

IMPROVING EMERGENCY RESPONSE PROVIDERS' REACTION TO ACUTE
AGGRESSION IN PATIENTS WITH DEMENTIA THROUGH ADAPTED
CRISIS INTERVENTION TEAM (CIT) EDUCATION

by

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of

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in

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ABSTRACT

Background: Acute aggression among elderly patients suffering from some form of dementia induced by delirium is a significant issue facing societies in the United States and around the world. It is not a new issue, but with improved healthcare, decreasing mortality, and demographic trends related to the generation born after World War 2 aging, the prevalence of people suffering from dementia and acute exacerbations of aggressive incidents are likely to increase. To improve the outcomes, a better understanding of the mechanisms involved and implementation of proven standardized methods of de-escalating the situation for healthcare workers, first responders, and law enforcement officers is desirable.

Methods: A scoping review of available peer-reviewed literature was initiated to formulate a basis for creating a pilot program. Data from the pilot program will inform further research, address deficiencies, and guide policies.

Interventions: Educational seminar with pre- and post-seminar surveys to evaluate knowledge and attitudes/confidence changes. A post-seminar Strengths, Weaknesses, Opportunities, and Threats (SWOT) to evaluate/guide future steps.

Results/Conclusions: The pre- and post-seminar survey data show that education changed confidence, attitude, and understanding. There was a statistically significant increase in participants' confidence in effectively dealing with acute dementia-related aggression. The post-seminar SWOT analysis identified IT glitches as a significant weakness. Participants felt that the seminar was well conducted, the material was relevant, the instructors were knowledgeable and well prepared, and they would recommend it to others.

Keywords: dementia, delirium, acute aggression, elderly, de-escalation, healthcare workers, first responders, law enforcement officers.

CHAPTER ONE

REVIEW OF THE LITERATURE

Contributing FactorsDementia

Overall, roughly 10% of the U.S. population age 65 and older has dementia, with a more significant number found in nursing homes and residential care facilities, with an estimated cost in 2023 of 345 billion dollars (Kramarow, 2024). Four percent of people who have dementia live in the community in a non-institutional setting. The prevalence of dementia increases with age from 1.7% for those aged 65-74 to 13.1% for those 85 and older. Alzheimer's Disease (AD) is the most common form of dementia, followed by frontotemporal, Lewy Body, and vascular dementia. All forms of dementia are related and present with similar signs and symptoms, making it difficult to ascertain which type of dementia an individual suffers from. AD and mild cognitive impairment (MCI) are progressive neurological decay disorders that result in memory loss, cognitive impairment, and behavioral changes, which may include agitation and aggressive behavior (Yu et al., 2019; Khan et al., 2018; Ballard & Corbett, 2013).

The neurodegenerative nature of dementia results in loss of brain matter, which can manifest in a cluster of symptoms, including forgetfulness, confusion, visual changes, hearing disturbances, and aggression. Aggressive and sometimes violent behavior associated with dementia is the most concerning for the safety and well-being of family members, the general public, healthcare workers, and first responders/law enforcement officers. With the increasing prevalence of people who have dementia living outside of institutional care centers, it is essential

to be able to recognize and intervene appropriately. When a person demonstrates aggressive violent behaviors, law enforcement officers are asked to intervene, and without appropriate training, excessive use of force may be used on elderly patients who suffer from dementia.

The development of Alzheimer's dementia is often associated with the aged persons and as the mean age of the general population in the United States increases, the risk of dementia also increases. According to the Census Bureau's 2017 National Population Projection (Medina et al., 2020), American life expectancies are projected to increase over the next decade, with men increasing more than women but women continuing to live longer than men overall. Fifty-five point eight million people (16.8% of the total population) were aged 65 or older. The portion of U.S. people aged 65 and older grew 38.6% between the 2010 census and the 2020 census. This is more than double the rate of increase of this demographic in the previous 10-year period and 5 times the rate of increase for the total population. Montana has more than 20% of its population older than 65. In 2020, 2.5% of the U.S. population (1.4 million people) lived in nursing or skilled nursing facilities, with the portion of each ten-year age bracket needing this service increasing from 0.9% in ages 65-74, 2.7% in 75-84-year-olds, and 10.2% in those 85 and older (Caplan & Rabe, 2023). With the aging of the generation born after the Second World War, the prevalence of dementia and associated acute delirium-related aggression is likely to become a more significant issue.

With the increasing age of the population and the presumptive increase in dementia, the risk for aggressive behavior increases and becomes a concern for law enforcement personnel. Recent reports of police "use of force" and limited knowledge regarding behavioral health and dementia have some groups concerned about inappropriate "use of force". Advocacy groups and

policymakers have identified a need to increase awareness of dementia-related acute aggression to allow healthcare workers, first responders, and law enforcement professionals to provide appropriate services while decreasing the threat to themselves or others. Developing clear rules of engagement (ROE) will standardize assessment and provide an algorithm to determine the best course of action and optimal personnel to de-escalate each situation on a case-by-case basis (Watson & El-Sabawi, 2023).

Prevalence

It is estimated that 5.5 million in the United States have dementia (Alzheimer's Association, 2017), and 27.8% of AD and 7.4% of people who have AD and MCI, respectively, manifest aggressive behavior. Individuals with frontotemporal dementia have a 37% greater prevalence for actions or conduct that violate the law and are considered harmful, threatening, or disruptive to individuals or society. People who have AD manifest a significantly higher (28-67%) rate of verbal aggression regardless of the severity of their dementia, and this was found to be related to the presence of delusions (Yu et al., 2019). In moderate to severe dementia, the primary factor in the decision to hospitalize was agitation and aggression (Takacs et al., 2015). The place of residence significantly affects the frequency and prevalence of aggression in patients who have dementia. Only 20% of outpatients diagnosed with dementia living in the community manifested aggressive behavior, and a 40-60% prevalence in patients residing in long-term care facilities was documented. (Margallo-Lana et al., 2001).

Neuropathophysiology

Pre-frontal cortical atrophy is the primary neuropathological manifestation related to progressive behavioral changes and increased aggression and is associated with dementia (Bear,

1991; Hirono et al., 2000). Atrophy of the frontotemporal lobe is associated with anger, increased confrontational behavior, and emotionally charged ideas, which lead to interpersonal aggression and social isolation. Individuals who have dementia with aggressive symptoms may also suffer deterioration of the dorsomedial, orbitofrontal cortices, and/or the amygdala. Men display higher rates of aggression and other behavioral problems such as wandering, abuse of others, and social incompetence than women (Moll et al., 2011). Aggression associated with dementia may be related to depression, loss of family contact, poor caregiver-patient rapport, and chronic pain (Yu et al., 2019; Whall et al., 2008).

This project therefore aims to provide an educational intervention aimed at improving recognition of dementia and altered level of consciousness, knowledge of verbal de-escalation techniques, redirection techniques, and techniques aimed at gaining trust, as well as familiarity with available community resources and how they may be accessed by healthcare workers, first responders, and law enforcement personnel.

Methods

Search Strategy

Initiation of a search of databases Web of Science, Google Scholar, CatSearch, PsycINFO, Hein Online, CINAHL, PubMed, and Cochrane using the terms: "dementia" "aggression" "de-escalation" "delirium" "guideline" "best practice" "protocol" as well as their synonyms and closely associated terms. Boolean operators "AND" "OR" and "NOT" were implemented to broaden and narrow the results as needed. Results were limited to peer-reviewed English language papers, with abstracts and full text available. No time restriction was initially implemented, dissertations and theses were included to ensure current information was not

overlooked and works cited in relevant articles were mined to provide insight into seminal works. The number of times these articles were cited themselves was also noted.

Inclusion

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (see Appendix A, Figure A1) guidelines directed the inclusion/exclusion of results utilized in this scoping review. Preference was given to systematic reviews or meta-analyses. After reviewing the titles and abstracts, nineteen articles were selected for detailed review. Fifteen articles were rejected due to their focus on provider-level medication management. Examining works cited and citing articles provided a further 23 articles for a total of 27 articles eligible for more extensive review. Of these, 16 were excluded from the Scoping Review based upon lack of relevance to the problem addressed in this QI project, leaving 11 for inclusion in this Scoping Review.

Results

Characteristics of Literature

The literature reviewed included three (3) Systematic Reviews, one (1) Best Practices Guide, one (1) Pilot Randomized Controlled Trial, one (1) Evaluation Study, one (1) Consensus Statement of the American Association for Emergency Psychiatry, one (1) Tools Development Study, one (1) Quantitative Analysis, one (1) Quasi-experimental Study, and one (1) prospective observational study. The population of interest in many of these studies is older adults with dementia, while some examine police officers aged 23-59.

Synthesis of Literature

Validated Assessment Tools. The Delirium Triage Screen (DTS) can be administered in roughly 20 seconds and does not require collateral information. The DTS is 98.0% sensitive (95% CI 89.5% to 99.5%), with an expected specificity of approximately 55%. The DTS's negative likelihood ratio was 0.04 (95% CI 0.01 to 0.25) and is very sensitive (98%), so it functions well as a screening tool. It consists of a formal assessment of the level of arousal (normal, sedated, or agitated) and an attention test. It is a highly validated delirium screening tool when utilized in conjunction with other tools with greater specificity. A positive Delirium Triage Screen result should trigger confirmation with a more specific test, such as the Brief Confusion Assessment Method (bCAM), which takes roughly 1 minute to administer. As the complement, the bCAM has a specificity of 95.8% (95% CI 93.2% to 97.4%) and 96.9% (95% CI 94.6% to 98.3%) and a sensitivity of 84.0% (95% CI 71.5% to 91.7%) and 78.0% (95% CI 64.8% to 87.2%) when performed by the physician and research assistant, respectively. The positive likelihood ratios for the bCAM were 19.9 (95% CI 12.0 to 33.2) and 25.2 (95% CI 13.9 to 46.0), respectively. If the research assistant DTS was followed by the physician bCAM, the sensitivity of this combination was 84.0% (95% CI 71.5% to 91.7%) and specificity was 95.8% (95% CI 93.2% to 97.4%). If the research assistant performed both the DTS and bCAM, this combination was 78.0% sensitive (95% CI 64.8% to 87.2%) and 97.2% specific (95% CI 94.9% to 98.5%). If the physician performed both the DTS and bCAM, this combination was 82.0% sensitive (95% CI 69.2% to 90.2%) and 95.8% specific (95% CI 93.2% to 97.4%) (Han et al., 2013).

CIT ECHO. Crisis Intervention Team (CIT) Extension for Community Healthcare Outcomes (ECHO) training developed by the University of New Mexico to educate law enforcement officers (LEOs) about signs and symptoms related to dementia, techniques for re-

directing individuals with dementia, and helping officers have more positive attitudes towards individuals with mental health problems is an educational approach aimed at improving outcomes (Crisanti et al., 2022). Education is delivered online as synchronous lectures and asynchronously as 40 different self-study modules. Twenty-five (25) percent of individuals with a mental illness have been arrested during their lifetime, twelve (12) percent have had a police encounter that precipitated mental health services, and one (1) percent of all police dispatches are coded as a primary mental health concern (Crisanti et al., 2022). Crisanti et al. (2022) examined 113 CIT ECHO sessions, producing 598 post-session surveys. Examination of these indicates that modules about Psychiatric Diagnosis and Substance Use significantly increased participant knowledge and increased participant's knowledge of available community resources and how to contact them. The module topic significantly impacted CIT ECHO participants' knowledge of the information presented in the weekly sessions ($F = 2.553$; $p=0.019$). The modules Psychiatric Diagnosis ($\beta = 4.18$) and Substance Use ($\beta = 4.04$) significantly increased participant knowledge compared to other modules. The module topic also significantly impacted participants' knowledge of resources in the community ($F = 4.222$; $p < 0.001$). More specifically, the modules Resources ($\beta = 3.89$), Substance Use ($\beta = 3.73$), Psychiatric Diagnosis ($\beta = 3.72$), and CIT Policing ($\beta = 3.6$) were significantly more helpful than other modules on increasing knowledge of other resources in the community (Crisanti et al., 2022). Eighty-nine point seven (89.7%) percent of participants agreed that they felt more comfortable interacting with people with mental illness after the training, forty-eight (48) percent agreed that they were better able to determine whether a person should be taken to jail or to a hospital after training, fifty-seven (57) percent felt comfortable utilizing verbal de-escalation, and eighty-four (84) percent were more

aware of who to contact for advice when dealing with a person with mental illness. The training also had a profound effect on participant attitudes. The module topic significantly impacted the likelihood that CIT ECHO participants would use the information presented in the weekly sessions on the job ($F = 4.5933$; $p < 0.001$). Specifically, the modules De-escalation and Communication Skills ($\beta = 4.11$), Psychiatric Diagnosis ($\beta = 4.08$), and Substance Use ($\beta = 4.03$) significantly increased the participant likelihood of utilizing information learned during that week's session on the job, compared to other modules. Similarly, participants reported that module topic significantly impacted their ability to interact with an individual in a mental health crisis ($F = 2.406$; $p = 0.027$). The module Psychiatric Diagnosis ($\beta = 3.80$) significantly increased participant confidence compared to other modules. Length of service and position did not significantly influence responses (Crisanti et al., 2022). Seventy-one (71) percent of participants felt that people living with a mental illness are more likely to be a victim of a crime than to commit a crime during the post-education survey as opposed to forty-four-point eight (44.8) percent in the pre-education survey. Sixty-six-point seven (66.7) percent opposed to thirty-nine-point seven (39.7) percent agreed that people living with mental illness are more likely to be the victim of violence than to be violent to others. Eighty-point-seven (80.7) percent opposed to sixty-seven-point two (67.2) agreed that symptoms of mental illness improve with treatment. Sixty-eight (68) percent opposed to thirty-four-point five (34.5) percent agreed it is the role of law enforcement to connect people living with mental illness to treatment. Seventy-three (73) percent opposed to fifty-six-point nine (56.9) percent agreed that people living with mental illness respond to de-escalation techniques. Seventy-five (75) percent opposed to fifty-five-point

two (55.2) percent agreed that people living with mental illness do not always require the use of force to maintain safety (Crisanti et al., 2022).

CIT ADEPT. Crisis Intervention Training (CIT) using Assess, Diagnose, Evaluate, Prevent, and Treat (ADEPT) is another education model that delivers the training in a more traditional in-person seminar fashion. They find that the essential initial step is to ensure that life-threatening and treatable conditions are ruled out and that there has been a change from baseline in their mental status (Assess). Then, "Diagnose" whether delirium is present; older patients present with hallucinations, confusion, agitation, or both. The third step (Evaluate) focuses on identifying underlying causes. Infection is the most common cause of delirium in the elderly. Prevent focuses on treating the underlying condition and treating pain to prevent the development of delirium. The last step focuses on avoiding actions exacerbating delirium (Shenvi et al., 2020; Arora et al., 2018; Watson & Fulambarker, 2012; Teller et al., 2006). Suspected delirium-induced agitation in older adults must prioritize identifying and addressing the underlying cause(s). Quick validated assessment tools like the Delirium Triage Screen (Han et al., 2013), which takes roughly twenty seconds to administer and has a sensitivity of 98% and a sensitivity of 84.0%, may be utilized to gauge whether a mental health expert or provider is needed to manage the situation best. Once a mental health provider is engaged or the individual is seen by a provider at the Emergency Department (ED), the Brief Confusion Assessment Method (bCAM) takes roughly 1 minute to administer can be administered to confirm the diagnosis. As the complement, the bCAM has a specificity of 95.8% (95% CI 93.2% to 97.4%) and 96.9% (95% CI 94.6% to 98.3%) and a sensitivity of 84.0% (95% CI 71.5% to 91.7%) and 78.0% (95% CI 64.8% to 87.2%) (Han et al., 2013). Most patients with delirium will need to be

observed or admitted unless the underlying cause is easily identifiable and reversible, or a reliable caregiver is available to monitor them closely because of the high morbidity and mortality associated with delirium and because individuals with delirium may have an impaired ability to comprehend and adhere to discharge instructions. De-escalation without the use of medication is preferred. Pharmacological treatment should only be considered to ensure the safety of the individual, staff, and others. When medication is deemed necessary, the lowest effective dose should be implemented. (Shenvi et al., 2020).

Evidence of CIT Education Efficacy. Evaluations of CIT suggest that referral to services is a common disposition for incidents managed by CIT officers and that referrals typically increase following the implementation of CIT programs. In one Midwest County, referrals to crisis centers increased by over 25% after CIT was implemented within the community. Examinations of differences in the referral rate between CIT and non-CIT officers provide further evidence of the impact of CIT on referral to services. In Akron, Ohio, CIT officers transported more individuals to emergency psychiatric services (30%) than non-CIT officers (27%). Similarly, Georgia CIT officers were significantly more likely to report referring individuals experiencing behavioral health challenges to services (40% compared to 29% for non-CIT officers) and were significantly less likely to resolve incidents using arrests. Further, a comparison of CIT and non-CIT officers in Chicago found that non-CIT officers generally felt the only options for responding to an individual in crisis were arrest or transportation to the hospital. In contrast, CIT officers identified referral to community-based services as a realistic option in managing crisis incidents (McManus, 2020).

Several research studies report on the positive effects of CIT programs on officers' use of force in crisis situations. For example, the Memphis CIT program resulted in reductions in police use of deadly force and a reduced use of restraints. Similarly, the number of police shootings involving individuals experiencing a behavioral health crisis in Albuquerque has declined since the implementation of CIT despite a growing residential population. CIT officers in Chicago were significantly less likely to use force against suspects who exhibited resistant behaviors than non-CIT officers. Georgia officers trained in CIT were significantly more likely to self-report that verbal persuasion was the highest level of force used in their recent encounters with individuals experiencing a mental health crisis than non-CIT officers. The Memphis CIT program has been associated with fewer injuries to officers and civilians. Minneapolis similarly experienced a reduction in shootings involving individuals experiencing mental illness after the adoption of CIT. Several officers in Georgia reported that CIT gave them the de-escalation skills needed to reduce civilian and officer injuries, often emphasizing the importance of communication and putting individuals at ease. Additionally, fewer than 1% of interactions between Albuquerque CIT officers and civilians resulted in a civilian injury (McManus, 2020).

CIT Program Differences. CIT ECHO and CIT ADEPT are educational models designed to increase Law Enforcement Officers' (LEO) knowledge and confidence in community resources, mental status assessment, and verbal de-escalation. The key difference between the two is the educational component's delivery method. The CIT ECHO model relies upon online delivery of up to 40 self-paced educational modules. In contrast, the CIT ADEPT model utilizes a more traditional in-person seminar style to deliver needed educational content.

Verbal De-escalation. The American College of Emergency Psychiatrists published a consensus statement detailing non-coercive verbal de-escalation of agitation. They use a three-step method based on their experience: verbally engaging the patient, establishing a collaborative relationship, and finally influencing the patient to attain a much less agitated state. They stress that there are four main objectives: 1. The safety of patients, staff, and others is paramount. 2. Helping the patient manage his distress and regain composure. 3. Avoid restraint when possible. 4. Avoid actions that escalate agitation (Richmond et al., 2020). This is an essential first step in gaining trust (Anderson & Bushman, 2002; Ballard & Corbett, 2013; Yu et al., 2019).

Discussion And Conclusion

The issue of aggression among elderly patients who have dementia has traditionally been an issue that is not well understood and has frequently resulted in an escalation of force to prevent individuals from harming themselves or others (Watson & El-Sabawi, 2023). Physical and chemical restraint was often employed, and the patient was isolated (Anderson & Bushman, 2002). Reputable studies agree that education is critical to recognizing delirium-induced aggression in elderly patients with dementia and, through that recognition, responding appropriately and achieving rapport with the individual. This is pivotal in defusing the agitated state and redirecting them to a non-distressing activity or subject (Anderson & Bushman, 2002; Teller et al., 2006; Richmond et al., 2012; Watson & Fulambarker, 2012; Ballard & Corbett, 2013; Arora et al., 2018; Yu et al., 2019; Shenvi et al., 2020; Crisanti et al., 2022). The literature contains preliminary, low-quality case studies and cohort studies which indicate that there has been self-reported improvement in confidence and knowledge in effectively dealing with

individuals diagnosed with dementia who are having an acute aggressive episode as well as decreases in excessive force reports and increases in disposition of callouts to the emergency room rather than jail after educational training has been initiated in multiple police entities within the United States (Teller et al., 2006; Watson & Fulambarker, 2012; Arora et al., 2018; Shenvi et al., 2020; Crisanti et al., 2022). A three-step non-coercive verbal de-escalation technique has also been identified as an essential component of the education process (Richmond et al., 2012).

CIT utilizing ADEPT to assess has been proven effective in increasing understanding of best practices in dealing with and de-escalating acute aggressive incidents among older adults living with dementia as well as decreases in excessive force reports and increases in disposition of callouts to the emergency room rather than jail after educational training has been initiated in multiple police entities within the United States (Shenvi et al., 2020; Arora et al., 2018; Watson & Fulambarker, 2012 and Teller et al., 2006). Education of relevant professionals with CIT ECHO has also effectively reduced excessive force incidents (Crisanti et al., 2022). These educational tools are readily available and have demonstrated positive self-reported results from program participants. The literature clearly shows improved attitudes and outcomes with training in dementia recognition, de-escalation techniques, and knowledge of available community resources regardless of the delivery method.

CHAPTER TWO

QUALITY IMPROVEMENT PROPOSAL

Acute aggression among elderly patients suffering from some form of dementia induced by delirium is a significant issue in the United States and around the world. Due to concerns about excessive force incidents in the recent past (Watson & El-Sabawi, 2023), a local Northwest U.S.A. Mental Health Organization initiated a working group of concerned interdisciplinary professionals, referred to hereafter as the host agency, to proactively address this potential problem. Data from the scoping review and pilot program will inform the development of this QI project.

Problem and Aim Statement

Recent use of excessive force when dealing with individuals suffering from mental health issues and associated aggressive behavior has focused attention and identified a need for training. The recognition of the signs and symptoms of someone in a mental health crisis, de-escalation techniques, and knowledge of resources available to best resolve the situation are areas identified as needing improvement. Law enforcement officers are often the primary respondents to incidents where individuals are exhibiting aggressive behavior. However, first responders and healthcare workers are also likely to encounter aggression related to delirium in patients who have dementia. To proactively address an observed issue, the PICO question, "Best practices for de-escalating delirium-induced aggression in dementia patients compared to no intervention," was used to initiate the scoping review.

This quality improvement project aims to develop and deliver a six-hour educational program adapted from the CIT ECHO programs to interested local area healthcare workers, first responders, and law enforcement personnel in a Northwest United States city of less than 100,000 residents. The topics addressed will be guided primarily by the information revealed by the scoping review and input from host agency members, a multidisciplinary task force comprising local CIT members, local fire department officials, local law enforcement, and mental health professionals. The educational seminar will specifically address participants' ability to recognize altered perceptions in individuals suffering from dementia and delirium, knowledge of screening tools, verbal de-escalation techniques, and recognition of resources available within each community to best address individual needs through four targeted one-hour educational presentations. These presentations will consist of a 30-minute PowerPoint lecture, followed by a ten-minute Question period, and finally, a 20-minute breakout session with role-playing utilized to demonstrate understanding of the techniques taught. With increased knowledge, invested individuals may feel greater confidence in correctly addressing situations where acute aggressive incidents manifest involving patients who have delirium-related dementia (See Appendix B Table B1).

Quality Improvement Framework

The quality improvement project will implement the Implementation Science Framework-Replicating Effective Programs Implementation developed by the U.S. Centers for Disease Control and Prevention (CDC) in 1996 and known as Replicating Effective Programs (REP) to guide its progress due to its proven efficacy in translating promising research interventions into effectively implemented programs in community settings (Kilbourne et al.,

2007). This model is effective due to emphasizing the need for rigorously identifying effective interventions (literature review and community input), translating the interventions' information into non-technical language (eliminating jargon), supporting the implementation of the intervention(s) through training and technical assistance (ensuring qualified individuals are involved), and ensuring that ongoing financial and technical support are sustained to ensure long-term viability (continuity) (Kilbourne et al., 2007). This framework derives from two foundational theories: 1) Diffusion of Innovation (advances evolve through the sharing of ideas among members of a social system over time), and 2) Social Learning Theory (behavior change results from a person's belief in their ability to change and the results of the change). This project will utilize elements of this model and will continue to utilize this model to guide effective implementation and sustainable adaptation over time (see Appendix A, Figure A2).

Methods

Intervention and Implementation

A six-hour in-person educational seminar will be adopted from the online CIT-ECHO model, focusing on recognizing a mental health deviation from baseline, the use of validated screening tools available, verbal de-escalation techniques, orientation to available community resources, and role-playing simulation. The seminar will be held in January 2025 and will involve four targeted one-hour educational presentations. These presentations will consist of a 30-minute PowerPoint lecture, followed by a ten-minute Question period, and finally, a 20-minute breakout session with role-playing utilized to demonstrate understanding of the techniques taught.

The target audience will include 30-40 healthcare workers, first responders EMS and Firefighters), and law enforcement personnel. A pre-survey will be administered prior to the education tool using specific QR codes linked to a Microsoft Forms survey. The pre-survey will ask for basic demographic information followed by seven core questions adapted to the target audience from the original CIT-ECHO project (Crisanti et al., 2022). These have been adapted because the original CIT-ECHO project was designed for law enforcement. The questions will use a 5-point Likert scale to evaluate the effectiveness of the intervention (see Appendix C, Surveys C1, and C2). At the conclusion of the educational intervention, a follow-up of the previous seven questions will be re-administered to assess changes in perception. The individual changes in each unique individual's responses to each question will be analyzed via paired t-test to determine whether the educational intervention was statistically significant. Each participant will be given a unique 4-digit number derived from a random number generator app, then provided to the participant when they check in for the educational intervention to preserve anonymity and facilitate data analysis using inferential methods. Anonymous data from these surveys will be compiled automatically on the host agency's password-protected computer.

Thirty days post-educational seminar, respondents and key stakeholders will be invited to participate in a focus group session to conduct a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis via Microsoft Teams. Using semi-structured questions, respondents will provide feedback on five additional guiding questions designed to evaluate the quality of the intervention, efficacy, and usefulness of subjects covered, and suggested direction of education in future seminars. Individuals will use initials to preserve anonymity during this focus group. The

transcript of the focus group session will be stored on the host agency's password-protected computer.

Timeline

The proposal defense for this QI project will be presented on 12/09/2024. Once the Graduate Student's Committee approves, the IRB application will be submitted during the week of 12/09/2024. The educational seminar will be conducted in January 2025, and the Focus Group will be convened 30 days after the educational seminar. A meeting will be conducted in March 2025 to inform the host agency of the Project's findings and recommend metrics for evaluation and possible future direction of the process. The final Defense of the QI project will be presented in April 2025 (See Appendix A, Figure A2).

Evaluation and Analysis

Descriptive statistics will be employed to summarize the data's central tendency, variability, distribution shape, and demographic information related to age, number of years in their profession, and number of years in their current role. Inferential statistics will be utilized to examine the change, if any, to the pre-and post-educational response to Questions #1-#7 of the surveys of each participant. A paired t-test will compare the difference between pre-and post-educational responses to every survey question. A unique four-digit identifier created by a random number generator will allow anonymous pairing of data pre- and post-seminar for analysis by paired t-test. Finally, the evaluation of the program itself will be reported as descriptive statistics.

All participants will be invited to participate in a focus group by logging into a Microsoft Teams meeting with their initials only as an identifier, which will be conducted 1 month after the

educational intervention. The purpose of the focus group is to perform a SWOT analysis evaluating program strengths, weaknesses, opportunities and threats. The focus group session will be conducted using a video conference platform, and the transcripts will use the auto caption feature. The focus group session will be guided using five loosely structured questions with branching questions depending on participant response. The responses will identify internal strengths and weaknesses of the program as well as external opportunities for improvement and external threats that potentially could be detrimental to the program.

SWOT is generally used as a business strategy tool to differentiate and establish an advantage over competing businesses, services, or ideas. It is helpful in identifying advantages and weaknesses so that the former can be enhanced and the latter minimized. (Teoli et al., 2023)

Participant responses will help identify the educational intervention's internal strengths and weaknesses, as well as external opportunities and threats. This will improve the program and make it more in tune with the needs of potential participants in the communities of interest.

Safety and Confidentiality

Descriptive and survey data will be collected electronically, where participants will enter a unique identification code to allow matching of pre-post data. Participants will code their responses directly into Microsoft Forms, and this data will be password-secured on a computer belonging to the host agency and accessible only to authorized host agency personnel.

During the focus group session, participants will provide verbal consent to participate in the focus group session using a pseudonym to maintain anonymity. The transcript of the video conference will be used for analysis. No direct identifiers will be maintained on the transcript.

This project will seek QI designation from the Montana State University Institutional Review Board (IRB) (See Appendix D, Document D2).

Conclusion

Acute aggressive incidents in elderly patients who have dementia are an increasingly encountered problem. Anecdotal evidence and documented studies highlight a deficit in training in recognizing signs and symptoms of dementia-related altered mental status, knowledge of validated tools for determining the level of alteration, knowledge of verbal de-escalation techniques, and knowledge of community resources available to resolve aggressive incidents in elderly dementia patients optimally. This project aims to provide proven training to interested local healthcare workers, first responders, and law enforcement personnel. It will measure pre-intervention and post-intervention data and compare them to determine whether the intervention was effective.

Dissemination and Recommendations

To further evaluate the intervention's success, it is recommended that the host agency look at differences between pre-and post-intervention levels in referrals to crisis centers rather than arresting individuals, decreases in use of force and restraints, and decreases in participant and patient injuries at the six (6) month and one (1) year post-intervention period and then yearly afterward. It is further recommended that Focus group participants' feedback be incorporated into setting future educational priorities. These recommendations, along with the findings of this project, will be communicated to the Host Agency at the end of the Project meeting to be held in March 2025.

CHAPTER THREE

QUALITY IMPROVEMENT MANUSCRIPT

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Introduction

It is estimated that 10% of the U.S. population age 65 and older has dementia or cognitive impairment, with a more significant number found in nursing homes and residential care facilities (Kramarow, 2024). The prevalence of dementia increases with age, from 1.7% for those aged 65-74 to 13.1% for those 85 and older (Kramarow, 2024). According to the Census Bureau's 2017 National Population Projection (Medina et al., 2020), Montana has more than 20% of its population older than 65, and American life expectancies are projected to increase over the next decade. With the aging of the generation born after the Second World War, the prevalence of dementia and associated acute delirium-related aggression is likely to become a more significant issue.

With the increasing age of the population and the presumptive increase in dementia, the risk for aggressive behavior increases and becomes a concern for all personnel working with this population (Watson & El-Sabawi, 2023). Advocacy groups and policymakers have identified a need to increase awareness of dementia-related acute aggression to allow healthcare workers, first responders, and law enforcement professionals to provide appropriate services while decreasing the threat to themselves or others (Watson & El-Sabawi, 2023). Developing clear practice guidelines will standardize assessment and provide an algorithm to determine the best course of action and optimal personnel to de-escalate each situation on a case-by-case basis (Watson & El-Sabawi, 2023). Crisis Intervention Team (CIT) training was developed to improve law enforcement officers (LEOs) ability to safely intervene in calls for service involving individuals with mental illness, as well as increase knowledge, self-efficacy, and attitudes toward individuals with mental illness (Crisanti et al., 2022; Watson & Fulambarker, 2012). Teller et al.,

2006 suggest that the CIT training program has had a beneficial impact in connecting persons with mental illness to the appropriate treatment facilities in the four years since being implemented.

Pathophysiology

Pre-frontal cortical atrophy is the primary neuropathological manifestation related to progressive behavioral changes and increased aggression and is associated with dementia. Atrophy of the frontotemporal lobe is associated with anger, increased confrontational behavior, delusions, and emotionally charged ideas, which lead to interpersonal aggression and social isolation. Individuals who have dementia with aggressive symptoms may also suffer deterioration of the dorsomedial, orbitofrontal cortices, and/or the amygdala. Men display higher rates of aggression and other behavioral problems such as wandering, abuse of others, and social incompetence than women. Aggression associated with dementia may be related to depression, loss of family contact, poor caregiver-patient rapport, and chronic pain. Aggressive and sometimes violent behavior associated with dementia is the most concerning for the safety and well-being of family members, the public, healthcare workers, and first responders/law enforcement officers (Ballard & Corbett, 2013; Bear, 1991; Hirono et al., 2000; Khan et al., 2018; Moll et al., 2011; Whall et al., 2008; Yu et al., 2019).

Review of Literature

A search of databases Web of Science, Google Scholar, CatSearch, PsycINFO, Hein Online, CINAHL, PubMed, and Cochrane using the terms: "dementia" "aggression" "de-escalation," "delirium," "guideline," "best practice" "protocol" as well as their synonyms and closely associated terms were initiated. The Preferred Reporting Items for Systematic Reviews

and Meta-Analyses (PRISMA) (see Appendix A, Figure A1) guidelines directed the inclusion/exclusion of results utilized in this scoping review.

Crisis Intervention Team (CIT) Extension for Community Healthcare Outcomes (ECHO) training developed by the University of New Mexico to educate law enforcement officers (LEOs) about signs and symptoms related to dementia, techniques for re-directing individuals with dementia, and helping officers have more positive attitudes towards individuals with mental health problems is an educational approach aimed at improving outcomes (Crisanti et al., 2022). Crisanti et al. (2022) examined 113 CIT ECHO sessions, producing 598 post-session surveys. Examination of these indicates that modules about Psychiatric Diagnosis and Substance Use significantly increased participant knowledge and increased participant's knowledge of available community resources and how to contact them. The module topics significantly impacted the likelihood that CIT ECHO participants would use the information presented in the weekly sessions on the job ($F = 4.5933$; $p < 0.001$).

Crisis Intervention Training (CIT), which uses Assess, Diagnose, Evaluate, Prevent, and Treat (ADEPT), is another education model that delivers the training in a more traditional in-person seminar fashion (Shenvi et al., 2020). CIT utilizing ADEPT to assess has been proven effective in increasing understanding of best practices in dealing with and de-escalating acute aggressive incidents among older adults living with dementia as well as decreases in excessive force reports and increases in disposition of callouts to the emergency room rather than jail after educational training has been initiated in multiple police entities within the United States (Shenvi et al., 2020; Arora et al., 2018; Watson & Fulambarker, 2012 and Teller et al., 2006).

Context

Acute aggression among elderly patients suffering from some form of dementia induced by delirium is a significant issue in the United States and around the world. Due to concerns about excessive force incidents in the recent past (Watson & El-Sabawi, 2023), a local Northwest U.S.A. Mental Health Organization in a city of <100,000 persons initiated a working group of concerned interdisciplinary professionals, referred to hereafter as the host agency, to proactively address this potential problem. Data from the scoping review informed the development of this QI project. This pilot project aimed to provide a six-hour in-person educational Quality Improvement (QI) intervention modeled upon law enforcement's successful CIT program, aimed at improving recognition of dementia and altered level of consciousness, knowledge of verbal de-escalation techniques, redirection techniques, and techniques aimed at gaining trust, and familiarity with available community resources and how they may be accessed by healthcare workers, first responders, and law enforcement personnel.

Methods

Intervention

A six-hour, in-person educational seminar consisting of four targeted one-hour educational presentations was held in a large conference room at one of the local hospitals. These presentations included a 30-minute PowerPoint lecture, followed by a ten-minute Question period, and finally, a 20-minute breakout session with role-playing utilized to demonstrate understanding of the techniques taught.

Study of the Intervention

A Pre- and post-seminar survey of seven (7) questions (See Appendix C, Surveys C1 and C2) pertaining to knowledge and attitudes towards older people with dementia who are experiencing an acute aggressive episode. Two (2) additional questions related to Medicare payment policies and treatability of Alzheimer's Dementia, as well as three (3) questions related to time in the present job, time in the present role, and whether the role was entry-level, mid-level, or management was administered before and after the educational portion of the seminar through the use of Microsoft Forms, a QR code, and the participants' smartphones. The participants identified themselves on the pre-and post-surveys with the same randomly generated four (4) digit number to enable anonymous linking of their responses in the statistical analysis with a paired t-test. Data was collected on the host agency's password-protected computer. Participants were further invited to participate in a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of the intervention (See Appendix C, Survey C3) held 30 days after the educational intervention.

Measures

The quality improvement project utilizes the Implementation Science Framework-Replicating Effective Programs Implementation developed by the U.S. Centers for Disease Control and Prevention (CDC) in 1996 and known as Replicating Effective Programs (REP) to guide its progress due to its proven efficacy in translating promising research interventions into effectively implemented programs in community settings (Kilbourne et al., 2007). This model is effective due to emphasizing the need for rigorously identifying effective interventions (literature review and community input), translating the interventions' information into non-technical language (eliminating jargon), supporting the implementation of the intervention(s) through

training and technical assistance (ensuring qualified individuals are involved), and ensuring that ongoing financial and technical support are sustained to ensure long-term viability (continuity) (Kilbourne et al., 2007). This framework derives from two foundational theories: 1) Diffusion of Innovation (advances evolve through the sharing of ideas among members of a social system over time), and 2) Social Learning Theory (behavior change results from a person's belief in their ability to change and the results of the change). This project utilizes elements of this model and will continue to utilize this model to guide effective implementation and sustainable adaptation over time (see Appendix A, Figure A3).

The pre-survey determined basic demographic information followed by seven core questions adapted to the target audience from the original validated CIT-ECHO project (Crisanti et al., 2022). These have been adapted because the original CIT-ECHO project was designed for law enforcement. The questions used a 5-point Likert scale to evaluate the effectiveness of the intervention (see Appendix C, Surveys C1, C2, and C3). After the educational intervention, a follow-up of the previous seven questions was re-administered to assess changes in perception. The changes in each unique individual's responses to each question were analyzed via paired t-test to determine whether the educational intervention was statistically significant (See Appendix B, Table B3).

Analysis Plan

Descriptive statistics were employed to summarize the data's central tendency, variability, distribution shape, and demographic information related to age, number of years in their profession, and number of years in their current role. Inferential statistics were utilized to examine the change in the pre-and post-educational survey scores using a Paired t-test. A SWOT

analysis was conducted approximately one month after the post-educational intervention to evaluate the intervention process and educational content.

Ethical Considerations

This pilot project was approved by this student's Committee and deemed to be Not Human Subjects Research by the Montana State University (MSU) Institutional Review Board (IRB) (See Appendix D, Document D2). To preserve participant anonymity, pre- and post-educational intervention survey responses were identified by a unique four (4) digit identifier number to link the difference in responses to each participant for paired t-test analysis. Invitations to attend were sent to department heads of potentially affected healthcare agencies in the host and nearby communities several months in advance. These individuals were encouraged to attend and bring interested subordinates who might benefit. Participation was voluntary.

Results

Overview

On January 15, 2025, 13 participants attended a six-hour educational seminar in a conference room of a local hospital. All participants' pre- and post-seminar responses were collected and compiled for paired t-test analysis (See Appendix B, Table B3). Seven questions evaluating participant confidence and knowledge regarding dementia-related aggression were evaluated utilizing a five-point Likert scale ranging from Strongly Disagree to Strongly Agree (See Appendix C, Surveys C1 and C2). Two questions were true or false, gauging their knowledge of Alzheimer's Dementia and Medicare reimbursement. The final three questions addressed the participant's time in the present job, present role, and whether the job was entry-

level, mid-level, or management. A post-seminar SWOT analysis meeting was conducted on 02/20/2025 with 12 contributors. See Appendix C, Survey C3.

Survey Data

Demographic information reveals that 6 of 13 participants were managers at their places of employment. One had been at their present job for >20 years and in their present role for 1 year or less, two had been at their present job for 11-20 years and in their present role for 11-20 years, one had been at their present job for 6-10 years and in their present role for 1-5 years, and one had been in their present job and in their present role for 1 year or less. Five of the thirteen participants were mid-level at their place of employment. Four had been at their present job and in their present role for 1-5 years, and one had been at their present job for >20 years and in their present role for 11-20 years. Two of the thirteen participants were entry-level; both had been at their present jobs and roles for 1 year or less.

The seven 5-point Likert scale questions demonstrate a trend towards improved knowledge and confidence. However, only Question 2, “I am confident in my ability to effectively deal with an older patient with dementia who is experiencing an acute aggressive episode,” produced statistically significant results. In the paired samples test, paired differences produced a Mean=-0.769, Std. Deviation=0.725, Std. Error Mean=0.201, 95% Confidence Interval of the Difference Lower=-1.207 and Upper=-0.331, $t=-3.825$, $df=12$, Significance one-sided, $p=0.001$, Significance two-sided, $p=0.002$ (See Appendix B, Table B3).

SWOT Analysis

Strengths. A post-seminar SWOT analysis held online on 02/20/2025 identified resource material, the venue, the presentation content, the expertise of the presenters, and especially the

interdisciplinary exchange as strengths of the educational seminar. This helped clarify the strengths and challenges experienced by different departments involved in dealing with dementia-related aggression. Participants rated their overall level of satisfaction with the seminar 8.4/10 and their likelihood of recommending this training to others 9.2/10.

Weaknesses. Identified weaknesses included computer/IT difficulties, ensuring that some resource materials contained current contact information, insufficient time allocated to practical scenario utilization, insufficient time allocated to networking, and the need to enforce adherence to agenda more strictly and discourage discourse down areas not on the agenda.

Opportunities. Growth opportunities identified include the need for an executive summary highlighting benefits and identifying issues so that new individuals can be recruited to champion and expand the program. Who would most benefit from this training should be identified. Criteria for when a dementia patient has a treatable condition should be clarified for law enforcement officers and first responders. Data on the number of dementia-related aggressive episodes and their outcomes over the next six months and one year should be compared to pre-seminar data to validate the effectiveness of the intervention. Refine and record presentations to be used as resources at other facilities. Ensure updated and valid resource material is constantly renewed within the presentations. Provide more time for real-time scenario practice and networking. Discourage the pursuit of topics not on the agenda.

Threats. Threats to this program include uncertainty of funding, reduction of available beds for long-term mental health patients, and the difficulty of engaging a dynamic team with networking capability and political connections to encourage the adoption of the program on a broader scale.

Discussion

Summary

The pre-and post-seminar survey data show that education changed confidence, attitude, and understanding. There was a statistically significant increase in participants' confidence in effectively dealing with acute dementia-related aggression. The post-seminar SWOT analysis identified IT glitches as a significant weakness and suggested that resource material contact information should be continually updated, and more time be allocated for scenario practice and networking. Participants felt that the seminar was well conducted, the material was relevant, the instructors were knowledgeable and well prepared, and they would recommend it to others.

Interpretation

There was a slight increase in confidence in the ability to recognize the signs and symptoms of dementia, delirium, and altered mental status. There was a statistically significant difference in participants' confidence in their ability to effectively deal with an elderly patient suffering from an acute dementia-related aggressive episode. Knowledge of available community resources to positively affect outcomes has increased. Participants' knowledge about and confidence in verbal de-escalation was positively impacted. Understanding of physical and chemical restraints was clarified as an option of last resort. Participants expressed an understanding that law enforcement officials are often not needed to de-escalate patients experiencing dementia-related acute aggression.

Most participants in this pilot QI project were managers at their place of employment; of these, one-half (50%) had been in their present job for more than ten years, and one-third had been in their present role for more than ten years. Of the rest, thirty-eight percent were mid-level

employees with several years of experience. The prevalence of managerial personnel with many years of experience may have affected the potential for change in this educational intervention through a selection bias skewed toward individuals with a higher knowledge of the techniques taught, greater confidence in their abilities due to years of on-the-job experiences, and change resistance.

Paired sample correlation coefficients indicate a moderate to strong positive correlation between pre- and post-seminar responses, suggesting that the educational intervention may have produced a net rightward and upward shift in post-seminar responses vs pre-seminar responses. The Paired Samples t-test produced t-values indicating that the intervention produced a trend towards increased knowledge, understanding, and confidence with only Question #2, “I am confident in my ability to effectively deal with an older patient with dementia who is experiencing an acute aggressive episode,” indicating a statistically significant effect from the educational intervention. Selection bias and lack of power may have influenced these results. Hedges’ g was used for paired samples effect size due to this pilot project's small sample size (N=13). Hedges’ g values indicate a moderate to large effect, suggesting that although many of the questions did not produce a statistically significant result, the practical significance of this small pilot QI project may have positive outcomes and merit further study.

Limitations

This is a small pilot project. The participants were mainly management or mid-level employees who had worked in healthcare for many years, potentially altering the intervention's

results. This project was also time-constrained due to the need to conduct the intervention, collect and analyze data, and disseminate the results within the spring academic semester.

Future Considerations

Future projects should be expanded to include other communities and a more significant number of participants with more varied levels of experience. Future projects should be conducted over a longer period of time and include pre- and post-intervention data on the number of incidences of dementia-related acute aggression encountered, methods and personnel utilized to resolve the incident, and incident outcomes as verifiable quantitative measures of change. Information Technology (IT) staff should be present to troubleshoot glitches, and a backup hardcopy of all material should be available onsite in case technical problems arise. More time should be allocated for scenario practice and interdisciplinary networking. The moderator should strictly enforce the agenda topics and firmly discourage off-topic discourses. Recruitment of interested individuals and organizations should be actively pursued to encourage beneficial growth. Updated, valid resource material should be continually evaluated and incorporated into the seminar sessions, and edited recordings of sessions should be made available for use when qualified instructors are not physically available.

Conclusions

The training was well received and reviewed by participants and presenters. The host organization feels that the project was beneficial and is committed to collaborating with interested individuals to facilitate improvements and expansion of the intervention. The data from the pilot program demonstrated limited statistical significance; however, it may still have clinical relevance. Collecting data on the number of incidents and disposition of these incidents

pre- vs post-intervention would be beneficial on a longer timeline to help evaluate the validity of this intervention. It is recommended that a larger study with participants recruited from other towns and with a more varied length of time dealing with elderly dementia patients may be beneficial in determining if the data seen in this study is valid and consistent.

CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

Introduction

The Doctor of Nursing Practice (DNP) degree represents the height of practice-focused nursing education, preparing graduates to tackle complex healthcare challenges through advanced clinical expertise, leadership, and systems thinking. The American Association of Colleges of Nursing (AACN) has established the DNP Essentials, which outline the foundational competencies central to all advanced nursing practice roles. Throughout my educational journey at Montana State University's DNP program with a Family Nurse Practitioner (FNP) focus, I have developed the knowledge, skills, and attitudes aligned with these essentials. This chapter highlights how the program has allowed me to develop and refine these competencies and my vision for implementing them as a doctoral-prepared nurse in a small community primary care setting.

Meeting the DNP Essentials Through My Educational JourneyKnowledge for Nursing Practice (Essential I)

The Montana State University DNP program provided a robust foundation in the scientific underpinnings of nursing practice through coursework that integrated nursing science with knowledge from other disciplines. In NRSG 602, we explored advanced pathophysiology, which enhanced my understanding of molecular, cellular, and system-level disease processes. This course strengthened my ability to approach clinical problems rigorously and apply theoretical frameworks to complex health situations. NRSG 604 and NRSG 605 prepared me to

review literature from across disciplines to improve clinical outcomes critically. This scientific foundation was particularly valuable when developing my DNP project on improving healthcare workers, emergency response providers, and law enforcement personnel's reactions to acute aggression in patients. Through this work, I applied psychology, crisis management, and behavioral health theories to understand the multifactorial nature of patient aggression and develop evidence-based interventions that have proven effective in law enforcement. Integrating nursing concepts with crisis de-escalation techniques and educational interventions originally developed for law enforcement exemplifies how interdisciplinary knowledge can inform nursing practice.

Person-Centered Care (Essential II)

Montana State University's FNP focus area within the DNP program provided comprehensive preparation for advanced nursing practice. Through didactic coursework and the requirement of over 1,000 hours of clinical practice, I developed advanced clinical judgment, systems thinking, and accountability in delivering evidence-based care to individuals and populations. My DNP project enhanced my expertise in psychiatric-mental health care, crisis intervention, and education. These are essential specialized areas complementing my FNP preparation. This additional expertise will allow me to provide more comprehensive person-centered care to patients with behavioral health needs in my future small community practice, where mental health resources may be limited.

Population Health (Essential III)

Montana State University's Doctor of Nursing Practice/ Family Nurse Practitioner program emphasizes public health, environmental health, and social determinants of health. I

developed competencies in analyzing epidemiological, biostatistical, and environmental data related to individual and population health and designing interventions to address gaps in care. My DNP project addressed a significant population health concern: managing behavioral health crises in emergency settings. By improving healthcare workers, emergency responders, and law enforcement abilities to de-escalate aggressive situations safely, the project aimed to prevent adverse outcomes for both patients and providers. This work demonstrated my commitment to clinical prevention and population health approaches, which I will continue to prioritize as a primary care provider addressing the diverse health needs of a small community.

Scholarship for the Nursing Discipline (Essential IV)

Montana State University's emphasis on evidence-based practice and research methodology in NRSG 605 gave me the analytical skills to critically appraise existing literature, design evidence-based interventions, and evaluate outcomes. I learned to use information technology to collect appropriate data, generate meaningful evidence for nursing practice, and apply relevant findings to develop practice guidelines. For my DNP project, I conducted a comprehensive literature review on crisis intervention models, analyzed data on patient aggression incidents, and utilized analytical methods to determine the most effective educational approaches for healthcare workers, emergency responders, and law enforcement personnel. This scholarship informed the development of the adapted Crisis Intervention Team (CIT) education program and established evaluation metrics to assess its impact. The project demonstrated my ability to translate research into practice and disseminate findings to improve healthcare outcomes.

Quality and Safety (Essential V)

My project focused on providing interdisciplinary education in the recognition of dementia and acute dementia-related aggression in the older population, effectively collaborating to ensure the best resources are utilized in each situation, and using verbal de-escalation techniques to facilitate safe, high-quality outcomes for the individuals involved. These values were emphasized throughout the program in courses NRSG 601, NRSG 604, NRSG 605, NRSG 607, NRSG 609, NRSG 612, and NRSG 615.

Interprofessional Partnerships (Essential VI)

Montana State University's DNP program emphasizes interprofessional collaboration through team-based learning activities and clinical experiences. I developed skills in effective team leadership, communication strategies, and collaborative approaches to improving patient and population health outcomes. My DNP project exemplified interprofessional collaboration as it required working with healthcare workers, emergency medical services, law enforcement, hospital security, psychiatric services, and administration. I led collaborative efforts to design, implement, and evaluate the CIT education program, navigating diverse professional perspectives and organizational cultures. This experience strengthened my ability to lead interprofessional teams in creating sustained changes in healthcare delivery, which will be essential in my future practice coordinating care in a small community setting.

Systems-Based Practice (Essential VII)

NRSG 609 enhanced my ability to lead changes and ensure patient safety within healthcare delivery systems. This course emphasized quality improvement methodologies, ethical decision-making, and advanced communication strategies essential for effective

leadership. NRS 611 provided knowledge about evidence-based practice and improvement science to plan and evaluate health-related programming. I gained skills in analyzing care delivery approaches that meet patient populations' current and future needs while ensuring accountability for quality healthcare. My DNP project directly addressed systems-level challenges in emergency response to patient aggression. I identified systemic barriers to effective crisis management, developed strategic solutions through adapted Crisis Intervention Team (CIT) education, and implemented changes that required collaboration across disciplines and departments. This experience developed my capacity to conceptualize new care delivery models based on contemporary nursing science feasible within current organizational, political, cultural, and economic perspectives.

Informatics and Healthcare Technology (Essential VIII)

Throughout the DNP program, particularly in NRS 675, I learned to use information systems and technology to support and improve patient care and healthcare systems. I learned to evaluate information systems to extract data for evidence-based practice, utilize decision-support systems, and evaluate ethical and legal issues related to healthcare information. My DNP project incorporated technology to deliver meaningful in-person educational presentations. I utilized data management tools to track outcomes and measure the effectiveness of the intervention. This experience highlighted how technology can enhance education, clinical practice, and program evaluation, preparing me to integrate these tools into my future practice as a small community provider with limited resources.

Professionalism (Essential IX)

My project in NRSRG 675 has provided leadership in developing a pilot interprofessional educational opportunity that could lead to a systemic approach to improving recognition of dementia-related aggression, utilization of verbal de-escalation techniques, and interagency collaboration to improve outcomes. The DNP program at Montana State University emphasized the critical role of healthcare policy in shaping care delivery and financing. I understood how policies are developed and the nurse's role in advocating professionally for healthcare policies that promote equity and social justice in NRSRG 614. NRSRG 609 mainly focused on leadership and communication skills to effectively collaborate intra- and inter-professionally to affect individual, community, state, federal, and global policies for better health outcomes. My DNP project intersected with policy considerations regarding mental health crisis response, the use of restraints, and training requirements for healthcare workers, emergency personnel, and law enforcement officers. I advocated policy changes at the institutional level to support sustainable implementation of the CIT education program. This experience prepared me to participate in policy development as a healthcare professional, educate others about policy changes, and advocate for nursing contributions to policy formation in my future role as a community-based FNP.

Personal, Professional, and Leadership Development (Essential X)

Being involved in Montana State University's Doctor of Nursing Practice/Family Nurse Practitioner program requires me to reflect, regroup, rethink, and revise. It has instilled in me that persistence is essential and collaboration in overcoming difficult hurdles is beneficial. It has highlighted the benefits of beneficent mentorship and encouraged me to desire to mentor and encourage the next generation of healthcare professionals.

Implementation in My Career as a Doctoral-Prepared Nurse

As I transition into my role as a DNP-prepared FNP in a small community setting, I envision implementing the DNP Essentials in several meaningful ways: First, I plan to establish a primary care practice that integrates evidence-based approaches to both physical and behavioral health, addressing a significant gap in many rural communities. Drawing on my DNP project experience, I will implement screening and intervention protocols for patients experiencing psychological distress, utilizing the crisis de-escalation skills I've developed. Second, I intend to serve as a practice leader who advocates improved healthcare access and quality in underserved areas. This will involve collaborating with local agencies, schools, and community organizations to develop sustainable health promotion initiatives and care coordination systems tailored to the community's unique needs. Third, I will utilize technology and information systems to monitor population health trends within my practice, identify care gaps, and implement targeted interventions. This data-driven approach will enable me to demonstrate the impact of DNP-led care on health outcomes and adjust service delivery as needed. Fourth, I plan to maintain academic partnerships to create clinical learning opportunities for nursing students in rural settings, thereby contributing to workforce development and potentially improving recruitment and retention of healthcare providers in underserved areas.

Conclusion

The DNP program at Montana State University has equipped me with the knowledge, skills, and experiences needed to fulfill AACN's DNP Essentials. Through rigorous coursework and my project on improving emergency response to patient aggression through CIT education, I have developed as a scholar, leader, and advanced practice nurse prepared to address complex healthcare challenges. As I embark on my career as a DNP-prepared FNP in a small community

setting, I am committed to applying these competencies to improve healthcare delivery, advocate for vulnerable populations, and demonstrate the unique contributions that doctoral-prepared nurses make to healthcare systems and patient outcomes. Integrating scientific evidence, systems leadership, interprofessional collaboration, and advanced clinical expertise will guide my practice and ensure I deliver high-quality, comprehensive care to my community.

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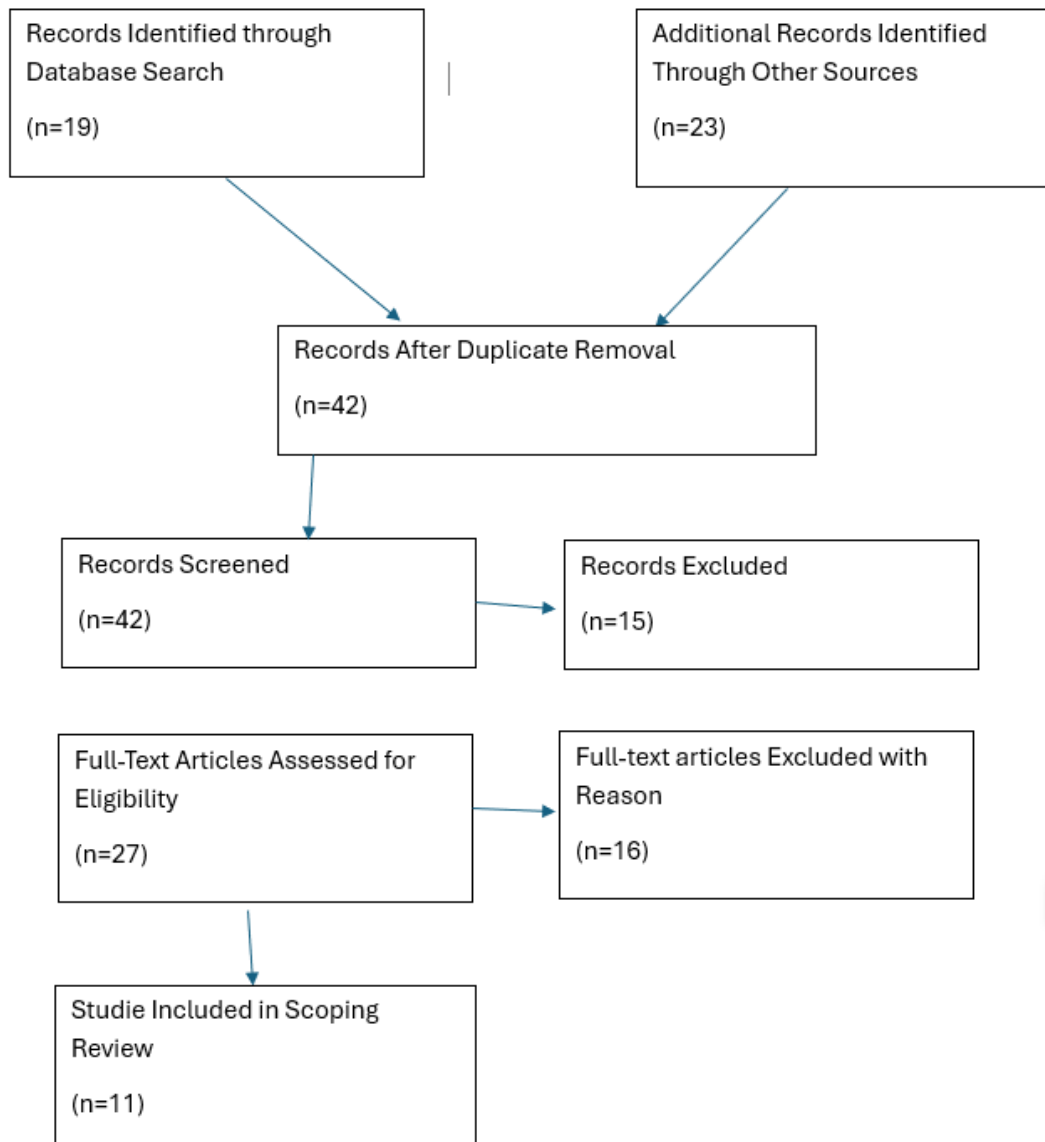
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APPENDICES

APPENDIX A

FIGURES

Figure A1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement *PLoS Med* 6(6): e1000097. Doi: 10.1371/journal.pmed.1000097

Figure A2. Project Timeline

Sept-Dec 2024	December 9, 2024	Week of December 9, 2024	January 2025	February 2025	March 2025	April 2025
Scoping Review and Proposal Development	Project Proposal Defense	Project Proposal Paper Revisions, IRB Application, Meeting with Advisor	IRB Approval, Educational Seminar, Survey Data Analysis	Focus Group Meeting, SWAT Analysis	Meeting with the Host Agency to Disseminate Project Findings and Recommend Evaluation Metrics not measurable within the Project Timeframe as well as Future Educational Direction	Project Final Defense

Figure A3. Intervention Timeline

Date	01/15/2025	02/20/2025
Activity	Educational Seminar	SWOT Analysis
Number of Participants	13	12
Data/Analysis	Pre- and post-seminar questionnaire/paired t-test	Identification of strengths, weaknesses, opportunities, and threats/ thematic analysis

APPENDIX B

TABLES

Table B1. Smart Goals

SMART Goal #1 By post-seminar, participants will demonstrate an increase of $>$ or $=$ to 1 point on the Likert scale in confidence in recognizing dementia, delirium, altered perception, and altered mental status. - Participants will attend an educational seminar hosted by the host agency and taught by qualified mental health experts. - An identical seven-question pre- and post-seminar survey utilizing a 5-point Likert scale will gauge the changes in knowledge and attitude of all participants.		
Data to be collected	Collection Process	Planned Data Analysis
- Pre-seminar survey of seven questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode. - Post-seminar survey of seven identical questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode.	- The survey will be created using Microsoft Forms - The host agency will collect the data - Data will be anonymous - Data will be retained on the host agency computers to refine the program - Data will be shared with this DNP student for data analysis and then deleted.	- Descriptive statistics will be employed to summarize the central tendency, variability, and distribution shape of the data as well as demographic information related to age, number of years in their profession, and number of years in their current role - Inferential statistics will be utilized to examine the change, if any, to the pre- and post-educational response to Question #1 of the surveys of every unique individual from the expected single group of 30-40 participants pre- and post-educational intervention and draw conclusions - A paired t-test will be used to compare the difference between every unique individual's pre- and post-educational responses to every survey question. - A unique four-digit identifier created by a random number generator will allow anonymous pairing of data pre- and post-seminar for analysis by paired t-test

Table B1. Smart Goals Continued.

SMART Goal #2 By post-seminar, participants will demonstrate a confidence increase of > or = to 1 point on the Likert scale in effectively utilizing non-coercive verbal de-escalation techniques.		
- Interested healthcare workers, first responders, and law enforcement personnel will attend an educational seminar hosted by the host agency and taught by qualified mental health experts. - An identical seven-question pre- and post-seminar survey utilizing a 5-point Likert scale will gauge changes in the knowledge and attitude of all participants.		
Data to be collected	Collection Process	Planned Data Analysis
- Pre-seminar survey of seven questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode. - Post-seminar survey of seven identical questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode.	- The survey will be created using Microsoft Forms - The host agency will collect the data - Data will be anonymous - Data will be retained on the host agency computers to refine the program - Data will be shared with this DNP student for data analysis and then deleted.	- Descriptive statistics will be employed to summarize the central tendency, variability, and distribution shape of the data as well as demographic information related to age, number of years in their profession, and number of years in their current role - Inferential statistics will be utilized to examine the change, if any, to the pre-and post-educational response to Questions #4 and #5 of the surveys of every unique individual from the expected single group of 30-40 participants pre- and post-educational intervention and draw conclusions - A paired t-test will be used to compare the difference between every unique individual's pre- and post-educational responses to every survey question. - A unique four-digit identifier created by a random number generator will allow anonymous pairing of data pre-and post-seminar for analysis by paired t-test

Table B1. Smart Goals Continued.

SMART Goal #3 By post-seminar, participants will demonstrate an increase of > or = to 1 point on the Likert scale in confidence of their knowledge of available community resources and how to contact them when needed.		
- Interested healthcare workers, first responders, and law enforcement personnel will attend an educational seminar hosted by the host agency and taught by qualified mental health experts. - An identical seven-question pre-and post-seminar survey utilizing a 5-point Likert scale will gauge changes in knowledge and attitude of all participants.		
Data to be collected	Collection Process	Planned Data Analysis
- Pre-seminar survey of seven questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode. - Post-seminar survey of seven identical questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode.	- The survey will be created using Microsoft Forms - The host agency will collect the data - Data will be anonymous - Data will be retained on the host agency computers to refine the program. - Data will be shared with this DNP student for data analysis and then deleted.	- Descriptive statistics will be employed to summarize the central tendency, variability, and distribution shape of the data as well as demographic information related to age, number of years in their profession, and number of years in their current role - Inferential statistics will be utilized to examine the change, if any, to the pre-and post-educational response to Question #3 of the surveys of every unique individual from the expected single group of 30-40 participants pre- and post-educational intervention and draw conclusions - A paired t-test will be used to compare the difference between every unique individual's pre- and post-educational responses to every survey question. - A unique four-digit identifier created by a random number generator will allow anonymous pairing of data pre-and post-seminar for analysis by paired t-test

Table B1. Smart Goals Continued.

SMART Goal #4 By post-seminar, participants will demonstrate an increase of > or = to 1 point on the Likert scale in confidence in their ability to effectively deal appropriately with patients who have dementia and are experiencing acute delirium-induced aggressive episodes. - Interested healthcare workers, first responders, and law enforcement personnel will attend an educational seminar hosted by the host agency and taught by qualified mental health experts. - An identical seven-question pre- and post-seminar survey utilizing a 5-point Likert scale will gauge changes in knowledge and attitude of all participants.		
Data to be collected	Collection Process	Planned Data Analysis
- Pre-seminar survey of seven questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode. - Post-seminar survey of seven identical questions pertaining to knowledge and attitudes towards older dementia patients who are experiencing an acute aggressive episode.	- The survey will be created using Microsoft Forms - The host agency will collect the data - Data will be anonymous - Data will be retained on the host agency computers to refine the program. - Data will be shared with this DNP student for data analysis and then deleted.	- Descriptive statistics will be employed to summarize the central tendency, variability, and distribution shape of the data as well as demographic information related to age, number of years in their profession, and number of years in their current role - Inferential statistics will be utilized to examine the change, if any, to the pre-and post-educational response to Question #2, #5, #6, and #7 of the surveys of every unique individual from the expected single group of 30-40 participants pre- and post-educational intervention and draw conclusions - A paired t-test will be used to compare the difference between every unique individual's pre- and post-educational responses to every survey question. - A unique four-digit identifier created by a random number generator will allow anonymous pairing of data pre-and post-seminar for analysis by paired t-test

Table B2. Project Implementation Within the REP Framework

Phases	Pre-Conditions	Pre-Implementation	Implementation	Maintenance and Evolution
Components	*Identification of Need for New Intervention. *Identification of Effective Intervention that Fits Local Setting. *Packaging Intervention for Training and Assessment	*Orientation: Explain Core Elements & Customize Delivery. *Logistics Planning *Staff Training - Technical Assistance	*Ongoing Support of & Partnership with Community Organizations *Booster Training *Process Evaluation *Feedback & Refinement of Intervention Package & Training.	*Organizational and financial Changes to Sustain Intervention *Prepare Package for National Dissemination *Re-Customize Delivery as Need Arises
Tasks	*Home Health Employee recognizes unacceptable level of mental health related aggression incidents with sub-optimal outcomes *Home Health Employee engages Community CIT group. *CIT Working Group is formed and grows numbers for community buy in *DNP Student is engaged to conduct a Scoping Literature Review and craft a written plan *Needs survey is crafted and disseminated to all reachable affected entities to identify areas of interest/deficit knowledge & increase buy-in. *Presentation to DNP Student Committee and all interested parties. *MSU IRB Review.	*Finalize content, location, time, staff responsibilities.	*Educational Seminar with Pre- and Post-Seminar questionnaires administered to gauge participant change in knowledge, attitude, and confidence. *Analysis of data *Compilation of data *Identification of deficits *Presentation of Results to DNP Committee and all interested parties. *Recommendations for the future. (examination of change in the total number of aggressive incidents by elderly people with a dementia diagnosis and change in the number of incidents that require use of force to resolve by host organization personnel after the conclusion of this project)	*Examine the change in dementia-related incidents of aggression pre- and post-intervention by members of the host group after the conclusion of this project *Examine the change in the need to use force to resolve aggressive incidents by elderly people with dementia diagnoses pre- and post-intervention by host organization personnel after the conclusion of this project *Refine intervention as needed. *Provide consultation with interested parties as needed.
Timeline	Jan.-Nov.2024	Dec. 2024	Jan.-April 2025	April 2025-

Table B3. Pre- and Post-Seminar Survey Data

Question	Mean (Standard Deviation)	Significance
1. I am confident in my ability to recognize the signs and symptoms of dementia, delirium, altered mental perception, and altered mental status.	Pre: 4.15 (sd 0.555)	t=1.477, (df 12), p=0.165
	Post: 4.31 (sd 0.630)	
2. I am confident in my ability to effectively deal with an older patient with dementia who is experiencing an acute aggressive episode.	Pre: 3.54 (sd 0.967)	t=3.825, (df 12), p=0.002
	Post: 4.31(sd 0.480)	
3. I am confident in my ability to contact qualified individuals who will effectively help de-escalate an acute aggressive episode in an elderly dementia patient. - I am confident in my ability to contact qualified individuals who will effectively help de-escalate an acute aggressive episode in an elderly dementia patient.	Pre: 4.23 (sd 0.725)	t=2.132, (df 12), p=0.054
	Post: 4.62 (sd 0.506)	
4. Older patients with dementia who are experiencing an acute aggressive episode cannot be verbally de-escalated. - Older patients with dementia who are experiencing an acute aggressive episode cannot be verbally de-escalated.	Pre: 2.00 (sd 0.816)	t=0.00, (df 12), p=1.000
	Post: 2.00 (sd 1.080)	
5. Older patients with dementia who are experiencing an acute aggressive episode cannot be persuaded or distracted. - Older patients with dementia who are experiencing an acute aggressive episode cannot be persuaded or distracted.	Pre: 2.08 (sd0.954)	t=0.519, (df 12), p=0.613
	Post: 1.92 (sd 1.320)	
6. Older persons with dementia and aggression must be restrained for safety - Older persons with dementia and aggression must be restrained for safety.	Pre: 2.00 (sd 1.080)	t=1.000, (df 12), p=0.337
	Post: 1.77 (sd 1.092)	
7. Persons with dementia who are experiencing aggression are best managed by law enforcement - Persons with dementia who are experiencing aggression are best managed by law enforcement	Pre: 2.00 (sd 0.913)	t=0.000, (df 12), p=1.000
	Post: 2.00 (sd 0.816)	

APPENDIX C

SURVEYS

Survey C1. Pre-Educational Seminar Survey

1. I am confident in my ability to recognize the signs and symptoms of dementia, delirium, altered mental perception, and altered mental status.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
2. I am confident in my ability to effectively deal with an older patient with dementia who is experiencing an acute aggressive episode.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
3. I am confident in my ability to contact qualified individuals who will effectively help de-escalate an acute aggressive episode in an elderly dementia patient.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
4. Older patients with dementia who are experiencing an acute aggressive episode cannot be verbally de-escalated.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
5. Older patients with dementia who are experiencing an acute aggressive episode cannot be persuaded or distracted.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
6. Older patients with dementia who are experiencing an acute aggressive episode must be chemically/physically restrained for their safety and the safety of others.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
7. Older patients with dementia who are experiencing an acute aggressive episode are best dealt with by law enforcement.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Demographics

- A. Please provide your assigned randomly generated four-digit Identification number:
- B. How long have you been in your present job:
- C. How long have you been in your present role at your job:
- D. Is your job entry-level, mid-level, or management:

Survey C2. Post-Educational Seminar Survey

1. I am confident in my ability to recognize the signs and symptoms of dementia, delirium, altered mental perception, and altered mental status.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
2. I am confident in my ability to effectively deal with an older patient with dementia who is experiencing an acute aggressive episode.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
3. I am confident in my ability to contact qualified individuals who will effectively help de-escalate an acute aggressive episode in an elderly dementia patient.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
4. Older patients with dementia who are experiencing an acute aggressive episode cannot be verbally de-escalated.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
5. Older patients with dementia who are experiencing an acute aggressive episode cannot be persuaded or distracted.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
6. Older patients with dementia who are experiencing an acute aggressive episode must be chemically/physically restrained for their safety and the safety of others.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree
7. Older patients with dementia who are experiencing an acute aggressive episode are best dealt with by law enforcement.
1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Demographics

- A. Please provide your assigned randomly generated four-digit Identification number:
- B. How long have you been in your present job:
- C. How long have you been in your present role at your job:
- D. Is your job entry-level, mid-level, or management:

Survey C3. Focus Group SWOT Analysis Guiding Questions

1. What are the strengths of this educational program?
2. What are the weaknesses of this program?
3. What techniques learned at the educational seminar were most helpful? Explain.
4. What external opportunities exist that this program is not yet utilizing?
5. What external threats could potentially detract from this program?

APPENDIX D

DOCUMENTS

Document D1. Site Representative Form

**Site Representative Form**

Student: Bradley Dixon
 Email: brad.dixon@student.montana.edu
 Phone number: 406 450-5610

Lead Faculty: Dr. Benjamin Miller Ph.D., APRN, FNP-C, ASNPC, ENP-C, FAANP
 Email: Benjamin.miller11@montana.edu

Project Site Representative (include Credentials & Job Title): Theresa Williams, LCSW, CMHPP
 Email: williamst@ci.missoula.mt.us
 Phone number: 406-830-0796

Project Site Name and Address:

Crisis Intervention Team Program
 435 Ryman
 Missoula, MT 59806

Proposed Practice Problem to be addressed:

Facilities, care providers and first responders who work with vulnerable populations over the age of 55, particularly with mental health disorders, medical complexities, and behavioral health challenges, often face difficulties in identifying and managing crises effectively. The lack of standardized training, inconsistent protocols, and insufficient decision making tools lead to fragmented care, which can result in inappropriate interventions, delayed responses, and unnecessary escalation of crises. This inconsistency increases the risk of harm to both individuals in crisis and care providers, while also placing undue strain on emergency systems.

Proposed Intervention:

- A Comprehensive 3-Pronged Strategy for enhancing crisis response and long-term support for the target population:
1. Comprehensive Needs Assessment for Training and Capacity Building
 2. Development and Implementation of a Unified Training Curriculum
 3. Creation of Actionable Protocols and Decision-Making Tools

Signature of Project Site Representative:

Main Campus
 Anna Pearl Sherrick Hall
 P.O. Box 173560
 Bozeman, MT 59717-3560
 Tel 406-994-3783
 Fax 406-994-6020

Billings Campus
 1500 University Drive
 MSU-Billings, Campus Box 574
 Billings, MT 59101
 Tel 406-657-2912
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Great Falls Campus
 400 15th Ave. South, Suite 106
 Great Falls, MT 59405-4375
 Tel 406-771-4450
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Kalispell Campus
 210 Sunny View Lane, Suite 5
 Kalispell, MT 59901
 Tel 406-751-6967

Missoula Campus
 32 Campus Drive #7416
 Missoula, MT 59812-7416
 Tel 406-243-6515
 Fax 406-243-5745

Document D2. IRB Determination email

IRB Not HSR Determination - Application #1915



NoReply@topazti.com

Wed, Dec
11, 2024,
2:43 PM

To: benjamin.miller11, me, brenna.szott

Hello Dixon, Bradley,

The IRB has evaluated the following application and determined that it does not meet the definition of Human Subjects Research under federal regulations (45 CFR 46). See more information at https://www.montana.edu/orc/irb/human_subjects_research.html.

Application Title: IMPROVING EMERGENCY RESPONSE PROVIDERS' REACTION TO ACUTE AGGRESSION IN PATIENTS THROUGH ADAPTED CIT EDUCATION

Application Reference #: 1915

Applicant: Dixon, Bradley

Reason: QI/QA Project

The work as proposed does not require IRB oversight, approval, or exemption. Feel free to proceed with your project. Do not refer to this project or outcomes as "human subjects research" or "Exempt," which has a specific research meaning.

Please submit a new request if there are changes that might affect this determination.

Institutional Review Board for the Protection of Human Subjects
Office of Research Compliance
Montana State University

<https://www.montana.edu/orc/irb>