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Nonpharmacological Interventions as an Adjunct Therapy for the Treatment of Elderly Patients with Postoperative Delirium

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**Nonpharmacological Interventions as an Adjunct Therapy for the Treatment of Elderly
Patients with Postoperative Delirium**

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NURS4500.2: Nursing Research & Senior Thesis

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Table of Contents

Abstract.....	2
Introduction.....	3
Relevance to nursing	4
Literature Review	4
Outcomes and Challenges in Prevention.....	4
Pharmacological Therapy	6
Non-Pharmacological Therapy	7
Summary of Literature Review	10
Proposal for Further Research	10
Theoretical Framework	11
Ethical Considerations.....	12
Research Purpose & Plan	13
Analysis	16
Conclusion	17
References & Bibliography	18
Appendix: Literature Review Table	21

Abstract

Background: Postoperative delirium is an iatrogenic disease that largely affects older surgical patients. Current treatment relies mostly on pharmacological management. However, this poses a problem due to the age-related changes in elders on drug metabolism. Other comorbidities increase chances of onset of postoperative delirium, and the possibility of unresolved cases. This leads to prolonged hospital stays, decreased quality of life, and overall poorer outcomes in these individuals.

Objective: The purpose of this literature review and proposal is to examine the use of non-pharmacological therapy as an adjunct treatment to improve outcomes in elderly patients diagnosed with postoperative delirium. Non-pharmacological interventions observed are focused on stress management and activities of daily living (ADL) training. The literature review summarizes eight studies and are organized based on outcomes, pharmacological, and nonpharmacological treatments.

Method: This paper proposes a controlled, randomized experimental trial that divides participants into a control group, meditation group, and ADL group. It will then compare initial and post-test scores of the initial, three-month, and six-month test scores with an ANOVA test. The tests that are going to be used for this proposal are the Confusion Assessment Method-Severity (CAM-S) (as cited in Seiber et al, 2019) and the Mini Mental Status Exam (MMSE) (as cited in Seiber et al, 2019). Scores will be broken down for individuals as well as groups. Group scores will then be compared to one another. Ethical considerations are concerned with informed consent in confused individuals and travel detriments imposed by this proposal.

Keywords: postoperative delirium, postoperative complications, stress management, exercise, ages 65 and up, non-pharmacological treatments, therapies, and interventions

Introduction

Postoperative delirium (PD) is an acute stage of confusion commonly found in the elderly population that had surgeries using anesthesia. Signs and symptoms of PD are altered levels of consciousness and memory impairment. Preoperative factors that increase incidence of PD are age, prior deficits in cognitive ability, polypharmacy, and dehydration (Sánchez et al, 2019). Complications of PD are longer hospital stays, long term institutionalization, and decreased quality of life associated with mental decline (Abelha, F et al, 2013). Treatment of PD aims to treat and prevent further cognitive decline by using pharmacological methods and frequent reorientation of the patient (Robinson & Eiseman, 2008).

There are numerous non-pharmacological therapies that emphasize stress management, such as exercise, self-care, and mindfulness therapies. The purpose of this literature review and proposal for further study is to use a non-pharmacological method of stress management alongside pharmacological treatments to increase efficacy of therapy and prevent further complications.

For the purpose of this literature review and study, stress management will be defined as meditation and self-care through activities of daily living. Meditation is the practice of minimizing distractions in order to achieve a calmer state of mind. A clinical trial observed the effects of meditation on psychological stress and well-being and found that participants found moderate improvement in their conditions (Goyal et al, 2014). Activities of daily living (ADLs) are activities such as hygiene care, eating, and necessary movements needed to complete the day.

Relevance to nursing

Nurses assess and monitor patients after surgery and postoperative delirium leaves patients in a vulnerable state that threatens their safety and well-being. Improvement of treatment of postoperative delirium can help reduce patient time in the hospital, reduce the chances of being transferred to a skilled nursing facility, and reduce costs of care. It is important given the continued growth of the geriatric population.

Literature Review

The purpose of this literature review is to provide insight on prevention, outcomes, and current therapies for postoperative delirium. The Dominican Iceberg, Google Scholar, and PubMed were used to research primary sources. Keywords for searches include postoperative delirium, postoperative complications, stress management, exercise, ages 65 and up, non-pharmacological treatments, therapies, and interventions.

Articles were chosen based on the type of study, methods used, and relevance to the topic. Using these methods, eight primary sources will be used throughout this section. These eight sources will be split into three subgroups: Outcomes and Challenges in Prevention; Pharmacological therapy; and Non-pharmacological therapy. See the Appendix for a Literature Review Table that provides a summary for each article.

Outcomes and Challenges in Prevention

Postoperative delirium is a disease that occurs as a complication of medical intervention. The literature in this section investigates the effects of postoperative delirium on patient outcomes and difficulties with prevention.

In a six-month follow up, it was found that postoperative delirium is associated with higher mortality rates, dependence on at least one ADL, and decreased function capacity and quality of life (Abelha et al., 2013). Additionally, mortality rates were consistent between in-hospital and within six-months of discharge. Because this is an iatrogenic disease, prevention should be a priority to protect patients from this harm. Prevention methods look to stabilize patients before procedures through adequate hydration, monitoring vital signs, and treating underlying conditions. This type of delirium is thought to be due to anesthesia used during the procedure.

In another study (Sieber et al), researchers used different depths of spinal anesthesia on patients undergoing hip surgery and how it affected the incidence of postoperative delirium and its outcomes over one year. These groups were randomly selected into 2 groups: one group receiving heavy levels of anesthesia, and the other group with lighter levels. There were no significant differences between the groups, and both saw similar accounts of mortality and decreased functional capacity (Sieber, 2019). Sedation is a necessary factor in many invasive surgeries, and there has been agreement that anesthesia does contribute to postoperative delirium.

Most research in postoperative delirium is focused on prevention. These research articles support and provide new information to the field. The first article offers new and specific information about the effects of postoperative delirium other than mortality rates. Not all patients die from this complication but are left with deficits that impair autonomy. The second article offers more research into the topic by highlighting a common procedure done in the elderly population and attempts to find a solution by modifying variables. The complexity of this disease makes it challenging for providers to prevent. This problem is further exacerbated by underlying

comorbidities of elderly patients and require health professionals to rely on treatments alongside prophylactic interventions.

Pharmacological Therapy

Interventions with antipsychotics are the staple therapies in treating confusion disorders. The literature in this section will look into the use of medications in the treatment of postoperative delirium. The standard medication for postoperative delirium is haloperidol, a common antipsychotic used to treat confusion and other psychotic disorders.

A double-blind, randomized control study compared the efficacy of haloperidol, chlorpromazine, and lorazepam in the treatment of HIV-induced delirium (Breitbart et. al, 2005). Haloperidol and chlorpromazine were found to be effective in the treatment of delirium. Lorazepam was the only drug in this study that did not find significant data in the treatment of delirium, and notes that it is associated with side effects that interfere with treatment (Breitbart et. al, 2005). In order to minimize side effects, lower dosages were used. Researchers also gradually decreased dosage as patients improved. While this information is relevant and aligns with current research, one aspect it fails to address is the complications of haloperidol therapy in the elderly. Older patients are at a higher risk of side effects due to age-related metabolic changes (Nijober et al., 2016).

A retrospective study conducted in the Netherlands observed the use of haloperidol in elderly patients who recently underwent surgery (Nijober et al., 2016). It was found that patients who were given haloperidol stayed in the hospital longer. Additionally, those who received haloperidol were more likely to return within the year for another procedure (Nijober et al., 2016). Haloperidol is known to cause cardiac arrhythmias and ineffective management of this

drug may result in uncontrolled delirium. These adverse effects can lead to substantial decline in the patient's quality of life, especially in this vulnerable population.

The first article attests to the efficacy of haloperidol in the treatment of delirium, which aligns with current research. It is a study older than 10 years, but it is important to mention as it provides information on an underrepresented and critically ill population. It provides information on alternative drugs and explores their efficacy in treating delirium. The second article is significant as it investigates ongoing therapies to bolster knowledge and spread awareness of complications that are not given enough attention. Its main focus was to improve patient outcomes and challenge the use of haloperidol in postoperative delirium.

Non-Pharmacological Therapy

There is a severe lack of research in the use of non-pharmacological interventions for the treatment of postoperative delirium. However, there is research with similar interventions for other forms of confusion. The last portion of this literature review will examine non-pharmacological therapies in the treatment of cognitive deficits and decline. It will also explore the use of these therapies alongside pharmacological therapies to improve outcomes in the older population. Research in this area focuses on different types of movement like exercise and yoga in the treatment of patients with cognitive decline.

A German study focused on the day care and nursing home population (Straubmeier et al., 2017). This study used MAKS, a multicomponent therapy that consists of motor, activities of daily living, cognitive, and social exercises. It was found that the clients who regularly participated in MAKS therapy sessions had scored better on the Mini Mental Status Exam (MMSE) and the Erlangen Test of Activities of Daily Living (ETAM) (Straubmeier et al., 2017).

These exercises help patients work with their conditions. The authors acknowledge that these interventions only improve symptoms, and do not expect changes in cognitive function. This project utilizes low demanding activities to manage patient conditions. However, the next study focuses on aerobic activity and its effects on cognitive impairment (Baker et. al, 2010).

This six-month long clinical trial by Baker and colleagues (2010) compared two groups of elderly patients with mild cognitive impairments: one completing high intensity exercise and the other participating in light stretching. Patients were then evaluated using different assessment tests. The results found that women in the exercise group had improved results on multiple tests assessing executive function, while the men only saw improvements on one executive function test (Baker et. al, 2010). While both groups did not see equal improvement, they did share some improvement. This difference may be linked to differences in baselines, such as previous activity level. However, these patients are also restricted by their comorbidities. Those with respiratory and cardiovascular conditions would not be the best candidates for high intensity aerobic training. This does not eliminate the possibility of exercise being used as a supplemental treatment.

In a nurse led study, researchers put participants through an eight-session program that implemented yoga and memory training (McDougall et al., 2015). These patients would complete a yoga class before each memory training, and their test results were compared from the start of the trial to the end. Some patients displayed signs of cognitive improvement, improvement in activities of daily living, and had fewer signs of depression (McDougall et al., 2015). Yoga is a more practical option for elderly patients due to its low demand for physical energy and its reputation in mindfulness. While exercise can be attributed to improved health and healthy aging, not all skills gained through exercise can be used daily.

The last study looks at the effectiveness of activities of daily living (ADL) training and exercise in older nursing home residents with dementia (Henskens et al., 2018). In this double parallel randomized controlled trial, elderly patients were divided into three groups: One group receiving ADL training, one group receiving exercise training, and the last group receiving a combination of the two. The MMSE was used as a way to collect baseline data and evaluate the effectiveness of the training at the end of the trial. Data was collected at the beginning, three-months, and final six-months. Participants who received ADL training had significant increases in executive function and decreased report of depressive symptoms. The exercising group only found improvement in physical function such as grip strength. The combination group mostly found improvements in physical function, specifically improved walking distance (Henskens et al., 2018). ADL therapy is realistic and practical intervention with this population. These patients had some quality of life improvements due to the increased independence received from ADL training.

The four articles used in this section are highly applicable to the purpose of this review of the research literature. The first and last study look at multicomponent therapy in the treatment of individuals with cognitive deficits. While both saw differences in their results, they provided new information to the topic. Additionally, the most significant data from both is that incorporation of ADL training improves total health. The second and third articles focused on exercise only for their interventions. While both were applied to an older population, the second article is limited by the subject's individual tolerance to exercise. Yoga is accessible to more in this population and serves as mind-body therapy. With all of these studies, they were limited by the patient's compliance to each treatment. Unlike pharmacological interventions, it takes much longer to see results in therapies only utilizing exercises or training. However, patients who were

able to complete the entire therapy were more likely to see significant results than those who dropped out.

Summary of Literature Review

All of the findings of these research articles have added to the discussion of treatments for postoperative delirium and cognitive impairment. The strengths of these studies are that they use tools that are valid and reliable. Also, most of them address problems identified in recent research (Abelha, F et al, 2013; Robinson & Eiseman, 2008; Sánchez et al, 2019) and look for alternatives to improve patient outcomes. One negative for addressing the purpose of this thesis that affects some articles is the lack of participants that fit the specific criteria of postoperative delirium. However, as the elder population continues to grow, more people will be at risk for postoperative delirium. Subsequently, more research will be required. These articles could be used as the foundation for future studies and therapies

Proposal for Further Research

There is a lack of data on postoperative delirium. This disease is a result of medical intervention, and while patients may have had their initial problem solved, they are sometimes left with life-long complications. Research surrounding postoperative delirium is focused on prevention, but the disease is still prevalent in the older population. Health declines with age and many conditions call for surgery as a treatment option. Pharmacological interventions for postoperative delirium can be effective, but age continues to be a problem due to metabolic changes interfering with the pharmacokinetics of medications. If left unresolved, these patients are with poorer outcomes and decreased quality of life. The literature review divides the articles into three sections: Outcomes and Challenges in Prevention, Pharmacological Therapy, and

Nonpharmacological Therapy. One article investigated different levels of sedation on the prevention of postoperative delirium, but found no significant data (Seiber et al, 2019). Another analyzes the use of haloperidol after surgery with anesthesia and finds that patients were at a higher chance of readmission to the hospital (Nijober et al., 2016). Patients also were left with poorer rates of mortality and morbidity. The group of articles representing the last section, examined how nonpharmacological interventions such as yoga and activities of daily living (ADL) training improves patient outcomes. This study proposal will differentiate itself by using meditation as a nonpharmacological intervention. It will also use ADL training to add to current research.

Theoretical Framework

Orem's Self-Care Deficit Nursing Theory is one part of her Theory of Nursing and focuses on how nursing is needed for people who are unable to take care of themselves. Orem defines self-care as the "practice of activities that an individual initiates and performs on his or her own behalf to maintain life, health, and well-being" (Orem's self-care deficit nursing theory, as cited by Petiprin, 2020, para. 4). It assumes that "People should be self-reliant, and responsible for their care, and as well as others in their family who need care" and "self-care and dependent behaviors learned within a socio-cultural context" (Orem's self-care deficit nursing theory as cited by Petiprin, 2020, para. 2). Deficits in health interfere with one's ability to do self-care.

Orem's definition of self-care is most relevant to the aims of this study in that it acknowledges the needs of individuals who do not have the ability to take care of themselves, and the ability of nurses and other providers to help teach patients so that they regain some of

their autonomy. This also personalizes care because providers must adjust to the needs of the patient, and this improves both the delivery of therapy and relationships with patients.

Ethical Considerations

Prior to starting this study, Internal Review Board (IRB) approval must be obtained from appropriate institutions. Ethical considerations to be taken into account are the privacy of the individual, potential risks of the study, possible burdens for participants, and informing the participants of the purpose and procedures for the study and obtaining informed consent.

To maintain confidentiality, participants will be assigned randomized numerical values to minimize use of names. This number will serve as a study identifier and follow them throughout the study. No names will be used during any part of the study, debriefing, or during the discussion of the results. Only members of the research team will have access to the data and all study information will be maintained in a password-protected computer.

This study is designed to pose minimal-to-no risk to patient's health and well-being. The goal of this proposal is to observe how nonpharmacological interventions work as adjunct therapies to pharmacological intervention, so this research will not interfere with any pharmacological therapies. Participants in the intervention groups will be monitored by trained research nurses during every session and will provide a weekly check-in for all participants throughout the study.

There may be a burden to the participant may include time commitment or obstacles to transportation. Compensation will be provided to cover costs of travel to location. In addition, locations that are central to participants' homes or living facilities and are easily accessible will be chosen for conducting the study's intervention sessions.

Patients with dementia are vulnerable and may not be able to understand the nature of the research. The potential participants are diagnosed with a disease relating to confusion. This may make it harder to obtain informed consent. If a patient is not able to make an informed decision regarding consent, the study will be explained to the patient's surrogate decision-maker or legal guardian, as the person who is able to provide consent. Potential participants and their surrogate decision-makers will be informed, in a private setting, of the type of study they would be participating in. A detailed, easy-to-follow+- description of the interventions will be provided. In addition, participants and surrogates will be informed that there will be no change in the quality of care they receive if they choose not to participate, and that they will have the opportunity to withdraw at any time during the study with no penalty. Finally, potential participants and their surrogates will be informed that they will be able to have access to the results of the study, if they choose.

Research Purpose & Plan

The overall objective of this proposal is to determine if mediation, as a stress management technique, can be an effective adjunct therapy for improving outcomes in elderly patients with postoperative delirium.

The specific study aim is:

To determine if patients diagnosed with postoperative delirium who engage in sessions of mediation over a six-month period will improve their scores on confusion assessments and mental exams compared to patients who receive ADL training sessions or to those who receive usual care.

Research Design

This study will be a longitudinal, randomized, controlled trial.

Sample

Inclusion criteria are:

- The participant needs to have been diagnosed and discharged from the hospital with a diagnosis of postoperative delirium
- They are age 65 or older
- They have no co-morbidity that would interfere with their participation in the study (such as patients with an end-stage disease, hospice patients, and patients with severe muscle impairment or neurological conditions that prevent a large portion of motor skills).

Potential participants will be checked to determine if they are receiving pharmacological management for their postoperative delirium. Demographics such as age, ethnicity, and other comorbidities will be collected from participants who give informed consent (or who's surrogate decision-maker gives consent).

A convenience sample will be obtained for this study. Patients will be recruited from within the Bay Area (which includes Sonoma County, Napa County, Solano County, Marin County, Contra Costa County, Alameda County, Santa Clara County, San Mateo County, and San Francisco County). Informational brochures that explain the study and contain contact information for the researchers will be given to Discharge Planners at area hospitals along with the request to include the brochure with discharge instructions for patients who meet inclusion criteria. Patients and/or their legal guardians who are interested in participating will be able to

contact the researcher. A time and place will be set up for a meeting to explain the study and provide informed consent.

One issue that could arise (see also the section on Ethical Considerations) is that participants may have a difficulty in communicating distresses that present during the study. Researchers will observe each subject to ensure the well-being of each patient, as well as listening to any legal representatives or caretakers of each patient.

The number of participants needed is at least 100 as there will be three groups, two experimental groups and one control group.

Methods

After obtaining informed consent, two diagnostic tests will be administered, the Confusion Assessment Method- Severity test (CAM-S) (as cited in Seiber et al, 2019) and the Mini Mental Status Exam (MMSE) (as cited in Seiber et al, 2019) and will provide baseline data for the patients and will be repeated for comparison after three months and at the end of the intervention trial. Both tests will measure the severity of confusion, and the use of both tests have potential to aid validity by ensuring a broader range of information is collected. Each participant will be given a randomized number and randomly assigned to one of three groups: a meditation control group, an activities of daily living (ADL) training group, and a control group.

This trial will last six months, ideally to be performed from the beginning of April through the end of September to minimize interference with major holidays. Data collection will be performed at the three months and six months. The control group will be monitored at these times and will receive their usual care, but will not receive any interventions.

The mediation group will first receive an educational session on how to meditate using a simple deep breathing and guided visualization technique. The mediation group will meet three times a week for sessions that will last 45 to 60 minutes (depending upon participants endurance) and consist of an instructor who will facilitate meditation sessions by providing a guided visualization.

The ADL training group will meet three times a week for classes that will last about 45 to 60 minutes and consist of an instructor that will lead interactive classes emphasizing personal hygiene such as oral care and grooming. Both interventional groups, as well as the control group, will also report on the type of the medication they are currently taking for the treatment of their postoperative delirium.

A trained research nurse will be available at all intervention sessions to answer participants' questions that arise and monitor participants for signs or symptoms of distress.

Analysis

This data will then be organized into tables that list the participants' study identifiers, group assignment, and their three sets of test scores.

Descriptive statistics, including mean, median, and range, will be used to examine the demographic data. Descriptive statistics also will be used to determine the mean, median, and standard deviation for scores of each group.

This quantitative study will use a multivariate analyses of variance (MANOVAs) to determine if there is a significant difference in both individual and group scores, between the baseline, three-month, and six month data of each group. Lastly, data will be compared with

each other to determine if there is improvement in patient outcomes between mediation intervention, ADL intervention, and control group, and comparisons will be made between all groups.

Conclusion

The information gathered from the literature review examines the potential of stress management techniques in improving outcomes in elderly patients with postoperative delirium. These nonpharmacological interventions potentially can be implemented earlier in care to improve recovery, as well as in outpatient settings for those who retained some cognitive decline from the disease. The proposal offers a way to monitor patients outside of the hospital and provide holistic care for patients who prefer flexibility in their treatment options. The next steps for this study are expanding the study area to other regions, experimenting with more or fewer sessions for each class, and exploring other forms of stress management to provide more options for patients and their care providers.

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Appendix: Literature Review Table

Authors/Citation	Purpose/Objective of Study	Sample - Population of interest, sample size	Study Design	Study Methods	Major Finding(s)	Strengths	Limitations
Abelha, F.J., Luís, C., Veiga, D. <i>et al.</i> Outcome and quality of life in patients with postoperative delirium during an ICU stay following major surgery. <i>Crit Care</i> 17 , R257 (2013). https://doi.org/10.1186/cc13084	The objective of this study was to evaluate the health-related quality of life outcomes for patients with postoperative delirium (PD) in the surgical ICU (SICU).	The population used for this study were adults admitted to the SICU who experienced postoperative delirium. 562 patients fit these criteria (n = 562).	Prospective cohort studies	The study was conducted over a 10-month period in the SICU. Patients were evaluated using the Diagnostic and Statistic Manual of Mental Disorders criteria for features of delirium. Outcomes were split into two categories: Primary outcomes were mortalities at six month-follow up. Secondary outcomes were hospital mortalities.	Of the 562 patients included in this study, 16% experienced delirium after admission into the SICU. Postoperative delirium was an independent risk factor at 6-month follow up (OR = 2.673) and hospital mortality (OR = 2.188). Additionally, patients with PD became dependent for some ADLs and had decline in physical function, vitality, and social function.	Data was relevant and contributed to current knowledge, specifically in addressing patient outcomes relating to quality of life after onset of disease	No documentation of sedation doses Did not address any comorbidities of these patients that may have contributed to changes/death
Baker, L. D., Frank, L. L., Foster-Schubert, K., Green, P. S., Wilkinson, C. W., McTiernan, A., Plymate, S. R., Fishel, M. A., Watson, G. S., Cholerton, B. A., Duncan, G. E., Mehta, P. D., & Craft, S. (2010). Effects of aerobic exercise on mild cognitive impairment: a controlled trial. <i>Archives of neurology</i> , <i>67</i> (1), 71–79. https://doi.org/10.1001/archneurol.2009.307	The objective of this study is to examine the effects of aerobic exercise on cognition and other biomarkers associated with Alzheimer disease pathology for older adults with mild cognitive impairment and assess the role of sex as a predictor of response.	The population observed consisted of 17 women and 16 men with minor cognitive impairment ranging from ages 55-85 (n=33).	6-month, randomized, controlled, clinical trial	Participants were split into an experimental aerobic exercise group and stretching control group. Aerobic group exercised with a trainer for 45-60 minutes a day 4 times a week for 6 months. Their goal was to exercise at 75-85% of the hearts rates. Stretching group worked to maintain heart rates under 50% of reserve. Baseline, 3-month, and 6-month data was recorded. Outcomes recorded were verbal fluency, task switching, story recall, and list learning.	Sex specific effects observed after 6-month results. Women under the aerobic exercise saw improved performance on executive function (P=0.04). Men experienced increased plasma levels of insulin like growth factors.	Data is relevant and contributed to current research. Tools used were valid and reliable	Small sample size Difficulty to reproduce Tolerance to exercise

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<p>Breitbart, W., Marotta, R., Platt, M. M., Weisman, H., Derevenco, M., Grau, C., Corbera, K., Raymond, S., Lund, S., & Jacobsen, P. (2005). A double-blind trial of haloperidol, chlorpromazine, and lorazepam in the treatment of delirium in hospitalized AIDS patients. <i>FOCUS</i>, 3(2), 333–340. https://doi.org/10.1176/foc.3.2.333</p>	<p>The purpose of this study was to compare the efficacy of haloperidol, chlorpromazine, and lorazepam in the treatment of delirium.</p>	<p>The population observed consisted of 30 patients with AIDS-induced delirium (n=30).</p>	<p>A randomized, double-blind comparison trial.</p>	<p>Participants were divided into 3 groups, with each receiving a different drug. Their progress was recorded using 3 different assessment tools: delirium rating scale, mini-mental state exam, and the extrapyramidal symptom rating scale.</p>	<p>Treatment with haloperidol and chlorpromazine produced significant improvement in patient condition. However, patients on the lorazepam treatment experienced adverse side effect. Scales used to evaluate outcomes found that improved levels below the threshold for delirium.</p>	<p>Tools used were reliable Data adds significant information to current research</p>	<p>Small sample One treatment had to get interrupted patients experience adverse side effect of treatment</p>
<p>Henskens, M., Nauta, I. M., van Eekeren, M., & Scherder, E. (2018). Effects of Physical Activity in Nursing Home Residents with Dementia: A Randomized Controlled Trial. <i>Dementia and geriatric cognitive disorders</i>, 46(1-2), 60–80. https://doi.org/10.1159/000491818</p>	<p>The purpose of this study was to examine whether physical stimulations were effective in reducing cognitive, physical, mood, and behavioral decline in nursing home residents with dementia.</p>	<p>The population for this study consists of 87 nursing home residents with dementia (n=87).</p>	<p>Double parallel randomized controlled trial.</p>	<p>Patients were randomly assigned to three groups that performed different physical activity interventions: ADL training, multicomponent exercise training, and ADL and multicomponent exercise training. Outcomes were measured at baseline, 3-months, and 6-months.</p>	<p>No significant improvements in cognitive functions or behavior for ADL, physical, and mixed ADL/physical combination. Groups participating in the ADL training were able to walk longer distances than those who did not receive ADL training (p=0.02). Those receiving physical training showed significant improvement for grip strength (0.03). There was a significant effect on mood in the ADL training group with positive effect on depressive symptoms among men (p=0.01). There was no significant improvement for physical exercise and mood.</p>	<p>The participants were randomized into groups Interventions can be easily applied in nursing homes. Tools were valid and reliable</p>	<p>There was a small sample size. Intensity of the physical interventions were not reported.</p>

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<p>McDougall, G. J., Jr, Vance, D. E., Wayde, E., Ford, K., & Ross, J. (2015). Memory training plus yoga for older adults. <i>The Journal of neuroscience nursing : journal of the American Association of Neuroscience Nurses</i>, 47(3), 178–188. https://doi.org/10.1097/JNN.0000000000000133</p>	<p>The purpose of this study was to use implement yoga before memory training to improve memory in elderly patients.</p>	<p>The population for this study were elders with impaired memory (n=133).</p>	<p>Quasi-experimental pre-post design</p>	<p>Eight memory training classes that lasted 1.5 hours each were held. Baseline data was obtained, and results were measured during each class. Outcomes were measured using the Rivermead behavioral memory test, direct assessment of functional status, memory self-efficacy, Spielberger state-trait anxiety inventory, and memory compliant questionnaire.</p>	<p>Of the 133 participants, 83 remained for the final results. On the Rivermead behavioral memory test, 13 individuals improved their scores from poor to normal performance, while seven went from impaired to poor performance. In the end, 15 individuals were ranked with normal performance.</p>	<p>Data was useful and supports current knowledge. Tools were valid and reliable</p>	<p>Lack of comparison group due to study design. Participants come from similar demographic, so results cannot be generalized.</p>
<p>Nijboer, H., Lefeber, G., McLulich, A., & van Munster, B. (2016). Haloperidol Use Among Elderly Patients Undergoing Surgery: A Retrospective 1-Year Study in a Hospital Population. <i>Drugs - Real World Outcomes</i>, 3(1), 83–88. https://doi.org/10.1007/s40801-016-0060-y</p>	<p>The aim of this study is to measure the frequency of at which patients over the age of 65 were given haloperidol.</p>	<p>The population under observation were patients who older than 65 and were given haloperidol (n=5946).</p>	<p>Retrospective study</p>	<p>Data was collected using the electronic drug database of a hospital in the Netherlands. The following definitions were used to identify potential participants for the study: Haloperidol starting dosage of 1mg, Minor procedures with patients being admitted for less than 6 days, and major procedures with patients being admitted for longer than 6 days. Lastly, procedures were organized as either acute or elective.</p>	<p>Statistical analysis of the results found that older patients who received haloperidol had significantly longer hospital stays (14 vs. 1 day, p<0.001). Overall haloperidol administration was 5.4% in these patients, and this aligns with delirium rates.</p>	<p>Raises awareness on a topic that affects a vulnerable population First study to examine relationship between procedures, age, and administration of haloperidol Uses statistical analysis (t-test and Mann-Whitney U test) that are valid and reliable</p>	<p>Limited to only haloperidol and not other antipsychotics No prospective data on haloperidol use Did not explore the adverse events caused by the use of haloperidol</p>

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<p>Sieber, F., Neufeld, K. J., Gottschalk, A., Bigelow, G. E., Oh, E. S., Rosenberg, P. B., Mears, S. C., Stewart, K. J., Ouanes, J. P., Jaber, M., Hasenboehler, E. A., & Wang, N. Y. (2019). Depth of sedation as an interventional target to reduce postoperative delirium: mortality and functional outcomes of the Strategy to Reduce the Incidence of Postoperative Delirium in Elderly Patients randomised clinical trial. <i>British journal of anaesthesia</i>, 122(4), 480–489. https://doi.org/10.1016/j.bja.2018.12.021</p>	<p>The objective of this study was to determine if depth of sedation had an effect on the incidence of postoperative delirium.</p>	<p>The population used for this study were patients older than 65 undergoing hip fracture repair with spinal anesthesia (n=200).</p>	<p>Randomized, two-group, parallel, superiority trial</p>	<p>Participants were split into two groups: one receiving heavy sedation and the other receiving light sedation. From there, they were assessed at 1 month and 1 year post surgery. They were measured for both mortality and their function, which included hand strength, walking speed, and timed chair rise. The tools used to measure delirium were the CAM, MMSE, and abbreviated DST.</p>	<p>There were no significant changes in mortality. When coming to the functional assessment, the timed chair rise saw no difference between lighter and heavy sedation, and neither one saw improvement in ambulation after 1 year. This may be attributed to the type of surgery and the function of the affected area</p>	<p>Study design was randomized and double blind Short and long-term follow up with participants Assessments for delirium were rigorous and passed multiple panels with data</p>	<p>No formal sample size requirements Excluded patients who had scores <15 limited the sample.</p>
<p>Straubmeier, M., Behrnt, E. M., Seidl, H., Özbe, D., Luttenberger, K., & Graessel, E. (2017). Non-Pharmacological Treatment in People With Cognitive Impairment. <i>Deutsches Arzteblatt international</i>, 114(48), 815–821. https://doi.org/10.3238/arztebl.2017.0815</p>	<p>The purpose of this study was to observe the effects of multicomponent therapy MAKES (Motor, Activities of Daily Living, Cognitive, Social) on day center adults with cognitive impairment.</p>	<p>The population used for this study were day care adult that were assessed as cognitively impaired according to the Mini-Mental Status Exam (n=452).</p>	<p>Cluster-randomized, controlled, multicenter, prospective study</p>	<p>Patients were split into experimental and control groups. Participants completed group therapy classes that consisted of introductions, sensorimotor activation, cognitive activation, and activation of ADLs. Baseline data was taken and participants who completed the sessions over a 6-month period were then reevaluated using the MMSE.</p>	<p>After 6 months, only 362 participants remained (n=362). This was due to dropping out of the nursing home, study, or illness/death. There were better results for cognitive and ADL abilities in the intervention group than in the control group (p=0.012).</p>	<p>Data contributes to current research. Easy to replicate. Tools were valid and reliable</p>	<p>Participating day cares did not want to complete a 12-month trial.</p>