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Association of a Communication Training Program With Use of Antipsychotics in Nursing Homes

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IMPORTANCE Off-label antipsychotic prescribing in nursing homes (NHs) is common and is associated with increased risk of mortality in older adults. Prior large-scale, controlled trials in the NH setting failed to show meaningful reductions in antipsychotic use.

OBJECTIVE To quantify the influence of a large-scale communication training program on NH antipsychotic use called OASIS.

DESIGN, SETTING, AND PARTICIPANTS This investigation was a quasi-experimental longitudinal study of NHs in Massachusetts enrolled in the OASIS intervention. Participants were residents living in NHs between March 1, 2011, and August 31, 2013. The data were analyzed from December 2015, to March 2016, and from November through December 2016.

EXPOSURES The OASIS educational program targets all NH staff (direct care and nondirect care) using a train-the-trainer model. The program goals were to reframe challenging behaviors of residents with cognitive impairment as the communication of unmet needs, to train staff to anticipate resident needs, and to integrate resident strengths into daily care plans.

MAIN OUTCOMES AND MEASURES This study used an interrupted time series model of facility-level prevalence of antipsychotic medication use, other psychotropic medication use (antidepressants, anxiolytics, and hypnotics), and behavioral disturbances to evaluate the intervention's effectiveness in participating facilities compared with control NHs in Massachusetts and New York. The 18-month preintervention (baseline) period was compared with a 3-month training period, a 6-month implementation period, and a 3-month maintenance period.

RESULTS This study included 93 NHs enrolled in the OASIS intervention (27 of which had a high prevalence of antipsychotic use) compared with 831 nonintervention NHs. Among OASIS facilities, prevalences of atypical antipsychotic prescribing were 34.1% at baseline and 26.5% at the study end (absolute reduction of 7.6% and relative reduction of 22.3%) compared with a drop of 22.7% to 18.8% in the comparison facilities (absolute reduction of 3.9% and relative reduction of 17.2%). In the OASIS implementation phase, NHs experienced a reduction in antipsychotic use prevalence among OASIS facilities (-1.20% ; 95% CI, -1.85% to -0.09% per quarter) greater than that among non-OASIS facilities (-0.23% ; 95% CI, -0.47% to 0.01% per quarter), resulting in a net OASIS influence of -0.97% (95% CI, -1.85% to -0.09% ; $P = .03$). A difference in trend was not sustained in the maintenance phase (difference of 0.93% ; 95% CI, -0.66% to 2.54% ; $P = .48$). No increases in other psychotropic medication use or behavioral disturbances were observed.

CONCLUSIONS AND RELEVANCE Antipsychotic use prevalence declined during OASIS implementation of the intervention, but the decreases did not continue in the maintenance phase. Other psychotropic medication use and behavioral disturbances did not increase. This study adds evidence for nonpharmacological programs to treat behavioral and psychological symptoms of dementia.

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Antipsychotic medications are commonly used off label to treat behavioral and psychological symptoms of dementia in nursing facilities,^{1,2} despite increased risk of stroke and death,³⁻⁸ US Food and Drug Administration black box warnings,^{9,10} and only modest evidence of efficacy.^{11,12} A variety of approaches to reduce nursing facility antipsychotic use have had limited success.¹³⁻¹⁸ The largest successful intervention reported a mean relative reduction in antipsychotic use of 23%.¹⁵ However, this intervention was resource intensive, requiring hour-long geriatric psychiatrist evaluations, evening meetings with families, up to 6 one-hour nurse trainings, and a 4-hour administrative consultation.¹⁵

The objective of this study was to evaluate the effectiveness of a statewide intervention program (OASIS) implemented by a state nursing facility trade organization that enrolled more than 100 nursing homes (NHs). OASIS uses an innovative training curriculum built on a hierarchy of needs by Maslow.¹⁹ Unlike most behavioral management programs that focus on reacting to and managing behavioral and psychological symptoms of dementia,²⁰ OASIS reframes challenging behavior as the communication of unmet biological and psychological needs. OASIS differs from traditional behavior management programs by shifting focus away from the functional and cognitive disabilities that NH residents have toward the personhood of who residents are. The primary hypothesis was that OASIS is associated with greater reductions in antipsychotic prescribing relative to controls, without increasing the use of other psychotropic medications or behavioral disturbances. The secondary hypothesis was that antipsychotic reductions are maintained after OASIS implementation.

Methods

Study Design, Setting, and Nursing Facility Recruitment

We used a quasi-experimental longitudinal study design with external controls to estimate changes in antipsychotic medication prescribing associated with the OASIS program. The target population included all 424 nursing facilities in Massachusetts. We excluded the 11 nursing facilities in the OASIS pilot study. We used a 2-stage recruiting process. We first ranked nursing facilities by facility-level baseline prevalence of antipsychotic use (ie, January to March 2012) using data from Nursing Home Compare.²¹ The state's nursing facility trade organization sent letters of invitation to the administrators of the highest antipsychotic prescribing facilities. The letter of invitation was followed up by a telephone call 2 weeks later. In the second stage, recruitment was expanded to all eligible facilities. The trade organization enrolled the first 106 nursing facilities that submitted a completed application. The OASIS intervention was a quality improvement program that did not require institutional review board approval. The present analysis was approved by the University of Massachusetts Medical School institutional review board. Informed consent was not required for the evaluation of this statewide quality improvement program.

We analyzed the Centers for Medicare & Medicaid Services (CMS) Minimum Data Set (MDS) 3.0 data (aggregated to the facility level) merged with Nursing Home Compare data

Key Points

Question Can nursing homes reduce antipsychotic use by training staff that behavioral and psychological symptoms of dementia are the communication of unmet resident needs?

Findings This quasi-experimental longitudinal study of the OASIS communication training program examined antipsychotic use before and after intervention training in 93 nursing homes. OASIS nursing homes had greater antipsychotic use reductions compared with 831 nonintervention nursing homes, but this influence waned over time.

Meaning Training nursing home staff to understand challenging resident behavior as the communication of unmet needs can reduce antipsychotic use, but training needs to be reinforced for a sustained influence.

for residents living in NHs between March 1, 2011, and August 31, 2013. The data were analyzed from December 2015, to March 2016, and from November through December 2016. The MDS is a federally required assessment for residents in Medicare or Medicaid-approved US nursing facilities and comprises more than 400 items related to resident health and functional status, including medication use and behavior. To complete the MDS assessment, a nurse interviews the resident, consults the medical record, and talks with other caregivers to collect information on the resident's care, cognitive and physical functioning, and behavior.

Nursing home residents were excluded if they (1) had a US Food and Drug Administration-approved indication for antipsychotic use (schizophrenia, Huntington disease, or Tourette syndrome), (2) were short-term residents (length of stay <90 days), or (3) were missing data on psychopharmacological medication use or behavior. We excluded NHs that (1) had fewer than 30 MDS resident assessments in at least 1 quarter ($n = 60$), (2) were not open for the entire intervention period ($n = 54$), (3) could not be linked to Nursing Home Compare ($n = 1$), or (4) dropped out of the intervention ($n = 2$) (eFigure in the Supplement).

OASIS Program

OASIS is a unique curriculum designed to assist NH staff in meeting the everyday needs and challenges of today's long-term care population.²² Originally a 5-module, 10- to 12-hour staff educational program, OASIS was developed for the nursing facility setting. The number of modules was reduced to 4 after piloting the intervention. That adaptation, led by an interdisciplinary team of patient advocates, trained medical professionals, and nursing facility trade organization leaders, was guided by principles for dissemination of evidence-based practices that include highlighting the evidence base, simplifying recommended practices, and developing practical implementation tools and guides for key stakeholders.²³ The content of the original 5 modules (<http://www.oasis.today>) included (1) Understanding Maslow's Hierarchy of Needs, (2) Person-Centered Care—Making Strength-Based Care Plans, (3) Behavior as Communication, (4) All About Behavior, and (5) How to Keep Residents and Staff Safe. Modules 1 through 3 were

designed to run sequentially and for rapid deployment. Modules 4 and 5 were combined and redesigned for training, maintenance, and training reinforcement. Each module included a well-defined set of learning objectives, a slide presentation, exercises, supplemental activities between learning sessions, and a pretest and posttest.

We used a train-the-trainer model with a staff member designated as the facility's OASIS program coordinator and internal OASIS champion. In September 2012, OASIS program coordinators and 2 to 3 team members from each facility attended an 8-hour, in-person, training session that focused on enhancing communication skills between staff and residents with cognitive impairment using the 4 OASIS modules described above. OASIS program coordinators and team members returned to their facility to deliver the staff training program (October to December 2012). The OASIS program was designed to be delivered to all staff members in a facility, including direct care staff and nondirect care staff (ie, housekeeping and dietary), in a team-based care approach. Telephone-based technical assistance and support were offered to all facilities for 6 months (12 webinars, 2 regional meetings, and 2 booster sessions). Monthly telephone support with an expert nurse facilitator was provided to 27 facilities with the highest prevalence of antipsychotic use.

Outcome Measures

The primary outcome variable was facility-level prevalence of antipsychotic use in long-term NH residents. The MDS 3.0 item NO410A captures the number of days antipsychotics were used by a resident in the 7 days preceding the MDS assessment (or since admission or reentry if <7 days). Secondary outcome measures included facility-level quarterly prevalence of psychopharmacological medications that may have been substituted for antipsychotic medications (anxiolytics [NO410B], antidepressants [NO410C], and hypnotics [NO410D]). The behavioral problems considered included physically abusive behavior (EO200A), verbally abusive behavior (EO200B), and rejecting care (EO800) in the 7 days before the MDS assessment. All variables were dichotomized as any in the prior 7 days or none and aggregated to the facility level for each quarter.

Evaluation of the Intervention

We applied the RE-AIM framework to evaluate the Reach, Effectiveness, Adoption, Implementation, and Maintenance of the intervention.²⁴ For reach, we measured the number of facilities invited, the number who agreed to participate and met eligibility criteria, the number of dropouts, and the number who completed all study components. Intervention adoption was reflected by participation at the full-day initial training. Implementation was reflected in participation in follow-up sessions, including 12 webinars, 2 regional trainer support meetings, and the reported number of OASIS training modules completed during the intervention period. We measured attendance at 2 booster sessions. Barriers to implementation were recorded at regional meetings. Because staff turnover is a barrier to implementation, we documented reported leadership and ownership turnovers. Effectiveness was considered to be changes in facility-level antipsychotic use prevalence in the

short term (December 2012 through May 2013), and maintenance was considered as the postimplementation antipsychotic use change (June through August 2013). The intervention influence was measured by comparing facility-level antipsychotic use prevalence in these periods with baseline antipsychotic use prevalence (March 2011 through August 2012) within OASIS facilities and non-OASIS facilities.

Facility Characterization

Profit status (for profit, government, or nonprofit) and a facility's overall 5-star rating (with lower star ratings indicating lower quality) were measured using data from Nursing Home Compare.²¹ We measured nurse staffing levels (including registered nurse hours, licensed practical nurse hours, and certified nursing assistant hours, each per resident day) and 1 or more health inspection deficiencies vs no inspection deficiency because these factors affect quality of care and antipsychotic prescribing.^{1,25,26}

Statistical Analysis

We used descriptive statistics to characterize facilities and the reach, adoption, and implementation of OASIS, including χ^2 test for categorical variables and *t* test or Wilcoxon signed rank test for comparison of normally distributed or nonnormally distributed continuous variables. Facility-level monthly prevalence of antipsychotic use was examined for consistency and validity. We used an interrupted time series model with external controls from Massachusetts and New York facilities to evaluate temporal trends in facility-level antipsychotic use prevalence. The interrupted time series estimation allowed us to test for changes in the trend (level and slope) of antipsychotic use after the intervention, controlling for historical trends.²⁷ We estimated the model using a generalized least squares approach described by Prais and Winsten.²⁸ We tested the first-order autocorrelation assumption with tests by Durbin and Watson.²⁹ We specified the base model to include an intercept and 3 terms to estimate (1) quarterly changes in baseline facility-level antipsychotic use (March 2011 through August 2012), (2) the mean level change per facility in the quarter of the intervention training period (September through November 2012), and (3) intervention trend (December 2012 through August 2013). The final model included an overall interaction term for the OASIS-associated differences in the level change and slopes of the intervention. The influence from the intervention appears as a disruption in the historical pattern. In addition, a secondary analysis based on the RE-AIM framework examined maintenance of intervention trends after OASIS initiation by parsing the intervention period into 3 phases (training, implementation, and maintenance). For all analyses, we use Bonferroni corrections to account for multiple comparisons.³⁰

We conducted sensitivity analyses to address the possibility of regression to the mean. These analyses included removing the top-prescribing facilities from the OASIS group in the base model, repeating the base model analysis with the top prescribers in both the OASIS and comparator groups removed, and repeating the base model analysis in all OASIS facilities compared with New York facilities with the highest tertile of antipsychotic use.

Table 1. Characteristics of OASIS and Non-OASIS Nursing Homes (NHs)

Variable	OASIS NHs in Massachusetts (n = 93)	Non-OASIS NHs ^a (n = 831)	P Value
Status, No. (%)			
For profit	72 (77.4)	515 (62.0)	.009
Government	1 (1.1)	43 (5.2)	
Nonprofit	20 (21.5)	273 (32.9)	
Corporate ownership, No. (%)	87 (93.5)	620 (74.6)	<.001
Changed ownership, No. (%)	2 (2.2)	12 (1.4)	.60
Councils, No. (%)			
Resident only	73 (78.5)	440 (52.9)	<.001
Family only	0	4 (0.5)	
Resident and family	20 (21.5)	382 (46.0)	
None	0	5 (0.6)	
Continuing care retirement community, No. (%)	2 (2.2)	18 (2.2)	.99
No. of beds, median (IQR)	122 (88-152)	140 (104-200)	<.001
Staff hours, mean (SD)			
Adjusted RN hours per resident	0.8 (0.2)	0.7 (0.3)	.01
Adjusted LPN hours per resident	0.8 (0.3)	0.8 (0.3)	.29
Adjusted CNA hours per resident	2.3 (0.4)	2.4 (0.5)	.04
Facility quality			
5-Star quality rating, median (IQR)	3 (2-4)	4 (2-5)	.41
5-Point health inspection rating, median (IQR)	2 (1-3)	3 (2-4)	.01
≥1 Fines, No. (%)	44 (47.3)	173 (20.8)	<.001

Abbreviations: CNA, certified nursing assistant; IQR, interquartile range; LPN, licensed practical nurse; RN, registered nurse.

^a Includes 257 in Massachusetts and 574 in New York.

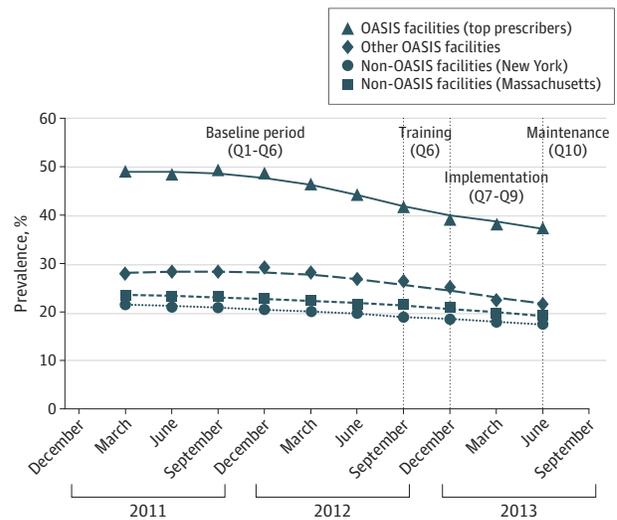
Results

We enrolled the first 25% of Massachusetts NHs (n = 106) with a completed application (eFigure in the Supplement). Because our recruitment strategy targeted high-prescribing NHs, OASIS facilities had a higher prevalence of antipsychotic use before the training was launched (ie, July to September 2012) than the non-OASIS facilities (34.1% vs 22.7%, *P* < .001).

OASIS facilities (median, 122; interquartile range [IQR], 88-152 beds) were smaller than non-OASIS facilities (median, 140; IQR, 104-200 beds; (*P* < .001). OASIS facilities were more likely to be for profit (77.4% vs 62.0%, *P* = .009), have corporate ownership (93.5% vs 74.6%, *P* < .001), and provide resident-only councils (78.5% vs 52.9%, *P* < .001) than non-OASIS facilities (Table 1). OASIS facilities had higher registered nurse staffing hours per resident (mean, 0.8 vs 0.7; *P* = .01) but lower certified nursing assistant hours per resident (mean, 2.3 vs 2.4; *P* = .04) than non-OASIS facilities. There was no difference in licensed practical nurse hours per resident. OASIS facilities had a lower health inspection rating (median, 2; IQR, 1-3 vs median, 3; IQR, 2-4; *P* = .01) and were more likely to have 1 or more fines (47.3% vs 20.8%, *P* < .001) than non-OASIS facilities.

Ninety-three OASIS nursing facilities participated in the 8-hour, in-person, training session. The mean number of

Figure 1. Trends in Prevalence of Antipsychotic Use Over Time by OASIS Training and Highest Prevalence of OASIS Nursing Homes



The y-axis shows the mean percentage facility-level antipsychotic use, and the x-axis shows time (represented in quarters). The vertical lines (from left to right) mark the beginning of the training period, implementation period, and maintenance period. Q indicates quarter.

webinars attended by facilities was 6.5 (range, 0-12). Thirteen facilities (14.0%) attended no regional seminars, 32 (34.4%) attended one, and 48 (51.6%) attended both. Four facilities attended one booster session, and 13 attended both.

The postintervention questionnaire response rate was 65.6% (61 of 93). Half of the facilities responding to the postintervention questionnaire reported that they completed all 4 OASIS training modules at their facility. The facility staff most often trained were the directors of nursing, nurses, certified nursing assistants, and activities personnel (eTable 1 in the Supplement). Approximately half of the reporting facilities trained support staff, such as housekeeping and dietary. Physicians and nurse practitioners participated infrequently. Among OASIS NHs responding to the postintervention questionnaire, 18.0% (11 of 61) reported administrator turnover, 31.1% (19 of 61) experienced a director of nursing turnover, 11.4% (7 of 61) had turnover of the OASIS program coordinator, and 29.5% (18 of 61) recorded turnover of the staff development coordinator or educator. Competing dementia care training programs were reported in 67.2% (41 of 61) of facilities completing the end-of-project questionnaire, including 30 using Hand-in-Hand, 16 using Alzheimer Association training, and 11 using the MassPRO dementia care training.

OASIS intervention effectiveness based on change in levels of atypical antipsychotic prescribing is shown in Figure 1, with the mean percentage facility-level antipsychotic use on the y-axis and time (represented in quarters) on the x-axis. The vertical lines (from left to right) mark the beginning of the training period, implementation period, and maintenance period. Between the observation periods of March 2011 and August 2013, prevalences of antipsychotic use dropped from 34.1% to 26.5% in OASIS NHs (absolute reduction of 7.6% and relative

Table 2. Influence of OASIS on Prevalence of Antipsychotic Use

Variable	OASIS NHs in Massachusetts (n = 93)	Non-OASIS NHs ^a (n = 831)	Difference	P Value for Difference
Baseline prescribing, %	34.1	22.7	11.4	<.001
Baseline period slope, % ^b	-0.32	-0.33	-0.01	>.99
Intervention change in level, % ^c	-0.73	-0.12	-0.61	.58
Intervention change in trend, % ^d	-1.20	-0.23	-0.97	.03

Abbreviation: NHs, nursing homes.

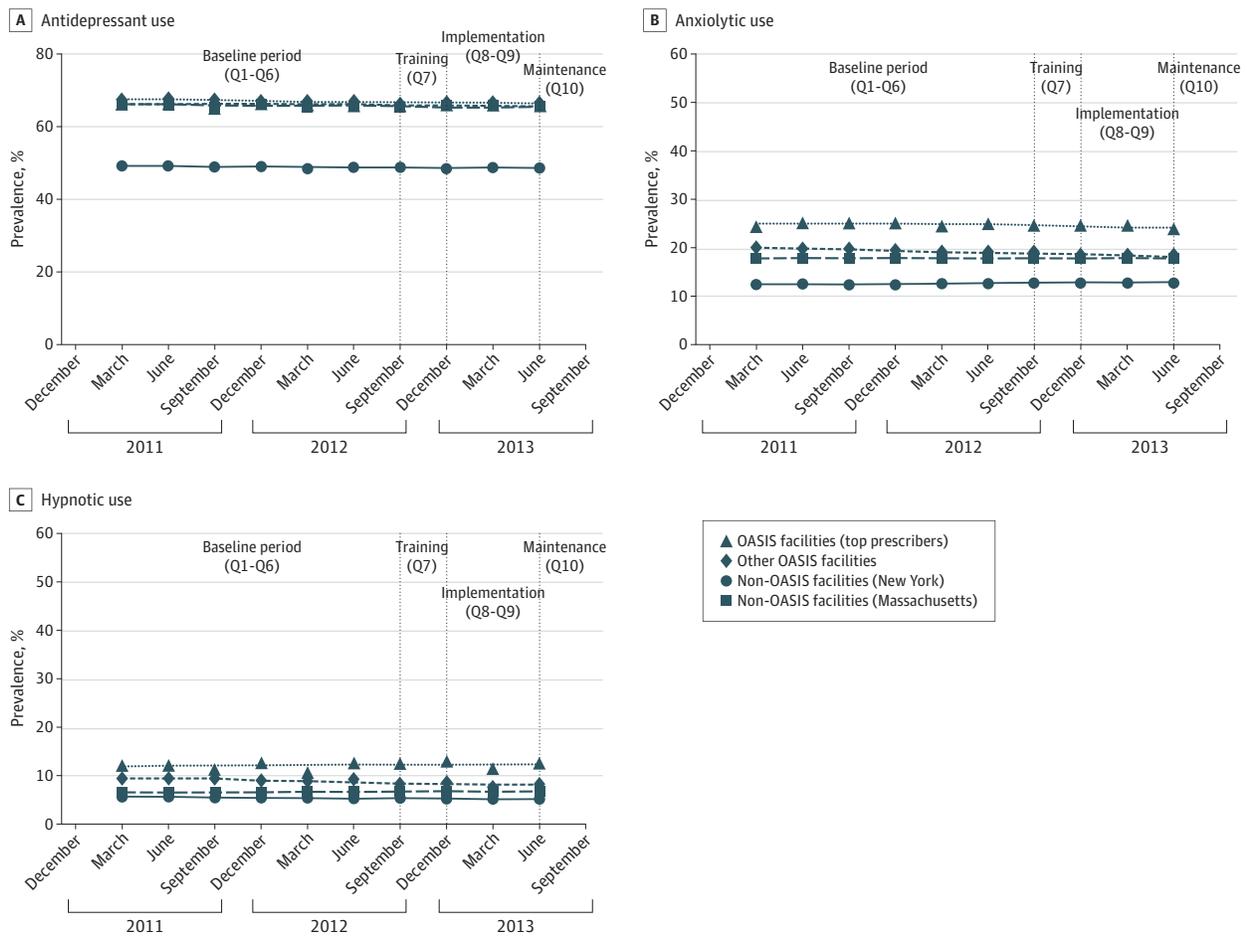
^a Includes 257 in Massachusetts and 574 in New York.

^b Change in prevalence of antipsychotic use per quarter (Q1-Q6, from March 2011 through August 2012).

^c Immediate change in prevalence of antipsychotic use during the first quarter of OASIS implementation (Q7, from September through November 2012).

^d Change in prevalence of antipsychotic use during OASIS implementation (Q8-Q10, from December 2012 through August 2013).

Figure 2. Use of Potential Substitutes for Antipsychotics During the Follow-up Period (March 2011 Through August 2013) by OASIS Training and Highest Prevalence of OASIS Nursing Homes



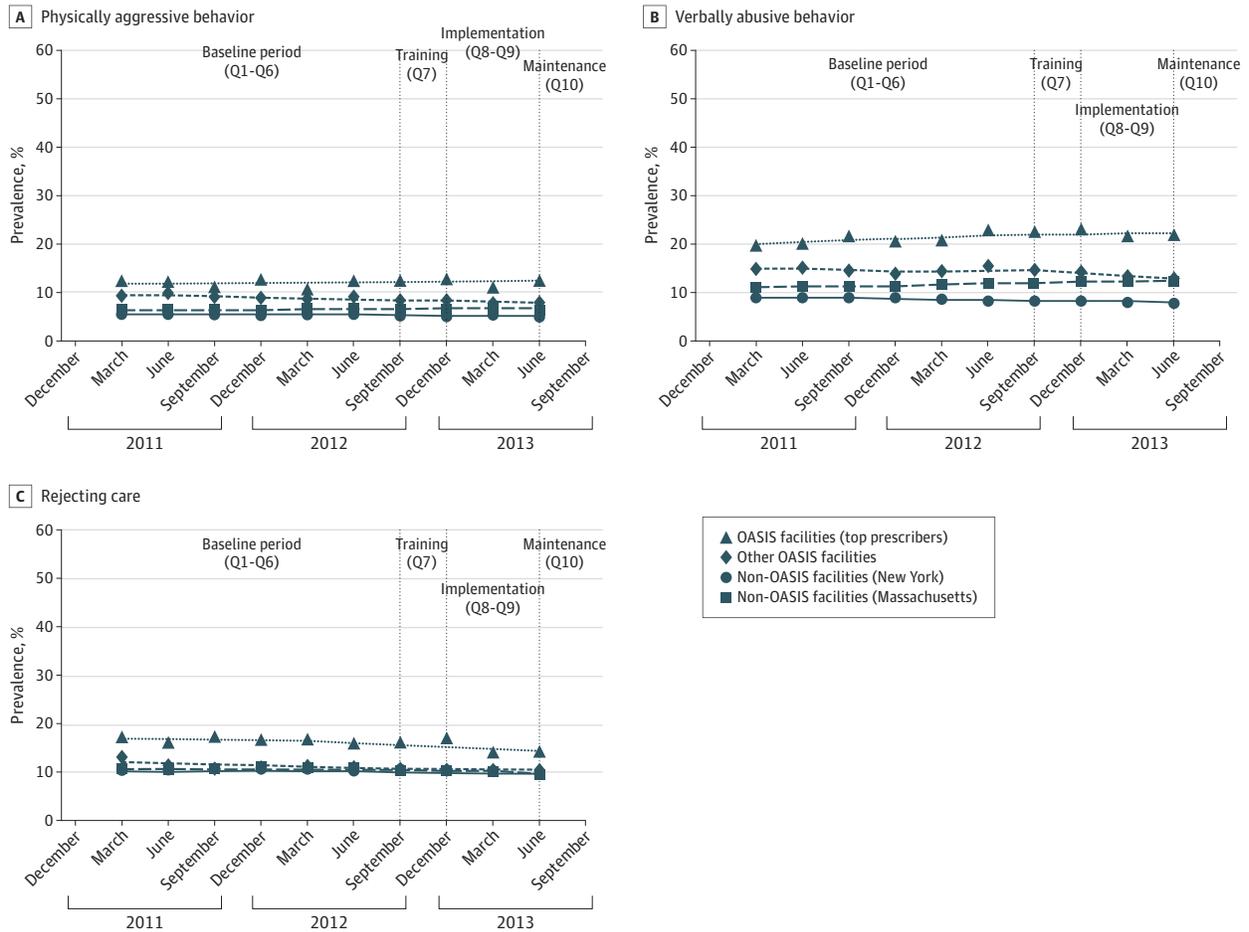
Q indicates quarter.

reduction of 22.3%) compared with a drop of 22.7% to 18.8% in the comparison facilities (absolute reduction of 3.9% and relative reduction of 17.2%).

As summarized in Table 2, a decreased trend in prevalence of antipsychotic use in the baseline period was found for both OASIS NHs (-0.32% per quarter) and the comparison NHs (-0.33% per quarter) ($P > .99$ for difference). We first evaluated whether there was an immediate change in prevalence

of antipsychotic use in the initial period of OASIS implementation. There was no statistical difference between the 2 intervention arms at the time of intervention implementation (-0.61; 95% CI, -1.91 to 0.68; $P = .58$). Estimates of the antipsychotic use trend in the postintervention implementation period revealed that, while both OASIS NHs and the comparison NHs were experiencing decreases (-1.20%; 95% CI, -2.05% to -0.35% per quarter for OASIS NHs and -0.23%; 95% CI,

Figure 3. Prevalence of Aggressive or Disruptive Behavior During the Follow-up Period (March 2011 Through August 2013) by OASIS Training and Highest Prevalence of OASIS Nursing Homes



Q indicates quarter.

–0.47% to –0.01% per quarter for comparison NHs), OASIS NHs experienced greater declines (–0.97%; 95% CI, –1.85% to –0.09%; $P = .03$).

To evaluate the extent to which these findings could be explained by regression to the mean, we conducted 3 sensitivity analyses. First, we removed the top antipsychotic prescribers among OASIS facilities. The difference in intervention trend between OASIS and non-OASIS arms remained statistically significant (difference of –1.3% per quarter, $P = .003$) (eTable 2 in the Supplement). Second, we further removed the top tertile of antipsychotic prescribers in the comparators. The OASIS influence remained significantly different (difference of –1.6% per quarter, $P < .001$) (eTable 3 in the Supplement). Third, we compared all OASIS facilities with the top tertile prescribers from the New York facilities. This analysis showed a difference in trend of 0.6% per quarter that was not statistically significant ($P = .17$) (eTable 4 in the Supplement).

An analysis examined the secondary hypothesis that antipsychotic use reductions were maintained after OASIS implementation (eTable 5 in the Supplement). The intervention phase was parsed into 3 separate periods (training, implemen-

tation, and maintenance), and analysis showed that the greatest difference was seen in the implementation phase (difference of –1.29%; 95% CI, –2.16% to –0.42%; $P = .01$), but it was not sustained in the maintenance phase (difference of 0.93%; 95% CI, –0.66% to 2.54%; $P = .48$).

Figure 2 and Figure 3 show no evidence of immediate changes in prevalence or trend changes of other psychotropic medication use or behavioral problems during the training and implementation phases. No statistically significant changes were found (eTables 6-11 in the Supplement).

Discussion

This investigation is the largest study to date to demonstrate meaningful reductions in nursing facility antipsychotic prescribing. The OASIS program was associated with a reduction in antipsychotic use prevalence during the implementation phase of the intervention, but it was not sustained in the maintenance phase. No increases in other psychotropic medication use or behavioral disturbances were observed. The

OASIS influence occurred in a setting of strong secular trends indicating reductions in prevalence of nursing facility antipsychotic use. These secular trends mirror national trends.

We believe that our estimate of the OASIS influence is conservative because our study was conducted in the context of a CMS campaign targeting reductions in antipsychotic prescribing and secular trends. Nationwide relative reductions of 9% among skilled nursing facilities nationally³¹ have been reported, with a mean absolute facility-level reduction in 2012 of 4%.³² Widespread attention to antipsychotic reductions was reported in numerous high-profile newspaper articles,³³ an Office of Inspector General report,² and the nationwide Advancing Excellence Campaign (<https://www.nhqualitycampaign.org/>). Among facilities participating in OASIS, an upward trend in early 2011 reversed at about the time of the well-publicized Senate hearings on antipsychotics³⁴ on November 30, 2011. Spillovers from each of these events likely contributed to reductions in antipsychotic use and thereby attenuated our estimate of the OASIS program influence. Our study was also conducted when competing programs, such as the CMS Hand-in-Hand program, and culture change initiatives were launched. Because NHs were free to participate in other programs, we believe that the estimate herein of the OASIS influence was muted.

There were differences in actual implementation and adherence to the OASIS intervention. The investigation presented is an intent-to-treat analysis that examined the outcomes regardless of adherence. Nevertheless, we observed an OASIS influence, despite the lack of participation in OASIS training by the actual prescribers. Only 11.5% (7 of 61) of physicians and 11.5% (7 of 61) of nurse practitioners participated in OASIS trainings. Many OASIS NHs experienced turnover in their leadership roles. Our findings also show that the antipsychotic reduction rates were greatest during the implementation phase but waned during maintenance of the program.

These challenges should be considered for sustainability of the program within facilities. We advocate for the use of booster sessions and opportunities for retraining.

Strengths and Limitations

Our findings must be considered in the context of several strengths and limitations. We used an interrupted time series model, one of the strongest quasi-experimental designs, to evaluate interventions because it is robust to many of the threats to internal validity.³⁵ The technique adjusts for differences in time-invariant confounders and historical changes in antipsychotic use. The analytic approach used facility-level aggregated data. While individual-level characteristics were not adjusted for, the case mix of residents was not expected to have changed during the study period. Mitigating these limitations is the large sample size of the study, as well as the inclusion of comparator facilities drawn from the same and an adjoining state relative to where the intervention was conducted.

Conclusions

This study found that the OASIS communication training program has its most measurable influence in the 6-month period of implementation after a 3-month training period. The fact that it waned thereafter is similar to other interventions in which the influence dissipates without active reinforcement.³⁶ Differences were compelling in the context of strong secular trends, contamination by other competing dementia care programs, and in comparison with comparator NHs. The implications are that a program to understand resident communication and to treat the personhood of who NH residents are, without an overt focus on antipsychotic prescribing per se, can be effective at reducing the use of these risky medications.

ARTICLE INFORMATION

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Author Contributions: Dr Tjia and Mr Hunnicutt had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Herndon, Wehry.

Acquisition, analysis, or interpretation of data: Tjia, Hunnicutt, Blanks, Lapane.

Drafting of the manuscript: Tjia, Hunnicutt.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Tjia, Hunnicutt, Lapane.

Obtained funding: Tjia.

Administrative, technical, or material support: Tjia, Blanks, Lapane, Wehry.

Study supervision: Lapane.

Conflict of Interest Disclosures: Dr Tjia reported that during the past 3 years she has received grant support from the National Institutes of Health, The Donaghue Foundation, The Arnold P. Gold Foundation, and the Cambia Health Foundation (none of which had a role in this publication). Dr Tjia also reported having received honoraria for serving

on and reviewing grants for the scientific review committee of The Donaghue Foundation and having received honoraria and travel support for serving on the geriatric technical expert panel for CVS Omnicare. She reported also being a consulting geriatrician for the CVS Caremark pharmacy and Therapeutics committee, for which she reviews medications and clinical programs for CVS Caremark. Dr Lapane reported that during the past 3 years she has received grant support from the National Institutes of Health, the Centers for Disease Control and Prevention, and Cubist Pharmaceuticals. Dr Wehry reported receiving personal fees from the Massachusetts Senior Care Foundation for OASIS training during the conduct of the study, reported receiving nominal licensing fees for the use of Oasis training materials, and reported receiving speaking fees for conducting Oasis Master Trainer programs. No other disclosures were reported.

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Disclaimer: The content of this report is solely the responsibility of the authors.

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