

# Characteristics Associated With Behavioral Symptoms Related to Dementia in Long-Term Care Residents

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This article describes care for behavioral symptoms related to dementia (BSRD) and identifies their potential correlates among 347 residents with dementia living in 45 assisted living facilities and nursing homes from four states. The prevalence of BSRD was associated with staff training and resident cognition, mood, mobility, and psychotropic use. Attention to staff training and depression management might improve BSRD.

**Key Words:** *Agitation, Assisted Living, Residential Care, Nursing Homes*

Behavioral symptoms related to dementia (BSRD) are defined as verbal, vocal, or motor activities that are considered to be aggressive, excessive, or lack adherence to social standards. BSRD are prominent factors in the decision to seek long-term residential placement,

can lead to inadequate management of health conditions, and constitute a common stressor resulting in staff burnout and turnover in institutional settings (Cohen-Mansfield, 2001). Depending on the measurement and the setting, the prevalence of BSRD in long-term care, including nursing homes and residential care/assisted living (RC/AL) facilities, varies from 40% to 90% (Brodaty, et al, 2001; Gruber-Baldini, Boustani, Zimmerman, & Sloane, 2004).

BSRD result from an interplay between host (resident), agent (caregiver), and environmental (setting) factors (Cohen-Mansfield, 2001). The majority of studies have evaluated only host characteristics and identified increased age, being male, functional impairment, moderate to severe cognitive deficit, greater comorbidity, pain, psychosis, and depressed mood as potential precipitants for BSRD (Brodaty, et al, 2001; Cohen-Mansfield, 2001; Gruber-Baldini et al, 2004). Evidence for caregiver and environmental factors is scattered (Roth, Stevens, Burgio, & Burgio, 2002; Sloane, Mitchell, Preisser, et al., 1998). This study begins to shed light on the relationship of caregiver and environmental factors to BSRD. We first describe the provision of care for behavioral symptoms for RC/AL and nursing home residents with dementia, such as care-provider assessment and management of symptoms. Second, we identify potential environmental and caregiver characteristics that play a role in BSRD, independent of the resident's cognitive and functional status.

## Methods

### Sample

The Dementia Care project randomly selected 421 residents 65 years or older who had a diagnosis of dementia and were living in a sample of 35 RC/AL facilities and 10 nursing home in Florida, Maryland, New Jersey, and North Carolina; of these, 347 had

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a measurement of their BSRD and were included in these analyses. There were no significant differences in cognition between the residents with and without an assessment of BSRD. Details about the Dementia Care project and data collection procedures can be found elsewhere (Zimmerman, Sloane, Heck, Maslow, & Schulz, 2005, this issue).

## Measures

The Dementia Care project assessed BSRD with the short form of the Cohen-Mansfield Agitation Inventory (CMAI), which has adequate validity and reliability (Cohen-Mansfield, 1995). The 14-item CMAI identifies the frequency (on a 5-point scale) of behavior symptoms during the previous 2 weeks based on interviews with the supervisor familiar with the resident. The CMAI includes three subtypes of behaviors: aggressive (4 items), physically nonaggressive (5 items), and verbal (5 items). A frequency of at least once a week on any of the 14 items was used to indicate the presence of behavioral symptoms. The CMAI is one of the most commonly used instruments to measure BSRD in epidemiological studies.

**BSRD care provision.**—For each resident, the supervisor also reported whether BSRD were perceived to be currently present (her or his own perception of a moderate level of BSRD), how BSRD were assessed and treated, and, if detected, how successful treatment was considered to be.

Resident demographics (age, gender, race, and presence of 11 comorbid medical conditions) and facility information (facility type, size, and profit status) were collected through interviews with the supervisor and the administrator. Cognitive status was based on the Mini-Mental State Examination (MMSE) via interviews with the resident (Folstein, Folstein, & McHugh, 1975) or the Minimum Data Set Cognition Scale (MDS-COGS) via interviews with the supervisor (Hartmaier, Sloane, Guess, & Koch, 1994), if the MMSE was unavailable ( $N = 51$ ). MMSE cutpoints for mild, moderate, severe, and very severe were  $\geq 18$ , 11–17, 3–10, and 0–2; respective MDS-COGS cutpoints were 0–1, 2–3, 5–8, and 9–10. Depression, functional status, and pain were assessed by interviews with the supervisor using the Cornell Scale for Depression in Dementia (CSD-D; Alexopoulos, 1988), the Minimum Data Set Activity of Daily Living scale (MDS-ADL; Morris, Fries, & Morris, 1999), and the Philadelphia Geriatric Center Pain Intensity Scale (Parmelee, 1994). Care providers assessed activity involvement with the Albert Patient Activity scale (Albert et al., 1996). Mobility and food and fluid intake were measured via direct observation (Williams et al., 2005, this issue) and the Structured Meal Observation (Reed, Zimmerman, Sloane, Williams, & Boustani, 2005, this issue). Medication use (all regular prescription and nonprescription medications administered at least 4 of the past 7 days) was recorded from residents' medication records and coded using American Hospital Formulary Service system criteria (McEvoy, 2001). Medications included

neuroleptics, antidepressants, hypnotics, and cholinesterase inhibitors (ChEIs). Care provider characteristics, including dementia-sensitive attitudes toward residents, work stress, and satisfaction working with this population were assessed by interviews with the care provider using the Approaches to Dementia Care scale (Lintern, Woods, & Phair, 2000), the Work Stressors Inventory (Schaefer & Moos, 1996) and the Staff Satisfaction scale (Åström, Nilsson, Norberg, & Winblad, 1990). The physical environment was assessed using the Special Care Unit Environmental Quality Scale (SCUEQS) and the Assisted Living Environmental Quality Scale (ALEQS; Sloane et al., 2002).

## Analyses

We computed simple descriptive statistics separately for RC/AL and nursing homes. We did statistical comparison of these characteristics based on score statistic  $p$  values from generalized estimating equations (GEE; Diggle, Heagerty, Liang, & Zeger, 2002) applied to linear or logistic models and an exchangeable correlation structure, with facilities specified as clusters. Similarly, we computed descriptive statistics for those for whom the supervisor reported BSRD compared to those with no BSRD. We estimated odds ratios and 95% confidence intervals using separate binary logistic regression models for each characteristic, controlling for clustering using GEE empirical standard error estimates and exchangeable correlation. We estimated adjusted odds ratios, controlling for resident age in years, gender, non-White race, cognitive impairment, comorbidity, and functional status. Finally, to ensure that the factors associated with supervisor report of BSRD did not differ between nursing homes and RC/AL facilities, we tested a setting-by-characteristic interaction term in each multivariable logistic regression model.

## Results

**Caring for Residents With BSRD in Long-Term Care.**—The mean age of the study subjects was 84.5 ( $SD = 7.1$ ); 18% were male, 10% were non-White, and the majority were severely cognitively impaired (14% had mild, 26% had moderate, 24% had severe, and 37% had very severe cognitive deficit). As shown in Table 1, using supervisor ratings of 1 or more BSRD occurring at least weekly within the past 2 weeks (based on the CMAI), 56% of RC/AL residents and 66% of those living in nursing homes had BSRD. We obtained a similar prevalence when supervisors were asked their perception as to whether residents had BSRD in the past 2 weeks. A majority of residents in both settings had been assessed for BSRD in the last year. However, over the past year, a physician, nurse, or a mental health professional treated 49% of RC/AL residents for BSRD, compared to 71% of those in nursing homes ( $p = .014$ ). Among all residents, 19% to 36% were receiving at least one neuroleptic, antidepressant, or hypnotic, with no statistical differences between settings. A higher

percentage of RC/AL residents received ChEIs than those residing in nursing homes (35% vs 19%,  $p = .015$ ). Finally, two thirds of both RC/AL and nursing home residents with BSRD were considered by the facility supervisors to have successfully managed BSRD.

The reported training for BSRD detection and management was high in both RC/AL and nursing homes, and supervisors and care providers in both settings perceived themselves as being well trained in assessing and treating BSRD. Care provider attitudes toward caring for dementia residents and satisfaction did not differ between nursing home and RC/AL settings, although care provider stress was higher in nursing homes than in RC/AL ( $p = .047$ ). Finally, there was a difference between the environments of the two settings as measured by the SCUEQS and ALEQS, with RC/AL scoring higher.

*Characteristics Associated With BSRD in Long-Term Care.*—As shown in Table 2, BSRD were more common among those with more cognitive impairment and with depression but less common among immobile residents; also, BSRD were associated with pain in nursing homes only. The odds of having BSRD did not differ by facility type, size, or ownership but were higher when residents were assessed by professionals or with standardized measures and were being treated for BSRD. Examining the relationship between staff training and BSRD, residents living in facilities with a higher percentage of supervisors trained in treating and managing BSRD were less likely to display BSRD (OR 0.28; 95% CI 0.15–0.53), but the odds of having BSRD were significantly elevated for residents whose most involved staff felt adequately trained to assess BSRD (OR 2.63; 95% CI 1.14, 6.04). Finally, in evaluating the care provider characteristics that might impact BSRD, our study found that staff sensitive attitudes toward dementia care (Lintern Approaches to Dementia Care scale), staff work stress (Schaefer Work Stressors Inventory), and staff satisfaction (Åström Satisfaction scale) were not related to the prevalence of BSRD.

## Discussion

Despite high reporting of assessment, management, and training, BSRD are still very common (56% to 66%) among long-term care residents with dementia, with similar percentages of residents using neuroleptics, antidepressants, and hypnotic in nursing homes and RC/AL facilities. Some interesting differences between nursing homes and RC/AL facilities were the greater use of ChEIs (the current standard of care for Alzheimer's disease pharmacological treatment) in RC/AL facilities and the higher use of professional services to manage BSRD in nursing homes. These variations might be expected, as the percentage of residents with mild to moderate dementia (the indicated stage for drug treatment and the stage with less BSRD) is higher in RC/AL facilities (Gruber-Baldini

**Table 1. Prevalence of Behavioral Symptoms and Relevant Components of Care in Dementia Care Study Sample, by Setting**

Variable	RC/AL ( $n = 238$ ) % or $M$ ( $SD$ )	NH ( $n = 109$ ) % or $M$ ( $SD$ )	$p$
Prevalence of BSRD			
Residents with BSRD	56.3%	66.1%	.133
Assessment of BSRD			
Professional	59.4%	73.3%	.436
Written or standardized	43.4%	59%	.083
Perceived presence, current	57.4%	66.4%	.215
Treatment of BSRD			
Professional	48.6%	71.3%	.014
Informal	60.2%	72.2%	.155
Receiving neuroleptics	36%	35.5%	.898
Receiving antidepressant	36.4%	42.1%	.353
Receiving hypnotics	21.8%	18.7%	.626
Receiving Cholinesterase inhibitors	35.1%	18.7%	.015
Perceived success (if perceived agitated)	64.5%	64.9%	.437
Training to detect and treat BSRD <sup>a</sup>			
Supervisory staff			
None in facility	4.4%	0%	.724
Some in facility	19.3%	31.2%	
Most in facility ( $\geq 75\%$ )	76.3%	68.8%	
Direct care providers			
None in facility	7.5%	0%	.392
Some in facility	16.2%	19.3%	
Most in facility ( $\geq 75\%$ )	76.3%	80.7%	
Staff feels adequately trained to assess	96.6%	88.1%	.558
Staff feels adequately trained to treat	94.5%	82.6%	.124
Staff approach to dementia care	75 (6.9)	75.6 (6.4)	.413
Staff work stress	1.7 (0.4)	2.0 (0.7)	.047
Staff satisfaction	63.1 (9.9)	60.8 (10.8)	.453
Environment			
SCUEQS	25.2 (5.0)	20.5 (2.9)	.002
ALEQS	13.7 (4.1)	10.9 (2.3)	.034

*Notes:* RC/AL = residential care/assisted living; NH = nursing home; BSRD = behavioral symptoms related to dementia; SCUEQS = Special Care Unit Environment Quality Scale; ALEQS = Assisted Living Environmental Quality Scale. For the table, behavioral symptoms are assessed by supervisor report on the Cohen Mansfield Agitation Inventory and refer to one or more behaviors that occurred at least weekly.  $P$  values are based on score statistics and are adjusted for facility-level clustering by general estimating equations (exchangeable correlation matrix). Except as noted for training, all data are resident level, are of those residents for whom outcome data are available, and are from supervisor report. Due to missing data,  $n$  varies from 219 to 238 (RC/AL) and 105 to 109 (NH), except in the case of perceived success of treatment, which is relevant only for those with BSRD and for whom there are data for 197 (83%) and 97 (89%) RC/AL and NH subjects, respectively.

<sup>a</sup>Data regarding supervisory staff training and direct care provider training are facility level and reported by administrators. Staff feelings of training adequacy are reported by the one supervisor (or direct care provider, if supervisor data are missing) who is most involved in the resident's care; adequately is quite or extremely well trained.

et al, 2004). However, after adjusting for resident characteristics (age, gender, race, cognition, comorbid-

Table 2. Characteristics Associated With Behavioral Symptoms, Unadjusted and Adjusted

Characteristic	Distribution of Characteristic as % or <i>M (SD)</i>		Relationship Between Characteristic and Presence of BSRD	
	No BSRD	BSRD	Unadjusted	
			OR (95% CI)	Adjusted <sup>a</sup> OR (95% CI)
<b>Resident<sup>b</sup></b>				
Cognitive status				
Mildly impaired	24.6%	4.7%	1.0	1.0
Moderately impaired	26.8%	25.8%	5.17 (2–13.39)	5.46 (2.08–14.29)
Severely impaired	25.4%	23.7%	4.89 (2.02–11.83)	5.04 (2.07–12.28)
Very severely impaired	23.2%	45.8%	9.46 (3.44–26)	8.9 (3.07–25.84)
Depressed	8.7%	33.7%	4.99 (2.62–9.49)	4.57 (2.31–9.06)
Low activity	41.5%	49.7%	1.67 (1.11–2.52)	1.34 (0.83–2.18)
High pain <sup>c</sup>				
NH	32%	19%	0.40 (0.19–0.84)	0.39 (0.19–0.76)
RC/AL	13%	24%	1.86 (0.79–4.37)	2.14 (0.80–5.75)
Immobile	17.1%	8.8%	0.57 (0.32–1.01)	0.46 (0.24–0.91)
Low food consumption	48.9%	55.4%	1.24 (0.75–2.08)	1.25 (0.71–2.2)
Low fluid consumption	46.6%	2.2%	1.07 (0.67–1.71)	1.01 (0.62–1.64)
<b>Facility</b>				
Facility type				
NH		37%	1.0	1.0
RC/AL, < 16 beds	26.8%	12.6%	0.56 (0.23–1.36)	0.79 (0.29–2.17)
RC/AL, traditional	26.1%	21.1%	0.57 (0.26–1.25)	0.85 (0.34–2.11)
RC/AL, new model	31.2%	29.5%	0.58 (0.22–1.54)	0.63 (0.21–1.91)
Facility bed size (OR is per 10 beds)	88.8 (56.5)	82.1 (51.2)	0.99 (0.93–1.06)	0.97 (0.90–1.04)
For-profit ownership	69.6%	72.6%	1.28 (0.64–2.55)	1.43 (0.69–2.90)
<b>Assessment of BSRD</b>				
Professional	59.9%	69.7%	1.79 (1.12–2.86)	1.82 (1.08–3.06)
Written or standardized	41.9%	53.5%	1.80 (1.07–3.03)	2.06 (1.16–3.66)
Perceived presence, current	39.0%	73.2%	4.11 (2.66–6.36)	3.45 (2.08–5.72)
<b>Treatment of BSRD</b>				
Professional	38.0%	69.3%	3.77 (2.26–6.29)	3.7 (2.05–6.66)
Informal	51.1%	73%	2.48 (1.59–3.86)	2.64 (1.62–4.3)
Residents receiving neuroleptics	27.1%	42.8%	2.11 (1.3–3.37)	2.19 (1.29–3.71)
Residents receiving antidepressant	39.1%	37.2%	0.86 (0.51–1.45)	0.83 (0.47–1.48)
Residents receiving hypnotics	15.8%	26.1%	1.67 (0.95–2.94)	1.91 (1.02–3.57)
Residents receiving ChEIs	28.6%	32.8%	1.23 (0.79–1.9)	1.55 (1.03–2.34)
Perceived success (at least quite a bit; if perceived agitated)	59.2%	73%	1.89 (1.22–2.92)	1.87 (1.10–3.16)

Table 2. (Continued)

Characteristic	Distribution of Characteristic as % or <i>M</i> ( <i>SD</i> )			Relationship Between Characteristic and Presence of BSRD	
	No BSRD	BSRD		Unadjusted	Adjusted <sup>a</sup>
				OR (95% CI)	OR (95% CI)
Training to detect and treat BSRD <sup>d</sup>					
Supervisory staff (most in facility; $\geq 75\%$ )	86.2%	65.3%		0.33 (0.17–0.64)	0.28 (0.15–0.53)
Direct care providers (most in facility; $\geq 75\%$ )	81.2%	74.7%		0.77 (0.36–1.66)	0.63 (0.30–1.31)
Staff feels adequately trained to assess	91.3%	96.3%		2.77 (1.38–5.54)	2.63 (1.14–6.04)
Staff feels adequately trained to treat	93.5%	88.9%		0.55 (0.23–1.36)	0.43 (0.16–1.13)
Staff approach to dementia care	75 (6.3)	76.1 (6.8)		1.01 (0.96–1.06)	1.02 (0.97–1.07)
Staff work stress	1.8 (0.6)	1.8 (0.5)		0.90 (0.64–1.25)	0.83 (0.58–1.17)
Staff satisfaction	62 (10.6)	63.3 (10)		1.01 (0.98–1.01)	1.01 (0.99–1.01)
Facility physical environment characteristics					
SCUEQS	24.2 (5.1)	23.6 (4.9)		0.95 (0.89–1.01)	0.98 (0.91–1.06)
ALEQS	13.3 (4.3)	12.5 (3.6)		0.93 (0.87–0.99)	0.95 (0.90–1.01)

Notes: BSRD = behavioral symptoms related to dementia; RC/AL = residential care/assisted living; NH = nursing home; SCUEQS = Special Care Unit Environmental Quality Scale; ALEQS = Assisted Living Environmental Quality Scale. For the table,  $N = 328$ . Behavioral symptoms are assessed by supervisor report on the Cohen-Mansfield Agitation Inventory. Except as noted for training, all data are resident level, are of those residents for whom outcome data and supervisor data (required for adjustment) are available, and are from supervisor report. Due to missing data,  $n$  varies from 291 to 347, except in the case of perceived success of treatment, which is relevant only for those with agitation and for whom there are data for 294 (85%) of subjects.

<sup>a</sup>Adjusted for male gender, non-White race, age, cognitive status, number of number of 11 comorbidities (congestive heart failure; high blood pressure or hypertension; myocardial infarction, heart attack, angina, arrhythmias, or other heart problem; diabetes; kidney disease or renal insufficiency; arthritis, rheumatism, degenerative joint disease, lupus, erythematosis, or scleroderma; fractured bones or osteoporosis; cerebrovascular disease, stroke, TIA, or CVA; hemiplegia or paraplegia; asthma, emphysema, bronchitis, or COPD; schizophrenia, manic-depressive disorder, or mental retardation), and impairments in seven activities in daily living (bed mobility, transfer, locomotion, dressing, eating, toilet use, hygiene).

<sup>b</sup>Cognitive status is based on Mini-Mental State Examination (MMSE) or Minimum Data Set-Cognition Scale (MDS-COGS) scores if the MMSE is missing ( $n = 51$ ). MMSE cutpoints for mild, moderate, severe, and very severe are  $\geq 18$ , 11–17, 3–10, 0–2; respective MDS-COGS cutpoints are 0–1, 2–3, 5–8, 9–10. Depression:  $\geq 7$  points on the Cornell Scale for Depression in Dementia; pain:  $\geq 2$  points on the Philadelphia Geriatric Center Pain Intensity Scale; activity participation—low:  $< 9$  (median) on the Albert Quality of Life Scale; mobility—moderate-high limitation: on feet during less than 25% of observation over 3 hours and/or demonstrating a position or location change at least once but less than 10% of consecutive observations (moderate impairment) or never being on feet and not changing position or location across any 2 consecutive observation periods (high impairment); food/fluid consumption—low: ate  $\leq 8$  ounces on the Structured Meal Observation. BSRD, depression, and pain are from supervisor report, activity is from care provider report, and immobility and consumption are based on direct observation.

<sup>c</sup>There was an effect modification for the type of long-term care facility (NH vs RC/AL facility) on the association between agitation and pain. Thus, we are reporting the OR separately for the facility type ( $p$  for interaction was .019).

<sup>d</sup>Data regarding supervisory staff training and direct care provider training (first two variables) are facility level and reported by administrators. Staff feelings of training adequacy are reported by the one supervisor (or direct care provider if supervisor data are missing) who is most involved in the resident's care; adequately is quite or extremely well trained.

ity, and function), these differences remained significant ( $p < .05$ ). Detected differences in the care for BSRD between nursing homes and RC/AL need to be interpreted with caution, though, because facilities were not representative of all nursing home and RC/AL facilities, nor was the sample size adequate to detect small differences between facility types.

Not surprisingly, residents with BSRD were more likely to have had formal assessment and management of BSRD and to be perceived by staff to have more BSRD; that is, treatment was a likely response to their BSRD. However, despite recognition and treatment, current management methods are insufficient in responding to the need of dementia residents with BSRD. We found no association between BSRD and facility characteristics such as type, size, ownership, and physical environment. Although residents in facilities in which more supervisory staff were trained to detect and treat BSRD were less likely to display BSRD, we found no association between BSRD and direct care provider approaches to dementia care, work stress, and satisfaction. Further, individual staff members who felt adequately trained to assess BSRD were more likely to report BSRD in their residents, which may reflect their enhanced ability to recognize these symptoms. While power may have been insufficient to detect weak associations between BSRD and care provider (and environmental) factors, the impact of these factors is clearly minimal in the presence of cognitive deficit, depressed mood, and immobility.

One caveat to the findings reported herein is that they are limited by their cross-sectional nature. Also, they relied on caregiver ratings. However, while such measures are subjective, this type of rating may be more valid than observation because it captures rare but clinically relevant BSRD (Cohen-Mansfield, 1995).

In conclusion, long-term care facilities, including nursing homes and RC/AL, are working to meet the needs of residents with BSRD. Based on our findings of the association between BSRD and two modifiable factors (resident depression and staff training), developing a program that includes depression detection and management, as well as staff training in BSRD management, may be a valuable next step to improve the care of long-term care residents with BSRD.

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