Decreasing Psychotropic Medication Use for Nursing Home Residents with Dementia:

A Quality Improvement Project

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Abstract

Skilled Nursing Facilities (SNFs) provide care for long-term care residents with multiple medical concerns as well as dementia. The number of the geriatric population showing dementia-related behavioral symptoms, such as agitation or screaming to get attention, is increasing. The traditional ways of using psychotropic medications to calm these residents have come under scrutiny. According to the Centers for Medicare and Medicaid (CMS), the practice of administering these medications to manage residents is no longer acceptable. In a selected SNF, there was a perceived need to implement a quality improvement project to replace nonpharmacological interventions with psychotropics as a solution to resolving the behavioral problems. Although there were limitations to the project, the findings indicated that the project effectively met the objectives of reducing the frequency of using psychotropic drugs for the residents of this SNF

 Keywords: dementia, antipsychotic drugs, skilled nursing facilities

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Section I

Introduction

The objectives of this quality improvement (QI) project were to improve the knowledge level of the care staff to assess, identify, proactively intervene when disruptive behaviors occurred among the residents at a Skilled Nursing Facility (SNF), and to provide documented evidence of the disruptive behaviors with a nonpharmacological resolution of the residents' behaviors. The three steps in Lewin's Change Theory provided the conceptual framework for planning strategies for the project (Lewin, 1947).

A review of the literature and a collaborative effort with the SNF stakeholders identified the issues surrounding the problem as well as the intended goal. Additional results included the development of rationales and plans for unfreezing the current practices. The elements of change took place with a training program that included strategies about how to identify, discuss, intervene, and document all the factors that supported or opposed the initiative. The refreezing stage involved periodic process reviews, follow-ups, coaching, and improvements in the implementation strategies of change based on feedback from the residents, staff, and family members.

A two-hour training program was a mandatory event for each of the care staff members. The program focused on (a) discussions related to identifying the residents' personal care needs and triggers for anxiety, agitation, and aggression, (b) demonstrations of how to implement nonpharmacological interventions in the presence of disruptive behaviors, and (c) demonstrations of documenting the processes listed above on a newly developed Resident Behavior Assessment Form. Forty days were sufficient to implement QI strategies.

During the implementation of the project, 29 staff members participated in the in-service training program and collected data from 88 cases of observed disruptive behaviors. The introduction of nonpharmacological interventions resulted in cessation of the behaviors in 70 (79%) of the 88 cases. Eighteen of the observed disruptive behaviors led to unsuccessful pharmacological interventions. A display of a run chart indicated that there were random patterns of successful nonpharmacological interventions when matched to the observed behaviors in the first three weeks of the project. However, there were improved matches of the successful nonpharmacological interventions when matched with the observed behaviors during the last week. Although there were limitations to the project, the findings indicated that the project effectively met the objectives of reducing the frequency of using psychotropic drugs for the residents of this SNF (see Appendix A).

Background

SNFs provide care for long-term care residents with multiple medical concerns as well as dementia. Alzheimer's Disease (AD) and Vascular Dementia, which can result from cerebrovascular strokes, are common forms of dementia. According to research evidence, personal types of discomfort such as hunger, thirst, or a need to use the restroom are some of the common causes of displays of irritability (Kemerer, 2018). As these residents are frequently cognitively impaired and unable to articulate the existence of a problem, they tend to resort to other methods of communications, such as fighting with the staff, refusing to accept personal care, and agitated yelling or screaming to get attention (In & Hee, 2018; Brett & Traynor, 2018).

According to Texas Health and Human Services (2019), 350,000 Texans are affected by dementia. In the fiscal year of 2015, over 90,000 people were living in SNFs and 49,000 diagnosed with Alzheimer's Disease or other dementias. Cognitively impaired residents exhibit anxiety,

agitation, and other behavioral symptoms that often increase over time. As the day transitions to

evening, the affected residents often begin to demonstrate the Sundowning Syndrome with

increased signs of agitation and increased confusion. Due to a lack of understanding of the triggers

that lead to those behavioral symptoms, the staff at SNFs tend to resort to prescriptions of

psychotropic medications to resolve them (Holmes & Sachs, 2017). Thus, the most frequently

prescribed drugs for this population are those intended to control some of the more severe and

unwanted behaviors such as hallucinations, delusions, and aggressiveness.

Due to the documented evidence of adverse events among nursing home residents with

dementia, the CMS recommended a reduction of antipsychotic medication use to 15% in this

population (Mort, Sailor & Hintz, 2014). However, residents diagnosed with schizophrenia,

Tourette's, and Huntington's Disease are excluded from this recommendation, as they are

considered acceptable recipients of these drugs.

Prescriptions for antipsychotics are controlled and regulated by the CMS with enforced

semi-annual audits of the facilities' medical records, and the Certification and Survey Provider

Enhanced Report (CASPER) is a recognized quality measurement for nursing homes (CMS,

2016). According to the more recent 2019 regulations, antipsychotic medications can only be

given on a short-term basis until the cause of the behavior is treated medically (CMS, 2019). For

example, infections such as urinary tract infections are notorious for causing altered mental states

with behaviors that trigger an acceptable need for using second-generation antipsychotic

medications to treat dementia-related behaviors (McKnight's Long-Term Care News, 2018).

Currently, the practice of giving antipsychotic medications to manage residents with

inappropriate behaviors in SNFs is no longer acceptable. If a resident does not qualify for

antipsychotic use under the current CMS (2019) guidelines, the provider should discontinue the

medication or reduce the dosage. According to McKnight (2018), the CMS's goal for the guidelines is for antipsychotic rates to be reduced to less than 15% of the residents at SNFs due to a high risk of adverse effects (Berklan, 2017). CMS recently introduced a five-star quality rating system (STAR) expected to improve the quality of care for Medicare beneficiaries, strengthen protections, and to help consumers compare health plans in nursing homes (CMS, 2020). Nursing homes with five-star ratings are considered above average quality, while those with only one star have quality much below average (CMS, 2019). There is one possible overall five-star rating for each nursing home and separate ratings for each of three sources of information that include health inspections, staffing, and quality measures. Fifteen different physical and clinical quality measures provide information about how well the nursing home meets the residents' physical and clinical needs (Goodwin et al., 2017). One specific quality measure within this category relates to a Long-Stay Quality Measure that relates to the percentage of long-stay residents who received antipsychotic medication (CMS, 2020).

Needs Assessment

In Texas SNFs), the off-label and excessive use of antipsychotic medications is significant (Texas Board of Nursing, 2016). Texas has one of the highest recorded uses of antipsychotics and has been ranked 49th in the United States for quality of care and quality of life (Alzheimer's Association, 2017). The Office of the Inspector General (OIG) report, the CMS, and the Governmental Accountability Agency (GAO) have additionally identified a need to improve the care of patients with dementia by using non-pharmacologic approaches and person-centered dementia-care practices (Mendes, 2019).

In the selected SNF, the use of antipsychotics among residents with dementia was 25% for the entire facility in the given quarter after their most recent CMS's evaluation. This use of

antipsychotics was above the acceptable rate of 15%. An internal screening of medical records indicated that 50% of a total of 70 residents with dementia, who were on antipsychotic medications, did not meet the recommended criteria to receive the drugs. Additionally, Kaplan (2018) reported that 90% of SNF residents admitted from hospitals were prescribed antipsychotics, such as Seroquel, to manage their anxiety, depression, or insomnia issues. These prescriptions were not appropriate because they did not support the residents' diagnostic criteria. This practice of prescribing high-risk antipsychotics upon discharge from the hospital tends to increase the operational cost for SNFs and decrease the quality of the lives of the affected residents. In order to comply with the CMS guidelines, there is a perceived need to implement strategies that will eliminate the expression of unacceptable behaviors, which tend to reinforce the need to use psychotropic drugs as a last resort solution to the problem.

Current Process

The current protocol at the local SNF follows the CMS guidelines. Upon admission to the SNF, an Interdisciplinary Care Team (ICT) develops a care plan for a newly admitted resident. Following an initial evaluation, representatives from each discipline, including nursing, physical therapy, nutrition, activities, and social services, develop the most beneficial plan for the resident. As the quality of life for the resident is most important, the primary care providers (PCP) are mandated to refer each new resident with prescribed psychotropic therapies to receive psychiatric services within 24 hours of admission. A psychiatric provider should determine the appropriateness of the antipsychotic prescription within 48 hours and make prescriptive adjustments that comply with the guidelines.

On an ongoing weekly basis, Quality Control personnel at the facility perform chart reviews to identify residents who have received psychotropic drugs. Clinical pharmacists

regularly review each resident's medication profile and flag records that suggest possible

inappropriate use of antipsychotics. The psychiatric provider has 48 hours to review the

pharmacists' concerns and make medication adjustments that comply with the CMS guidelines.

Gaps

The research literature suggests that high-quality dementia care consists of training the

nursing staff and using non-pharmacologic methods that would support the residents' state of

well-being (Marx et al., 2019). With today's CMS guidelines, agitated residents, for example,

cannot be ignored or medicated with psychotropics to calm them. Instead, the staff and nurses

require training and education to personalize their care in order to proactively reduce the

situations that trigger these behaviors among the residents (Marx et al., 2019). Some

recommended nonpharmacological behavior management strategies include avoidance of

overstimulation, regular hygienic care, hunger and thirst management, assistance with

elimination, and the provision of sensitive explanations of inappropriate behavior and gentle

redirection (Dementia care: Nonpharmacological approaches to behavior management, 2018).

Before the implementation of this project, there were no recommended strategies to offset

the residents' agitated behaviors when discontinuing antipsychotics. A cycle of inappropriate use

was resumed when the nurses sought new orders for the same drugs to calm the resident from

their recurring agitated behaviors. Furthermore, there were no known tools to assist with

communicating about the triggers that frequently tend to lead to unacceptable behaviors. In other

words, there was no data that described the antecedent circumstances that led to the expression of

the unacceptable behaviors of the residents.

Due to a lack of training, evidenced by no documentation of formal education for

overcoming agitated behaviors, the nursing staff and the caregivers in this SNF often failed

to identify or deal with behaviors that were the likely causes of anxiety or agitation. There was a gap between the expressed needs of the residents and the observed skills of the care staff at the SNF. This gap included a lack of training within the organization, with inadequate compliance with the most current CMS guidelines that relate to reductions in the use of antipsychotic drugs. The use of non-pharmacologic methods and a person-centered approach for behavior management was a perceived key to a resident's overall wellness (Bohn, Kwong & Fung, 2019).

There was an identified need to develop an evidence-informed protocol to support the needs of the providers of care for the residents with dementia in this local skilled nursing facility.

Stakeholders

The key stakeholders who identified the necessity for improved care among the residents with dementia in this SNF include the Skilled Nursing Home organization, the SNF associated director, providers, nurses, and aides, Medicare payers, and Medicare recipients. The central role of the primary and additional stakeholders is to attain the long-term financial goals for the facilities and to determine the outcomes of decision-making. The direct management of healthcare, which includes the identification of short-term goals and meeting the needs of nursing homes and their residents, is another crucial role of stakeholders. PCPs have a gatekeeper role as stakeholders to control the rising costs of healthcare. In the case of antipsychotic medications, the PCPs are responsible for controlling the necessary use of diagnostic tests and referrals for the patients.

From a business perspective, the corporate partners who assist with the management of this agency and the many skilled nursing homes and rehabilitation centers in Texas include the

owners of the company, administrative employees, suppliers, physicians, and insurance companies. Additional stakeholders are the community of the care homes and the federal government, the main provider of reimbursements for care.

Purpose

The purpose of this quality improvement project was to provide a training program that addresses the necessary knowledge and patient care skills to reduce the administration of antipsychotic drugs for disruptive behaviors among residents with dementia in a SNF.

Aims

The project's aim was to offer the caregivers at the SNF an evidence-informed training program. The intent was to encourage a personalized approach to proactively care for the antecedent triggers that cause the residents to exhibit inappropriate behaviors leading to the need for antipsychotic drug uses.

PICO(T)

The PICOT statement was: Will a staff-appropriate training program that uses nonpharmacological strategies to assess and resolve antecedent triggers that lead to inappropriate behaviors among residents with dementia reduce the recorded use of antipsychotic drugs within 30 days?

P: Population Group: Care staff - Care providers for SNF residents with dementia

I: Intervention/Assessment: A training program that introduces personalized nonpharmacological strategies to assess and resolve the antecedent triggers among residents with dementia

C: Comparison: Prior strategies of the management of care for residents with dementia

O: Outcome(s): Record of documented evidence that antipsychotic drugs were or were not used

to assist a resident with dementia with inappropriate behaviors

T: Timeline: 30 days

Objectives

The Institute of Medicine's (IOM) 2020 goals guided the project's development. The

IOM has developed six aims for the improvement of healthcare organizations: safety,

effectiveness, equity, timeliness, patient-centeredness, and efficiency (IOM, 2020). The main

objective of the project was to develop a Quality Improvement project to provide a timely and

efficient strategy to provide a safe environment for residents with dementia in a SNF.

Specifically speaking, the objectives of the project were to: (a) improve the knowledge

level of the care staff to assess, identify, and proactively intervene when disruptive behaviors

occur among the residents, and (b) to provide documented evidence of the disruptive behaviors

with a nonpharmacological resolution of the behaviors.

Theoretical/Conceptual Framework

Kurt Lewin's change theory, which has supported many improvements in nursing

practice, was used in the development of the project. Lewin's theory focuses on three steps to

successfully make a change to the existing nursing practices (McKimm & Till, 2015). The three

steps in Lewin's change theory are: (a) unfreezing, (b) changing, and (c) refreezing (Lewin,

1947). Unfreezing is the first stage of change that prepares an organization to discontinue the

status quo. In the case of this project, following a collaborative effort with the stakeholders and

care staff of the SNF, the issues surrounding the problem and the intended goal were identified,

and the rationales and plans for change developed. The driving forces and the potential resisting

forces were also explored (see Appendix C).

Change refers to how people begin to participate in the newly established strategies implemented as a part of the regular routines at the SNF. During this stage, the anticipated change management process included strategies on how to identify, discuss, intervene and document all the factors that supported or opposed a change initiative, and the desired expectation of observing the benefits of the strategies.

The refreezing stage involves a time when the new strategy becomes institutionalized. This stage involved the periodic process reviews, follow-ups, coaching, and the improvement in implementing strategies of change based on feedback from the residents, staff, and family members. Theory analysis shows the driving and resisting forces fighting for balance (see Appendix C).

Driving forces and resisting forces are the main elements in theory analysis (Holmes & Sachs, 2017). The two forces oppose each other and show the need for improvement among staff members. Driving forces to improve behavioral care with nonpharmacological management included reduced costs for the care home, decreased patient suffering, compliance with CMS, and reduced stress for the caregivers. On the other hand, resisting forces are in constant need for education due to staff's lack of motivation for the change, limited resources for education, lack of nursing staff's confidence due to limited training in dementia behavior management, and lack of awareness for choices of nonpharmacological behavior management.

Section II

Presentation of Evidence

Literature Review

A review of the literature searched for the latest non-pharmacologic intervention practices that discussed the triggers, symptoms, and causes of problematic behaviors, and how to recognize and treat the underlying causes, before using antipsychotic medications. The literature provided some guidelines or best practice ideas for the staff who care for individuals with dementia. With the help of the Texas Woman's University online services, the Pub/Med, Medline, and CINAHL databases were searched. The search used the following keywords to locate the most suitable topics: (a) "non-pharmacologic," (b) "dementia," (c) "triggers," (d) "behaviors," (e) "nursing home," (f) "neuropsychiatric symptoms," and (d) "nursing." The first-step filter focused on studies published within the last five years, from 2014–2019. The second-step filter focused on nursing home caregiver education. The third-step filter limited the search to peer-reviewed English-language articles.

Dementia was first searched on a Medline database and generated a total of 8691 searches based on peer-reviewed inclusion criteria of full text with dates between 2014–2019. A review of the titles and abstracts led to the exclusion of the following topics: home care for family members diagnosed with dementia, nursing home infections, and acute care hospitalization. The primary search terms of d*ementia* AND *nonpharmacological*, for a narrower search, produced 38 articles with a direct relationship between nursing home dementia care and non-pharmacologic interventions. Of those 38 articles, 29 were considered evidence-based and suitable for review. A search of the CINAHL database using *antipsychotic* AND *dementia* AND *non-pharmacologic* resulted in no matches. A search of Medline produced 29 full-text literature

reviews, five of which were relevant to the project. Another Pub/Med search with the same

search term of *dementia* yielded 59,797 articles. Adding *nursing homes* to the search reduced the

count to 1,93. The search narrowed by adding *antipsychotics.* As a result of the narrowed search,

61 articles and two evidenced-based articles (limited by full-text studies published within the

past five years) remained. Not considered were studies with genetics as the primary focus for

dementia, anticholinergic medications use, and caregiver burden. Finally, a total of seven full-

text, evidence-based articles were selected to guide this project. A summary of the literature that

guided planning for this project follows:

Dementia-Oriented Assessments and Behaviors

Halek et al. (2017) reported on the development, content validity, practicability, and

feasibility of using an Innovative Dementia-oriented Assessment (IdA) system for challenging

behaviors in residents with dementia. A need-driven dementia-compromised behavior (NDB)

model was used as a theoretical framework to guide the development of the assessment tool

during three stages.

The first stage of the project included a search of the literature for the identification of

assessment components and challenging behaviors that included wandering among patients

with dementia (Halek et al., 2017). The assessment framework focused on the apparent

causes of challenging behaviors due to the increased inability of residents to meet their basic

personal needs as the primary triggers for challenging behaviors. Triggers were documented

and assessed according to the Cohen-Mansfield agitation (CMA) model. The CMA model is

a 29-item scale to systematically assess agitation, which identifies physically aggressive and

non-aggressive behaviors as well as verbally agitated behaviors among elderly persons

(American Psychological Association [APA], 2020). Halek et al. (2017) identified a total of

93 items for their IdA system, and 15 expert practitioners completed the elements of the assessment system.

During the second stage, an expert panel and healthcare practitioners at a workshop judged the clarity and completeness of the questions in the assessment system (Halek et al., 2017). Leaders from some selected nursing homes recruited the key people experienced in caring for patients with dementia to implement the IdA in their facilities.

During stage three, the feasibility and usefulness of the IdA were evaluated (Halek et al., 2017). The sample size for the study of caregivers included 11 nursing homes, from which 17 units within the nursing homes participated. Twelve of the units were traditional care units, and five were care units for residents with dementia. The study lasted for six weeks, during which the care staff received a one-day training. The other staff received a one-hour training.

For evaluation purposes, 229 questionnaires returned from the participants resulted in a response rate of 58% (Halek et al., 2017). From a nursing perspective, the use of the assessment tool was promising as it assisted with the identification of the unmet needs of the residents with dementia as being the main trigger for the manifestation of challenging behaviors. Overall, 84% of the users said they would continue to use the IdA system in their nursing homes as a tool to reduce antipsychotic medications. In conclusion, Halek et al. (2017) reported that the findings of the study offered strong evidence and validity for a recommendation to use the IdA to create a comprehensive understanding of the persons exhibiting challenging behaviors. This comprehensive literature review was a Level V on the hierarchy of evidence. The review offered support for using the IdA assessment tool to help identify the unmet needs of residents with dementia who displayed challenging behaviors.

Antipsychotics in Nursing Homes

A systematic review of the literature authored by Cioltan et al. (2017) discussed in detail the variations of the use of antipsychotic medications in nursing home residents in the United States. The sources of evidence generated from Ovid Medline, CINAHL, Embase, Web of Science, Elsevier, PsycINFO, Sociological Abstracts, Wiley, and the Cochrane Library databases. Data abstractions followed guidelines for Preferred Reporting Items for System of Reviews and Meta-Analysis (PRISMA); however, there was no meta-analysis conducted.

The inclusion criteria for the studies required that all residents from the nursing home were 60 years or older to participate (Cioltan et al., 2017). The 19 cross-sectional and cohort peer-reviewed studies assessed followed Strengthening the Reporting of Observational Studies in Epidemiology (STROBE). The sample sizes of the selected studies ranged from 204 to 155,095 participants overall. Two reporting systems were the area of focus; one was the Online Survey Certification and Reporting (OSCAR) database; the other was the Minimum Data Set (MDS) that collected nursing home quality information based on CMS requirements. The findings of the study indicated that the increased use of antipsychotic medications (ASM) was associated with southern regions in the U. S., lower availability of registered nurses (RNs), higher numbers of Medicare patients' in a facility (with up to 83% of claims associated with off-label antipsychotic use) and in private facilities since there was no regulatory oversight. Overall, some nursing home characteristics were related to increased uses of ASM, suggesting that a facility's characteristics should focus on adhering to the CMS's requirements.

Education to Reduce Challenging Behaviors in Assisted Living Residences

Karlin, Visnic, McGee, and Teri (2014) evaluated the implementation of a pilot to study the effects of a Staff Training in Assisted Living Residences in the Department of Veterans

Affairs (STAR-VA) program in 17 nursing homes that were managed by the VA system. The

STAR-VA intervention is a multicomponent psychosocial intervention method to manage

challenging dementia-related behaviors. STAR allowed staff education to identify trigger

symptoms to reduce challenging behaviors for nursing home staff. The first phase of the study

provided the participants with descriptions of trigger activators that included under-stimulation,

sadness, pain, noise, and crowded surroundings. After identifying the triggers, the interventional

strategy provided ideas about how to change each resident's behavior.

The caregivers' training incorporated a STAR-VA-related video that included 21 Mental

Health Providers and staff partners (Karlin et al., 2014). Sixty-four veterans completed the study.

Challenging behaviors were identified by a STAR-VA ABC Card to target specific interventions

for each resident. A record of the frequency of behaviors used a Likert scale, based on a point

system of 0–4 (zero (0) meant no behaviors, and four (4) meant extreme ones). A Revised

Memory and Behavior Problem Checklist (RMBPC) was also used and rated on a 5-point Likert

scale (zero (0) meant no behaviors, and five (5) showed having behaviors four to six times a

week) (Karlin et al., 2014). Depression was measured on the Cornell Scale for Depression in

Dementia (CSDD) to evaluate possible depressive symptoms, and a 3-point Likert scale was

used (zero (0) meant no depression and two (2) suggested severe symptoms of depression).

Anxiety was also measured based on The Rating Anxiety in Dementia (RAID) instrument, which

focused on apprehension, worry, fear, irritability, motor tension, dry mouth, hypersensitivity, and

hyperventilation. This measure was for residents with cognitive impairment. Each item was rated

on a Likert scale as well (zero (0) suggested no anxiety and three (3) suggesting severe

symptoms). A score greater than 11 indicated significant symptoms of anxiety.

The timeframe for the interventions was 46 days, and 33% of the staff partners were certified nursing assistants (Karlin et al., 2014). The results showed six different behavior types: (a) resistance to care, (b) refusing to shower, (c) agitation, (d) violence/aggressive behavior, (e) wandering, and (f) yelling out. The STAR-VA ABC baseline score of 2.6 to a final score of 1.1 showed a 46% average decline in behaviors with a statistically significant change in scores ($p < 0.01$). A reduced CSDD base score of 10 to 6.8 resulted in a 32 % decrease in overall symptoms. A reduced RAID score from 10.8 resulted in a final score of 6.8, indicating a 37% reduction, which was statistically significant [$p < 0.0001$] (Karlin et al., 2014). Overall, the study showed promising results with this cohort high-quality evidence level II study to decrease dementia-related behaviors and decrease the usage of antipsychotic medications within nursing homes.

Interventions to Reduce Antipsychotic Drugs among Home Care Residents with Dementia

Brooker et al. (2016) used a cluster randomized-controlled trial (RCT) to introduce a Focused Intervention Training and Support (FITS) program to reduce the use of antipsychotic medications for people with dementia, who lived in care homes in the United Kingdom (UK). The program aimed at reducing antipsychotic medication usage by providing person-centered psychosocial interventions. The researchers compared the usual 40% antipsychotic drug use in 150 care homes.

Dementia-Care Coaches (DCCs) worked with the caregiving staff to educate and identify a baseline understanding of attitudes toward the residents with dementia, knowledge of dementia, and the impact of the education on practice. The DCCs selected a specific goal to increase the quality of life of the residents. The implementation of the program included: (a) a review of the

medication prescriptions with the healthcare provider; (b) a re-evaluation of using antipsychotic medications; and (c) care planning with a focus on behavioral analyses for all residents.

Fellow care staff members received education to increase their knowledge of dementia and to develop interactions with the residents to prevent under-stimulation with the use of role modeling. Qualitative and quantitative evaluation measures compared the pre-training and post-training scores. Goal Attainment Scaling (GAS) evaluated the personalized outcomes of the residents with dementia. Overall, there was a statistically significant reduction in antipsychotic prescription rates from baseline (20%) to post-intervention (14%) with a total reduction of 31% post-intervention. The study showed that the Focused Intervention Training and Support (FITS) into Practice Program was a robust intervention to introduce a change in nursing homes that had administered high rates of antipsychotics to patients with dementia. Within the 65 selected care homes that completed the study, there were significant reductions of prescribed antipsychotic medications. This Randomized Control Study provided level I high-quality evidence.

In another clustered RCT conducted in 69 UK nursing homes, Ballard et al. (2018) evaluated the impact of agitation and antipsychotic use among nursing home residents with dementia. The UK study randomized 847 individuals into a Well-being and Health for People with Dementia (WHELD) treatment group and a "treat as usual group." That study assessed outcome measures at baseline and nine months after the intervention.

The WHELD intervention focused on training person-centered care, social interactions, and education regarding the use of antipsychotic medications (Ballard et al., 2018). The introduction of the care staff champion model reduced neuropsychiatric symptoms of dementia with a secondary outcome measure, the Cohen-Mansfield Agitation Inventory (CMAI). The interventional model targeted 12 neuropsychiatric symptoms of dementia: delusions,

hallucinations, agitations, dysphoria, anxiety, apathy, irritability, euphoria, disinhibition, aberrant motor behavior, night-time behavior disturbances, and eating problems. Each of the symptoms was scored according to the CSDD, the Clinical Dementia Rating (CDR), and the Camberwell Assessment of Need for the Elderly (CANE) instruments.

The results from the WHELD intervention group demonstrated a statistically significant improvement in the quality of life (QoL) (Ballard et al., 2018). Overall, the study findings indicated that the model for training the staff with the nonpharmacological interventions for this population was effective. The study provides high-quality level-1 evidence that robust intervention can be used in care homes to place a focus on promoting nonpharmacological approaches in place of antipsychotic medications.

Litchwarck et al. (2019) led an exploratory quasi-experimental design, consisting of evidence-based, multicomponent, and biopsychosocial interventions for the nursing staff and physicians, intended to reduce agitation in persons with dementia in nursing homes. The study emphasized the need for face-to-face dementia-care learning for care staff. The study's timeframe was three-months. RE-AIM scopes used the questionnaires given to 807 staff members and 46 ward nurses. The concepts within RE-AIM refer to the following: (a) Reach the target population; (b) Effectiveness or efficacy; (c) Adoption by target staff, settings, or institution; (d) Implementation consistency, costs and adaptions made during delivery; and (e) Maintenance of intervention effects in individuals and settings over time (Gaglio, Shoup, & Galsgow, 2013). The intervention had three overlapping assessment phases.

The first phase included registration and assessment, the second phase included reflection with care conferences, and the third focused on an action and evaluation phase (Lichtwarck et al., 2019). The TIME intervention trial consisted of five specialists, registered nurses, and one

physician who cared for geriatric patients. Seventeen nursing homes with 104 resident-participants used randomized control and intervention groups. There were 797 staff members from the intervention nursing homes (INH) and 889 staff members from control nursing homes (CNH) involved. The RE-AIM framework questionnaires assessed the staff and leading members of the team. The questionnaire scores used a Likert scale format from 0–5. Zero (0) meant there was no assessment of neuropsychiatric symptoms (NPS) in those nursing homes. The value of five (5) meant very often or always assessed treatment routines for NPS.

After 12 months, the findings of the study indicated there was a significant decrease in NPS among nursing home residents with dementia (Lichtwarck et al., 2019. The results indicated that high-quality patient-centered care depended on a continuous need for staff education and the ongoing assessments of NPS along with their possible underlying issues. Because most persons living with dementia in nursing homes will develop NPS, this quasi-experimental design with a level II on the hierarchy of evidence identified guidelines recommended for nonpharmacological intervention for agitation, verbal and physical aggression, and excessive motor activity.

Antipsychotic Drug Use Among Patients with Alzheimer's Disease

Eikelboom et al. (2019) introduced a protocol for a quasi-experimental interventional study from Rotterdam, Netherlands, by incorporating the Describe, Investigate, Create, Evaluate (DICE) method. One hundred and fifty community-dwelling residents participated in this pilot study involving interventions for early recognition and treatment of neuropsychiatric symptoms to improve the quality of life in people with early Alzheimer's Disease with behavioral symptoms. The findings of this pilot study with a level II level of evidence demonstrated that the use of the DICE method significantly increased the quality of life of AD patients, reduced antipsychotic drug use, and decreased caregiver burden.

Utility/Feasibility

The STAR-VA ABC model's strategic behavior management program provides a feasible strategy to focus on identifying triggers that cause behavior problems (Karlin et al., 2014). For example, the unmet basic physiological needs that included hunger, thirst, pain, tiredness, elimination need, or simply being irritated by the surroundings, were some of the primary triggers that led to problematic behaviors. Finally, an analysis of the behavioral data collected by Karlin et al. (2014) demonstrated that the staff was able to identify triggers and act in time to prevent the escalation of problematic behaviors, as well as decrease the use of antipsychotic medications. This cohort study showed high-quality level II evidence that dementia trigger identification was the most important in managing dementia-related behaviors.

Summary of Evidence

The relevant literature to this project consists of seven peer-reviewed articles that guided an intervention to meet the objectives of this project. There were two RCTs, two quasi-experimental design studies, a cohort pilot, two literature reviews with one being a systematic, comprehensive review, and one cohort study. The studies showed strong evidence for the need to educate the nursing home staff, so they can readily identify triggers that influence patients with dementia to behave in inappropriate and disturbing ways. According to the studies, interventions that focused on patient-centered care, dementia behavior education, and neuropsychiatric symptoms identification led to decreased uses of antipsychotics. Drivers for success included collaboration and engagement with other medical providers such as clinical pharmacologists, social workers, primary care, director of nursing, and other interdisciplinary care providers. The ABC model for dementia symptoms management showed the best evidence supporting the current need to decrease antipsychotic use to less than 15% and meet the national CMS goal.

Ethical Issues

This evidence-informed practice plan is a practical education plan that aims to influence positive outcomes for nursing home residents with dementia-related neuro-biological symptoms. Project implementation occurred in a nursing home where residents diagnosed with dementia had behavioral problems. The strategies within the protocol were literature-derived and based on a similar study carried out with a large sample size. That study's findings strongly supported an educational project to promote the reduced use of antipsychotic medication with nonpharmacological interventions. All members of the nursing staff were encouraged to be a part of the evidence-based practice change to comply with CMS standards of care. For those participants who were members of the nursing staff, there were no confidentiality concerns. To conceal the participants' identities, all of the data collected remained anonymous.

IRB Approval

There was no requirement to submit this QI project for IRB review because it was not a research study, and there was no human subject research. Consequently, oversight by an IRB was unnecessary. The agency granted approval for the QI project on March 2, 2020.

Section III

Methodological Framework

The purpose of this quality improvement project was to provide an evidence-based training program that addressed the necessary patient care skills to reduce the administration of antipsychotic drugs for disruptive behaviors among residents with dementia in a SNF.

The objectives of the project were to: (a) improve the knowledge level of the care staff to assess, identify, and proactively intervene when disruptive behaviors occur among the residents with dementia and (b) provide documented evidence of the disruptive behaviors with a nonpharmacological resolution of the behaviors.

The Plan, Do, Study, Act Framework

The Plan, Do, Study, Act framework provided an iterative guide through the processes of this project (Ballard et al., 2018). The Plan phase included identification of the who, what, when, where, how, and why questions related to the planned change activity. The action plan intended to reduce the inappropriate administration of psychotropic drugs among residents in the SNF by providing nonpharmacological techniques. The Do phase implemented the project strategies, and the project team monitored the ongoing effects of the changed protocols. The Study phase required the project director to evaluate the attitudes and beliefs about the documentation of care. The Act phase included a decision to promote the adoption of the protocol as an expected procedure for the SNF.

Plan for the Project

The plan for the quality improvement project supported the needs of the staff, who are responsible for the residents with dementia at a large local SNF with 150 beds. The selected SNF was a non-profit organization with corporate ownership that provides continuing care for

members of the retirement community in North Texas. The nursing home has a locked Alzheimer's unit with extra security measures to prevent patient elopements. The facility houses about 110 residents with rehabilitation needs and chronic medical illnesses, who are unable to care for themselves, and residents with moderate to severe dementia, who depend on full nursing care. More than half of the residents suffer from neuropsychiatric symptoms related to dementia, and from a historical basis, half of those had been prescribed antipsychotic medications on an as-needed basis.

The nursing care staff includes RNs, licensed practical nurses (LPNs), and certified nursing aides (CNAs). Eight members of the staff work during the day shift (0600 to 1400), six nursing staff members work during the afternoon shift (1400 to 2200), and five nursing staff members work during the night shift (2200 to 0600). The nurse-to-resident ratio is high; 1 to 8 during the day shift, 1 to 10 during the afternoon shift, and 1 to 15 during the night shift. The highest patient care needs are in the morning when assistance with activities of daily living (ADLs) provided. The least number of needs are during the night when the residents are sleeping.

The RNs' primary responsibilities include administering scheduled and as-needed medications, delegating ADL responsibilities to the CNAs, and documenting exceptional resident-related situational changes with appropriate interventions throughout their shift. Also, the LVNs' responsibilities include documentation of residents' daily routines, taking vital signs, assisting with hygienic care, mealtimes, dressing changes, and other bedside care. Due to the high nurse-to-resident ratio, there is frequent administration of antipsychotic medications to manage the disturbing behaviors often observed among dementia residents. Critical thinking is rarely applied to discover antecedent causes of observed behaviors of the neuropsychiatric

symptoms found among individuals with dementia. A review of the records for nursing staff development at this agency indicated there was a perceived need to provide dementia-related training to overcome what appeared to be staff-related deficiencies for providing care.

Although the facility has regular in-service training with high attendance rates for the RNs, the CNAs are frequently too busy with resident care to attend. The main goal for this project was to present nurses and CNAs with an in-depth 2-hour training service that would help them have a better understanding of dementia, its triggers, and related neuropsychiatric symptom management, as well as how to intervene and document.

The timeframe for the planning and implementation of the study covered a two-semester grid. The focus of the first semester was to identify the problem, plan the intervention, critically analyze the research that was relevant to the intended project, and to gain approval to implement the project from the agency's stakeholders. The education program introduced during the second semester was for all of the administrative and caregiving staff. The education included the introduction of a new flow sheet for data collection for use by the nursing staff with didactic instruction and opportunities to practice the implementation of the strategies. The intervention was implemented with data collection for evaluation purposes over 30 weekdays with weekends excluded from the project. Collected data covered the time from March 9, 2020–April 17, 2020.

Implementation and Data Collection Framework

In-service education and training were mandatory for each of the care staff members. There were 6 RNs, 2 LPNs, and 12 CNAs who participated in the training phase of the program. The SNF's Director of Nursing (DON) and Assistant Director of Nursing (ADON) were present to help identify gaps in knowledge to meet the residents' needs best. The project's outline to educate the care staff on non-pharmacologic practices among the residents with dementia in the

SNF included plans: (a) to survey caregivers' baseline knowledge on the relevant topics; (b) to

identify the residents' personal care needs and triggers for anxiety, agitation, and aggression; (c)

to describe and demonstrate strategies to implement the newly expected evidence-based

interventions to reduce behaviors associated with agitation; (d) to demonstrate how to document

the processes listed above; (e) to identify the usefulness of the documentation strategy among the

providers of care; and (f) to acquire feedback from the care staffs' perceived competency in

caring for the residents.

Before the training began, the care staff received written documents; they researched

strategies that outlined ways to identify key triggers of behavioral changes, how to de-escalate

anxiety without using chemical restraints, and how to effectively cater to the personal needs of

the residents. During the initial part of the two-hour in-service session, the training session

focused on providing an in-depth knowledge of dementia as a disease and the various stages of

its progression. The training helped the staff identify the possible physiological and individual

needs of the residents. Each staff member learned one key trigger for their patients and then

practiced what they learned. The staff's knowledge of current methods to deal with behaviors

was recorded on day one of training using the Baseline Survey Form (see Appendix D). Five

strategies were measured: knowledge discovery of caregivers, evidence summary, translation

into practice recommendations, integration into practice, and evaluation. An introduction of the

behavioral assessment form included how to complete it. Practice forms were given to each

participant to help learn data entry requirements.

Current Practice Intervention

The issues surrounding the inappropriate use of antipsychotics among the residents have

historically followed a cyclical pattern of discontinuing the drugs and then resuming them. When

the staff became overwhelmed when residents exhibited signs of agitation or other disruptive behaviors, they tended to look for "as-needed" medication orders as the first solution to decrease these behaviors. There was no system of documentation for the assessment of the basic biological needs that may influence these unwanted behaviors. A lack of periodic in-service teachings was the reason for medicating these patients instead of providing nonpharmacological interventions. When a resident became agitated and aggressive, the resident was medicated and transferred back to their room, where they continued to scream and yell. The goal for the intervention stemmed from witnessing signs about the unmet basic needs of the residents. The improper care stemmed from the apparent lack of understanding of the neuropsychiatric behavior symptoms of dementia. The result was the excessive use of antipsychotic medications to control disruptive symptoms.

Plan for Improvement

The primary care physicians, the Director of Nursing (DON), and other collaborating practitioners who are responsible for the care of the residents of this agency met with this project director. The collaborators agreed on the need to educate all of the nursing staff members to be aware of the triggers that cause the behaviors and to establish a process to overcome them with the assistance of a tool-box of non-pharmacologic evidence-based interventions. The three specific areas of the educational intervention included how to: (a) identify possible triggers or antecedent circumstances of agitated behaviors, (b) introduce non-pharmacologic strategies to reduce the frequency of the unwanted behaviors, and (c) document on a newly developed ABC behavior chart at the time of each incident.

Measurement Methods

A literature completed literature review along with selectin of the ABC model guided the collection of data for evaluation purposes. A matrix grid identified the measurement of collected

data (see Appendix I). The effectiveness of the quality improvement project included three types

of evaluation. Three data collection tools were developed by the project director, approved by the

DON, and used for the QI project. The created Baseline Survey Form recorded qualitative

responses from the participants before the training program (see Appendix E). The questions

were: (a) What is dementia? (b) What are some behaviors associated with dementia? (c) How do

you deal with an agitated resident? (d) How do you manage behaviors? (e) What is your view of

psychotropic medications? Responses to the questions reinforced the anticipated needs for

training before implementing the program.

The developed Checklist of Staff's Behavioral Competency Level provided an

opportunity for the care staff to reflect on and rate their own perceived competency in

appropriately caring for the residents following completion of the data collection of the project.

Each of the following concept ratings used a 5-point Likert Scale with the use of five stars

indicating the strongest agreement with the concept and one star indicating the weakest

agreement. The concepts within the checklist were: (a) Empathy for individuals and family

members, (b) Awareness and understanding of an individual's unique needs, (c) A patient and

gentle demeanor with high emotional intelligence, (d) Flexibility and resourcefulness, and (e)

Willing and enthusiastic to make changes in order to improve competency (see Appendix F).

The final strategy to measure the effectiveness of the project was using the Resident

Behavior Assessment Form (RBAF) [ABC Model (RBAF)]. The RBAF provided a 24-hour

appropriate checklist of progress notes to record the observed resident antecedent triggers,

disruptive behaviors, interventions, and consequences of the interventions (see Appendix H). The

development of this instrument evolved from a review of the literature. Also, there was influence

from the multiple informal evaluations of the tool's usability with the DON and care staff

members at the SNF. The use of the Resident Behavior Assessment Form with the implementation of the QI Protocol was rolled-out over 30 weekdays following the In-Service Training Program.

During the roll-out part of the program, the staff was observed by the DON or ADON as they proceeded to implement the nonpharmacological interventions. The interventions included providing meals when hungry, providing fluids, helping with elimination, administering showers, and removing residents from monotonous and irritating activities. Each incident was evaluated for what worked, what did not work, and for what could have been done better for that incident.

Caregiver-training showed how to be gentle, how to avoid confrontation, and how not to ignore or miss behaviors. The documentation form was filled out by one nurse, who was responsible for observing, identifying, and correcting the underlying behavioral triggers. The assessment forms provided places for checkmarks to identify types of patient behaviors, the time of day of the occurrence, and the resident's response.

In summary, The ABC study (Karlin et al., 2014) guided the protocol, and evidence-informed guidelines were incorporated into a protocol to focus on person-centered care and the use of nonpharmacological approaches to decrease and prevent dementia-related behaviors. The project benefited the residents of nursing homes with a diagnosis of dementia who suffer from neuro-biological behavioral symptoms. The staff's learning through training and their increased ability to identify triggers that cause unwanted and inappropriate behaviors benefited the affected patients, other residents, and caregiving staff. Overall, with the help of nonpharmacological approaches, there was a reduction in dementia-related behaviors of anxiety, anger, yelling out, aggressiveness, and crying.

SWOT Analysis

A SWOT analysis provided a systematic approach to evaluate the environmental data and information for both internal (strengths, weaknesses) and external (opportunities, threats) factors associated with the plans of this project (see Appendix H). The SWOT analysis helped to identify the facilitators and barriers in advance of the implementation of the planned project.

A strength of the plan was its intention to offer a free self-funded project aimed to help improve the care of the SNF residents. The plan had the unanimous support of the DON, the nurses, PCPs, and nursing home administrators. Although no grant funding was available for the project, printers, computers, papers, copy machines, and ink were provided by the facility for this study. The facility also provided meeting rooms with appropriate spaces and materials for learning.

The provision of a free education and training experience for the care staff to increase the quality of care was an essential part of the study. Moreover, the processes of the project facilitated strong interdisciplinary collaborations between providers, the care staff, and the clinical pharmacist, all of whom track the use of antipsychotic medications. Other strengths were the expressed willingness of the staff to support the project and the drive to succeed as they reported that the success of the program depended on them.

A project weakness was related to the systemwide high nurse-to-patient ratios (1 to 8) during the day, which traditionally challenged the care staff's ability to initiate timely responses to the unwanted behaviors by the residents. The facility also has a high proportion of senior nursing and CNA staff members, who could have influenced a reluctance to follow the change initiative. A lack of motivation from some caregiving staff members could have weakened the effectiveness of the project. The nursing staff had the poor practice of not documenting and

keeping track of the observed behaviors. Good documentation is necessary for effective follow-up care. A perceived lack of awareness of dementia as a disease and its neuropsychiatric symptoms is another weakness that the project intended to overcome by practicing evidence-informed nonpharmacological interventions. Often, nursing homes underpay their nurses and nursing aides; this plays a significant role in the ways these caregivers handle stressful situations during their patient care.

The project offered significant opportunities for improving the quality of life of residents in skilled nursing facilities who are suffering from dementia. There was an anticipated opportunity to transform the current practice into a patient-centered evidence-informed practice and to improve the facility's star rating created and approved by CMS. In association with long-term reductions of the inappropriate use of antipsychotic drugs, there was an anticipated parallel decrease in the costs of medications.

One of the threats to the project was the lack of electronic medical record forms that could provide documented evidence of the implementation of the strategies for the residents. A significant threat to the study was the potential language barrier between the care staff and the residents; nurses might be unable to comprehend foreign or non-native language and cues. Such a language barrier could have been a threat to the success of the project if the nurses were unable to understand and identify the resident-based triggers. Ethnic diversity at the facility was high; Asians comprised the majority nursing group. Ethnic differences between nurses and residents can affect communication and misinterpretation of patient needs. A potential threat was the possible failure of a staff member to comply with a program directive due to lack of motivation or, for unforeseen reasons, the inability to attend the training.

Data Evaluation Plan

The final plan for this quality improvement project was to implement the evidence-informed practice concepts using the ABC model (Karlin et al., 2014) for a two-hour in-service education for the Director of Nursing (DON), the Assistant Director of Nursing (ADON), the administrator, and all of the nursing care staff. The Psychiatric Nurse Practitioner and the project director provided the teaching intervention. The topics of instruction included a basic and advanced understanding for dementia as a disease, its commonly observed neuropsychiatric symptoms, and the triggers/or antecedent causes of the symptoms, and how to introduce a nonpharmacological management approach to decrease disruptive behaviors and how to document the interventions to overcome the unwanted behaviors (Lucas & Bowblis, 2017). Staff members entered data useful for evaluative purposes by using paper-pencil based assessment forms. There were no computer-stored entries. The data were analyzed with descriptive statistics and chi-square values to measure the nature of associations between nonpharmacological behaviors and management adaptability and displayed with a run chart.

Section IV

Findings

Data Analysis

Data analyses used Microsoft Excel 2019 for Windows. Descriptive analyses included frequencies, percentages, means, medians, and modes to describe and measure variability within the variables. Chi-Square analyses examined whether there were statistical associations between the categorical variables of the antecedent triggers and the use or non-use of psychotropic drugs.

The chi-square test for independence indicated whether the distributions of categorical variables differed from each other (see Appendix R). The null hypothesis (H_0) and the alternative hypothesis (H_1) were as follows: H_0 asserts that categorical variables are independent, and there is no relationship exists between triggers. H_1 asserts that categorical variables are dependent, and there is a relationship between the triggers and behaviors. By measurement, H_0 is false. The chi-square critical value was calculated to be 4.46E-26 using Microsoft Excel Formula CHITEST (Observed Range, Expected Range). A low p-value, such as $p = \leq .05$, indicated a strong relationship between the triggers and behaviors; thus, we can reject H_0; the null hypothesis H_0 is false.

Baseline Survey Form

Out of the 29 nursing staff participants in the training program, 85% presented with a reported lack of knowledge about nonpharmacological approaches to decrease behaviors on the Baseline Survey Form with qualitative responses. All the staff members validated each other and agreed on a lack of knowledge other than choosing psychotropics to decrease behaviors. During the 2-hour long in-service training program, there was an open discussion of the baseline survey results.

Checklist of Staff's Behavioral Competency Level

Upon completion of the project, the care staff reported on their perceived levels of competencies of meeting the care needs of the residents on the Checklist of Staff's Behavioral Competency Level. Twenty-five staff members selected five stars (indicating highest agreement) on the Likert scale, one selected three stars (indicating uncertain agreement), and three members selected four stars to rate their competencies associated with empathy, awareness of unique needs, gentle demeanor, resourcefulness, and enthusiasm for changing.

Resident Behavior Assessment Form

The frequencies of the triggers, which were the assumed antecedent or triggering circumstances of the disruptive behaviors, were recorded (see Appendix J). The selections of the available kinds of triggers included incontinence, pain, hygiene, hunger, thirst, change in surroundings, and overstimulation. Technically, the intervention was (a) a successful nonpharmacological intervention or (b) an unsuccessful nonpharmacological intervention, which led to the use of a drug. The significance level for the relationships between the trigger and the success of the nonpharmacological interventions was 0.05, and a confidence level of 95% (see Appendix L). A run chart displayed the data (see Figure 1). The data were from March 9, 2020–April 17, 2020. Due to the inability of the weekend staff, who were mostly agency nurses, to attend the training program, there was no weekend collection of data. The agency staffing issue was a limitation to the project.

Sample size

A total of 29 staff members participated in the in-service training program on one occasion for two hours. The participating staff members represented 70% of those expected to attend. Due to night shift and weekend schedules, not all nursing staff were able to attend during

the daytime and weekdays. Staff member attendees were ten registered nurses, sixteen CNA's,

one social worker, one DON, and one ADON. The rest of the staff members were working

during the afternoon shifts or on another day during the week.

A total of 88 resident situations generated a need for the care staff to intervene during

episodes of inappropriate behaviors during the protocol's implementation period. These episodes

resulted in a sample size of n=88 cases (see Appendix N).

Process Measure Outcomes

Resident Behavior Assessment Forms were available at the nursing station at a designated

site for easy access. The assessment form itself was not available in the electronic medical records.

All of the nurses and CNAs had access to the forms during the time designated for the QI project.

The forms were available and completed during work weekdays only with Saturdays and Sundays

excluded from the study due to a lack of available and trained regular nursing staff. There were 88

behavior assessment sheets used to document the findings of the care given by the nursing staff.

The Resident Behavior Assessment Forms were collected weekly. The nursing staff

received weekly reminders of the importance of completing the forms at the time of each

behavioral occurrence. Upon completion of the project, forms and data collection were necessary.

There were information forms from DON and data from the collection tools (the Resident

Behavior Assessment Forms). The Excel database received both the information and the data.

Results

There were 88 dementia-related behavior occurrences during the 40-day project that

excluded weekends. There were no patient identifiers recorded on the data collection tools. There

was documentation of the behaviors and their interventions as they occurred. All 88 events met

the inclusion criteria for residents with a diagnosis of dementia. The categorization of results and

observed behaviors documented the assumed triggers that led to disruptive behaviors. Also

categorized were the successful nonpharmacological interventions and unsuccessful

interventions. Appendix K illustrates the results.

The observed counts of behavior and successful nonpharmacological interventions

achieved a significance level of (p-value 0.003), with 70 (79%) of the 88 episodes of the

interventions followed by cessation of disruptive behaviors (see Appendix P). Some interventions led

to unsuccessful outcomes with 18 (11%) needing a pharmacological solution (see Appendix O).

Anecdotal reports from the nurses indicated that residents with unsuccessful interventions were

followed by reviewing their laboratory reports. When a review confirmed an acute medical

problem, the resident was referred back to their primary care provider for medical treatment.

Table 1

Frequencies of Categories of Behaviors, Successful, and Unsuccessful Interventions

Triggers	Observed Behaviors n=88	Unsuccessful Intervention n=18	Successful Non-Pharmacological Intervention n=70	p-Value
Incontinence	49	10	39	0.005
Pain	16	3	13	0.002
Hygiene	6	1	5	0.017
Hunger	5	1	4	0.029
Overstimulation	5	1	4	0.025
Change in Surroundings	4	1	3	0.116
Thirst	3	1	2	0.116
Total	**88**	**18**	**70**	**0.003**

Table 1 shows a summary of data collected for all of the consecutive weekdays after the protocol for the project commenced. A total of 88 occurrences of disruptive behaviors were associated with the highest incidences of assumed triggers, with 49 recorded needs for incontinence care. These residents, identified as incontinent of either urine or bowel movements, were unable to tell the nursing staff about their need for care.

The occurrences of incontinence were not attended to before the behaviors arose. Of the 49 incontinence-related behaviors, ten interventions were unsuccessful. There were 16 episodes of pain, identified as the second-most frequent trigger (see Appendix M). There were six cases of hygiene recorded and five occasions of hunger recorded during the project. Overstimulation triggers occurred in five cases, and that trigger was related to change in the surroundings in four of the cases. Three cases of thirst represented the least frequently occurring trigger for unwanted behaviors.

A Run Chart statistical analytical tool used Microsoft Excel version 2019 to visualize how the data fluctuated during the project. Run Charts are widely used in healthcare to provide a simplistic display of data of time-ordered events (Perla, Provost, & Murray, 2011). The chart provided a visual frequency summary of observed behaviors and successful nonpharmacological interventions over the time from March 9, 2020–April 17, 2020 (see Figure 1).

The frequencies of the successful nonpharmacological interventions were considered a response to the observed behaviors. The data associated with the frequencies of both variables appeared on the y-axis of the chart. The dates of the events also appeared on the x-axis of the chart.

Zero was the lowest number of observed behaviors, but they were for the weekend days on which there was no data collected. Nine was the highest recorded frequency of observed behavioral events. The chart displays a random pattern of less frequently occurring successful

nonpharmacological interventions in response to the observed behaviors during the first three

weeks of the project. However, during the fourth week, the frequencies of the successful

nonpharmacological interventions more closely matched the frequencies of the observed

behaviors. Another interesting discovery was there were two astronomical points of observed

behaviors on the 13th day (a Wednesday), for March 25th, and the 23rd day (also a Wednesday),

for April 8th.

Figure 1

Run Chart
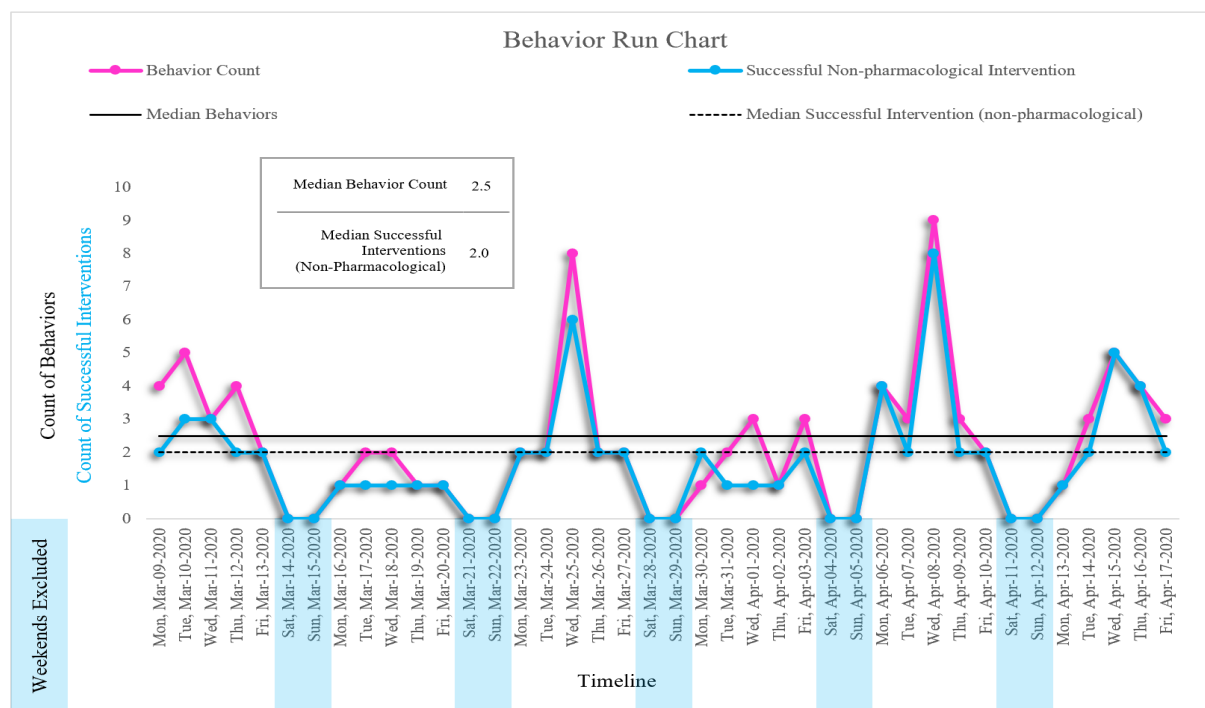
Except for those two Wednesday outliers, the Run Chart shows that nonpharmacological

interventions worked to decrease dementia-related behaviors without a need for drug-related

measures over time; successful nonpharmacological interventions accompanied the frequencies

of behavior counts (see Figure 1).

Evaluation/Outcome Criteria

The evaluation criteria for the effectiveness of project interventions during the 30-day evaluation period showed a successful resolution of 79% of the behaviors using nonpharmacological therapies over the 30-day evaluation period (see Figure 1). Nonpharmacological approaches were successful in intervening for inappropriate behaviors related to dementia, and no psychotropic medications needed to reduce the behaviors. The nursing staff completed in-service evaluations with a 100% attendance rate, filled out the behavior monitoring and intervention forms in a timely manner and evaluated nonpharmacological interventions as a priority treatment over psychotropics to decrease and resolve disruptive behaviors.

During the final meeting of the project, the participants of the in-service training project reported that the Resident Behavior Assessment Form was easy to use, and they had learned about important triggers causing the residents to experience distress. They also reported a decreased need for psychotropic medications to manage behaviors. Psychotropic medication use percentages were not readily available before or after the project to make a comparison; however, there were no new psychotropic medication requests made from the nurses during the quality improvement project. Overall, the staff reported that they had more time to focus on other nursing tasks beyond trying to obtain psychotropic prescriptions for the residents and to de-escalate problematic behaviors, which often took time and assistance from more than three nursing staff members. The Resident Behavior Assessment Forms were readily available for use at the nursing stations for all staff members who observed problematic behaviors. The data on all the completed forms were also validated by the project director and collected every week.

Limitations/Barriers

This QI project had several limitations. The project's focus was limited to the care of residents of the SNF with a diagnosis of dementia. Consequently, the project did not include the SNF's other residents. Project evaluation was limited to the results of the documented incidents of the antecedent and/or disruptive behaviors with interventions. There was no strategy to verify if there were other incidents that went unreported during the time of the project, especially during the weekends and night shifts. It is feasible to consider that incidents that occurred during the night may be underrepresented, as the nursing staff from the night shifts were not available to participate in the training program. Another limitation of the project was the exclusion of weekend days because most of the weekend nursing staff and CNAs were from a nursing staffing agency; these caregivers did not attend the training program because they had only worked on the weekend.

Discussion/Conclusion

The nursing staff reported successful nonpharmacological interventions in 79% of the 88 reported cases during this project. The most frequently occurring disruptive behaviors were associated with incontinence and pain. Acute medical problems confirmed by laboratory studies accounted for the remaining 21% of behaviors. Data collected during each of the consecutive weekdays of the QI project showed clinically significant improvement in the presence of dementia-related behaviors and the provision of nonpharmacological interventions that led to the resolution of the identified biological needs.

The discovery that there were nine events of disruptive behaviors that occurred as outliers on two consecutive Wednesdays was troubling. Upon investigating the possible causes, the project director learned that on those Wednesdays, the primary care provider was making rounds,

and the residents were participating in song and prayer sessions with a visiting church group. As these circumstances tend to increase a sense of excitement in the residents, the assumption is that the residents may have wanted to be clean and ready for their visitors but were unable to communicate their needs because of the dementia-related aphasia. Residents with dementia-related aphasia can comprehend the need for being clean but are unable to speak for themselves. This realization became apparent with the run chart display as it provided a daily depiction of the frequencies of observed disruptive behaviors, rather than an average number of events during the week.

A challenge associated with the QI project included the need to provide timely documentation of behaviors as they occurred; this was an issue in week one, as the forms were placed in a closed binder and put in a rack with other resident documentation forms. To meet this challenge, the Resident Behavior Assessment Forms were readily available to the nursing staff, and the DON involvement in the project helped increase staff-related compliance with this concern. Another challenge was that there was a lack of documentation of behaviors during the night and weekend shifts.

The QI project showed the need to teach the nursing staff about the biological triggers as the leading cause of dementia-related behaviors. There were no psychotropic medications given in 70 of the 88 cases of disruptive behaviors. There was a need for medical interventions in the remaining 18 cases related to acute medical diagnosis; those cases were referred back to their primary care provider for medical treatment.

Section V

Recommendations and Implications for Practice

Implications for Practice

The Quality Improvement project supported the desire for educating the care staff to understand the needs of residents with dementia as well as how to intervene with nonpharmacological therapies in the presence of disruptive behaviors. The QI project provided an evidence-informed process to reduce psychotropic medication use among the residents diagnosed with dementia. This project helped to develop an interprofessional and collaborative relationship between the nursing staff and upper management with linear leadership practices. The Director of Nursing showed great appreciation toward the QI project, and nursing staff enjoyed the benefits of intervening when they identified triggers that led to unwanted dementia-related behaviors. The first implementation of this evidence-informed protocol effectively complements the current processes of the SNF to reduce the excessive uses of psychotropic medications among the residents with dementia; the success of the project suggests incorporating the protocol into the standard practices of the agency.

DNP Implications

The Essentials of Doctoral Education for Advanced Nursing Practice formed the foundation for this QI professional project. An evaluation of the current practice identified gaps from the CMS guidelines and an evidence-informed literature review (Texas Board of Nursing Bulletin, 2019). Multiple DNP Essentials used throughout the project ensured focus on leadership and policy development. Interprofessional collaboration with the primary care team, DON, nursing staff, administration, social worker, and hospice care team showed a strong

interest in the development of the QI project. Quality improvement with improved dementia behavior management of the residents was the focus.

Project Sustainability

Following the completion of the project, the facility's end-of-the-month CMS-related STAR rating increased from two to three stars due to reduced use of psychotropic medications among the residents. The benefit of the improved rating for the facility prompted the stakeholders and the administrators of the SNF to promote the strategies of the project with its accompanying flow sheet (the Resident Behavior Assessment Form) as a part of the permanent electronic medical record (EMR) for the residents. All clinical and nursing staff are to continue with interdisciplinary meetings to meet the goals of reduced psychotropics use at the facility. The facility is a corporate entity. There were discussions about introducing the Resident Behavior Assessment Form with its associated protocol to their other SNFs after incorporating the form into their EMR system.

The success of this QI project suggests that it is feasible to expect that nonpharmacological interventions with timely documentation can be the first line of treatment directed at dementia-related behaviors. Due to the high risks or mortalities associated with psychotropic medications, the multidisciplinary care team at this SNF will continue to focus on decreasing such medications used for the selected behaviors. This professional project meets a critical need and should be continued and expanded to other SNFs that may desire to improve their quality star reviews of skilled nursing homes. The Resident Behavior Assessment Form's daily use by nursing and other caregiving staff should be evaluated over a longer time to see if improvements are necessary to reduce the various types of dementia-related behaviors. Results of the QI project strongly suggest increasing the use of nonpharmacological therapies over psychotropic drug use with this

vulnerable population, who suffer from dementia and other comorbidities. For those who are interested in increasing the quality of life of their residents, the second recommendation is to use the ABC Resident Behavior Assessment Form in Alzheimer's units, rehabilitation SNFs, and assisted living facilities.

Methods of Dissemination

There are currently two opportunities to disseminate the findings of this QI project. The first opportunity is a poster presentation at Texas Woman's University's *23rd Annual Student Creative Arts and Research Symposium.* The symposium provides opportunities to share other scholarly work from the university from different fields of study, including undergraduate and graduate studies. Students and other invitees can immerse themselves in numerous projects. With the knowledge gained from other scholarly projects, attendees are encouraged to learn more and to grow professionally.

A second educational opportunity is at the local facility where this QI project took place. There will be a poster presentation with a face-to-face explanation of the project conducted for the administration, DON, clinicians, and all nursing staff. This QI project focused on the safety of residents with dementia. Dissemination of this project may motivate others to focus on the needs for improvement of care among residents in other SNFs.

Lewin's Change Theory Evaluation

An evidence-based literature review showed a significant benefit of nonpharmacological approaches to resolve disruptive behaviors among SNF residents with dementia. Following consultations with the stakeholders at a selected SNF, I developed a plan for a quality improvement project to change the way the nursing staff responded to residents with disruptive behaviors. Participation in this quality improvement program by the staff was mandated. The

purpose was to learn how to incorporate the activities of a new protocol into their practice. The program additionally informed the staff of the risks associated with not following the CMS guidelines and the overall risk of psychotropic drugs to the residents' well-being. Lewin's Change Theory provided a framework that supported a new standard of practice in SNFs to benefit the best interests of the residents and the stakeholders by the end of a one-month timeframe (see Appendix B). There was an effort to unfreeze the traditional preference of psychotropic drug use to resolve disruptive behaviors among residents with dementia with an in-service program at the selected SNF. The actual change of care staff behaviors occurred during a 40-day project timeframe in which the residents with dementia received interventions to reduce the use of psychotropic drugs. Refreezing occurred regularly. The care staff members were encouraged to use the newly established protocol that led to reduced use of psychotropic drugs to resolve disruptive behaviors.

During the implementation of the training program, the results of a survey demonstrated a baseline understanding of dementia as a disease, neuropsychiatric behavior symptoms with underlining triggers, and pharmacologic and non-pharmacologic symptom management. The second type of evaluation focused on perceptions of witnessing unwanted behaviors, identifying triggers, and relieving symptoms using a non-pharmacologic care approach with timely documentation. The final type of evaluation included demonstrations of the appropriate use of flow charts used to document the observed existence of apparent biological needs that led to either the pharmacological or nonpharmacological interventions.

After the statistical evaluation of the QI project, the improved results exceed the initial anticipations. There is an expectation that the project strategies will remain in practice at the facility with the sustained incorporation of the Resident Behavior Assessment form into the

electronic medical records (EMR). The initiation of patient behavior evaluations when disruptive behaviors occur will be encouraged, along with nonpharmacological treatments, instead of using psychotropic drugs. After the introduction of nonpharmacological therapies, the consideration of psychotropic medications will be the last choice of care. As the protocol becomes a standard of practice over time, the CMS's future visits to the SNF should lead to favorable evaluations associated with the expected decreased use of psychotropics.

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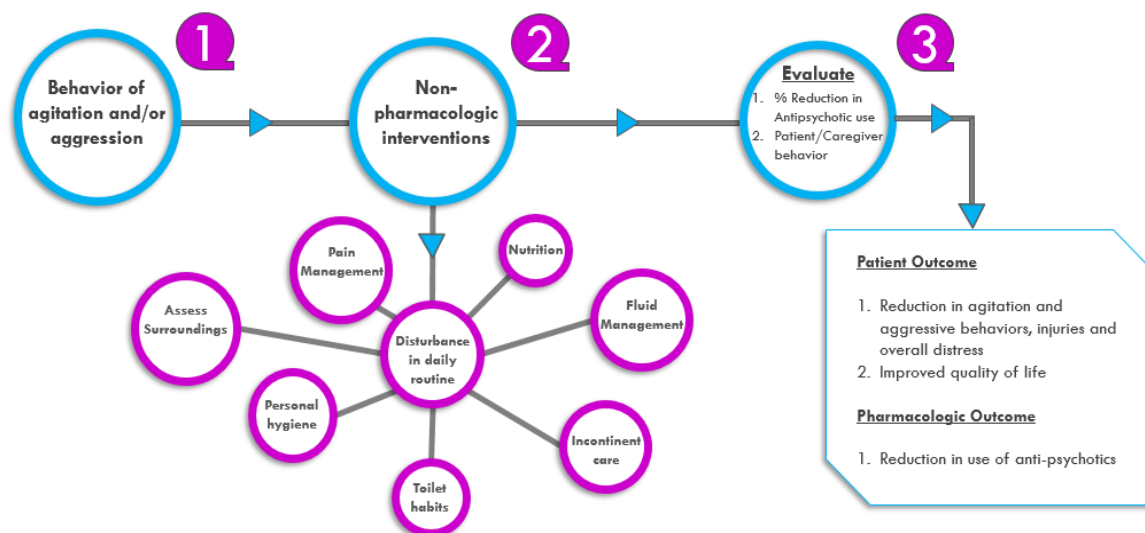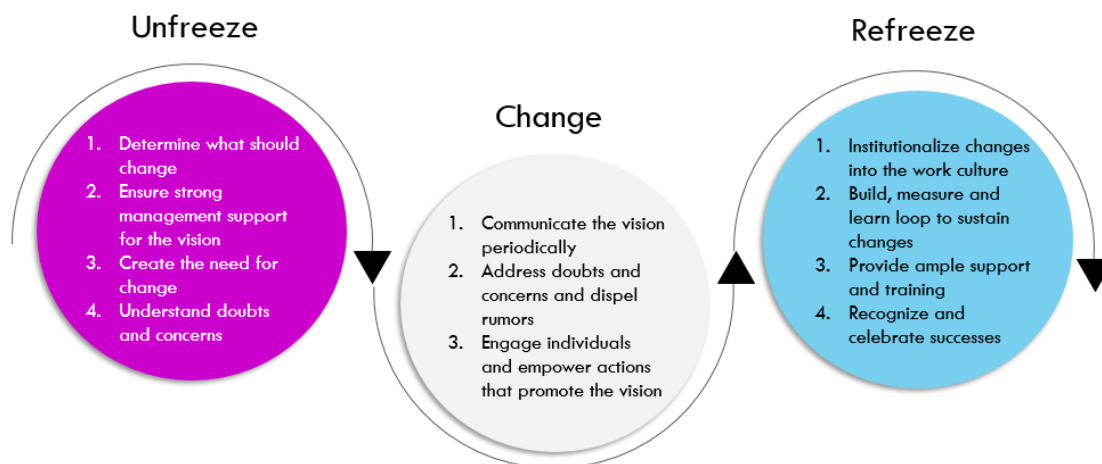
    138. https://doi.org/10.1177/1744987118756479

Appendix A

Nonpharmacological Intervention Techniques

Analytic framework for non-pharmacologic interventions
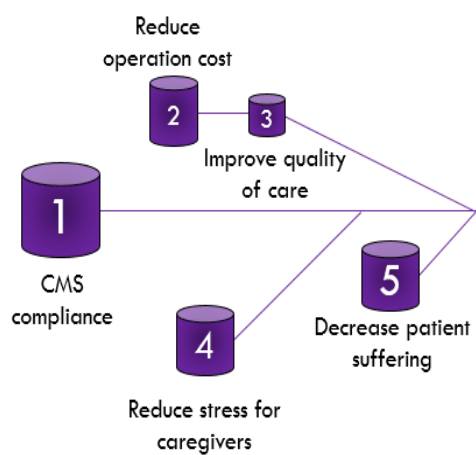Manage agitation and aggression in patients suffering from dementia

Appendix B

Kurt Lewin's Theory of Change

Kurt Lewin's Change Theory

Unfreeze

1. Determine what should change
2. Ensure strong management support for the vision
3. Create the need for change
4. Understand doubts and concerns

Change

1. Communicate the vision periodically
2. Address doubts and concerns and dispel rumors
3. Engage individuals and empower actions that promote the vision

Refreeze

1. Institutionalize changes into the work culture
2. Build, measure and learn loop to sustain changes
3. Provide ample support and training
4. Recognize and celebrate successes

Appendix C

Theory Analysis

Theory Analysis

Driving Forces   **Resisting Forces**

Reduce operation cost

2 — 3

Improve quality of care

1

CMS compliance

5

4

Decrease patient suffering

Reduce stress for caregivers

Lack of motivation

4

Limited resources

1

3

Lack of confidence due to no training

2

Lack or no awareness of alternatives for behavior management
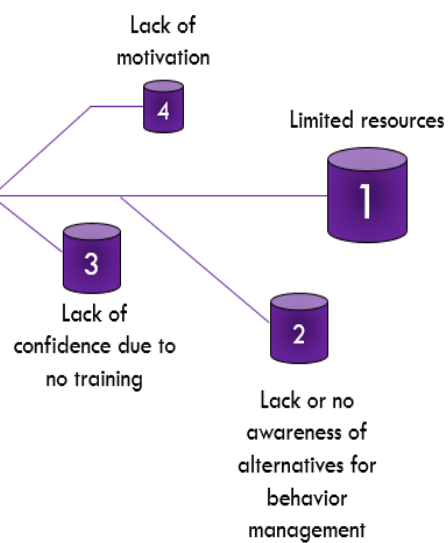
Appendix D

Baseline Staff Survey Form

Baseline Staff Survey Form		
#	Questions	Answers
1	What is dementia?	
2	What are some behaviors associated with dementia?	
3	How do you deal with an agitated resident?	
4	How do you manage behaviors?	
5	What is your view of psychotropic medications?	

Appendix E

Checklist of Staff's Behavioral Competency Level

Checklist of Staff's Behavioral Competency Level	
Area	**Score**
Empathy for individuals and family members	☆ ☆ ☆ ☆ ☆
Awareness and understanding of an individual's unique needs	☆ ☆ ☆ ☆ ☆
A patient and gentle demeanor with high emotional intelligence	☆ ☆ ☆ ☆ ☆
Flexibility and resourcefulness	☆ ☆ ☆ ☆ ☆
Willing and enthusiastic to make changes in order to improve competency	☆ ☆ ☆ ☆ ☆

Appendix F (1/3)

Evidence-Based Practice/Matrix

Author (Year)	Setting	Participants	Design/Strength	Training Intervention	Outcome
Ballard et al. (2018)	Nursing home	69 United Kingdom Nursing homes, 847 sample size	RCT/ Level I evidence/High quality	WHELD intervention training care staff, promoting person-centered activities, TAU control group, dementia symptom assessment	Reduce neuropsychiatric symptoms (NPS), increase focus on person-centered care, reduce antipsychotic use, decrease agitation
Brooker et al. (2016)	Care home	106 Care homes	RCT/ Level I evidence/High quality	FITS into practice intervention tool, CBT model, DCC coaches, problem-solving techniques	Reduction in inappropriate antipsychotic use multi strategies, increase psychosocial approach

Appendix F [cont'd (2/3)]

Author (Year)	Setting	Participants	Design/Strength	Training Intervention	Outcome
Cioltan et al. (2017)	Nursing home	16-17,213 nursing homes, participants from 204-155,095	Literature review/level V evidence/high quality	PRISMA checklist, STROBE strengthening assessment, the effect on APM	Decrease antipsychotic use, increasing staffing ratios, higher quality of care and maintenance occupancy
Eikelboom et al. (2019)	Community hospital	150 patients	Quasi-experimental design/Level II/High quality	DICE method, improve quality of life, teaching early recognition of NPS, cost-effectiveness, BEAT-IT study	Improving caregiver competence, decrease caregiver burden, implement a teaching plan, increase staff confidence
Halek et al. (2017)	Nursing home	11 Nursing homes with 17 units participating, 12 traditional care units, and five specialized units for dementia	Comprehensive literature review/Level V evidence/high quality	IdA® nursing assessment tool, focus on triggers causing challenging behavior	Reduce challenging behaviors, caregivers better identify-cation of triggers causing challenging behaviors

Appendix F [cont'd (3/3)]

Author (Year)	Setting	Participants	Design/Strength	Training Intervention	Outcome
Karlin et al. (2014)	Nursing home	Department of Veterans Affairs 17 Nursing homes with 64 veterans	Cohort study/Level II evidence/high quality	STAR-VA intervention including 2.5 days in-person clinical workshop, and weekly telephone consultations, dementia education, STAR video, using ABC approach for problem-solving	identifying and changing activators for challenging behaviors, interventions decreased behaviors
Lichtwarck et al. (2019)	Nursing home	17 Nursing homes with 104 residents from 22 wards in the intervention group, and 16 nursing homes with 125 residents	Quasi-Experiments designs/Level II/High quality	TIME educational intervention for dementia care, SMART evaluation action, RE-AIM framework for intervention	Reduction in NPS, competence increase for staff, leadership engagement, increase individual patient care

Appendix G

Resident Behavior Assessment Form / ABC Model

					Resident Behavioral Assessment Form (ABC Model)	
Date :					**AM** 0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00	**PM** 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00

A	**Trigger Identifications (Antecedents)**	**Intervention**	**Psychotropics Used**		
	Pain	Administer pain meds	Y	N	
1	Hunger	Provide meals	Y	N	
	Thirst	Provide fluids	Y	N	
Antecedent	Incontinence	Diaper change	Y	N	
	Hygeine	Check shower/bathing routine	Y	N	
	Change in Surroundings	Mitigate inconvenience	Y	N	
	Overstimulation	Periodic breaks during monotonus activity	Y	N	

B	**Behaviors**	
	Agitation	
2	Yelling Out	
	Verbal abuse towards staff	
Behavior	Aggression	
	Crying	
	Refusal of nursing or medical care	

C	**Expected Response**	
	Nothing needed to be done/No change	
3	Decreased Agitation	
	Yelling out subsided	
Consequence	Verbal abuse stopped	
	Agression decresased	
	Crying stopped	
	Compliant with care	

Provider Only	Changes in Antipsychotic?		Y	N	↑ Increase ↓ Decrease No Change	Comments

Q1. Did this tool assist you in providing satisfactory service for the patients without the use of anti-psychotics?
Answer:

Q2. Did this tool make it easy to carry out your caregiving services?
Answer:

Appendix H

Cost-Benefit / SWOT Analysis

SWOT ANALYSIS		
	Strengths	Weakness
Internal	Ensuring facility is compliant with CMS regulation	Low patient to nurse ratio
	Unanimous support from Director of Nursing, Primary care physician, and administrator	High percentage of senior nursing staff could result in reluctance to following change initiative
	Providing free training, education, and guidance to nursing staff	Underpaid nursing staff
	Strong interdisciplinary collaboration between providers	Lack of motivation of some staff members
	Collaboration with Clinical pharmacist to reduce antipsychotics	Prevailing habit of lack of documentation and lack of organization
	Nursing staff's willingness to support and drive program to success	Lack of awareness of dementia as a disease and its neuropsychiatric symptoms
	Opportunities	Threats
External	Improve quality of care for patients suffering from dementia in skilled nursing homes	Language barriers can result in not recognizing triggers
	Evolve the current practice into a patient-centered, evidence based practice	Ethnic or cultural differences between nursing staff and patients can affect communication and adequate response to patient's needs
	Improved star rating of facilities by CMS	Non-compliance with program directive due to lack of motivation
	Lower cost of care paid by Medicare	Inability to attend in-service training and education

Appendix I

Metrics Grid

Measure of Interest	Measure or Metrics Needed	Time Period for Measure	Type of Measure	Operational Definition Denominator	Denominator Exclusions	Operational Definition Numerator	Data Elements Needed	Level of Measured Need for Data	Location of Data	Requires Permission (Y/N)	Data Owner
Behavior Occurred	%	30 Week Days	Outcome	Total number of Dementia related behaviors	Residents without Dementia diagnosis	Total % of behaviros	Dementia behaviros and problem list	Count-need ratio level data	Nurse station	N	Skilled Nursing Facility & Clinician
Behaviors Decreased	%	30 Week Days	Process	Total number of behaviors decreased	No acute behavioral episodes	Behaviors	Dementia behaviros and problem list	Count-need ratio level data	Nurse station	N	Skilled Nursing Facility & Clinician
Number of Behaviors	Number	30 Week Days	Process	Trigger's Identifiers for behaviros	Illness at time of measurement	Behaviors	Behavioral Assessment ABC Chart	Count-need ratio level data	Nurse station	N	Skilled Nursing Facility & Clinician
Behavior Ceased	Number	30 Week Days	Process	Behaviors decreased with trigger identification	NA	Behaviors	Behavioral Assessment ABC Chart	Count-need ratio level data	Nurse station	N	Skilled Nursing Facility & Clinician

Appendix J

Data Collection

	Total Behavior/Week	Behavior Stopped (Non-pharmacologic intervention)	Incontinence	Pain	Hygeine	Hunger	Overstimulation	Change in Surroundings	Thirst
Week 1	18	12	8	6	1	2	1	0	0
Week 2	7	5	4	1	0	0	0	1	1
Week 3	16	14	9	3	1	1	1	1	0
Week 4	10	7	6	2	0	0	1	1	0
Week 5	21	18	13	1	2	1	2	1	1
Week 6	16	14	9	3	2	1	0	0	1
	88	70	49	16	6	5	5	4	3

Description	Total	Incontinence	Pain	Hygeine	Hunger	Overstimulation	Change in Surroundings	Thirst
Sample Size/Interventions	88	49	16	6	5	5	4	3
Behavior Stopped	70	39	13	5	4	4	3	2

	Incontinence	Behavior Stopped/Intervention Worked
Week 1	8	7
Week 2	4	3
Week 3	9	7
Week 4	6	6
Week 5	13	10
Week 6	9	6
	49	39

	Hunger	Behavior Stopped/Intervention Worked
Week 1	2	1
Week 2	0	0
Week 3	1	1
Week 4	0	0
Week 5	1	1
Week 6	1	1
	5	4

	Pain	Behavior Stopped/Intervention Worked
Week 1	6	5
Week 2	1	1
Week 3	3	2
Week 4	2	1
Week 5	1	1
Week 6	3	3
	16	13

	Overstimulation	Behavior Stopped/Intervention Worked
Week 1	1	0
Week 2	0	0
Week 3	1	1
Week 4	1	1
Week 5	2	2
Week 6	0	0
	5	4

	Hygiene	Behavior Stopped/Intervention Worked
Week 1	1	1
Week 2	0	0
Week 3	1	1
Week 4	0	0
Week 5	2	2
Week 6	2	1
	6	5

	Change in Surroundings	Behavior Stopped/Intervention Worked
Week 1	0	0
Week 2	1	0
Week 3	1	1
Week 4	1	1
Week 5	1	1
Week 6	0	0
	4	3

	Thirst	Behavior Stopped/Intervention Worked
Week 1	0	0
Week 2	1	0
Week 3	0	0
Week 4	0	0
Week 5	1	1
Week 6	1	1
	3	2

Appendix K

Descriptive Analysis

Descriptive Analysis Total Behaviors/Week	
Mean	14.66666667
Standard Error	2.123937643
Median	16
Mode	16
Standard Deviation	5.202563471
Sample Variance	27.06666667
Kurtosis	-0.834465772
Skewness	-0.546339232
Range	14
Minimum	7
Maximum	21
Sum	**88**
Count	6
Largest(1)	21
Smallest(1)	7
Confidence Level(95.0%)	5.459755525

Descriptive Analysis Behaviors Stopped/Week	
Mean	11.66666667
Standard Error	1.97765293
Median	13
Mode	14
Standard Deviation	4.844240567
Sample Variance	23.46666667
Kurtosis	-1.015705708
Skewness	-0.312578313
Range	13
Minimum	5
Maximum	18
Sum	**70**
Count	6
Largest(1)	18
Smallest(1)	5
Confidence Level(95.0%)	5.083718699

Descriptive Analysis Incontinence/Week	
Mean	8.166666667
Standard Error	1.249444321
Median	8.5
Mode	9
Standard Deviation	3.060501048
Sample Variance	9.366666667
Kurtosis	0.692620408
Skewness	0.330232253
Range	9
Minimum	4
Maximum	13
Sum	**49**
Count	6
Largest(1)	13
Smallest(1)	4
Confidence Level(95.0%)	3.211798876

Appendix L

p-value Descriptive Analysis (part 1 of 3)

Behavior

Regression Statistics	
Multiple R	0.954932894
R Square	0.911896832
Adjusted R Square	0.88987104
Standard Error	1.726506259
Observations	6

ANOVA

	df	SS	MS	F	Significance F
Regression	1	123.4100379	123.4100379	41.4013184	0.003000799
Residual	4	11.92329545	2.980823864		
Total	5	135.3333333			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.701704545	1.988635856	1.358571775	0.245848618	-2.819633744	8.223042835	-2.819633744	8.223042835
X Variable 1	1.025568182	0.159388672	6.434385627	0.003000799	0.583034283	1.468102081	0.583034283	1.468102081

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	15.00852273	2.991477273	1.93719151
2	7.829545455	-0.829545455	-0.537188909
3	17.05965909	-1.059659091	-0.68620364
4	9.880681818	0.119318182	0.077266898
5	21.16193182	-0.161931818	-0.104862218
6	17.05965909	-1.059659091	-0.68620364

Incontinence

Regression Statistics	
Multiple R	0.940450055
R Square	0.884446305
Adjusted R Square	0.855557882
Standard Error	1.163159996
Observations	6

ANOVA

	df	SS	MS	F	Significance F
Regression	1	41.42156863	41.42156863	30.61594203	0.005213706
Residual	4	5.411764706	1.352941176		
Total	5	46.83333333			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.117647059	1.570709403	-0.074900589	0.943890118	-4.478635492	4.243341374	-4.478635492	4.243341374
X Variable 1	1.274509804	0.230340002	5.53316745	0.005213706	0.634983432	1.914036176	0.634983432	1.914036176

Appendix M

_p_-value Descriptive Analysis (part 2 of 3)

Pain								
Regression Statistics								
Multiple R	0.961028836							
R Square	0.923576424							
Adjusted R Square	0.904470529							
Standard Error	0.575472702							
Observations	6							
ANOVA								
	_df_	_SS_	_MS_	_F_	_Significance F_			
Regression	1	16.00865801	16.00865801	48.33986928	0.002248534			
Residual	4	1.324675325	0.331168831					
Total	5	17.33333333						
	Coefficients	_Standard Error_	_t Stat_	_P-value_	_Lower 95%_	_Upper 95%_	_Lower 95.0%_	_Upper 95.0%_
Intercept	0.246753247	0.419924577	0.587613253	0.588362471	-0.91914429	1.412650783	-0.91914429	1.412650783
X Variable 1	1.116883117	0.160640479	6.952687918	0.002248534	0.670873645	1.562892588	0.670873645	1.562892588

Overstimulation								
Regression Statistics								
Multiple R	0.867721831							
R Square	0.752941176							
Adjusted R Square	0.691176471							
Standard Error	0.418330013							
Observations	6							
ANOVA								
	_df_	_SS_	_MS_	_F_	_Significance F_			
Regression	1	2.133333333	2.133333333	12.19047619	0.025089001			
Residual	4	0.7	0.175					
Total	5	2.833333333						
	Coefficients	_Standard Error_	_t Stat_	_P-value_	_Lower 95%_	_Upper 95%_	_Lower 95.0%_	_Upper 95.0%_
Intercept	0.3	0.229128785	1.309307341	0.260574547	-0.336163493	0.936163493	-0.336163493	0.936163493
X Variable 1	0.8	0.229128785	3.491486244	0.025089001	0.163836507	1.436163493	0.163836507	1.436163493

Appendix N

***p*-value Descriptive Analysis (part 3 of 3)**

Change Surroundings

Regression Statistics								
Multiple R	0.707106781							
R Square	0.5							
Adjusted R Square	0.375							
Standard Error	0.40824829							
Observations	6							

ANOVA

	df	SS	MS	F	Significance F			
Regression	1	0.666666667	0.666666667	4	0.116116524			
Residual	4	0.666666667	0.166666667					
Total	5	1.333333333						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.333333333	0.23570226	1.414213562	0.230199641	-0.321081054	0.98774772	-0.321081054	0.98774772
X Variable 1	0.666666667	0.333333333	2	0.116116524	-0.258815035	1.592148368	-0.258815035	1.592148368

Thirst

Regression Statistics								
Multiple R	0.707106781							
R Square	0.5							
Adjusted R Square	0.375							
Standard Error	0.433012702							
Observations	6							

ANOVA

	df	SS	MS	F	Significance F			
Regression	1	0.75	0.75	4	0.116116524			
Residual	4	0.75	0.1875					
Total	5	1.5						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.25	0.216506351	1.154700538	0.3125	-0.351117998	0.851117998	-0.351117998	0.851117998
X Variable 1	0.75	0.375	2	0.116116524	-0.291166914	1.791166914	-0.291166914	1.791166914

Appendix O

***p*-Value Behaviors & Intervention & Residual Plot**

Behavior Count & Successful Non-pharmacological Intervention								
Regression Statistics								
Multiple R	0.906487708							
R Square	0.821719965							
Adjusted R Square	0.815352821							
Standard Error	0.82101664							
Observations	30							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	86.99275362	86.99275362	129.056285	0.000000000005364			
Residual	28	18.87391304	0.674068323					
Total	29	105.8666667						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.447826087	0.2652123	1.688557004	0.102412907	-0.095436683	0.991088857	-0.095436683	0.991088857
X Variable 1	1.065217391	0.093766708	11.36029423	0.000000000005364	0.873144997	1.257289786	0.873144997	1.257289786
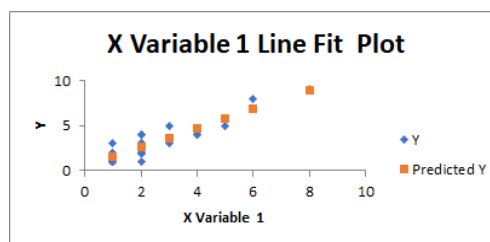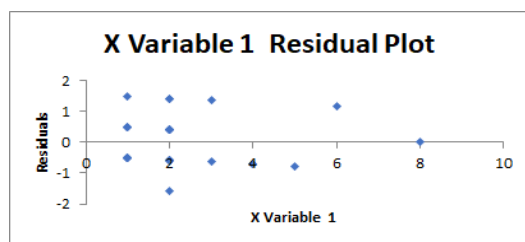
Appendix P

Descriptive Statistics Daily

Behavior Count	
Mean	2.933333333
Standard Error	0.348834952
Median	2.5
Mode	2
Standard Deviation	1.910647721
Sample Variance	3.650574713
Kurtosis	3.493134683
Skewness	1.722464018
Range	8
Minimum	1
Maximum	9
Sum	88
Count	30
Largest(1)	9
Smallest(1)	1
Confidence Level(95.0%)	0.713447584

Successful Intervention	
Mean	2.333333333
Standard Error	0.296854519
Median	2
Mode	2
Standard Deviation	1.625939163
Sample Variance	2.643678161
Kurtosis	4.594733999
Skewness	2.047550501
Range	7
Minimum	1
Maximum	8
Sum	70
Count	30
Largest(1)	8
Smallest(1)	1
Confidence Level(95.0%)	0.607135661

Appendix Q

Behavior & Interventions Data (March 9, 2020–April 17. 2020)

Date	Week	Behavior Count	Successful Non-pharmacological Intervention
Mon, Mar-09-2020	Week 1	4	2
Tue, Mar-10-2020		5	3
Wed, Mar-11-2020		3	3
Thu, Mar-12-2020		4	2
Fri, Mar-13-2020		2	2
Sat, Mar-14-2020	Weekend	0	0
Sun, Mar-15-2020		0	0
Mon, Mar-16-2020	Week 2	1	1
Tue, Mar-17-2020		2	1
Wed, Mar-18-2020		2	1
Thu, Mar-19-2020		1	1
Fri, Mar-20-2020		1	1
Sat, Mar-21-2020	Weekend	0	0
Sun, Mar-22-2020		0	0
Mon, Mar-23-2020	Week 3	2	2
Tue, Mar-24-2020		2	2
Wed, Mar-25-2020		8	6
Thu, Mar-26-2020		2	2
Fri, Mar-27-2020		2	2
Sat, Mar-28-2020	Weekend	0	0
Sun, Mar-29-2020		0	0
Mon, Mar-30-2020	Week 4	1	2
Tue, Mar-31-2020		2	1
Wed, Apr-01-2020		3	1
Thu, Apr-02-2020		1	1
Fri, Apr-03-2020		3	2
Sat, Apr-04-2020	Weekend	0	0
Sun, Apr-05-2020		0	0
Mon, Apr-06-2020	Week 5	4	4
Tue, Apr-07-2020		3	2
Wed, Apr-08-2020		9	8
Thu, Apr-09-2020		3	2
Fri, Apr-10-2020		2	2
Sat, Apr-11-2020	Weekend	0	0
Sun, Apr-12-2020		0	0
Mon, Apr-13-2020	Week 6	1	1
Tue, Apr-14-2020		3	2
Wed, Apr-15-2020		5	5
Thu, Apr-16-2020		4	4
Fri, Apr-17-2020		3	2

Appendix R

Chi-Square Test of Independence

Trigger Categories	Observed Behavior	Expected %	Actual %
Incontinence	49	12.57	56%
Pain	16	12.57	18%
Hygiene	6	12.57	7%
Hunger	5	12.57	6%
Overstimulation	5	12.57	6%
Change in Surroundings	4	12.57	5%
Thirst	3	12.57	3%
Total	88	88	100%

Null Hypothesis (H0): The categorical variables are independent. No relationship exists between the triggers and behaviors.

Alternate Hypothesis (H1): A relationship exists between the triggers and the observed behaviors. H0 is false.

*P-Value
(Chi Square Test)
4.46E-26

A low P-value indicates a strong relationship between the triggers and behaviors.

*P-value calculated using Microsoft Excel - CHITEST(Observed Range, Expected Range)

			Observed Behaviors						
			49/39	16/13	6/5	5/4	5/4	4/3	3/2
Weeks	Behavior Count	Successful Non-pharmacological Intervention	Incontinence	Pain	Hygeine	Hunger	Overstimulation	Change in Surroundings	Thirst
1	18	12	8	6	1	2	1	0	0
2	7	5	4	1	0	0	0	1	1
3	16	14	9	3	1	1	1	1	0
4	10	7	6	2	0	0	1	1	0
5	21	18	13	1	2	1	2	1	1
6	16	14	9	3	2	1	0	0	1
Total	88	70	49	16	6	5	5	4	3
			Successful Non-pharmacological Intervention						
Weeks	Behavior Count	Successful Non-pharmacological	Incontinence	Pain	Hygeine	Hunger	Overstimulation	Change in	Thirst
1	18	12	6	4	0	1	1	0	0
2	7	5	3	1	0	0	0	0	1
3	16	14	8	2	1	1	1	1	0
4	10	7	2	2	1	0	1	1	0
5	21	18	12	1	1	1	1	1	1
6	16	14	8	3	2	1	0	0	0
Total	88	70	39	13	5	4	4	3	2