

DEPRESSION, ANXIETY, AND PAIN AMONG NEWLY ADMITTED NURSING HOME RESIDENTS

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Abstract: *Background:* Depression, anxiety, and pain are commonly experienced by older adults living in nursing homes. *Objectives:* To describe the prevalence of depression, anxiety disorders, and pain among newly admitted nursing home residents in the United States and to describe the treatment of these disorders. *Design:* Cross-sectional study of newly admitted residents. *Setting:* Residents able to complete a pain assessment (n=783,826) living in Medicare- and Medicaid-certified nursing homes in the United States in 2011-2012. *Measures:* Measures of sociodemographic, mood and behavior, pain, diagnoses, and functioning items from the Minimum Data Set (MDS) version 3.0. *Results:* Approximately 36% of residents had a diagnosis of depression (other than bipolar disorder) and/or an anxiety disorder (n = 272,311). Of these residents, 25.2% had both depression and an anxiety disorder (95% CI = 25.0-25.4%), 54.3% (95% CI = 54.1-54.5%) had depression without an anxiety disorder, and 20.5% had an anxiety disorder without depression (95% CI = 20.3-20.6%). Fifteen percent had the triad of depression, anxiety, and pain at admission (95% CI = 9.3-23.3%). Depressive symptoms were more commonly reported by residents with pain than by those without pain. Receipt of psychological therapy (range: 0.9%-2.0%) or any psychiatric medication was lacking (range: 35.3%-48.5%), regardless of pain status. Participants reporting pain received a combination of scheduled, pro re nata (PRN)/as-needed, and non-medication pain interventions (range: 59.8% depression without anxiety to 62.9% depression and anxiety disorder). *Conclusion:* Residents often suffer from combinations of depression, anxiety, and pain at admission to nursing home. While treatment of pain is more common than treatment of psychiatric treatments, both psychiatric treatment and pain management may be suboptimal in nursing homes.

Key words: Nursing homes, major depressive disorder, anxiety, pain.

Introduction

Depression (1), anxiety (2), and pain (3) are commonly experienced by older adults living in nursing homes. It has been estimated that 11.0% of older adults admitted to nursing homes had depression in 1999 whereas the prevalence of depression had been estimated to be as high as 51.8% for older nursing home residents in 2007 (1, 4). Estimates of the prevalence of anxiety in nursing home residents has varied from 3.2% to 20% (2). Up to 80% of nursing home residents experience pain (3). The wide variation in these estimates is likely due to differences in study sample selection and how each condition or disorder is defined and measured (2, 5, 6). Depression, anxiety and pain are each independently associated with distress, impaired functioning, worse outcomes for additional multimorbid conditions, increased health services use, higher total healthcare costs, and mortality (7). These conditions, either individually or together, often remain undiagnosed and unsuccessfully treated (8). Furthermore, while these disorders have been observed to co-occur frequently in community-dwelling adults (9), few studies have examined multimorbid depression, pain, and anxiety among older nursing home residents and thus the extent to which nursing home residents experience all three conditions simultaneously is unclear (10).

While the appropriate assessment and management of

depression, anxiety, and pain are widely recognized goals in nursing homes (11), successful management of these conditions is hampered by the general complexity inherent in treating multimorbidity; a lack of research focusing on simultaneously occurring depression, anxiety, and pain (10); and an insufficient knowledge about effective interventions in this population of older adults (12). Addressing multimorbidity is necessary to improve overall psychiatric and physical health. Comorbid anxiety with depression might hinder symptom remission as antidepressant treatment response appears to differ by the presence of anxiety and those with anxious depression are more likely than those with depression without anxiety to discontinue treatment (13). Additionally, undertreatment of pain in the nursing home setting persists (14) and lack of receipt of analgesics has been associated with depressed mood and anxiety (15).

Despite the recognition of the importance of addressing these conditions in older adults, little is known about the current prevalence and treatment of depression, anxiety, and pain in nursing homes. Nursing home residents are routinely excluded from US population-based surveys and the clinical trials that form the basis of treatment guidelines. Previous observational studies have differed in years of data collection; depression, anxiety, and pain assessment.

Using the national Minimum Data Set 3.0 (MDS 3.0), the

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objectives of this descriptive study were to: 1) estimate the prevalence of multimorbid depression, anxiety disorders, and pain in newly admitted nursing home residents; 2) describe the sociodemographic and clinical characteristics of residents by psychiatric disorder and pain status; 3) examine receipt of psychiatric treatment by psychiatric disorder and pain status; and 4) describe characteristics of pain by psychiatric disorder. We hypothesized that depression, anxiety, and pain would frequently co-occur and that residents experiencing this triad would be less likely than those not experiencing all three conditions to receive relevant psychiatric treatment and pain management.

Methods

Data source

We used data from MDS 3.0 from 2011-2012. The MDS is a comprehensive clinical assessment that is federally mandated to be completed for all residents of Medicare- and Medicaid-certified nursing facilities in the United States. MDS 3.0 contains more than 450 items pertaining to disease diagnoses, health conditions, treatments, and functional and cognitive status. Assessments are conducted on admission, quarterly, and annually thereafter and if there are substantial changes in a resident's health status. The assessments are conducted by registered nurses and other facility staff, who review residents' medical records and use a validated instrument to evaluate their health (16). The MDS is intended to be used by stakeholders not only as an assessment tool but also for care planning. The Institutional Review Board at the University of Massachusetts Medical School approved this study.

Sample

We identified residents with MDS assessments performed at admission between 2011-2012 who were 65 years of age or older; were non-comatose; were not admitted to a swing bed provider; did not have intellectual or developmental disabilities; and were able to self-report pain presence. Of the 759,055 residents who met these criteria, 35.9% (n = 272,311) had a documented active diagnosis of depression (other than bipolar disorder), anxiety disorder, or both upon admission and were included in this study.

Measures

Depression and anxiety disorders

Depression (other than bipolar disorder) and anxiety disorder diagnoses were ascertained from the Active Diagnoses section of the MDS 3.0. A diagnosis is considered active if 1) it has been documented by a physician in the last 60 days; and 2) has a "direct relationship to the resident's current functional, cognitive, mood or behavior status, medical treatments, nursing monitoring, or risk of death during the 7-day look-back period." In addition to depression being documented as

an active diagnosis, depressive symptoms and severity within the previous two weeks were assessed with the Patient Health Questionnaire-9 (PHQ)-9 (17). Symptoms were considered present for the purposes of this study if they bothered the resident for any amount of time within the two weeks prior to the interview.

Psychiatric treatment

Treatment with antidepressant, antianxiety, hypnotic and antipsychotic medication is assessed in a checklist in the Medications section of the MDS. Use refers to medications received by the resident at any time during the previous seven days or since admission if admission was less than seven days before the MDS assessment was conducted. The resident's medical record and documentation from other health care settings that may have provided medication to the resident during the look-back period are reviewed to complete this section. Receiving any pharmacological psychiatric treatment was defined in this study as treatment with any antidepressant, antianxiety, hypnotic, and/or antipsychotic medication.

The receipt of psychological therapy by any licensed mental health professional is documented in a checklist in the Therapies subsection of the Special Treatments, Procedures, and Programs section. To be included in the MDS, therapy must be medically necessary, occur after admission, and documented in the resident's medical records. Therapy could have been provided inside or outside the nursing home.

Pain

The pain assessment interview portion of the MDS 3.0 evaluates pain presence (yes/no). Pain frequency (almost constantly, frequently, occasionally, or rarely), difficulty sleeping due to pain (yes/no), limitation of daily activities because of pain (yes/no), and pain intensity is noted for all residents who endorse having pain or hurting. Pain intensity refers to the worst pain over the previous five days and is measured either with a numeric rating scale that is scored 1-10 with 10 being the worst pain or a verbal descriptor scale (mild, moderate, severe, and very severe/horrible). Both instruments can be summarized as a four-point ordinal scale where a score of one = mild and a score of four = very severe pain. Pain management is also recorded, based on review of medical records. It is noted if a resident has been on a scheduled pain medication regimen, received pro re nata or as-needed (PRN) pain medications, and received non-medication intervention for pain. This is done for all residents, regardless of level of pain. All items for pain have a five-day look back period. The accuracy of subjective measures such as pain has been improved in the MDS 3.0 (17).

Additional sociodemographic and clinical characteristics

Sociodemographic characteristics of interest include gender, age group, race/ethnicity, and marital status (married, other). Clinical characteristics include functional impairment,

Table 1
Sociodemographic and Clinical Characteristics of Newly Admitted Nursing Home Residents
by Psychiatric Disorder (n = 272,311)

Characteristic ^a	Overall (N = 272,311)	Residents with Depression & Anxiety Disorder (n = 68,620)	Residents with Depression without Anxiety Disorder* (n = 147,902)	Residents with Anxiety Disorder without Depression (n = 55,789)
Age, years, mean (standard deviation)	81.2 (8.2)	80.8 (8.2)	81.2 (8.1)	82.1 (8.3)
Age, years, %				
65-74	23.3	26.1	23.1	20.6
75-84	38.3	38.8	38.7	36.9
85+	38.3	35.1	38.2	42.5
Women, %	70.2	76.6	71.8	66.6
Race/ethnicity, %				
Asian	0.9	0.5	1.1	0.9
Black or African American	5.6	3.5	6.6	5.5
Hispanic or Latino	5.0	4.4	5.2	5.4
Native Hawaiian or other Pacific Islander	0.3	0.1	0.2	0.2
White	88.0	92.3	86.5	87.8
Location prior to nursing home entry, %				
Psychiatric hospital	0.6	0.7	0.6	0.4
Acute hospital	60.8	57.3	61.3	63.1
Community	25.9	27.5	25.1	26.0
Another nursing home or swing bed	10.11	11.6	10.6	7.1
Married, %	31.1	29.7	32.1	30.4
Comorbid conditions active in 7 days before admission assessment, %				
Neurological				
Dementia	30.4	31.2	31.6	26.3
Alzheimer's disease	10.1	10.7	10.0	9.5
Stroke, cerebrovascular accident, transient ischemic attack	12.5	11.5	14.2	9.5
Parkinson's disease	5.5	6.0	5.8	4.0
Cardiovascular				
Hypertension	77.3	77.6	78.0	75.3
Coronary artery disease	26.0	26.6	26.2	25.0
Musculoskeletal				
Arthritis	31.7	35.3	30.5	30.3
Osteoporosis	17.0	18.7	16.7	15.7
Hip fracture (previous 6 months)	5.5	5.0	5.6	5.7
Other fracture (previous 6 months)	9.2	9.3	9.4	8.7
Other conditions				
Diabetes mellitus	31.2	29.3	34.1	26.0
Cancer	9.9	9.9	8.7	12.9
Pressure ulcers	13.6	12.4	13.9	14.6
Surgical wounds	15.9	14.6	16.2	16.7
Hallucinations, %	1.3	1.6	1.1	1.5
Delusions, %	3.3	4.4	2.6	4.0
ADL compromise, % †				
Dependent/totally dependent	21.0	20.3	21.0	21.9
Moderate	57.7	57.1	58.5	56.0
Limited	21.4	15.3	14.2	15.3
Cognitive impairment, % ‡				
Intact or mild	47.3	47.9	46.6	48.6
Moderate	27.9	27.7	28.8	26.1
Severe	24.7	24.4	24.7	25.3
Any pain, %	55.6	59.6	53.0	57.5

*Depression other than bipolar disorder; †MDS-ADL Self-Performance Hierarchy (Morris et al., 1999); The categories "extensive 1" and "extensive 2" were combined to form this category; ‡ Categories provided by CMS derived from the Cognitive Performance Scale (CFS) or Brief Interview for Mental Status (BIMS): none or mild = BIMS 13-15 or CPS 0-2; moderate = BIMS 8-12 or CPS 3-4; severe = BIMS 0-7 or CPS 5-6 (CMS: Centers for Medicare and Medicaid Services, 2015, Nursing Home Data Compendium, 2015 Edition; BIMS; Saliba, Buchanan et al., 2012; CPS: Morris et al., 1994); Missing: gender: n = 53; marital status: n = 5,141; race/ethnicity: n = 5,696; ADL: n = 23.

Table 2
Depressive Mood Symptoms and Severity by Psychiatric Disorder and Pain Status

Patient Health Questionnaire-9 Item, %a	Resident Self-Reported Depression					
	Depression & Anxiety Disorder		Depression without Anxiety Disorder		Anxiety Disorder without Depression	
	With pain (n = 40,910)	Without pain (n = 27,710)	With pain (n = 78,310)	Without pain (n = 69,592)	With pain (n = 32,063)	Without pain (n = 23,726)
Anhedonia	11.5	8.7	9.6	7.7	9.1	6.9
Depressed mood	24.3	18.2	19.2	14.8	16.3	12.8
Insomnia or hypersomnia	18.9	11.6	15.7	9.5	17.2	10.7
Fatigue	31.7	21.5	28.0	19.7	27.3	18.8
Increased or decreased appetite	15.3	9.4	13.3	8.6	14.1	8.4
Guilt/worthlessness	8.4	5.8	6.8	4.9	5.5	3.8
Impaired concentration	9.0	8.6	7.7	7.4	6.9	6.9
Psychomotor agitation or retardation	7.1	5.3	5.5	4.3	5.9	4.6
Suicidal ideation	4.1	3.0	3.7	2.7	2.9	2.1
Patient Health Questionnaire-9 Depression Severity (Score Ranges), %b						
Minimal (0-4)	62.4	72.9	68.4	76.9	68.8	77.4
Mild (5-9)	24.0	18.4	20.9	16.2	21.4	16.5
Moderate (10-14)	9.2	6.3	7.4	5.1	4.4	6.9
Moderately severe (15-19)	3.5	1.9	2.6	1.5	1.4	2.2
Severe (20-27)	1.0	0.5	0.4	0.7	0.62	0.3

Missing individual PHQ-9 items: depression & anxiety disorder, n = 3,750; depression without anxiety disorder: n = 8,189; anxiety disorder without depression, n = 3,594; Missing PHQ-9 depression severity: depression & anxiety disorder, n = 3,930; depression without anxiety disorder, n = 3,853; anxiety disorder without depression: n = 1,876.

cognitive impairment, and active diagnoses of comorbid conditions commonly associated with pain and/or depression and anxiety. Functional impairment in activities of daily living was measured with the MDS-ADL Self-Performance Hierarchy. The MDS-ADL Self-Performance Hierarchy assesses the resident's need for assistance with four activities of daily living (ADLs): personal hygiene, toileting, locomotion, and eating. Dependence required with ADLs indicates that full staff assistance was required for "one or both of eating and locomotion" every time the activity occurred during the 7-day lookback period. Total dependence means that full staff assistance with hygiene, toileting, locomotion, and eating was required every time each activity was occurred during the lookback period. The Cognitive Function Scale (CFS) was used to evaluate cognitive impairment. The CFS relies on the Brief Interview for Mental Status (BIMS) for residents who were able to self-report and the Cognitive Performance Scale (CPS) for those who were not able to complete the BIMS and received a staff assessment. Comorbid conditions were assessed similarly to depression and anxiety diagnoses, as described above.

Analysis

The overall goal of this study was to provide descriptive information relating to depression, anxiety, and pain. As

such, we estimated descriptive statistics pertaining to the demographic and clinical characteristics of newly admitted nursing home residents with depression, anxiety, or both. Ninety-five percent confidence intervals (CI) for the prevalence of depression and anxiety disorders were estimated using standard formulas. Analyses were stratified by psychiatric disorder and presence of pain as appropriate. Differences in psychiatric symptoms, receipt of psychiatric treatment, pain characteristics, and pain treatment between those experiencing the triad and those who were not were evaluated with χ^2 tests. Because even minor differences can achieve statistical significance in studies with very large sizes, we considered an absolute difference of at least 5 percentage points to indicate clinically notable differences across the groups.

Results

Prevalence of concurrent depression and anxiety disorders

Of the 272,311 nursing home residents with a diagnosis of depression or an anxiety disorder eligible for this study, 25.2% (95% CI = 25.0-25.4%) had an active diagnosis of both depression and an anxiety disorder, 54.3% (95% CI = 54.1-54.5%) had an active diagnosis of depression without anxiety disorder, and 20.5% (95% CI = 20.3-20.6%) had an anxiety disorder without depression.

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Table 3
Psychiatric Treatment Received by Psychiatric Disorder and Pain Status

Treatment	Depression & Anxiety Disorder	Depression without Anxiety Disorder	Anxiety Disorder without Depression
<i>Non-Pharmacological</i>		<i>Percentage</i>	
Psychological therapy			
Pain	1.8	1.1	0.9
No pain	2.0	1.3	1.3
<i>Pharmacological</i>		<i>Percentage</i>	
No psychiatric medication			
Pain	35.3	38.5	45.5
No pain	37.9	40.4	48.5
Antidepressant & antianxiety			
Pain	25.8	4.0	5.0
No pain	22.7	2.7	4.2
Antidepressant alone			
Pain	13.1	40.8	3.8
No pain	15.0	41.7	4.1
Antianxiety alone			
Pain	2.8	0.7	27.7
No pain	2.5	0.5	23.9

Characterization of depression/anxiety groups

Table 1 shows the descriptive statistics for the nursing home residents stratified by the groups of depression and anxiety diagnoses (both, depression but no anxiety, anxiety but no depression). Across all groups of depression and anxiety, the average age was 81.2 years (standard deviation (SD): 8.2 years), which ranged from 80.8 years (SD: 8.2) for residents with both depression and an anxiety disorder to 82.1 years (SD: 8.3) for those with an anxiety disorder but not depression. Regardless of the depression/anxiety group, most residents were women (range: 66.6-76.6%), nearly one third were married (29.7-32.1%), and few were African American (3.5-6.6%). Most residents were admitted from an acute hospital (57.3%-63.1%).

Comorbidities were common across all groups. Dementia was the most frequent neurological condition, regardless of depression/anxiety group (26.3-31.2%). Hypertension affected the majority of these residents (75.3-78.0%). Arthritis was the most common musculoskeletal condition (30.3-35.3%) and was most commonly documented for residents with both depression and anxiety disorder. The prevalence of diabetes was highest for residents with depression but not an anxiety disorder, 34.1% of whom had a documented diabetes diagnosis (26.0-34.1%). Slightly more than a fifth of all residents had severe limitations with activities of daily living, with 20.3-21.9% of residents being dependent or totally dependent on assistance. Almost half of all residents had intact cognition or mild cognitive impairment upon admission (44.9-46.8%).

Pain was common within each group, with more than half of residents having documented pain (range: 53.0-59.6%). Fifteen percent of all residents who were eligible for this study had the triad of depression, anxiety, and pain at admission (95% CI: 9.3-23.3%).

Depression characteristics

Individual depressive mood symptoms and depression severity from the self-reported PHQ-9 are presented in Table 2. Across the depression and anxiety groups, those in pain were more likely than those not in pain to report insomnia/hypersonmnia (15.7-18.9% vs 9.5-11.6%), fatigue (27.3-31.7% vs 18.8-21.5%), and eating too much or too little (13.3-15.3% vs 8.4-9.4%). The majority of all residents had minimal depression (62.4-77.4%) although residents in pain reported more severe depression than residents without pain.

Treatment of depression and anxiety

As displayed in Table 3, lack of psychological treatment was common for these residents despite all having documented active diagnoses of depression and/or anxiety. This did not differ by pain status. Psychological therapy was rare, with only 0.9-2.0% of residents receiving any number of minutes of therapy. More than a third of the residents did not receive any psychiatric medication (range: 35.3-48.5%), with residents with anxiety disorders only being the least likely to receive treatment (45.5% of residents with pain, 48.5% of residents without). Approximately one quarter of residents with both depression

Table 4
Characteristics of Pain for Residents Reporting Pain Stratified by Depression/Anxiety Disorder (N = 151,283)

Pain Assessment Item	Depression & Anxiety Disorder (n = 40,910)	Depression without Anxiety Disorder (n = 78,310)	Anxiety Disorder without Depression (n=32,06)
	<i>Percentage</i>		
Pain frequency			
Almost constantly	15.4	12.8	13.5
Frequently	38.2	35.3	36.9
Occasionally	38.8	43.0	41.2
Rarely	5.9	7.5	6.6
Unable to answer	1.6	1.3	1.7
Effect of pain on functioning			
Pain has made it hard to sleep at night	29.8	25.2	28.5
Day-to-day activities have been limited because of pain	40.2	37.3	38.1
Pain intensity of worst pain in prior 5 days			
Mild	21.1	23.2	22.0
Moderate	44.1	45.6	45.0
Severe	24.8	22.9	23.5
Very severe, horrible	9.9	8.1	9.4
Pain management			
Combination	62.9	59.8	61.6
Scheduled only	6.2	6.5	5.0
pro re nata only	25.2	26.4	27.6
Non-medication intervention only	1.0	1.3	1.0
No management	4.7	6.0	4.8

Missing: frequency: n = 2,391; affects sleep: n = 2,528; affects daily activities: n = 2,996; intensity: n = 3,694; management: n = 633.

and an anxiety disorder received both antidepressant and anti-anxiety medications (25.8% of residents with pain, 22.7% of residents without pain). Of the residents with depression only, 40.8% with pain and 41.7% without pain received an antidepressant alone. The psychiatric treatment most commonly received by residents with a diagnosis of an anxiety disorder without depression was anti-anxiety medication alone (27.7% of residents with pain, 23.9% of residents without pain).

Pain characteristics

Table 4 shows that pain occurred almost constantly for 12.8-15.4% of the residents reporting any pain within the five days prior to the assessment. Slightly more than one-quarter of the residents reporting said that pain had made it difficult to sleep (range: 25.2-29.8%). Daily activities were also reported to be limited by pain for more than a third of residents (range: 37.3-40.2%). The worst pain over the previous five days was reported to be of moderate to severe intensity for the majority of residents. More than half of residents reporting pain (range: 59.8-62.9%) received a combination of scheduled and PRN pharmacological pain management and non-medication intervention. Few residents in pain did not receive any pain

management (range: 4.8-6.0%).

Discussion

This study identified depression and anxiety as being prevalent and commonly co-occurring disorders among older adults newly admitted to nursing homes. Approximately half of all of these residents also reported being in pain. Psychiatric treatment was lacking for these vulnerable older adults with 40% were not receiving any psychiatric medication or psychological therapy. Those with anxiety disorders without depression were the least likely to receive such treatment. The triad of depression, anxiety disorders, and pain was particularly prevalent among these older adults. Most reported that the worst pain over the previous five days ranged from moderate to severe intensity. Analgesic agents were employed for the majority of these residents who reported pain, with a combination of pharmacological treatment being the most commonly utilized strategy.

That almost 36% of older adults had an active diagnosis of depression and/or an anxiety disorder upon admission to a nursing home is in accordance with previous studies in

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nursing homes (18). The substantial multimorbidity between depression, anxiety, and pain in our study is also consistent with the growing body of research examining the increasing multiplicity of chronic diseases experienced by an aging population, especially those residing in nursing homes (19). While depression appears in 40% of patterns of chronic co-morbid medical conditions observed in older adults in U.S. nursing homes (20), less is known about the simultaneous occurrence of anxiety and pain, the directionality of this multimorbidity that was documented for 14% of residents with an active diagnosis of depression and/or anxiety disorder included in this study, and how best to treat these residents.

Disentangling the commingled effects of pain, depression, and anxiety is difficult. Pain is a risk factor for developing both depression and anxiety and can exacerbate psychiatric symptoms (21). Moreover, depression and anxiety increase the risk of experiencing pain and can also adversely affect pain outcomes such as intensity (22). As such, the complex interplay of these conditions likely needs to be addressed in a comprehensive fashion to improve residents' quality of life. Treatments which incorporate strategies for addressing all of the components of this triad might be most effective than approaches that address depression, anxiety, and pain separately.

Although providing successful treatment in this population is a complicated issue, it was somewhat surprising to see that 35.3-48.5% of residents in this study did not receive psychiatric treatment, especially given the morbidity and mortality associated with inadequate treatment of psychiatric disorders and the emphasis on depression as a measure of nursing home quality. Although pharmacologic management of depression in nursing homes is common in some states, evidence from clinical trials in this population is limited and the effectiveness of antidepressants may be modest (23). Poor antidepressant treatment response is associated with a more severe and chronic course of depression and with comorbid psychiatric disorders, particularly anxiety. Treating depression by itself may improve quality of life and functional impairment, anxiety, pain, functional impairment, and diabetes for community-dwelling older adults and nursing home residents.

While these residents all had an active diagnosis of depression and/or an anxiety disorder, it is unknown how or when the diagnosis was originally made and thus the residents' need for active treatment remains unclear. Somatic mood symptoms such as sleep problems, lack of energy, and appetite issues were reported by more residents with pain than without pain, regardless of psychiatric disorder, in this study. Many of the new residents were admitted from a hospitalization and we were unable to determine if pharmacological treatment for depression and anxiety was discontinued during the hospital stay. While the PHQ-9 has been validated for use in a variety of populations (24), including being preliminarily validated in for nursing home populations (17), there are concerns that it may not accurately identify depression in older nursing home

residents. Not only are older adults with depression more likely than younger adults to present with somatic symptoms not included in the PHQ-9 and other depression instruments (25) but pain can also impact item response in geriatric depression assessments (26). Research on how best to assess depression and anxiety in older adults with multiple intersecting comorbidities, as are typically seen in nursing homes, would be valuable for informing treatment efforts.

Despite almost all residents reporting pain in the prior five days received some form of pain management, approximately half of all the included residents said that they had experienced pain almost constantly or frequently over the previous five days. Furthermore, 25.2-29.8% of residents in pain reported sleep difficulties due to pain and 37.3-40.2% of residents reported functional limitations because of pain. While the cross-sectional nature of the data in this study limit our ability to determine temporality between the occurrence of pain and receipt of management, this may indicate potential undertreatment of pain. This would be consistent with previous research of pain management in the nursing home setting. Such pain management issues may be in part due to uncertainty about the long-term safety and efficacy of common analgesics and a lack of knowledge about both the course of common pain syndromes and the effectiveness of interventions to improve pain management (27). In nursing homes, systematic approaches to pain management are needed to understand how different types of treatment can improve pain management for residents (28). These approaches might include care pathway algorithms with dose, duration, and schedule of pain treatments.

Our work has several strengths and limitations that must be considered. This study is a national study on a topic which to our knowledge has not been explored. We relied on documented active diagnoses of depression and anxiety, which could have led to underestimating the prevalence of these disorders. The MDS 3.0 does not contain a screening instrument for anxiety disorders. Because of this, we did not examine the PHQ-9 as a screener for probable major or minor depression. Psychiatric disorders are routinely underdiagnosed in general and older adults may be less likely to be properly diagnosed given that they tend to present with somatic symptoms that are sometimes misattributed to normal aging (25). It is also possible that pain is underestimated in nursing home residents, especially for those with psychiatric disorders (10), although pain measurement has been improved in MDS 3.0 relative to MDS 2.0.

Although this study attempted to capture depressive symptoms that did not occur frequently enough to formally qualify as significant enough to warrant a depression diagnosis by examining PHQ-9 items that were endorsed as present with any frequency, MDS 3.0 does not uniformly capture symptoms of depression and anxiety that do not meet formal diagnostic criteria but may still be clinically significant. The MDS 3.0 now includes the PHQ-9, which is an advantage of this study. A systematic review of 18 studies also concluded

that clinically significant anxiety symptoms among older adults living in residential aged care facilities were more frequent than threshold anxiety disorders (2). Estimates of subsyndromal depression among older adults in long-term care settings range from 4.0-30.5%, depending on diagnostic criteria (29). It is necessary to address these symptoms as subsyndromal depression is associated with comorbid anxiety disorders, impaired functioning, increased medical service utilization, and suicidal ideation (30).

Because we focused on the period closest to admission to the nursing home, we cannot establish temporality between our measures, nor can we comment on the prevalence of these conditions beyond the admission period. Examining these conditions throughout the nursing home stay could provide valuable information about the course of symptoms and could inform improvements in processes of care. Furthermore, we restricted our sample to those residents able to answer questions about their pain and thus our results may not be generalizable to residents incapable of self-reporting. Despite this exclusion, our sample is drawn from two years of admissions to all Medicaid- and Medicare-certified nursing home facilities in the United States whereas other recent studies have been limited to community-dwelling older adults, used older datasets that did not have detailed pain and depression measures, or focused on a subset of nursing homes (2).

Conclusions

Many older adults in the U.S. are experiencing some combination of depression, anxiety, and pain when they are admitted to a nursing home. With the aging of the population and the need for long-term care persisting, it is important to improve our understanding of the multimorbidities faced by many of the older adults residing in nursing homes. Advancing knowledge of the complicated relationships between depression, anxiety, and pain is necessary for adequate treatment of these sources of considerable negative health outcomes and diminished quality of life. This is particularly true for nursing home residents as they are often excluded from the clinical trials that provide the evidence base for treatment decisions, despite being at high risk for adverse events associated with pharmacotherapy.

Funding: The work was supported by the National Center for Advancing Translational Sciences, National Institutes of Health under Grant TL1 TR001454; by the National Cancer Institute, National Institutes of Health under Grant R21CA198172; by the National Institute on Aging, National Institutes of Health by Grants R21AG046839 and R21AG056965; and by the National Institute of Nursing Research, National Institutes of Health by Grant R56NR015498 and R01NR0116977.

Conflict of interest: The authors have no conflicts of interest to declare. Dr Hunnicutt now works for a pharmaceutical company but this work was conducted when he was student.

Ethical standard: This study was approved by the University of Massachusetts Medical School Institutional Review Board.

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