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Non-pharmacological management of behavioural symptoms in nursing homes

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SUMMARY

Background Behavioural and psychological symptoms of dementia (BPSD) are often reported in institutions for the elderly.

Objective To evaluate the effectiveness of a staff education intervention to manage BPSD in older people with a diagnosis of dementia.

Methods The trial was conducted in 16 nursing homes; 306 patients with a diagnosis of dementia and presenting BPSD were selected. Nursing homes were randomly allocated to an intervention group or a control group. An 8-week staff education and training programme was conducted in the nursing homes in the intervention group. The main outcome measures were the Cohen-Mansfield Agitation Inventory (CMAI) and an Observation Scale (OS) score. Assessments were done at baseline (W0), at the end of the 'intervention' period (W8) and 12 weeks after (W20).

Results There was a significant decrease in the global CMAI score between baseline and W8 (-7.8; $p > 0.01$) and between baseline and W20 (-6.5; $p > 0.01$) in the intervention group but not in the control group. Results of mixed linear models showed that the CMAI global score, the CMAI physically non-aggressive behaviours subscale score and verbally non-aggressive behaviours subscale score significantly decreased in the intervention group ($p < 0.001$) although there was no significant evolution in the control group. Direct assessment with the OS produced the same pattern of results, with a significant decrease only in the intervention group.

Conclusion The intervention reduced BPSD in severely demented nursing home residents and this effect was still present 3 months after the end of the programme. Copyright © 2009 John Wiley & Sons, Ltd.

KEY WORDS — Alzheimer's disease; BPSD; staff training; disruptive behaviours

INTRODUCTION

Agitation, aggressiveness, oppositional behaviour and psychotic disturbances are often reported in institutions for the elderly. For the purposes of our study, they have been grouped together under the heading 'positive symptoms' as opposed to symptoms such as apathy.

These symptoms are generally the most invasive, the most difficult for caregivers and care teams to manage, and the most distressing for other patients (Buhr and White, 2006). They have been identified as one of the primary concerns facing staff and administrators of nursing homes.

Several systematic literature reviews have been done to rate the effectiveness of non-pharmacological treatment for behavioural and psychological symptoms of dementia (BPSD). Livingston *et al*. (2005) identified a total of 1632 studies and only 162 satisfied the inclusion criteria for the review. Specific types of

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caregiver and residential care staff education and possibly cognitive stimulation appear to have lasting effectiveness for the management of BPSD. Conclusions are limited because of the paucity of quality research. Ayalon *et al*. (2006) used the more restrictive criteria devised by the American Psychological Association (Chambless and Hollon, 1998), to determine whether a non-pharmacological intervention has sufficient evidence of efficacy. Only three randomised controlled trials (RCTs) met the inclusion criteria and only one in a nursing home (McCallion *et al.*, 1999) demonstrated the efficacy of educating nursing assistants on communicating with residents with dementia, especially with regard to behavioural problems.

In France, Alzheimer's disease (AD) was selected as a National Cause in 2007 and a National Plan has recently been developed. However, the number of clinical trials devoted to BPSD in nursing homes is rather limited.

The aim of this study was to evaluate the effectiveness of staff education as a non-pharmacological intervention to manage BPSD in older people with a diagnosis of dementia. The training programme was designed both to provide advice on how to manage specific BPSD and to encourage nursing home staff to propose non-pharmacological solutions. It was hypothesised that staff education and training would have a positive impact on residents' behaviours when compared to a control group.

METHODS

Setting and participants

The study was conducted in 16 nursing homes in two French regions (Alpes Maritimes and Gironde). In each region nursing homes were randomly selected from a list of all nursing homes and divided according to the type of administrative organisation (8 private, 6 public and 2 associative). A majority of residents in each unit experienced dementia. The staff/resident ratio ranged from 0.09 to 0.45.

Prior to randomisation each nursing home director was approached to find out if they would agree to participate in a study on BPSD in nursing homes. No other information was given. Once the director had agreed to participate an open questionnaire was then mailed to the physician in charge of the nursing home. Each MD, in consultation with staff members, was asked to select residents they considered suitable for inclusion in the study. The questionnaire included demographic information, the patient's diagnosis of dementia, the Mini-Mental State Examination (MMSE) score (Folstein *et al.*, 1975) and the occurrence of some of the listed BPSD. Criteria for inclusion were patients with a diagnosis of dementia according to the ICD 10 criteria (Pull, 1992), an MMSE score $\leq$24 and presenting at least one of the following BPSD at least once a week: opposition, denial of care, aberrant motor behaviour, agitation, delusions, hallucinations or screaming. Through this process 306 (22%) residents were selected for the study from among the 1369 residents living in the 16 nursing homes. The project received institutional approval from the Ethics Committee of Nice. As the study was classified as a routine clinical procedure, no signed informed consent was required from patients or caregivers.

Design

On receipt of the questionnaire concerning the characteristics of the patients, we verified that each nursing home had a sufficient number of patients corresponding to the inclusion criteria. Nursing homes were randomly assigned to the control group or the intervention group. This design (Figure 1) was chosen in order to avoid contamination of the intervention. None of the nursing homes shared facilities or staff.

The directors of the nursing homes assigned to the control group were informed only that the purpose of the study was to assess the frequency of behavioural disturbances regularly with independent raters. They were also requested to care for the patients as usual with their own practices and procedures. The directors of the nursing homes assigned to the intervention group were informed that they would benefit from a staff-training programme. At this stage the investigators had no direct contact with any of the care staff. No information concerning the existence of another group (control or intervention) was given to the directors and staff of the nursing homes of either group at any time during the study. Baseline assessments were done before the beginning of the training programme.

Staff training programme

The training programme was conducted by two independent professionals with extensive experience of working with residents with dementia. In each nursing home the programme began with a 90-min teaching session on dementia, BPSD and the use of 'how to' instruction cards (Staff Instruction Cards). There were four instructions cards, summarising practical advice on how to deal with BPSD. They were designed in order to be small and resistant enough to be easily carried by staff members. The first

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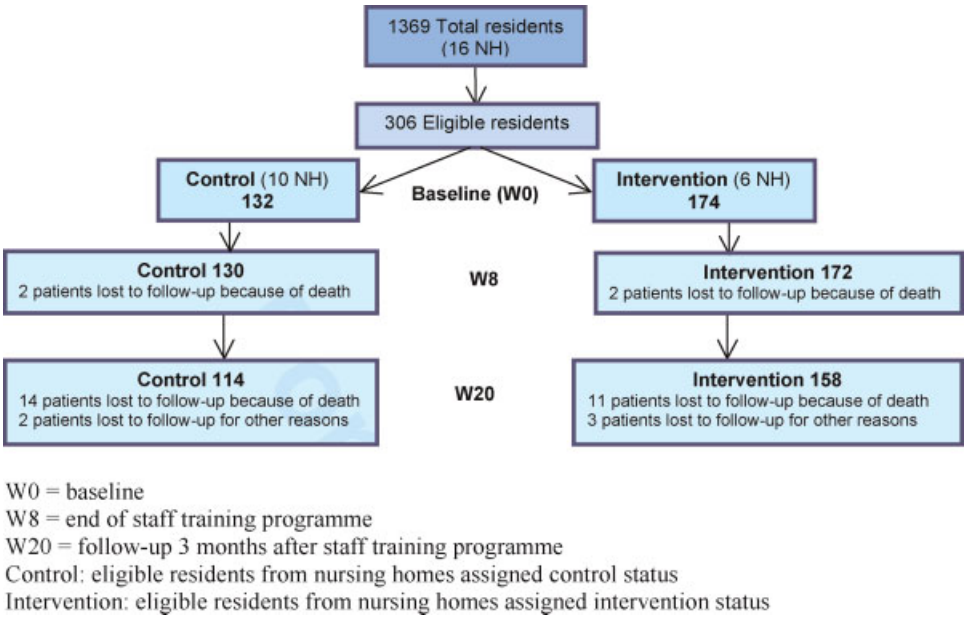

Figure 1. Design of the study—flow chart of study participants.

card gave general guidelines on what to do and what to avoid when faced with opposition, denial of care, aberrant motor activity, agitation, aggression, delusions, hallucinations or screaming. The second card explained how to act during the day to avoid or to decrease the emergence of BPSD, such as what to do at the patient's bed time or during meals. The other two cards provided recommendations on non-pharmacological interventions, giving examples and ideas for mini interventions designed to deal with individual instances of BPSD. Examples of the cards are shown in Figure 2.

The remainder of the training programme consisted of individual and interactive sessions in which trainers provided constructive feedback on how staff members dealt with BPSD. They also emphasised the importance of using the instruction cards in daily practice. The trainers were at each staff member's disposal, rather like a coach, for 2 h twice a week during the first month and then once a week during the second month, thus providing an opportunity for more personalised training, advice and feedback. The total training time was thus 24 h. The study was conducted in all nursing homes between 15 October and 15 December 2007, with the follow-up at 3 months being performed in March 2008. The study was planned so as to avoid any assessments having to be performed during the holiday period at the end of the year.

Measurement

Assessments were performed by four psychologists blind to the intervention condition and previously trained in the assessment tools. None of them participated in the staff training programme. Each psychologist visited the same nursing homes during the study. Data on residents were collected from nursing staff and they were asked not to talk about the intervention.

Before assessments, the first step at baseline was to confirm screening data and to collect demographic, clinical and therapeutic information.

For outcome measures, data were collected at baseline (W0), week 8 (W8) corresponding to the end of the training programme and at week 20 (W20), namely 3 months after the end of the training programme. Assessment tools were the Neuropsychiatric Inventory (NPI) (Cummings *et al.*, 1994), the Cohen-Mansfield Agitation Inventory (CMAI) (Cohen-Mansfield, 1989) and an Observation Scale (OS).

The NPI nursing home version is an interview-based instrument designed to elicit information from an informal caregiver to evaluate behavioural disturbances. The NPI evaluates 12 behavioural symptoms. NPI items were divided into four subgroups (Aalten *et al.*, 2007): Psychotic, Hyperactivity, Apathy and

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ABERRANT MOTOR BEHAVIOUR: Dos and Don'ts *

Do:	**Don't**:
1 Check that the resident is wearing suitable shoes for walking. 2 Make it easy for the resident to move around without endangering the safety and well-being of other residents. 3 Maintain a regular presence with the resident. 4 Walk with the resident and take them back to their room or the lounge.	1 Block the resident's path and stop them moving. 2 Insist on them sitting down, even during meals. 3 Leave obstacles in their path (wet floor, etc.). 4 Leave doors open to staff working areas. 5 Leave doors open that give access to the outside.

HINTS AND TECHNIQUES to reduce BPSD at key points in the day

Washing and bathing **	
• Let the resident know in advance that it will soon be bath time. • Choose the most suitable form of bathing for the resident. • Obtain the resident's consent. • Focus on the resident's autonomy. • Try not to appear intrusive. • Respect the resident's privacy (keep the door closed, etc.).	• Try to delay the activity as far as possible if the resident refuses to cooperate. • Be gentle in manner and voice. • As you go along, explain to the resident what will happen next. • Negotiate care-giving. • Keep talking to the resident during bathing.

MINI INTERVENTIONS

GENERAL RECOMMENDATIONS

· Details of mini interventions are kept in a box in with drawers, one for each type of intervention.
· List the residents' main interests (e.g. history and way of life). List to be kept in the first drawer.
Place: Resident's room or an available activity room (i.e. somewhere quiet).
Duration: Maximum of 15 minutes, including time taken to go the room.
Aim: To decrease behavioural disturbances.

WELL-BEING ***:

Material: refreshing wipes, perfumed moisturizing hand cream.
Description of the activity:
Invite the resident to sit down comfortably in an armchair.
Gently wipe the resident's hands then slowly apply the cream to their hands using circular movements.
While massaging, speak soothingly with words that will increase the resident's self-esteem.
When the resident has calmed down, take them back to the lounge or their room.
DO: sit down facing the resident and establish eye contact.
DON'T: massage the resident's face.

* Instruction cards of this type cover various situations such as opposition/denial of care, agitation, aggressiveness, delusions/hallucinations and screaming.
** Instruction cards of this type cover various key periods of the day: waking up/breakfast, meals, visits, evening and night-time.
*** We create several cards to provide themes for mini interventions. For example, current events, photos, souvenirs, manual activity, walking, music, relaxation/breathing exercises, and "letting off steam".

Figure 2. Instruction cards used during the teaching programme to provide caregivers with practical information on what to do and how to respond when faced with BPSD. The complete set of cards (in French) can be obtained from the following address: &&&http://cm2r.enamax.net/onra/index.php?option=com_content&task=view&id=82&Itemid=0.

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Affective subgroups. In the present study, targets were the Psychotic subgroup, including NPI items hallucinations and delusions, and the Hyperactivity subgroup, including NPI items agitation, euphoria, disinhibition, irritability and aberrant motor behaviour. The scores for each subgroup were the sum of the frequency x severity for each of the NPI items.

The CMAI is an interview-based instrument designed to measure the frequency of 29 behaviours as observed by the caregiver over the previous 2 weeks. In addition to the global score (range 0–203), it is also possible to consider four subscale scores: Physically aggressive behaviour (PA) (9 items), Physically non-aggressive behaviour (PNA) (13 items), Verbally aggressive behaviour (VA) (3 items) and Verbally non-aggressive behaviour (VNA) (4 items). For the CMAI subscales, we considered mean scores in order to avoid items that were not evaluable. For each CMAI subscale, the score corresponded to the mean scores of the evaluable items divided by the theoretical total number of items.

The OS is a scale derived from the Agitated Behaviour Mapping Instrument (Cohen-Mansfield *et al.*, 1990) and was specifically developed for the study in order to assess behavioural disturbances directly through patient observation. The OS focuses predominantly on agitated behaviours. Clinical raters observed the patient for 3 min. The OS comprises 25 items describing positive BPSD, especially agitated behaviours (e.g. screaming, hitting, tearing things, making verbal sexual advances, biting): the higher the score, the more severe the patient's behavioural disturbance. For this scale the assessment was done at baseline, W8 and W20.

Statistical analysis

The study was based on a 2 (intervention conditions) $\times$ 3 (assessments) nested partial crossover control group design. Statistical analysis was carried out using SPSS, version 11.0 software (SPSS Inc., Chicago, Illinois, USA) using a level of significance of less than 0.05. Values are expressed as means $\pm$ standstandard deviation (SD). Time was the within-subjects factor and Group was the between-subjects factor. Mean comparisons between the two groups were performed using the Wilcoxon non-parametric test. Comparisons at different study times — between baseline and W8, and between baseline and W20 — were performed using the Wilcoxon non-parametric test for paired values. In addition, changes in scores were analysed using a mixed linear model with random effect adjusted with age and heterogeneity tests to look for significant differences between the two groups.

RESULTS

At baseline (Table 1) there were no differences between groups in terms of demographic and clinical data. Before baseline, there were more hospitalisations ($p < 0.01$) in the control group than in the intervention group, but there was no longer a difference between groups during the follow-up. Psychotropic prescription and the average number of psychoactive drugs were comparable between groups at baseline and at each point during the follow-up.

In comparison to the control group, the intervention group had a significantly higher CMAI global score ($p < 0.05$), physical and verbal non-aggressive score ($p < 0.05$), and physical aggressive score ($p < 0.01$). Similarly, the OS score ($p < 0.01$) and the NPI psychotic and hyperactivity subgroup scores ($p < 0.05$) were significantly higher in the intervention group. Evaluation of the quality of life did not show any statistical difference between the two groups.

Table 2 shows means and SD for outcome variables at each follow-up time for each group. Table 3 presents the results of mixed linear models and associated heterogeneity tests designed to detect any significant differences in the evolution of scores between the two groups.

Regarding the CMAI scale, analyses indicated that the global score was different between the intervention group and the control group at baseline but not thereafter (Figure 3). We found similar results for each CMAI subscale except for the physically aggressive subscale (PA). Between baseline and W8, we found a significant decrease in global CMAI scores (-7.8 points per week, $p < 0.001$), PNA subscale scores (-0.40, $p < 0.001$), VNA subscale scores (-0.41, $p < 0.001$) and VA subscale scores (-0.19, $p < 0.05$) in the intervention group but not in the control group. Similarly, between baseline and W20, we found a significant decrease in global CMAI scores (-6.52, $p < 0.001$), PNA subscale scores (-0.43, $p < 0.001$) and VNA subscale scores (-0.47, $p < 0.001$) in the intervention group but not in the control group.

Results of mixed linear models showed that CMAI global scores, CMAI PNA subscale scores and CMAI VNA subscale scores significantly decreased in the intervention group ($p < 0.001$) although there was no significant evolution in the control group for these scores. Heterogeneity tests revealed that the evolution of these subscale scores was significantly different between groups ($p < 0.001$).

Regarding the OS (Figure 4), analyses indicated that, in the control group, scores were significantly lower at baseline ($p < 0.05$) and significantly higher at

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Table 1. Demographic and clinical characteristics of the participants at baseline

	Intervention ($n = 174$)		Control ($n = 132$)		*p*-value
	n	(%)	*n*	(%)	
Gender					
Male/Female	40/134	23/77	28/104	21.2/78.8	0.71
Education					
None	12	14.3	9	17.3	0.39
Less than 12 years	54	64.3	37	71.2	
12 years (high school graduate)	13	15.5	3	5.8	
More than 12 years (college)	5	6	3	5.8	
Diagnosis					
Alzheimer's disease	91	52.3	60	45.5	
Vascular dementia	12	6.9	11	8.3	
Mixed dementia	22	12.6	14	10.6	
Dementia with Lewy bodies	2	1.2	6	4.6	
Frontotemporal dementia	2	1.2	6	4.6	
Non-specific dementia	32	18.4	34	25.8	
Other	13	7.5	1	0.8	
	Mean	SD	Mean	SD	*p*-value
Age	86.5	7.6	86.0	6.7	0.58
MMSE Score	9.2	6.8	12.1	6.0	0.0004
CMAI					
Global score	53.08	18.1	48.21	15.9	0.017
Physically non-aggressive behaviour (PNA)	2.02	0.9	1.80	0.8	0.043
Verbally non-aggressive behaviour (VNA)	2.18	1.1	1.89	1.0	0.017
Physically aggressive behaviour (PA)	1.46	0.8	1.28	0.6	0.004
Verbally aggressive behaviour (VA)	2.52	1.4	2.32	1.3	0.224
Observation Scale	22.22	31.9	13.26	20.0	0.002
NPI					
Psychotic sub group	10.22	14.7	6.14	10.6	0.016
Hyperactivity sub group	49.89	53.1	35.68	40.0	0.014

MMSE, Mini Mental State Examination; CMAI, Cohen-Mansfield Agitation Inventory; NPI, Neuropsychiatric Inventory.

Table 2. Mean (SD) scores for outcome variables, hospitalisation and use of psychotropic drugs, by time and group

Outcome variable	W0 Mean (SD)	W8 Mean (SD)	W20 Mean (SD)	Difference (W8–W0)	Difference (W20–W0)
CMAI Global score					
Intervention	53.08 (18.1)	45.48 (13.9)	47.00 (16.0)	−7.8 (16.0)	−6.52 (16.8)
Control	48.21 (15.9)*	45.59 (13.9)	47.54 (18.1)	−2.56 (14.3)	−0.83 (17.6)
PNA					
Intervention	2.02 (0.9)	1.64 (0.6)	1.62 (0.6)	−0.40 (0.8)	−0.43 (0.8)
Control	1.80 (0.8)*	1.69 (0.7)	1.71 (0.8)	−0.12 (0.7)	−0.11 (0.7)
VNA					
Intervention	2.18 (1.1)	1.78 (0.8)	1.71 (0.8)	−0.41 (1.1)	−0.47 (1.1)
Control	1.89 (1.0)*	1.85 (0.9)	1.85 (1.1)	−0.04 (1.1)	−0.03 (1.1)
PA					
Intervention	1.46 (0.8)	1.28 (0.6)	1.41 (0.8)	−0.35 (1.2)	−0.15 (1.4)
Control	1.28 (0.6)**	1.18 (0.5)**	1.31 (0.6)	−0.22 (1.1)	−0.07 (1.2)
VA					
Intervention	2.52 (1.4)	2.17 (1.1)	2.37 (1.3)	−0.19 (0.7)	−0.07 (0.7)
Control	2.32 (1.3)	2.10 (1.2)	2.23 (1.3)	−0.08 (0.5)	0.09 (0.6)
Observation scale					
Intervention	22.22 (31.9)	11.73 (21.6)	7.58 (14.7)	−13.8 (29.0)	−10.5 (26.5)
Control	13.26 (20.0) **	10.89 (19.8)	9.91 (15.8) *	−3.40 (22.9)	−2.58 (20.5)

(*Continues*)

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Table 2. (Continued)

Outcome variable	W0 Mean (SD)	W8 Mean (SD)	W20 Mean (SD)	Difference (W8–W0)	Difference (W20–W0)
NPI					
Psychotic subgroup					
Intervention	10.22 (14.7)	8.46 (13.3)	8.68 (13.5)	−1.67 (13.0)	−1.51 (13.6)
Control	6.14 (10.6) *	7.02 (12.4)	6.50 (11.4)	0.95 (13.0)	0.27 (9.4)
Hyperactivity subgroup					
Intervention	49.89 (53.1)	43.62 (51.2)	44.87 (51.7)	−6.41 (57.3)	−6.99 (56.8)
Control	35.68 (40.0)*	39.10 (41.4)	42.20 (55.9)	4.10 (41.1)	7.1 (53.5)
Quality of life					
Intervention	31.02 (5.5)	32.20 (5.4)	31.78 (7.2)	0.76 (5.4)	1.16 (7.8)
Control	31.29 (9.3)	32.61 (10.1)	30.78 (8.6)	0.12 (7.9)	−0.35 (8.1)
Psychotropic drugs[a]					
Intervention	2.52 (1.3)	2.62 (1.3)	2.51 (1.3)		
Control	2.68 (1.65)	2.76 (1.6)	2.81 (1.6)		
	n (%)	*n* (%)	*n* (%)		
Hospitalisations[a]					
Intervention	40 (23)	6 (3.6)	13 (8.2)		
Control	49 (37.1)*	7 (5.5)	15 (13)		

W0, baseline; W8, end of staff training programme; W20, follow-up 3 months after staff training programme; PNA, Physically non-aggressive behaviour CMAI subscale; VNA, Verbally non-aggressive behaviour CMAI subscale; PA, Physically aggressive behaviour CMAI subscale; VA, Verbally aggressive behaviour CMAI subscale.
*$p < 0.05$ for the comparison between groups; **$p < 0.01$ for the comparison between groups.
[a]mean number of hospitalisations and psychotropic drugs (including anticholinergics, memantine, antipsychotics, anxiolytics and antidepressants).

W20 ($p < 0.05$) compared with the intervention group. OS scores decreased significantly in the intervention group between baseline and W8 (−13.8 points per week, $p < 0.001$) and between baseline and W20 (−10.5 points per week, $p < 0.001$), whereas there was no significant change in score in the control group (−3.4 and −2.58, respectively). Results of mixed linear models showed that OS scores significantly decreased in the intervention group (−0.71, $p < 0.001$) but not in the control group (−0.16, $p = 0.17$). Heterogeneity tests revealed a significant difference in the evolution of this score between groups ($p < 0.001$).

NPI scores for the psychotic subgroup ($p < 0.01$) and hyperactivity subgroup ($p < 0.05$) were no longer different at W8 and W20 (Table 2). Within the intervention group and the control group, there was no significant evolution in NPI psychotic and hyperactivity subgroup scores (Table 3). Heterogeneity tests revealed a significant difference in the evolution of this score between groups ($p < 0.05$) only for the NPI hyperactivity subgroup.

Table 3. Evolution of the outcome variables between the two groups (Intervention/Control) during the follow-up, using mixed linear models

	Intervention		Control		*p*-value heterogeneity
	β (std)	*p*-value	β (std)	*p*-value	
CMAI					
Global	−0.26 (0.05)	<0.0001	0.02 (0.06)	0.797	0.001
PNA (s/i)	−0.02 (0.002)	<0.0001	−0.003 (0.03)	0.368	<0.0001
VNA (s/i)	−0.02 (0.003)	<0.0001	0.001 (0.004)	0.832	<0.001
PA (s/i)	−0.001 (0.002)	0.613	0.004 (0.002)	0.110	0.142
VA (s/i)	−0.01 (0.004)	0.239	−0.001 (0.004)	0.776	0.571
Observation Scale	−0.71 (0.13)	<0.0001	−0.16 (0.12)	0.170	<0.001
NPI Psychotic factor f*s	−0.08 (0.05)	0.085	0.03 (0.05)	0.604	0.119
NPI Hyperactivity factor f*s	−0.25 (0.2)	0.472	0.35 (0.2)	0.091	0.032
Quality of Life	−0.04 (0.09)	0.712	−0.15 (0.17)	0.367	0.188

β is an estimator associated with time, *p*-values indicate if there are significant changes.
PNA, Physically non-aggressive behaviour CMAI subscale; VNA, Verbally non-aggressive behaviour CMAI subscale; PA, Physically aggressive behaviour CMAI subscale; VA: Verbally aggressive behaviour CMAI subscale.

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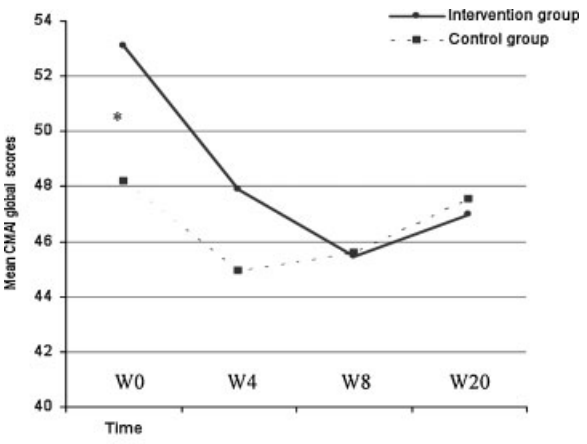

Figure 3. Mean CMAI global scores by group and time. W0 = baseline; W4 = after 4 weeks of the staff training programme; W8 = end of staff training programme; W20 = follow-up 3 months after staff training programme.

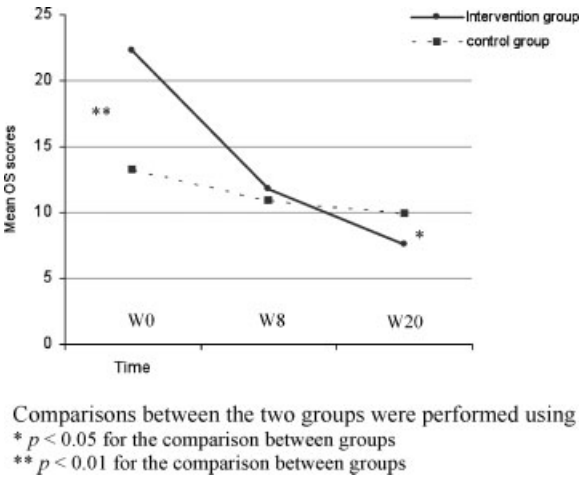

Figure 4. Mean scores for the Observation Scale (OS) by group and time. W0 = baseline; W8 (end of staff training programme) and W20 (follow-up 3 months after staff training programme).

DISCUSSION

Because AD has an impact not only on cognitive but also on psychological and social functioning and because psychotropic drugs have limited efficacy and possible side effects, there is now a broad consensus that patient care should not be limited to pharmacological treatment but should also include non-pharmacological approaches. Over the last 20 years, a very large number of articles have been published illustrating the benefits of non-pharmacological treatment options in AD. Nevertheless, it is noteworthy that the vast majority of these results were derived from studies whose methodology leaves much to be desired.

Concerning BPSD in nursing homes, several studies (McCallion *et al.*, 1999; Peterson *et al.*, 2002; Coogle *et al.*, 2004) have suggested that educational programmes for staff members are likely to be effective in reducing the frequency of these symptoms. For instance, McCallion *et al.* (1999) found a significant group difference of small to medium magnitude in scores for the four CMAI subscales, representing a significant reduction in agitated and aggressive behaviours.

In contrast, Visser *et al.* (2008) reported that staff education was not associated with an improvement in resident behaviour. It seems that the potential benefit also depends on the content of the programme, and whether it includes only didactic education (O'Brien *et al.*, 2001) or offers additional support (Bråne *et al.*,1989; Edberg and Hallberg, 2001).

The results of our study show that a programme including a group teaching session for staff, individual instruction cards and interactive coaching sessions can be an effective strategy.

The most striking effects of the programme were on agitation and aggressiveness. These results were obtained using different types of assessments: the CMAI and the NPI, which are caregiver-rated scales, and also the OS, which provides for direct observation of the patients' behaviour by the clinical raters. The beneficial effect was observed immediately after the 2-month programme and was still present 3 months later.

Interestingly, psychotic symptoms assessed with the NPI did not follow the same evolution as the agitation and aggressive symptoms. Differences between the intervention and control groups in terms of these symptoms remained significant after 4 weeks of the training programme and there was only a trend for an increase in the control group and a decrease in the intervention group in comparison with baseline ratings. These results indicate that the general denomination of 'positive symptoms' used in this study and frequently in clinical practice is inappropriate since it encompasses symptoms that do not respond in a similar manner to the therapeutic strategy.

CMAI total score changes observed between the pre- and post-intervention assessments (−7.8 in the intervention group *vs.* −2.5 in the control group) are within the range of changes observed in pharmacological studies using antipsychotics; −8.3 for risper-

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idone *versus* −4.9 for placebo in the study by De Deyn *et al.* (1999) and −7.5 for risperidone *versus* −3.1 for haloperidol in the study by Brodaty *et al.* (2003). The CMAI subscale changes suggested that the effects were related to the physically and verbally non-aggressive subscales but not to the physically aggressive subscale. Such an interpretation must be treated with caution given the small size of the changes. The OS results are also interesting because they show that it is possible for the intervention group score to decrease below that of the control group. It is also the only assessment where data were not taken from the care staff, and therefore, not potentially biased by the impact of the intervention.

Our study was designed to try to eliminate some of the weaknesses of previous non-pharmacological studies, such as insufficient sample size, absence of a control group or randomisation and lack of defined outcome criteria and a procedure enabling evaluation in a blind fashion. In addition, one of the important points contributing to the lack of credibility concerning the use of these strategies in the context of AD is the failure to respect the uniform application of the same technique on the part of the health care assistants. For a given technique, the description of the treatment programmes often varies from one study to another. Here, the duration of the programme and the frequency of the sessions were controlled. Furthermore, the given material is reproducible and the coaching programme was conducted by only two professionals, both of whom were trained together.

Our study nevertheless has several limitations. Firstly we were unable to avoid all of the potential difficulties related to randomisation. We chose to randomise nursing homes rather than patients because it would have been impossible to randomise patients into two different groups in the same nursing home. A negative result of this choice is that the two groups had different baseline characteristics. In particular, BPSD were more severe in the intervention group. This may have increased the efficacy of the technique, which might have been less apparent had the initial scores been lower. Therefore we cannot rule out the possibility that the intervention group score was more likely to decrease and tend to equalise with the score of the control group.

Furthermore, the baseline assessment was done before the teaching programme but after the nursing homes had been randomised. This may have increased the possibility of the independent raters becoming unblinded, in particular during the NPI and CMAI assessment. Indeed, the nursing home care staff in the intervention group may have been influenced in their responses at the week 8 and week 20 assessments by the effect of the teaching programme.

Another limitation is that it was impossible to conduct a 'pure' non-pharmacological study; patients continued to receive their usual pharmacological treatment. Nevertheless, we found that both groups received a comparable mean number of psychotropic drugs during the study.

Even with these limitations, such results are important in France, where scientific evidence or proof of the efficacy of these methods is lacking, while at the same time professional guidelines state that 'for patients living in an institution, management of BPSD is part of the institutional plan. Care teams have a capital role in the evaluation, management and follow-up of BPSD' (Benoit *et al.*, 2006). Our study is also important in having demonstrated the feasibility of conducting such non-pharmacological randomised studies in nursing homes in France. Even if the results were positive, the major challenge of this type of study is whether it has the potential to be extended to the vast majority of nursing homes at a national level. Although the first part of the programme (Staff Information Cards and group teaching) should be easy to implement on this scale, the coaching part might be more difficult.

Under the auspices of the French National Plan for AD, the next stage in the research is to explore the feasibility of applying the programme to all nursing homes within a given region and to determine the most appropriate procedure.

CONFLICT OF INTEREST STATEMENT

None of the authors have any competing interests to disclose.

KEY POINTS

- BPSD such as agitation, aggressiveness, oppositional behaviour and psychotic disturbances are often reported in institutions for the elderly.
- Daily practices indicate that care teams have a capital role in the evaluation, management and follow-up of BPSD.
- Management of BPSD should preferentially be non-pharmacological and it is necessary to conduct non-pharmacological randomised studies in nursing homes.
- Results of the study show that a teaching programme for cares staff can be an effective strategy.

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