addition, Weiner and Hanlon identified pain management strategies for nursing home residents, in general,<sup>11</sup> which provided a comprehensive review underlying causes of pain, pain management strategies related to levels of pain, and adverse effects of analgesics. These studies contribute to a better understanding of pain medication with the purpose of maximizing therapeutic effect and mitigating pain. To our knowledge, pain interventions among residents with dementia in nursing homes have not been fully studied. Our study aimed to compare pain interventions (scheduled pain medication, PRN pain medication, and nonmedication intervention for pain) between nursing home residents with and without dementia in New York State.

## Methods

### Study Design

This was a cross-sectional study. Inclusion criteria for the study population mandated that the sample include older adults (aged 65 years) who received care from a nursing home in New York State and had an annual assessment in 2012. The study was approved by the internal review board of the University at Albany.

### Data Source

The Minimum Data Set 3.0 (MDS3.0) from 2012 contains assessment forms for each patient residing in a Medicare- and Medicaid-certified nursing home in New York State. For residents with more than one annual assessment, we retained the

latest record for the analysis. The data set was provided by the NYS Department of Health; unique resident identifiers were removed before being given to the researchers.

### Study Variables

The MDS3.0 included information on age (in years), gender, ADL, comorbidities, pain assessment, and pain interventions. All ADL functional disability measures in MDS3.0 are performance based on a scale from 0 (independent) to 4 (total dependence). For purposes of this study, if a resident's ADL item was recorded as "activity did not occur during entire 7 days," that ADL was considered missing. The overall ADL disability was a summary variable including bathing, toileting, dressing, transferring, eating, and personal hygiene. The presence of comorbidities was a dichotomous variable (yes vs no). Dementia status was coded as yes versus no, based on a diagnosis of Alzheimer disease or dementia other than Alzheimer disease. Pain presence (yes vs no) was derived from 3 questionnaires: "Should a pain assessment interview be conducted?" If the answer was yes, we moved to the next question: "Have you had pain (or hurting) at any time in the last 5 days?" If the answer was yes, it means that the residence reported pain presence (yes) versus else (no). The outcome variable under study was pain interventions. Pain intervention options were (1) scheduled pain medication, (2) PRN pain medication, and (3) nonmedication intervention for pain. Nonmedication interventions for pain include heat, therapy, massage, stretching, and muscle release techniques used for muscle spasm or myofascial pain, walkers, or raised chairs used for lower extremity arthritis and carpometacarpal braces used for painful hand osteoarthritis.<sup>9</sup> Although some residents received more than 2 pain intervention options, we focused on each option and coded yes versus no.

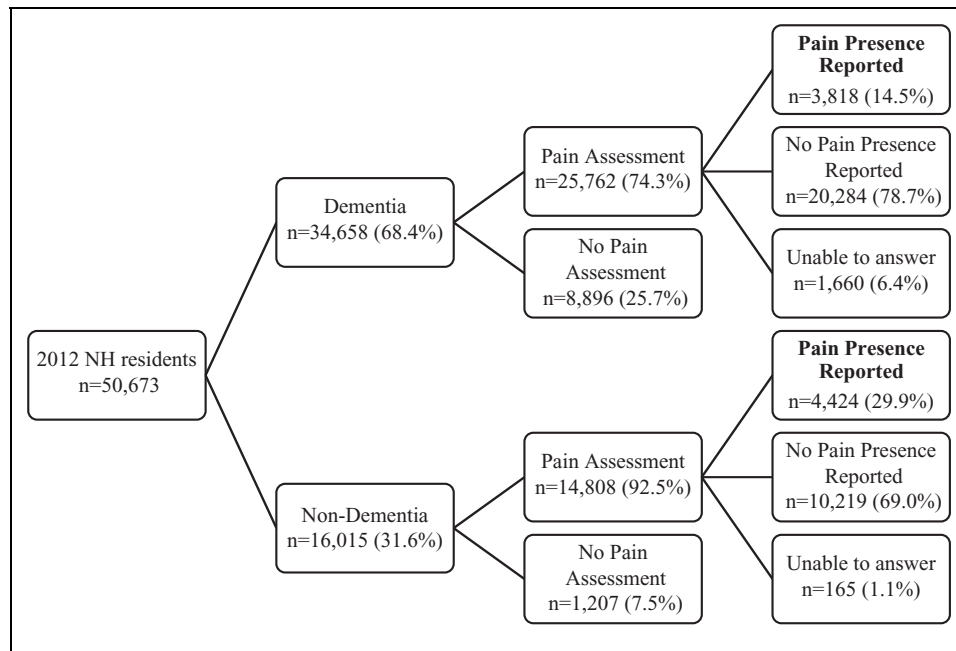
### Data Analysis

Frequency distributions and bivariate analyses with  $\chi^2$  tests were used to organize and summarize the data. Logistic regressions were performed to compare the pain interventions received by nursing home residents with and without dementia while adjusting for age, gender, overall ADL disability, and comorbidity. Analyses were conducted using Statistical Analysis Software, version 9.3 (SAS Institute, Inc, Cary, North Carolina). The significance level was set at  $\alpha = .05$  (2-tailed).

## Results

As Figure 1 shows, of the 50,673 nursing home residents in New York State, 34 658 (68.4%) had dementia in 2012. Residents with dementia had significantly fewer pain assessments than those without dementia (74.3% vs 92.5%;  $P < .0001$ ). Likewise, residents with dementia had significantly less pain presence than their counterparts (14.5% vs 29.9%;  $P < .0001$ ).

Table 1 presents the sociodemographic and selected health conditions of the study population. Of the 8,242 residents, the



**Figure I.** Flowcharts of pain assessment and pain presence between residents with and without dementia (2012).

**Table I.** Characteristics of NYS Nursing Home Residents Who Received Pain Assessment and Reported Pain Presence in the Dementia and No-Dementia Groups.

Characteristics	Total <sup>a</sup> (N = 8242)		Dementia <sup>a</sup> (n = 3818)		No Dementia <sup>a</sup> (n = 4424)		P Value
	#	%	#	%	#	%	
Age, mean (SD)	83.2	8.9	85.0	8.0	81.7	9.4	<.0001
Male	2017	24.5	866	22.7	1151	26.0	.0004
White	6435	78.1	2891	75.7	3544	80.1	<.0001
Overall ADL, mean (SD)	2.3	1.0	2.4	0.9	2.2	1.0	<.0001
Health characteristics							
Anemia	2819	34.2	1299	34.0	1520	34.4	.75
Arthritis	3250	39.4	1567	41.0	1689	38.2	.008
Cancer	484	5.9	196	5.1	288	6.5	.009
Depression	4715	57.2	2349	61.5	2366	53.5	<.0001
Heart failure	2177	26.4	932	24.4	1245	28.1	.0001
Hypertension	6537	79.3	3050	79.9	3487	78.8	.23
Gastroesophageal	2923	35.5	1316	34.5	1607	36.3	.08
Stroke	1402	17.0	649	17.0	753	17.0	.98
Psychotic disorder	523	6.4	360	9.4	163	3.7	<.0001
Pain intervention							
Scheduled pain medication	5878	71.3	2713	71.1	3165	71.5	.63
PRN pain medication	4378	53.1	1773	46.4	2605	58.9	<.0001
Nonmedication intervention for pain	1657	20.1	689	18.1	968	21.9	<.0001
No intervention	549	6.7	305	8.0	244	5.5	<.0001

Abbreviations: ADL, activities of daily living; PRN, pro re nata; SD, standard deviation.

<sup>a</sup>Components may not sum to totals because of rounding.

mean age was 83.2 years; 24.5% were male and 78.1% were white. The average overall ADL disability was 2.3 and a higher score indicates a higher level of disability. Regarding health characteristics, 46.3% had dementia, 79.3% hypertension, 57.2% depression, and 39.4% arthritis. The percentage of residents receiving scheduled pain medication was 71.3%, PRN

pain medication 53.1%, and nonmedication intervention for pain 20.1%. In comparison to residents without dementia, residents with dementia were significantly older (85.0 vs 81.7;  $P < .0001$ ), had a lower proportion of men (22.7% vs 26.0%;  $P < .0004$ ), and had higher overall ADL disability (2.4 vs 2.2;  $P < .0001$ ). Regarding health conditions, residents

**Table 2.** Multivariate Logistic Regression Results on Pain Intervention in the Dementia and No-Dementia Groups.<sup>a</sup>

Outcome	OR <sup>b</sup>	95% CI	P Value
Scheduled pain medication	0.91	0.82-1.01	.07
PRN pain medication	0.67	0.61-0.73	<.0001
Nonmedication intervention for pain	0.77	0.69-0.87	<.0001

Abbreviations: CI, confidence interval; OR, odds ratio; PRN, pro re nata.

<sup>a</sup>N = 8,242.

<sup>b</sup>Odds ratios were adjusted by age, gender, white, arthritis, cancer, depression, heart failure, and psychotic disorder.

with dementia had lower prevalence of arthritis (41.0% vs 38.2%), cancer (5.1% vs 6.5%), depression (61.5% vs 53.5%), heart failure (24.4% vs 28.1%), and psychotic disorder (9.4% vs 3.7%). For pain intervention, dementia residents had a lower proportion of PRN pain medication (21.5% vs 31.6%;  $P < .0001$ ) and of nonmedication intervention for pain (8.4% vs 11.7%;  $P < .0001$ ). There is a total of 6.6% of residents who reported pain but didn't receive any pain intervention; of these, a higher proportion of dementia residents received no intervention compared to residents without dementia, respectively (3.7% vs 2.9%;  $P < .0001$ ).

The results of multivariate logistic regression analysis in Table 2 indicate dementia residents had significantly lower odds of receiving PRN pain medication (odds ratio [OR] = 0.67, 95% confidence interval [CI] = 0.61-0.73) and nonmedication intervention for pain (OR = 0.77, 95% CI = 0.69-0.87). That being the case, there were no significant differences in scheduled pain medication between the 2 groups.

## Discussion

For pain intervention, our study indicates no significant difference in the administration of scheduled pain medication between residents with or without dementia. This finding is consistent with previous studies.<sup>11,24</sup> However, the pain intervention related to PRN pain medication and nonmedication intervention for pain shows discrepancies. Our study result indicates residents with dementia are less likely to receive PRN pain medication, and this result is consistent with previous studies.<sup>24</sup> For nonmedication intervention for pain, our results indicate residents with dementia are less likely to receive this intervention option compared to their counterpart (18% vs 22%). One study indicated that approximately one-third of the residents had moderate to severe pain regardless of regularly scheduled pain medication.<sup>25</sup> There is a possibility that residents with dementia may experience pain but are unable to articulate it at the time and, thus, get overlooked. For residents with dementia who cannot effectively verbalize their pain using self-report questionnaires, alternative pain assessment modalities should be considered (eg, observational methods, the pain thermometer, the pain map).<sup>5,11</sup> For example, one observational method is the Pain Assessment in Advance Dementia scale. This is an option that assesses 5 pain behaviors: breathing not including vocalization, vocalization, console ability, facial

expression, and body posturing. The scale is completed by an independent rater and collected while the person with dementia is receiving nursing care.<sup>5</sup> Another example is the Pain Assessment Check List for Seniors with Limited Ability to Communicate (PACSLAC) scale.<sup>26</sup> This scale is a checklist that is used to assess pain in nursing home residents who have dementia and are unable to communicate verbally. The PACSLAC includes 4 subscales: facial expressions, activity/body movement, social/personality mood, and other. A higher score (indicated by the number of check marks in each subscale) suggests an increase in pain. This is a starting point that indicates that further pain assessment is required. These assessment tools can measure the extent of pain, and the results may be useful for prescribing appropriate pain interventions to alleviate pain, leading to a better quality of life. With an appropriate assessment, there is a possibility that nonmedication intervention for pain such as heat, therapy, massage, hydrotherapy, and so on, can alleviate pain, avoid polypharmacy and adverse drug reactions, and should be considered as an alternative when instituting pain management strategies.

In addition, it was found that a systematic approach to pain management significantly reduced agitation in residents of nursing homes with moderate to severe dementia.<sup>27</sup> Appropriate and effective pain management could reduce the number of unnecessary prescriptions for psychotropic medication to control agitation resulting from untreated pain. To improve quality of life of residents with dementia who seem to have pain, it is of paramount importance to recognize and detect pain before pain treatments can be initiated. In relation to undertreated and untreated pain, it is clear that a comprehensive assessment program is needed that can take into account of disease burden, functional disabilities, and neuropsychiatric and behavior disorders. Also, more focus should be on how pain management could use specific and tailored approaches adjusted to individual needs at appropriate times. It is recommended that health-care providers and caregivers receive proper education and training in the assessment of pain and administration of appropriate treatment modalities.<sup>14,23,28</sup> Therefore, it is important to solicit the assistance of knowledgeable hands-on caregivers to identify typical pain behaviors for residents with dementia using appropriate pain assessment tools so that pain interventions can be administered.

The prevalence of dementia and pain both increase with advancing age. The prevalence of nursing home residents with dementia in New York State (68.4%) is comparable to previous studies.<sup>11,13,29</sup> Our study results show those who received pain assessment and reported pain is about 20%, which is lower than previous studies (29%-83%).<sup>11-14</sup> It is noted that no-dementia residents are more likely to receive pain assessment (92.5% vs 74.3%) and twice as likely to report having pain compared to dementia residents (29.9% vs 14.8%). This difference may be due to their difficulty expressing pain through verbal communication.<sup>30</sup> In terms of social demographics, residents with dementia who receive pain assessment and had pain are significantly older (85 vs 81.7) and being women (77.3% vs 74%)

than residents without dementia; this result is comparable to previous studies.<sup>13,31</sup>

### Study Limitations

There are limitations to consider in our study. We could not analyze the situation of the residents unable to indicate their pain. In future research, we need to focus on the residents with severe dementia. MDS3.0 did not assess the reasons why the residents had pain and what kinds of pain medication or non-medication intervention for pain they received for their pain. Given the nature of secondary data analysis, we were not able to address this question in our study. Future studies related to pain management among nursing home residents with dementia should focus on clinical (eg, arthritis) and nonclinical factors (eg, prescription adherence) associated with PRN pain medication and nonmedication interventions for pain.

### Conclusion

Our study results indicate that no significant difference exists in the administration of scheduled pain medication between residents with or without dementia; however, residents with dementia are less likely to receive PRN pain medication and nonmedication intervention for pain. There is a possibility that residents with dementia may experience pain but are unable to articulate it at the time and, thus, get overlooked. To address the gap, more research is needed to design a pain assessment tool that can be sensitive to differentiating severity of pain; thus, appropriate interventions can be applied.

### Author's Note

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### Declaration of Conflicting Interests

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