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Elder-clowning in long-term dementia care: Results of a pilot study

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ABSTRACT

Objectives: To assess the effects of elder-clowning on moderate to severe behavioral and psychological symptoms of dementia (BPSD) in nursing home residents with dementia, primarily of the Alzheimer's type.

Design: Before-and-after study.

Setting: Nursing home.

Participants: Nursing home residents with moderate to severe BPSD, as defined according to a Neuropsychiatric Inventory-Nursing Home version (NPI-NH) score of 10 or greater (N = 23),, and their care aides.

Intervention: A pair of elder-clowns visited all residents twice weekly (~10 minutes per visit) for 12 weeks. They used improvisation, humor and empathy, and expressive modalities such as song, musical instruments, and dance to individualize resident engagement.

Measurements: Primary outcomes were BPSD measured using the NPI-NH, quality of life measured by Dementia Care Mapping (DCM), and nursing burden of care measured by the Modified Nursing Care Assessment Scale (M-NCAS). Secondary outcomes included occupational disruptiveness measured by the NPI-NH, agitation measured by the Cohen Mansfield Agitation Inventory (CMAI), and psychiatric medication use.

Results: Over 12 weeks, NPI-NH scores significantly declined ($t_{22} = -2.68$, $p = 0.01$) and DCM quality of life scores significantly improved ($F_{1,50} = 23.09$, $p < 0.001$). CMAI agitation scores decreased nominally, but was not statistically significant ($t_{22} = -1.86$, $p = 0.07$). The occupational disruptiveness score significantly improved ($t_{22} = -2.58$, $p = 0.02$), yet there was no appreciable change in M-NCAS scores of staff burden of care.

Conclusion: Results suggest that elder-clowning reduced moderate to severe BPSD of nursing home residents with dementia, primarily of the Alzheimer's type. Elder-clowning is a promising intervention that may improve Alzheimer's dementia care for nursing home residents.

Key words

Behavioral and psychological symptoms of dementia; person-centered care; arts-based intervention; loss of self

INTRODUCTION

The treatment and management of behavioral and psychological symptoms of dementia (BPSD) is associated with use of high levels of psychotropic medications,[1] which has received national[2] and international[3] attention given the evidence of significant harms, and deleterious consequences of inappropriate psychotropic medication use.[4, 5] In addition, the behavior of persons with Alzheimer's disease is not always symptomatic of dementia itself, but may be need-driven[6] or indicative of other purposeful and meaningful communication.[7-9]

In response, best practice guidelines now recommend non-pharmacological interventions before resorting to antipsychotics or other psychotropic medications.[10, 11] Arts-based approaches are gaining prominence for their demonstrated behavioral improvements and their promotion of quality of life.[12, 13] The most recent development in arts-based approaches to dementia care is the use of specialized red-nosed clowns, referred to as elder-clowns.[14] Elder-clowns use improvisation, humor, empathy, and expressive tools such as song, musical instruments and dance to engage nursing home residents.[14]

Few empirical studies have examined the effects of the presence of elder-clowns on dementia care units. Most have been qualitative observation studies with methodological limitations.[15-17] One exception was a single-blind, longitudinal, cluster randomized controlled study designed primarily to evaluate the effectiveness of elder-clowning combined with "laughterbosses" (healthcare practitioners trained to assist elder-clowns in introducing humor in care practices and to continue the humor intervention between elder-clown visits) in improving mood, decreasing agitation and other behavioral disturbances, and improving quality-of-life and social engagement of nursing home residents[18]. They found that intervention residents had lower agitation scores, but there were no significant differences in depression, overall behavioral

disturbances, social engagement, or quality of life. The effect of the intervention on medication use and staff outcomes beyond satisfaction[19] was not addressed, despite important links between less agitation, practice efficiency, and better staff-resident relationships.[20]

This study sought to evaluate the impact of elder-clowning on nursing home residents' BPSD and quality of life, and nursing burden of care in Canada. Secondary outcomes included effect on resident agitation levels, nursing perceived occupational disruptiveness, and residents psychotropic medication use. The evaluation included a qualitative component to explore the aesthetic and relational components of elder-clowning.[21]

METHODS

Eligibility Criteria and Recruitment

This was a mixed methods before-after study of residents with dementia from two 28-bed special care units of a 472-bed nursing home in urban central Canada. The units provide flexible schedules for programs and personal care. Family member substitute decision-makers of 54 residents agreed to be contacted about the study; 45 provided consent for participation in the study; 9 declined because of poor health of the resident or for undisclosed reasons. All consented resident participants were screened using the Neuropsychiatric Inventory: Nursing Home Version (NPI-NH).[22] Twenty three of the consenting residents with an NPI-NH score of 10 or greater (indicating moderate to severe behavioral challenges) were included in the intervention. Care aides with resident participants on their caseloads were also recruited. Approval for the study was obtained from the ethics review boards of the study site and the research institute of the principal investigator.

Intervention

Four elder-clowns were hired to deliver the program; two as the lead pair and the others as backup either to work as a pair or individually to fill in for an absent member of the lead pair. Consistent with current practice, all the elder-clowns had been trained at professional clown organizations and received dementia-specific training (symptomatology, differences between Alzheimer's disease and other dementias, practice approaches, ethical care). Also consistent with practice, a clown pair visited resident participants individually in their rooms or in a public space of the unit two times per week for 12 weeks. Visits averaged 10 minutes.[23] The elder-clowns determine the duration of the visit based on resident receptivity and engagement as assessed by attending to verbal and gestural cues (e.g. whether the resident is relaxed and open to the interaction or tense and closed to it).

Elder-clowns don a red nose but unlike pediatric clowns, they keep their faces natural with minimal make-up and wear clothing that evokes an earlier era, such as 1950's swing dresses. Elder-clowns also rely on clinical, social, and familial details to customize their interactions to each resident in a manner appropriate to mood, interactional style, or clinical condition. Examples of interactions in our study included songs and music, such as singing with residents' favorite songs with them with the accompaniment of a miniature ukulele or co-constructing with them improvised songs with them; witty, playful scenarios involving, for example, teasing the elder-clowns by playfully pretend-kicking their buttocks as the clowns bent over, to which the elder-clowns responded with exaggerated pratfalls, sound explosions, and facial animations; supporting sadness with soft reassuring touch rather than trying to change the emotional timbre; and artistic expression by residents through the elder-clowns' provision of pens and sketch pads, or more imaginative engagement of residents such as an elder-clown creatively miming an artist painting a canvas.

During visits with residents, the elder-clowns were careful not to interfere with care tasks. Staff were able to observe the interactions when in close proximity, but did not participate in them.

Measures

Demographic data were collected from staff participants, and family members completed a demographic questionnaire for resident participants. Primary outcome measures were NPI-NH total scores,[22] an interview-based instrument to assess BPSD, and the Modified Nursing Care Assessment Scale (M-NCAS),[24] a self-administered questionnaire to measure nursing burden of care, each administered at baseline and at 12 weeks, and the well- or ill-being score of Dementia Care Mapping (DCM),[25] an observational tool that provides detailed, standardized observational ratings of behaviors and levels of mood and engagement over a period of time,[26] conducted at baseline, 4, 8, and 12 weeks to identify shorter and longer term changes. Secondary measures included: three subscale scores (aggressive behavior, physically nonaggressive behavior, and verbally agitated behavior) and their total from the Cohen-Mansfield Agitation Inventory (CMAI), an interview-based scale to measure prevalence and type of agitation among nursing home residents, collected at baseline and 12 weeks; the NPI-NH domain and occupational disruptiveness scores; other DCM scores (agitation and distress, potential for positive engagement, occupational diversity, withdrawal, and passive engagement); and psychotropic medication use collected at baseline, 4, 8, and 12 weeks.

A research associate (RC) collected the NPI-NH, CMAI, and the M-NCAS at baseline and at the end of the end of the intervention by obtaining care aides' ratings for each participant on their assigned caseloads. DCM takes place only in public areas of the care environment (e.g.,

dining room, hallway). A recording is made every 5 minutes – referred to as time frames (TFs) – for a period of up to 6 consecutive hours, to achieve a maximum 72 TFs per resident. A trained mapper (RC) made DCM observations during day and evening nursing shifts.

Analysis

Feasibility determined sample size, given the time intensive methodological demands of DCM in a study with 4 time points. Although a maximum of 72 TFs per participant was targeted at each time point, not all participants were available in the observation areas (public areas of the nursing home) to achieve this. Variation in the range of TFs is attributed to infectious outbreaks, which barred the mapper from entering the unit, and occasions when participants were off the unit.

The distribution of DCM TFs showed that five participants had fewer than 15 TFs of data recorded at one or two of the observation time points. Any time points with fewer than 15 TFs were considered insufficient for the purposes of analysis, and therefore these were excluded. Three participants were excluded from the DCM analysis altogether because they had an insufficient number of TFs at three or more time points because they had been confined to bed or wished to remain in their room and thus were unavailable in the observation areas for DCM.

For each of these five outcome measures, a paired t-test was used to test whether significant change occurred over the 12-week period. A random-effects model with random intercept and unstructured covariance matrix structure was used to test whether significant change in the well- or ill-being score of the DCM occurred over the 12-week period. Hypothesis tests were performed at an α-level of 5%.

Four classes of drugs were considered for analysis of medication use: antipsychotics, benzodiazepines, antidepressants, and dementia symptom control medications (i.e., cholinesterase inhibitors and memantine). For antipsychotics, olanzapine equivalents were calculated based on within-class dosing equivalencies for antipsychotic medication.[21] Dosing equivalents were not calculated for the other drug classes because within-class dosing equivalents were not found for anti-depressants and dementia medications. Rate of change in dosing (mg/quarter) was then calculated for each class of drug for each resident.

RESULTS

Consent by proxy was obtained for 45 residents to be screened with the NPI-NH. Of 45 residents screened, 23 were recruited: 12 with a NPI-NH score from 10 to 20 (moderate behavioral challenges) and 11 with a score greater than 20 (major behavioral challenges). The characteristics of the participants are described in Table 1. The residents were predominately elderly women with Alzheimer's disease. Sixteen care aides with these residents on their caseloads were recruited; they were predominately middle-aged women. There was minimal variation in dose of the intervention; 10 resident participants received all 24 possible visits and 13 missed an average of 2.3 ± visits. Visits lasted an average of 10 minutes (range of 2-35 minutes); 93% were 5 minutes or longer.

The results for the primary and secondary outcome measures are shown in Table 2. The NPI-NH total score at 12 weeks was significantly lower (t_{22} = -2.68, P = .01) using a paired t-test. In addition, the NPI-NH occupational disruptiveness total score improved significantly (t_{22} = -2.58, P = .02). The NPI-NH agitation/aggression domain score was also significantly lower at 12 weeks (t_{22} = -2.30, P = .03). No differences were found on the other domain scores. For the M-NCAS, at 12 weeks, neither attitude (t_{22} = -0.02, P = .98) nor strain total score (t_{22} = 0.39, P =

.69) was found to be different from baseline using a paired t-test. For DCM scoring, an average of 4.3 hours each. A random effects model for DCM's well- or ill-being score showed an improvement over time ($F_{1,50} = 23.09$, $P < .001$).

The DCM agitation and distress score also improved over time ($F_{1,50} = 6.02$, $P = .02$). No change over time was detected for the other DCM variables (Table 2). The total of the three CMAI subscales at 12 weeks was nominally, but not statistically significantly lower ($t_{22} = -1.86$, $P = .07$). The physically nonaggressive behavior subscale was significantly lower at 12 weeks ($t_{22} = -2.32$, $p = 0.03$). No differences were found on the other CMAI subscales.

A nominal decrease in dosing of psychotropic medications was observed over the 12-week period (Table 3), but the magnitude of this difference was small ($d = -0.08$ if residents not taking antipsychotics were included as no change and $d = -0.13$ if only residents taking antipsychotics at some point during the study were considered), and the change was not statistically significant.

DISCUSSION

This pilot study found a significant reduction of BPSD, based on the NPI-NH total score and agitation/aggression domain score, for nursing home residents with dementia, primarily of the Alzheimer's type, who were exposed to elder-clowning. In contrast, the previous elder-clowning study [18] did not find a significant decrease in NPI-NH scores. This may be attributed to their co-introduction of "laughterbosses" who were not tested for competency in delivering humor,[18] and thus may have contributed to the intervention failing to exhibit its full impact because they assisted in the delivery of the intervention. The lack of detectable change in the NPI-NH domain scores other than agitation/aggression may suggest that elder-clowning is not effective for other behaviors, such as apathy, but this needs further study. It may also be attributed to the greater difficulty in rating these types of neuropsychiatric symptoms than in rating overt aggression;[27] thus a structured training period may be required to improve the ratings that care aides provide.[28]

DCM was a useful objective outcome measure that did not rely on staff report of resident behaviors and well-being, and DCM data showed significant improvement in quality of life over 12 weeks. These benefits suggest that it should be considered for future studies, in spite of the time demands its use places on researchers. These findings replicate those of other intervention studies involving music[13] and dance.[29] Since elder-clowns utilize a far broader range of artistic modalities (e.g. drama and magic), future research should examine which particular modalities of elder-clowning are most efficacious.

The intervention did not affect the attitude or the strain total scores of the M-NCAS, indicating that there was no appreciable change in staff burden of care, yet the NPI-NH occupational disruptiveness total score improved significantly, which indicates that resident

activities such as repetitive behaviors affected staff routines less. This discrepancy may reflect the inclusion in the M-NCAS of questions related to staff perceptions of the meaningfulness and utility of residents' lives. Societal biases concerning the loss of self attributed to Alzheimer's,[30] may have negatively affected staff beliefs, and contributed to an emotional burden that improvements in residents' well-being did not ameliorate. Training of staff and their education and years of experience regarding dementia care were not assessed and might be associated with staff perceptions of BPSD. Resident functional abilities, chronic diseases, pain, and time since admission, which might have affected engagement and mood, were not assessed either. Thus further research is required to better understand resident- and staff-level factors that contribute to resident behaviors and nursing burden of care.

Consistent with the significant reduction in the NPI-NH agitation/aggression domain score, we found a significant decrease in the physically nonaggressive behavior subscale of the CMAI. DCM scores for agitation and distress also significantly decreased over the course of the study. The significant improvements seen in behavioral symptoms over the 12-week study period cannot be attributed to increased doses of psychotropic medications given our finding of a small, non-significant decrease in dosing over the course of the intervention (Table 3). Still, it will be important for a larger future trial to explore the impact of elder-clowning on psychotropic medication use.

Unlike the NPI-NH agitation/aggression domain, we did not find significant reductions in the aggressive behavior and verbally agitated behavior scores on the CMAI. This might be due to differences in how each measures agitation and aggression (e.g. the CMAI includes 29 different agitated behaviors and the NPI-NH combines agitation and aggression in eight broader behavior

types). There was a nonsignificant increase in aggressive behavior scores on the CMAI, suggesting the need for close examination of adverse effects in future studies.

This study has several limitations. There was no control group, so improvements over time unrelated to the intervention cannot be excluded. Our sample size was small, so there may not have been sufficient power to identify changes in all of the outcome measures. As a preliminary quantitative study of elder-clowning in a small sample without a control group, these results should be considered as hypothesis generating; confirmation of the findings in future larger comparative studies is required. Participants were recruited from a single nursing home, potentially limiting the generalizability of our findings to other nursing home settings. Intervention dose beyond receipt of elder-clowning visits for approximately 10 minutes twice a week, and thus it was not possible to examine the implications of variation in the intervention dose. Attending to the effect of different doses of the intervention will be important in future investigations of elder-clowning. Finally, we relied on established measures which, although validated for this population, do not reflect current understandings of BPSD in the dementia field,[6, 7, 20] specifically differentiation between behaviors based on their potential cause, were relied on. As a consequence, the quantitative assessment of the effect of the elder-clowning intervention was not able to discern between changes in need-driven behaviors that may be more amenable to psychosocial intervention and those with other causes which may not (e.g. pain).[6]

When considering the effectiveness of an intervention, it is important to compare the observed changes with differences that are considered clinically relevant. For clinical trials in dementia of the Alzheimer's type, it has been assumed that differences as small as 4.5 points on the NPI-NH[31] are clinically relevant. In our study, average differences observed on NPI-NH over the period of the clowning intervention exceeded this clinically relevant difference (mean

difference = 5.83), but observed effects on the M-NCAS were similar to (strain total score) or even smaller than (attitude total score) those for nonresponders in the risperidone clinical trial[32], in concurrence with the lack of statistical evidence for changes in perceived burden of care. That a reduction in overall BPSD, particularly agitation; reduced occupational disruptiveness scores due to behavioral disturbances; and improved residents quality of life over a period of time during which residents with dementia were exposed to elder-clowning were observed, suggests that elder-clowning is a promising intervention for nursing home residents with behavioral symptoms of Alzheimer's dementia. As arts-based approaches are gaining prominence in person-centered dementia care, elder-clowning will be an important intervention for continued evaluation in a large adequately powered randomized controlled trial to further assess its clinical effectiveness and cost-effectiveness.

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Graphics

Table 1. Baseline Participant Characteristics

Participants	Frequency (%) or Mean ± SD (Range[a])
Residents (N = 23)	
Age	87.78 ± 8.00 (69-101)
Sex	
Female	16 (69.6)
Male	7 (30.4)
Dementia Diagnosis	
Alzheimer's Dementia	17 (73.9)
Vascular Dementia	1 (4.4)
Mixed Alzheimer's and Vascular Dementia	3 (13.0)
Lewy Body Dementia	2 (8.7)
Neuropsychiatric Inventory-Nursing Home Version Screening Scores	24.00 ± 11.90 (11-49)
10-20	12 (52.2)
>20	11 (47.8)
Care Aides (N = 16)	
Age	54.91 ± 6.34 (46-63)
Sex	
Female	14 (87.5)
Male	2 (12.5)

[a] Sample range based on the observed values in these participants.

Table 2. Primary and Secondary Outcomes at Baseline, 4 Weeks, 8 Weeks and 12 Weeks

Outcomes	Baseline		4 Weeks		8 Weeks		12 Weeks		Test Statistic	p-value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Primary Outcomes[a]										
Neuropsychiatric Inventory-Nursing Home Version[b]										
Total Score (scale = 0 to 144)	24.43	12.91	.	.	.	.	18.60	13.15	$t_{22} = -2.68$	0.01*
Dementia Care Mapping										
Well/Ill-Being (scale = -5 to 5)	0.045	0.51	1.000	0.339	0.955	0.349	1.048	0.283	$F_{1,50} = 23.09$[c]	< 0.001*
Modified Nursing Care Assessment Scale										
Attitude (scale = 0 to 128)	58.56	11.48	.	.	.	.	58.52	14.83	$t_{22} = -0.02$	0.98
Strain (scale = 0 to 128)	61.56	10.14	.	.	.	.	62.39	8.75	$t_{22} = 0.39$	0.69
Secondary Outcomes[a]										
Neuropsychiatric Inventory-Nursing Home Version[b]										
Agitation/Aggression Domain (scale: 0 to 12)	3.30	3.28	.	.	.	.	2.09	2.00	$t_{22} = -2.30$	0.03*
Depression/Dysphoria Domain (scale: 0 to 12)	2.08	2.76	.	.	.	.	1.48	2.59	$t_{22} = -0.90$	0.37
Apathy/Indifference Domain (scale: 0 to 12)	6.39	4.34	.	.	.	.	5.91	4.42	$t_{22} = -0.70$	0.48
Irritability/Lability Domain (scale: 0 to 12)	2.17	2.80	.	.	.	.	1.61	2.74	$t_{22} = -0.98$	0.33
Total Occupational Disruptiveness (scale: 0 to 60)	8.09	7.10	.	.	.	.	4.87	5.19	$t_{22} = -2.58$	0.02*
Cohen-Mansfield Agitation Inventory[b]										
Total Score for 3 Subscales (scale: 0 to 140)	32.86	12.23	.	.	.	.	29.48	9.72	$t_{22} = -1.86$	0.07
Physically Nonaggressive Behavior (scale: 0 to 63)	11.56	7.48	.	.	.	.	9.43	4.60	$t_{22} = -2.32$	0.03*
Aggressive Behavior (scale: 0 to 42)	11.78	5.08	.	.	.	.	13.48	4.55	$t_{22} = 0.08$	0.94
Verbally Agitated Behavior (scale: 0 to 35)	9.52	5.67	.	.	.	.	8.13	3.63	$t_{22} = -1.50$	0.14
Dementia Care Mapping										
Agitation and Distress (scale: 0 to 100)	4.67	6.45	1.33	2.32	1.99	4.10	1.65	4.00	$F_{1,50} = 6.02$[c]	0.02*
Potential for Positive Engagement (scale: 0 to 100)	79.98	17.56	75.13	25.78	77.81	26.63	75.89	25.63	$F_{1,50} = 0.85$[c]	0.36
Occupational Diversity (scale: 0 to 14)	2.75	1.55	3.33	1.65	75.89	25.64	2.79	1.44	$F_{1,50} = 0.35$[c]	0.56

Withdrawal (scale: 0 to 100)	13.58	15.70	14.55	24.09	14.30	24.07	14.41	22.54	$F_{1,50} = 0.18$[c]	0.68
Passive Engagement (scale: 0 to 100)	6.68	7.70	9.55	14.52	6.22	8.03	8.75	13.59	$F_{1,50} = 0.01$[c]	0.92

[a] Scale indicates the lower and upper limits of possible values for the measure.

[b] These measures were not administered at 4 and 8 weeks. There are no data for these time points, as indicated by "." in the table.

[c] Degrees of freedom for the random intercept model of DCM scores were calculated as (k-1)*(n-1) = 50 with an average of k=3.28 observations per resident for each of the n=23 residents. .

* Statistically significant at an α-level of 0.05.

Table 3. Change in Psychotropic Medication Dose (mg/quarter) during the 12-week Elder-clowning Intervention Ordered by Change in NPI-NH

	NPI-NH TOTAL SCORE[A]			**DOSE CHANGE OVER TWELVE WEEKS (MG/QUARTER)[B]**			
PARTICIPANT	Baseline	Week 12	**Difference**	Antipsychotics - Olanzapine Equivalent[c]	Benzodiazepines	Antidepressants	Dementia Meds[d]
041	46	7	**-39**	.	.	0	.
036[E]	45	28	**-17**	-1.125	.	0	0
044	22	7	**-15**	.	0	0	0
016[F]	32	21	**-11**	.	.	-7.500	.
010[G]	14	4	**-10**	-0.304	.	0	0
043	28	18	**-10**	0	.	.	.
028[H]	17	8	**-9**	-1.125	.	.	.
008	23	15	**-8**	.	.	.	0
021[I]	16	8	**-8**	.	.	0	-7.200
022	9	3	**-6**	.	.	.	.
042	23	17	**-6**	.	.	0	0
018[J]	25	20	**-5**	3.000	.	0	0
007	28	24	**-4**	.	.	.	0
025	12	8	**-4**	.	.	.	.
037	54	52	**-2**	.	.	0	.
040	41	39	**-2**	.	.	.	0
014[L]	40	39	**-1**	-1.125	.	0	.
015	16	15	**-1**	.	.	.	.
013	13	12	**-1**	.	.	.	0
026	12	12	**0**	.	.	.	.
027	19	24	**5**	.	.	.	.
004	18	39	**21**	0	.	.	.

[a] Participants are ordered with respect to change in NPI-NH in order to display patterns of medication change that might be co-occurring with changes in the primary outcome measure.
[b] Patients without prescription for that class of drug indicated by "."
[c] Olanzapine equivalents were calculated based on within-class dosing equivalencies for antipsychotic medication. Dosing equivalents were not calculated for the other drug classes as no within-class changes in resident prescriptions were reported.
[d] Refers to dementia symptom control medications (i.e., cholinesterase inhibitors and memantine).
[e] Olanzapine Oral Disintegrating discontinued at Week 12.

[f] Escitalopram Oxalate discontinued at Week 4.
[g] Decrease in Quetiapine dosage at Week 12.
[h] Olanzapine discontinued at Week 12; PRN Lorazepam added at Week 12.
[i] Galantamine Hydrobromide ER discontinued at Week 4.
[j] Increase in Olanzapine dosage at Week 8; PRN Lorazepam added at Week 8.
[k] Decrease in Respiridone dosage at Week 12.
[l] Olanzapine Oral Disintegrating discontinued at Week 12.

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