

Psychosis, depression and behavioural disturbances in Sydney nursing home residents: prevalence and predictors

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SUMMARY

Background There is wide variation in the rates of behavioural and psychological symptoms of dementia (BPSD) reported in nursing homes.

Aims This study aimed to investigate: (1) the prevalence of BPSD in nursing home residents using the BEHAVE-AD; (2) the relationships of BPSD with (a) demographic, (b) dementia, (c) diurnal and (d) nursing home variables; and (3) the inter-relationships between different types of BPSD, as measured by subscales of the BEHAVE-AD.

Results Over 90% of residents exhibited at least one behavioural disturbance. Specifically, there was evidence of psychosis in 60%, depressed mood in 42% and activity disturbances or aggression in 82% of residents. Younger, more functionally impaired residents with a chart diagnosis of psychosis had higher BPSD rates, as did those residing in larger nursing homes. Individual BPSD were significantly intercorrelated.

Conclusions BPSD are ubiquitous in nursing home residents. Behavioural disturbances are frequently associated with psychosis and/or depression. The findings suggest the need for psychogeriatric services to nursing homes and smaller facilities. Copyright © 2001 John Wiley & Sons, Ltd.

KEY WORDS — psychosis; depression; behavioural disturbances; dementia; nursing home

INTRODUCTION

Behavioural and psychological symptoms of dementia (BPSD) is a term designed to encompass many

of the non-cognitive manifestations of dementia (Finkel, 1998). Behavioural symptoms include physical and verbal aggression, wandering, agitation, sexual disinhibition and screaming, whilst psychological symptoms include depression, anxiety, delusions and hallucinations. BPSD can cause distress and reduce the quality of life of persons with dementia and their caregivers and result in earlier institutionalization (Swearer, 1994).

Between 60 and 90% of people with dementia will experience BPSD at some time during the course of their illness (Tariot and Blazina, 1994). However, there is considerable variation in reported prevalence

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rates. The prevalence of BPSD in nursing home patients is higher than in community-dwelling patients, perhaps reflecting the association of BPSD with dementia severity and with nursing home entry (Steele *et al.*, 1990). The prevalence of BPSD in nursing homes has been found to vary between 43 and 93% in the USA (Beck and Shue, 1994), and between 29 and 67% in Australia (Rosewarne *et al.*, 1996; Snowdon *et al.*, 1996a).

The reported ranges of prevalences of individual behaviours in nursing home residents has been broad: 4–24% wandering, 8–25% verbally aggressive, 8–33% actively aggressive, 11% resistive to care, 12–33% restless, 18–75% depressed, 12–100% delusional and 13–34% hallucinating (Zimmer *et al.*, 1984; Rovner *et al.*, 1986, 1991; Ames, 1993; Colenda, 1995; Rosewarne *et al.*, 1996; Butler *et al.*, 1998; Snowdon *et al.*, 1996a,b).

Our aim was to determine the prevalence of BPSD using accurate, reliable, valid, focused and sensitive methods of assessment (Zaudig, 1996). The variability in the estimates reported above may stem from the use of non-standardized instruments or from sampling biases inherent in the choice of nursing homes sampled (e.g. Rabins *et al.*, 1987; Snowdon *et al.*, 1996a). We sought to address these shortcomings using the standardized and validated Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD; Reisberg *et al.*, 1987), an instrument recommended for use when examining the frequency of psychotic symptoms and behaviour disturbances in dementia (Zaudig, 1996). BEHAVE-AD subscales and total score have previously been used in the measurement of behavioural disturbance in institutionalized patients (Katz *et al.*, 1999).

Secondly, we wished to examine which factors might predict BPSD in nursing home residents. Previous reports have associated BPSD with cognitive impairment (Rosewarne *et al.*, 1996), physical dependence (Morriss *et al.*, 1995; Brandt *et al.*, 1998), intrusion by nursing home staff or other residents (Bridges-Parlet *et al.*, 1994), day/night disturbance (Tsai *et al.*, 1996; Koss *et al.*, 1997; Kloszewska, 1998) and loss of autonomy (Morriss *et al.*, 1995). There are also associations between behavioural disturbances, depression and psychotic symptoms (Deutsch *et al.*, 1991; Levy *et al.*, 1996; Kunik *et al.*, 1999).

Thirdly, we were interested in the effect of time of day upon BPSD. 'Sundowning', the increased confusion and agitation occurring in the late afternoon, has been found in about one-third of nursing home residents (Devanand *et al.*, 1992). Fourthly, we were cur-

ious about the variability of BPSD across nursing homes and specifically as to whether this was linked to nursing home size. Finally, we wished to study whether different BPSDs were associated.

METHOD

A survey of 11 eastern Sydney nursing homes was undertaken during 1996–97 as part of a study of the treatment of depression and psychosis in persons with dementia who had been residing in that nursing home for at least 1 month. Of the 25 nursing homes in the area, three refused to participate. The reason given was that the survey coincided with the Commonwealth introduction of a new resident classification scheme and the directors decided that to attempt both at once would be too difficult. Eleven of the remaining 22 nursing homes, or a one-in-two sample, were chosen on the basis of size and geography, i.e. they reflected the range of small (< 60 beds), medium (60–90 beds) and large (> 90 beds) homes and were geographically dispersed over the eastern suburbs of Sydney. The Directors of Nursing and proprietors of the participating nursing homes gave their permission for the involvement of their facility in the project. Approvals were obtained from the Ethics Committees of the South-Eastern Sydney Area Health Service and the University of New South Wales. The entire population of 647 residents was screened by use of case record audit and observer rating scales.

Instruments

BEHAVE-AD (Reisberg *et al.*, 1987). This is a 26-item observer rating scale containing seven subscales, each rated 0–3: (A) paranoid and delusional ideation, (B) hallucinations, (C) activity disturbances, (D) aggressiveness, (E) diurnal rhythm disturbance, (F) affective disturbance and (G) anxiety and phobias. The paranoid and delusional ideation and hallucinations subscales were summed to produce a total psychosis score. Items 2 ('one's house is not one's home') and 4 ('delusion of abandonment') in the paranoid and delusional ideation subscale were not included in the analyses as affirmation of these items was often true. The activity disturbance and aggressiveness subscales were summed to produce a behavioural disturbance score. The behaviour of each subject over the previous 2 weeks was rated separately by morning shift and evening shift nursing staff. Residents were classified as positive on any of the BEHAVE-AD subscales if either morning or evening

raters gave them a score of ≥ 1 on any of their component items except for the hallucinations subscale. We determined that a score of ≥ 2 was necessary for a positive rating on hallucination items as scores of 1 on these items indicate 'vague; not clearly defined' hallucinations. Additionally, as tearfulness may reflect lability rather than true depression, item 21 was examined on its own as it refers specifically to the presence of depressed mood. Levels of BPSD were determined by taking the mean of morning and evening raters' scores for each subscale, item 21 and total score.

Resident Classification Index (RCI) (Commonwealth Department of Health, Housing and Community Services, 1992). This 14-item scale, designed to determine the level of federal government funding for nursing home residents, was used to measure the general functioning and needs of the subject. It has four subscales—clinical care, social and emotional support, communication and sensory processes, and activities of daily living. Each item is rated on a four-point scale. Information was obtained from nursing home staff and the subject's nursing home record. The scores were then weighted, summed and categorized according to the Commonwealth Department of Health, Housing and Community Services formula. RCI category 5 residents receive the least government assistance whilst RCI category 1 residents receive the most.

FAST (Reisberg, 1988). This is a seven-stage observer rating scale measuring dependency. Stages 6 and 7 are further subdivided into substages, a–e. These were scored as 6.2, 6.4, 6.6, etc., as advised by B. Reisberg (personal communication, 1998).

Chart diagnoses. Chart diagnoses of dementia, depression and psychotic disorders recorded in nursing home files were noted.

Abbreviated Mental Test Scale (AMTS) (Hodkinson, 1972). Cognitive status was assessed in consenting residents with the AMTS, a 10-item cognitive screening test administered by the research psychologist or research nurse. Residents who were too aphasic, too severely impaired to test or who did not comprehend English were not tested. Scores of ≤ 7 indicate the presence of significant cognitive impairment. The AMTS has been found to have a sensitivity of 81% in a sample of patients in acute geriatric wards (Jitapunkul *et al.*, 1991).

Statistics

Data were analysed using the SPSS statistical package (Norussis, 1993). Residents with a chart diagnosis of dementia or who were cognitively impaired according to the AMTS criteria were deemed demented and included as subjects in this analysis. Categorical variables were analysed using χ^2 analysis (with Yates' continuity correction for all 2×2 analyses). Where possible, skewed test scores were transformed by $\log(1 + \text{variable})$ or $\sqrt{(1 + \text{variable})}$. Scores that remained skewed after transformation were analysed using both parametric and non-parametric methods and no difference in either the results or pattern of the analyses was found. The statistical significance of κ was reported. α was set at 0.05 except where Bonferroni corrections were used to control for multiple comparisons. The recommended level of significance for multiple *t*-tests is 0.0045. All comparisons were two-tailed.

Stepwise logistic regression models were used to test predictors of rates of behaviours. Stepwise linear regression models were used to test predictors of levels of behaviours. In all multivariate models, independent variables entered were age, gender, FAST scores, chart diagnosis of depression and psychosis and RCI scores. Only variables retained in multivariate models are reported. Multiple logistic and linear regression models were used to test the influence of nursing home size on rates and levels of BPSD, respectively. Age, gender, FAST scores, chart diagnosis of depression and psychosis and RCI scores were entered into the regression in the first block to control for their effects. Nursing home size was entered into the second block.

RESULTS

The sample: demography and severity

Nursing home records for 647 residents were checked although some data sets were incomplete. The mean age of the residents was 82.3 years (range 24–111 years; median 84 years) and 45.7% of residents were aged 80–89 years. One hundred and seventy-six (27.2%) residents were male and 471 (72.8%) female; 544 (93.5%) of the residents were fluent in English. Twenty-nine (4.6%) residents fell into RCI category 1, 232 (36.7%) into RCI category 2, 220 (34.8%) into RCI category 3, 125 (19.8%) into RCI category 4 and 26 (4.1%) into RCI category 5.

Five hundred and five subjects (78.1%) had either a diagnosis of dementia or an AMTS score of ≤ 7 and

Table 1. Mean and percentage classified as positive on BEHAVE-AD subscale and total scores

BEHAVE-AD subscale or item	Mean score (SD)			% positive		
	a.m.	p.m.	a.m./p.m.	a.m.	p.m.	a.m. and/or p.m.
A Delusions	1.60	1.75	1.68 (2.33)	4.21	43.0	54.3
B Hallucinations	0.76	1.35*	1.06 (1.84)	16.8	25.0	32.7
A and B Psychosis	2.36	3.09*	2.74 (3.76)	44.7	47.3	60.1
C Activity disturbance	0.90	1.05*	0.97 (1.43)	41.3	42.9	52.9
D Aggression	2.21	2.07	2.14 (2.14)	62.6	63.4	76.5
C and D Behavioural disturbance	3.11	3.12	3.11 (3.11)	70.0	70.1	82.2
E Diurnal disturbance	0.30	0.51*	0.41 (0.58)	20.0	39.2	46.7
F Affective disturbance	0.79	0.78	0.79 (0.98)	42.3	43.7	60.2
Q21 Depressed mood	0.36	0.35	0.36 (0.48)	29.4	31.5	44.1
G Anxiety and phobias	1.31	1.50	1.41 (1.65)	48.8	53.5	69.0
BEHAVE-AD total	7.86	9.02	8.47 (8.04)	83.0	81.7	92.2

*Evening score significantly greater than morning score ($p < 0.0045$).

were included as subjects in subsequent analyses. Four hundred and eighty-four (73.9%) residents had a chart diagnosis of dementia. Of the 333 residents tested using the AMTS, 312 (93.7%) were found to be cognitively impaired. Twenty subjects (4.13%) with chart diagnoses of dementia did not score in the cognitively impaired range on the AMTS. The mean age of the subgroup of residents with dementia so defined was 83.4 years (range 33–111 years; median 85 years). Three hundred and seventy-four (74.1%) were female. Twenty-four (4.9%) subjects fell into RCI category 1, 179 (36.3%) into RCI category 2, 174 (35.3%) into RCI category 3, 94 (19.1%) into RCI category 4 and 22 (4.5%) into RCI category 5.

Prevalence of BPSD

Residents were most frequently classified by either morning or evening raters as positive on behavioural disturbance (82.2%); 76.5% were positive on aggression and 52.9% on activity disturbance (see Table 1). More than half of the residents (60.1%) were classified as psychotic, with 56.0% positive for delusions and 32.8% positive for hallucinations. More than half of the residents were also over the threshold on the affective disturbances subscale (60.2%), with 44.1% positive on item 21, depressed mood. Most residents (92.2%) were classified as positive on at least one BEHAVE-AD subscale. Reports of hallucinations, psychosis, activity disturbance and diurnal disturbance were significantly more frequent and prominent by evening raters. Levels of other BEHAVE-AD subscales were similar in the morning and evening.

Of those 141 residents who were not classified as demented, 85.5% were rated as positive for BPSD on at least one BEHAVE-AD subscale. Similar to the demented residents they were most frequently rated as positive on behavioural disturbance (71.9%); 51.4% were positive for affective disturbance but only 36.0% were positive for psychosis.

Agreements between morning and evening positive raters on hallucinations, diurnal disturbance, affective disturbance and depressed mood were weak ($\kappa = 0.280, 0.200, 0.296$ and 0.348 , respectively). Agreements between the two raters on delusions, psychosis, activity disturbance, aggression and behavioural disturbance were moderate ($\kappa = 0.443, 0.424, 0.556, 0.414$ and 0.417 , respectively).

Predictors of BPSD

Predictors of rates and levels of delusions, hallucinations and psychosis are reported in Table 2. Only the 403 (79.8%) demented subjects for whom there were complete data sets were included in these analyses. Younger age was a significant predictor of rates and levels of aggressiveness, behavioural disturbance and total BEHAVE-AD score and of levels of activity disturbance. Male gender was a significant predictor of rates of behavioural disturbance and depressed mood. Greater functional incapacity, as measured by FAST, predicted rates and levels of aggressiveness and behavioural disturbance and rates of delusions, anxiety and phobias and total BEHAVE-AD score. Chart diagnosis of depression predicted rates and levels of depressed mood and affective disturbance. Chart diagnosis of psychosis predicted rates and levels of hallucinations and psychosis and levels of

Table 2. β Coefficients for multiple linear regressions predictors of levels of BEHAVE-AD subscales and odds ratios for logistic regression significant predictors of positive classification on subscales

BEHAVE-AD subscale or item		Age	Gender*	FAST	Depression diagnosis	Psychosis diagnosis [†]	RCI score
Delusions	rates			0.070**			
	levels					0.141 [‡]	
Hallucinations	rates					3.89 [#]	1.06 [#]
	levels					0.266 [#]	0.179 [#]
Psychosis	rates					2.33**	
	levels					0.201 [#]	0.140 [‡]
Activity Disturbance	rates						
	levels	-0.110**					
Aggressiveness	rates	0.96 [#]		0.42 [#]			1.08 [#]
	levels	-0.147 [#]		-0.196 [#]			0.277 [#]
Behavioural disturbance	rates	0.96 [#]	0.044**	0.24 [#]			1.20 [#]
	levels	-0.154 [‡]		-0.135**			0.232 [#]
Affective disturbance	rates				2.41 [#]		
	levels				0.150 [#]		
Depressed mood	rates		0.62**		3.50 [#]		
	levels				-0.209 [#]		
Anxiety and phobias	rates			0.43 [#]			1.04*
	levels						
BEHAVE-AD total	rates	0.93 [‡]		0.14 [#]			
	levels	-0.110**				0.119**	0.156 [‡]

*Male = 0, female = 1; [†]yes = 1, no = 2; **significant at the 0.05 level; [‡]significant at the 0.01 level; [#]significant at the 0.001 level.

delusions and total BEHAVE-AD score. Greater dependency, as measured by RCI, predicted rates and levels of hallucinations, aggressiveness and behavioural disturbance, rates of anxiety and phobias, and levels of psychosis and total BEHAVE-AD score.

Differences between nursing homes in rates and levels of BPSD

There was significant variability between nursing homes in proportions of residents rated positive on all BEHAVE-AD subscales and total score (see Table 3). There were also significant differences between nursing homes on levels of BPSD as measured using the BEHAVE-AD subscales and total score, although not for the depressed mood item.

After controlling for the effects of age, gender, FAST score, chart diagnosis of depression and psychosis and RCI score, the number of residents per nursing home was a weak but significant predictor of rates of delusions, hallucinations, psychosis, aggressiveness, behavioural disturbance, mood disturbance, item 21 (depressed mood), anxiety and phobias and total score (odds ratios between 1.02 and 1.03, 95% confidence intervals between 1.00 to 1.06). After con-

trolling for the same variables, the number of residents per nursing home was a significant predictor of levels of delusions, hallucinations, psychosis and BEHAVE-AD total score ($\beta=0.196$, $p < 0.001$; $\beta=0.271$, $p < 0.001$; $\beta=0.254$, $p < 0.001$; $\beta=0.159$, $p < 0.001$; respectively).

BPSD intercorrelations

BEHAVE-AD subscale and total scores were significantly positively correlated (see Table 4). All residents rated positive on psychosis and all residents rated positive on affective disturbance were also rated positive on behavioural disturbance; these represented 65.2% and 65.4%, respectively, of those rated positive on behavioural disturbances. Positive rating on behavioural disturbances was significantly associated with positive rating on psychosis (Pearson $\chi^2=62.12$, $df=1$, $p < 0.001$) and affective disturbances (Pearson $\chi^2=62.65$, $df=1$, $p < 0.001$). Similarly, presence of psychosis was significantly associated with presence of affective disturbances (Pearson $\chi^2=65.67$, $df=1$, $p < 0.001$), with 71.1% of the residents classified as positive on psychosis also rated positive for affective disturbances.

Table 3. Differences between nursing homes on rates and levels on BEHAVE-AD subscales (df=10)

BEHAVE-AD subscale or item	Rates			Levels		
	Range of positive classifications	χ^2	<i>p</i>	Range of mean nursing home scores	<i>F</i>	<i>p</i>
Delusions	25.9–68.9	40.43	0.000	0.68–2.62	6.04	0.000
Hallucinations	7.3–55.1	77.33	0.000	0.19–2.17	9.58	0.000
Psychosis	25.9–72.6	49.29	0.000	1.88–4.63	8.50	0.000
Activity disturbance	29.6–63.0	27.27	0.002	0.38–1.66	3.99	0.000
Aggressiveness	51.9–88.4	39.39	0.000	1.37–3.14	4.46	0.000
Behavioural disturbance	55.6–93.8	40.63	0.000	1.65–4.35	5.21	0.000
Diurnal disturbance	3.7–66.7	43.58	0.000	0.05–0.76	3.89	0.000
Affective disturbance	25.0–66.7	40.13	0.000	0.40–1.43	4.24	0.000
Depressed mood	22.2–62.3	28.27	0.002	0.19–0.49	2.34	0.011
Anxiety and Phobias	21.9–87.5	41.81	0.000	0.45–2.16	7.35	0.000
Total score	59.3–100	52.45	0.000	4.27–10.42	8.84	0.000

Table 4. Intercorrelations for BEHAVE-AD subscales*

	Delusions	Hallucinations	Psychosis	Activity disturbance	Aggressiveness	Behavioural disturbance	Affective disturbance
Hallucinations	0.614						
Psychosis	0.922	0.871					
Activity disturbance	0.492	0.363	0.483				
Aggressiveness	0.644	0.364	0.570	0.500			
Behavioural disturbance	0.669	0.417	0.620	0.804	0.917		
Affective disturbance	0.375	0.250	0.355	0.156	0.370	0.326	
Total score	0.879	0.700	0.889	0.659	0.798	0.852	0.540

*All correlations significant at the 0.001 level.

Population of all nursing home residents

When the above analyses were repeated for all 647 residents, i.e. those both with and without dementia, the results were very similar.

DISCUSSION

Prevalence of BPSD in nursing home residents

In the present study, the point prevalence of BPSD overall was >90% with 80% having behavioural disturbances and over half having psychosis or depression. These results are consistent with some (Beck and Shue, 1994) but higher than other studies (Rosewarne *et al.*, 1996, Snowdon *et al.*, 1996a).

Association of BPSD and demographic, dementia, diurnal and nursing home variables

There is inconsistency in the literature regarding the associations between BPSD, age, gender and level of functioning. Whilst some studies have reported that

older patients experience more psychosis and less depression and agitation (Cooper *et al.*, 1990; Levy *et al.*, 1996), others have found no age differences (Aarsland *et al.*, 1996). We found younger age to be associated with overall BPSD and more specifically with levels of behavioural disturbances. We did not replicate the findings that women are more likely to have multiple symptoms (Levy *et al.*, 1996) or to be significantly more agitated (Levy *et al.*, 1996), nor that men are more physically aggressive (Morriss *et al.*, 1995). Aarsland *et al.* (1996) reported no gender differences. In this study, gender was found to be associated with rates of behavioural disturbance and depressed mood.

Finally, although some previous studies have found no association between level of functioning and aggressive behaviour (Aarsland *et al.*, 1996; Eastley and Wilcock, 1997), the current study found functional impairment to be associated with rates of behavioural disturbances. This finding is in concordance with previous studies where level of functioning was reported to be related to both aggressive behaviour and psychotic symptoms (Kloszewska, 1998; Levy *et al.*, 1996).

We found evidence for a sundowner effect, with evening staff giving higher ratings for hallucinations, psychosis, activity disturbance and diurnal disturbance. These data should be interpreted with caution: while morning and evening nurses were asked to rate behaviours over the previous 2 weeks, we cannot be certain that nurses did not change shifts over this period.

The threefold difference in the prevalence of different BPSD across nursing homes is a major finding that cannot be explained by differences in age or functional impairment across nursing homes. None of these homes had a policy of selective recruitment of disturbed residents, though some may have been more reluctant to accept difficult referrals. In this study, larger size of nursing home was associated with higher rates and levels of BPSD, but even so size only accounted for 3% of the variance in BPSD levels. It may be that other characteristics of the facility may predispose to the development of BPSD. This warrants further study.

Interrelationship between different types of BPSD

We confirmed a striking and significant relationship between aggressive behaviour and psychosis (Kotrla *et al.*, 1995; Aarsland *et al.*, 1996; Cohen-Mansfield *et al.*, 1998; Kloszewska, 1998; Levy *et al.*, 1996), although others have refuted this association (Rosewarne *et al.*, 1996; Marin *et al.*, 1997). The reason for this disparity is unclear, but if aggressiveness and psychosis are associated, there are implications for the management of aggressiveness in nursing homes, specifically in the use of antipsychotics. Similarly, our finding of an association between depression and psychosis as well as between depression and behavioural disturbances, especially aggressiveness, lends support to consideration of antidepressant treatment in this population. Previous examinations of these relationships have been inconsistent (Aarsland *et al.*, 1996; Levy *et al.*, 1996). Overall, there were significant associations between ratings of psychosis, depression and behavioural disturbances.

Limitations

Major limitations to this study are the lack of observational ratings and the reliance on nursing staff for information in order to complete the BEHAVE-AD. Nursing staff vary in their knowledge and responses (Snowdon *et al.*, 1996a) and we did not ascertain the reliability of their ratings. However, we attempted

to survey nursing staff, who were registered nurses where possible, and who had closest daily contact with residents. Whilst the BEHAVE-AD was designed for use in ambulatory care, it has been used in residential care settings previously (Sclan *et al.*, 1996; Katz *et al.*, 1999) and proved suitable in practice. Furthermore, we obtained concurrent validity against independent ratings of the RCI behavioural items 4 (physical aggression), 5 (verbal disruption) and 6 (behaviour not included elsewhere) which were used as a second measure of behavioural disturbance in this study.

We were conservative in our use of different cut-off points for the psychotic phenomena on the BEHAVE-AD. In reality, this made little difference. If the threshold for hallucinations was lowered to a score of 1 on any item, the percentage of psychotic residents only increased by 3.2%. Most of the other more stringent cut-offs lowered the prevalence of psychosis by < 10%.

We consider that the nursing homes surveyed were representative. Of the 25 nursing homes in the eastern suburbs of Sydney, 11 were chosen on the basis of size and geography. The demography of the residents and proportion with a chart diagnosis of dementia (63.1%) were representative of the Australian nursing home population (Commonwealth Department of Health and Family Services, 1997).

Conclusions and implications

BPSD in nursing homes have significant ramifications. Residents may be treated with psychotropic medication, be physically restrained or put into seclusion (Cariaga *et al.*, 1991; Burton *et al.*, 1992). Nursing staff may be vulnerable to increased distress and burnout when regularly exposed to behaviours that make their work more difficult (Berg *et al.*, 1994; Novak and Chappell, 1996). Fellow residents may also be affected: they may be victimized, become distressed and respond with disturbed behaviour themselves (Bridges-Parlet *et al.*, 1994). Finally, nursing home administrators may choose to narrow their admission policy to exclude those with potential problems (Zarit and Whitlatch, 1993).

We conclude that BPSD are extremely common in nursing homes; <10% of nursing home residents with or without dementia are free of all disturbances. This is stressful to all concerned—other residents, staff and visitors. Educational programmes may help in dealing with these problems, though ultimately some residents require special care. It may be that the behavioural disturbances create a positive

feedback loop so that eventually all are caught in the whirlwind, with behavioural disturbances leading to staff stress, poorer management techniques and fewer visitors, leaving residents more isolated and, perhaps, more angry. The frequent concurrence of behavioural disturbances, psychosis and depression builds to the need for psychogeriatric expertise in the assessment of behaviourally disturbed residents. It also supports consideration of antipsychotic and/or antidepressant therapy in disturbed residents, especially if they have failed behavioural and environmental techniques of management. The higher rate of BPSD in larger nursing homes needs to be examined more carefully but suggests advantages for smaller units.

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