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# Relationship Between Psychotropic Drugs and Falls in the Geriatric Population

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Relationship Between Psychotropic Drugs and Falls in the Geriatric Population

by

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Abstract

Falls in the geriatric population are extremely common and the risk for falls continues to increase with age. Falls are a leading cause of mortality in the geriatric population, and it is the number one reason for institutionalization in the United States. The purpose of this study was to explore the relationship of the prescribing effects of psychotropic medications such as antidepressants, benzodiazepines, and antipsychotics on falls in the geriatric population who live in a long term care community with a diagnosis of depression, dementia, anxiety, delirium, and Alzheimer's disease. The literature provided mixed conclusions on the effects of psychotropic medications in the geriatric population who live in long term care communities. The study performed was a retrospective chart analysis with 106 participants ranging in age from 65 years to 104 years, who were prescribed an antidepressant, antipsychotic or a benzodiazepine. The data was collected from July 2012 to April 2013. The study showed there were several significant correlations between different variables. There are many variables that contribute to falls in older adults that showed significance in the study. From this study, the nursing profession can gain a greater understanding of psychotropic drugs and how it impacts the geriatric patients they provide care.

*Keywords*: falls in the geriatric population, falls and antipsychotic use, prevention of falls in the elderly, falls in the nursing home setting, falls in long term care, Beers Criteria

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# CHAPTER I

## Introduction

Falls are extremely common in the geriatric population, which is considered to be an adult over the age of 65 years. The likelihood of falling continues to increase as a person ages (Hawkins et al., 2011). Falls are defined by the World Health Organization as "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level (Huang et al., 2012, p.360.) In addition to the risk for falling increasing with age; with each additional medication prescribed for a patient, it will only add another risk factor for falling. Geriatric patients who live in a long term care community are generally residing in a nursing setting due to daily care needs, as well as medical needs with disease and medication management ranking the highest. Geriatric patients need close management in regards to their medications to be able to prevent falls with injuries.

## Purpose and Rationale

The purpose and rationale of this study was to explore the relationship of the prescribing effects of psychotropic drugs such as antidepressants, benzodiazepines, and antipsychotics on falls in the geriatric population who live in long term care communities with a diagnosis of depression, dementia, anxiety, delirium, and Alzheimer's disease.

## Research Question

What is the relationship between psychotropic drugs such as antidepressants, benzodiazepines, antipsychotics and falls in patients with comorbidities?

**Background and Significance**

Falls and injuries are among the leading causes of morbidity and mortality in the geriatric population (Hawkins et al., 2011). In the past 15 to 20 years, falls and associated injuries among the geriatric population have been recognized as a major public health problem (Hill & Wee, 2012). One in three people aged 65 years or older fall each year with around 10% of these falls causing serious injuries and frequently requiring hospitalization (Hill & Wee, 2012), with 30% to 70% of nursing home patients having at least one fall annually (Sterke, Velde, Ziere, Petrovic, & Looman, 2012). The seven most common injuries that required hospitalization after a fall included forearm fractures (26.4%), femoral fractures (22.9%), fractures of the lower leg and ankle (13.8%), open wound of the head (11.4%), shoulder or upper arm fracture (10.9%), lumbar spine or pelvic fracture (7.3%), and intracranial injury (7.3%) (Hill & Wee, 2012). When an elderly person experiences a fall that results in a hip fracture, it generally requires surgery and rehabilitation. Up to one third of patients who fall die within 12 months of the fracture and their functional recovery is limited in up to 50% of survivors (Hill & Wee, 2012). After a fall with an injury, the cumulative mortality rate is higher in men than in women (Panula et al., 2009). In addition to the physical injuries, there is also a loss of confidence, mobility, and the ability to live independently as well. Loss of independence can be a bigger factor than the fracture itself.

Risk factors for falls are categorized into two different categories. They are extrinsic risk factors and intrinsic risk factors (Hill & Wee, 2012). The extrinsic risk factors include uneven or slippery surfaces, poor lighting, loose rugs, and unsafe footwear. Intrinsic risk factors include sensory loss, chronic health conditions or

comorbidities, high-risk medications and polypharmacy, incontinence, balance, gait, functional impairment, as well as previous falls. Most falls occur due to a combination of extrinsic and intrinsic factors.

Psychotropic medications are considered to be intrinsic risk factors and affect the geriatric population more than younger generations. Psychotropic drugs are broadly defined as drugs that cross the blood-brain barrier and directly act on the central nervous system.  They are used to treat insomnia, agitation, and pain.  "Psychotropic medications are commonly prescribed in older people, with over 20% of older people in the community taking one or more of the medications, and up to 80% of older people in residential care settings take at least one psychotropic medication" (Hill & Wee, 2012, p.17). A high proportion of nursing home patients with dementia are prescribed psychotropic medications to treat their behavioral and neuropsychiatric symptoms (Sterke et al., 2012).  Psychotropic drugs can be grouped into the following subcategories:

- Antidepressants

- Drugs used to treat bipolar disorder

- Anxiolytics/ Hypnotics

- Drugs used to treat dementia

- Antipsychotics

- Benzodiazepines.

**Antidepressants**

Antidepressants first indication for use includes treating individuals with moderate to severe depression.  Depression in older adults is much more complicated than in younger people (Coupland et al., 2011).  It manifests itself in much different

ways, while at the same time the geriatric population responds much differently to antidepressants and the doses (Coupland et al., 2011). The two categories of antidepressants that are prescribed the most frequently in the geriatric population are selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) (Coupland et al., 2011). Tricyclic antidepressants have been known for an extended length of time to increase the risk for falls when given in the geriatric population, and more recently, selective serotonin reuptake inhibitors are being recognized as a cause for falls. The prevalence of prescribing antidepressants in long term care settings continues to increase as the patients continue to age and have more comorbidities (Hill & Wee, 2012).

**Antipsychotics**

Antipsychotic medications main indication for treatment is psychotic disorders, but at the same time antipsychotics have many others uses as well, including the treatment of behavioral disturbances in individuals with dementia (Menta, Chen, Johnson, & Aparasu, 2010). If antipsychotics are used in the treatment of behavioral issues with dementia patients, then they have the potential to be given to someone who is already at a high risk for falling. By adding in an antipsychotic to their drug regimen it increases their fall risk (Menta et al., 2010).

Antipsychotic medications are classified into two categories: typical and atypical (Hill & Wee, 2012). Both typical and atypical antipsychotics are associated with an increased risk of falls. The increased fall risk is due to the extrapyramidal effects, sedation, and orthostatic hypotension (Hill & Wee, 2012). Atypical antipsychotics are prescribed to treat depression, dementia, and obsessive-compulsive disorder, but have

only been approved by the United States Food and Drug Administration (US FDA) to

treat schizophrenia and bipolar disorder. Atypical antipsychotics are newer agents that

have fewer extrapyramidal side effects than typical antipsychotics (Menta et al., 2010).

Typical antipsychotics may cause sedation, dizziness, orthostatic hypotension, blurred

vision, decreased central nervous system processing/alertness, and confusion. The most

common atypical antipsychotics used in the geriatric population are Risperidone

(Risperidol), Olanzapine (Zyprexa), and Quetiapine (Seroquel) (Chatterjee, Chen,

Johnson, & Aparasu, 2012).

Long-term use of antipsychotic medications, which is considered to be greater

than 90 days, has been shown to increase the risk of falls or fracture by 81% as compared

with short-term use (Hill & Wee, 2012).  According to the 2012 Beers Criteria,

antipsychotic use in the geriatric population increases the risk of a cerebrovascular

accident and mortality in persons with dementia (The American Geriatrics Society,

2012).  The American Geriatrics Society also recommends in their 2012 Beers Criteria

update that antipsychotics should be avoided in the geriatric population  for behavioral

problems of dementia unless nonpharmacological options have failed and the patient is a

threat to themselves or others (The American Geriatrics Society, 2012). There is a wide

consensus among healthcare professionals that antipsychotics should be used sparingly in

the geriatric population, and should be considered as a last resort when all other

interventions have failed.

**Benzodiazepines**

Benzodiazepines continue to be associated with falls (Bulat, Castle, Rutledge, &

Quigley 2008).  With the use of benzodiazepines, older adults have increased sensitivity

and slower metabolism of long-acting agents. They increase the risk of cognitive impairment, delirium, falls, fractures, and motor vehicle accidents (The American Geriatrics Society, 2012). In the geriatric population, benzodiazepines should not be used for the treatment of insomnia, agitation, or delirium according the 2012 Beers Criteria. Within the first two weeks of initiation of a benzodiazepine, there is a remarkable increase in the risk for falls and injuries (Kamble, Sherer, & Aparasu, 2008). A patient's fall risk should be monitored closely by their primary care physician when new medications are added to their regimen, especially benzodiazepines.

**Polypharmacy**

Polypharmacy is defined as the use of four or more medications (Haung et al., 2012, p.361). Polypharmacy is extremely prevalent in the geriatric population due to the co-existence of multiple diseases (Hill & Wee, 2012). An elderly patient who has multiple physicians for multiple illnesses or conditions is at an increased risk of polypharmacy, due to multiple prescribers. Pharmacokinetic and pharmacodynamic properties of drugs change as people age and may result in a different response to drug therapy in the geriatric patient (Haung et al., 2012). The distribution and absorption of the medication vary drastically as people age, but with appropriate prescribing adverse reactions can be avoided. Bulat et al. (2008) stated:

> Patients who have fallen should have their medications reviewed and altered or stopped, as appropriate, in light of their risk for future fall. Particular attention to medication reduction should be given to older persons who are taking four or more medications and those taking psychotropic medications.

There are associations between psychotropic medications and falls; these medications should be consistently reviewed for appropriate use by the prescriber and also a primary care physician.  Reviewing, modifying, and reducing medications is part of a multifactoral approach to reduce falls in all settings, but in particularly falls in long term care communities where the administration of  psychotropic drugs are at the highest.

Falls are inevitable in a long term care setting due to the fact that nursing facilities admit people who are at the highest risk for falling (Hill & Wee, 2012).  By working to reduce the number of medications that increase the risk for falls, healthcare providers may begin to decrease the risk for falls in the geriatric population. By using nonpharmacological measures prior to the prescribing of psychotropic drugs such as antidepressants, benzodiazepines, and antipsychotics, the quality of life can be improved for many patients with depression, dementia, and behavioral disturbances due to these diseases.  Comorbidities, disease processes, and certain medications cannot be eliminated or removed from the situation but, with careful prescribing and reviewing of medications, falls can be reduced.

## Theoretical Framework

The guiding framework for this study is the conceptual framework of Albert Bandura's Social Cognitive Theory.  Social cognitive theory provides a framework for understanding, predicting, and changing human behavior.  This theory provided an advanced view of human functioning that accords a central role to cognitive, vicarious, self-regulatory, and self-reflecting (Bandura, 2004).  The foundation of Bandura's concept of reciprocal determinism, which is the view that personal factors in the form of cognition, affect, and biological events, behavior, and environmental influences create

interactions that result in a triadic reciprocality.  Bandura's social cognitive theory is

rooted in a view of human agency in which individuals are agents proactively engaged in

their own development and can make things happen by their actions (Bandura, 2004).

Environments and social systems influence human behavior through psychosocial

mechanisms of the self-system.  In this particular study the environment included the

variables of the unit the patient lives on and the medications in which they are prescribed.

The behavior being studied was the number of falls that one patient has during the time

period of the study. The personal factors involved in the study included age, gender and

diagnoses. In Figure 1, a representation of the social cognitive theory as it applies to the

study is depicted.
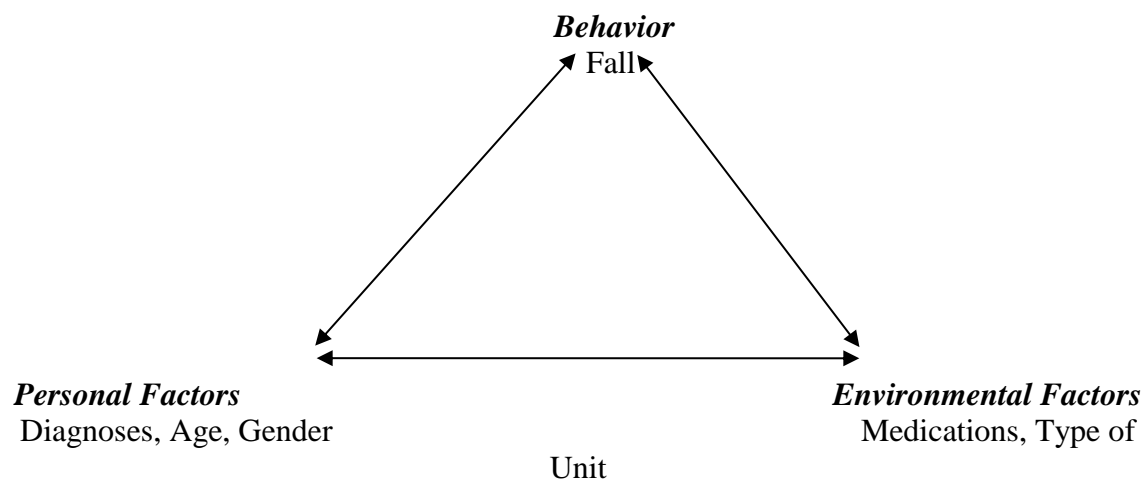


*Figure 1.* Social Cognitive Theory

The social cognitive theory explains how people acquire and maintain certain

behavioral patterns, while also providing the basis for intervention strategies (Bandura,

2004).  This theory displayed a multifaceted casual structure in which self-efficacy

beliefs operate together with goals, outcome expectations, and perceived environmental

impediments and facilitators in the regulation of human motivation, behavior, and well-being. Through the Conceptual-Theoretical-Empirical Model Representation of Research, the theory in the research study can be seen as the behavior, personal factors, and environmental factors are studied through a retrospective chart analysis. To be able to view the complete diagram, refer to Figure 2.

| Behavior | → | Fall | → | Retrospetive Chart Analysis |
| --- | --- | --- | --- | --- |
| Personal Factors | → | Diagnoses Age Gender | → | Retrospective Chart Analysis |
| Environmental Factors | → | Medications Type of Unit | → | Retrospective Chart Analysis |
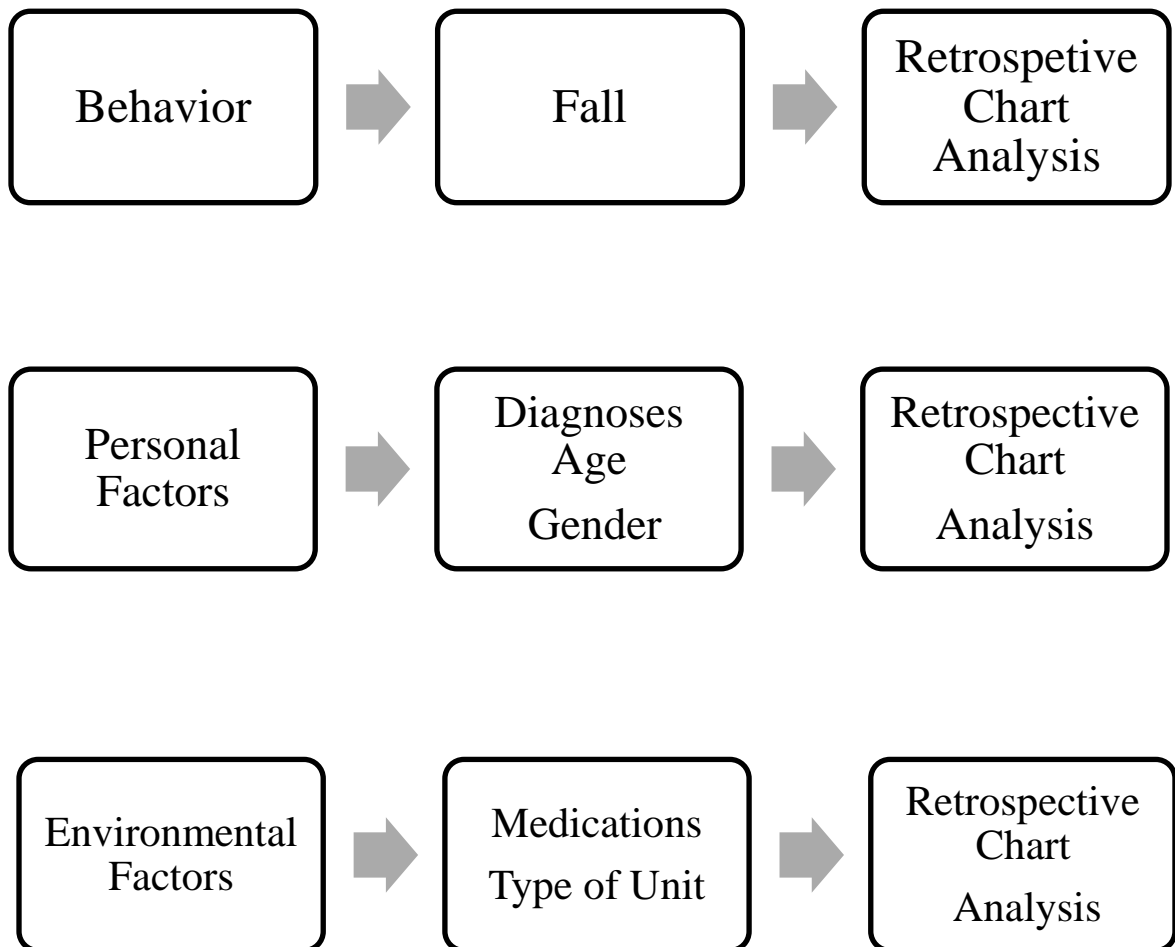
*Figure 2.* Conceptual-Theoretical-Empirical Model Representation of Research
Albert Bandura's Social Cognitive Theory

## Summary

Falls in the long term care setting are an area of great need.  Each patient who falls only increases their risk for further falls and injuries.  Prevention is the key factor to keep all patients and staff injury free. Falls are inevitable and will continue to occur, but with proper prescribing of medications and disease management and other interventions, falls can be reduced in a nursing setting.

**CHAPTER II**

**Literature Review**

A limited review of research literature is included.  Database searches including Cumulative Index to Nursing and Allied Health (CINAHL), Google Scholar, and Medline.  Scholarly peer-reviewed journals were used in the literature review. Key word searches included the following:  falls in the geriatric population, falls and antipsychotic use, falls and psychotropic drugs, falls and antidepressant use, falls and benzodiazepine use, prevention of falls in the elderly, falls in the nursing home setting, falls in long term care, and Beers Criteria.  The purpose of this study was to explore the relationship between certain psychotropic medications and falls in the geriatric population.

Falls are the leading cause of mortality in the geriatric population, and it is the number one reason for institutionalization in the United States (Hill & Wee, 2012). There are many causes to falls, while the leading cause is medications (Hill & Wee, 2012).  Medications are a preventable cause of falls if reviewed and prescribed by healthcare professionals appropriately (Hill & Wee, 2012).  There is mixed research in regards to the effects of prescribing psychotropic medications in the elderly and also in prescribing more than one psychotropic drug.  There is little known about the prescribing effects on the elderly and how it affects their fall risk.   Prescribing medications to geriatric patients should be done with careful consideration to their medical history as well as their comorbidities.

**The American Geriatrics Society: Beers Criteria**

The American Geriatric Society was charged in 2012 with updating the Beers Criteria in conjunction with an expert panel.  The specific aim was to update the previous

Beers Criteria using a comprehensive, systematic review, and grading of the evidence on

drug-related problems and adverse drug reactions in older adults (The American

Geriatrics Society, 2012). The strategies to achieve this aim are to:

- Incorporate new evidence on currently listed potentially inappropriate

  medications and evidence from new medications or conditions not addressed in

  the previous 2003 update.

- Grade the strength and quality of each potentially inappropriate medication

  statement based on level of evidence and strength of recommended grading.

- Convene an interdisciplinary panel of 11 experts in geriatric care and

  pharmacotherapy who will apply a modified Delphi method to the systematic

  review and grading to reach a consensus on the updated 2012 American Geriatrics

  Society Beers Criteria.

- Incorporate needed expectations into the criteria as deemed clinically appropriate

  by the panel.  These evidence-based exceptions will be designed to make the

  criteria more individualized to clinical care and more relevant across settings of

  care. (The American Geriatrics Society, 2012, p.2)

The intent of the 2012 American Geriatrics Society Beers Criteria is for all

ambulatory and institutional settings of care for populations 65 years of age and older in

the United States (The American Geriatrics Society, 2012).  The goal is to reduce the

exposure to potentially inappropriate medications which will improve the care of older

adults.  To complete the update of the Beers Criteria, the American Geriatrics Society has

developed a framework that has been developed to provide the best clinical practice

guidelines.  There was an 11-member interdisciplinary expert panel with relevant clinical

expertise and experience.  They also had a great understanding of how the criteria have

been previously used and the current expectations for the future guidelines.  The literature

review looked at literature from December 1, 2001 to March 30, 2011.  The drugs of

interest that were added include antipsychotics first (conventional) and second (atypical)

generation, benzodiazepines (short, intermediate and long acting), selective serotonin

reuptake inhibitors (SSRIs), and tricyclic antidepressants (TCAs).  To review a detailed

list of the medications by classes refer to Tables 1, 2 and 3.

Table 1

*Types of Antipsychotics*

| Types | Names of Medications |
|---|---|
| Typical Antipsychotics | |
| | Chlorpromazine (Thorazine) |
| | Fluphenazine (Prolixin) |
| | Haloperidol (Haldol) |
| | Loxapine (Loxapine) |
| | Molindone (Moban) |
| | Pimozide (Orap) |
| | Promazine (Sparine) |
| | Thioridazine (Thioridazine) |
| | Thiothizene (Navane) |
| | Trifluoperazine (Stelazine) |
| | Triflupromazine (Vesprin) |
| | Trilafon (Perphenazine) |
| Atypical Antipsychotics | |
| | Aripoprazole (Abilify) |
| | Asenapine (Saphris) |
| | Clozapine (Clozaril) |
| | Iloperidone (Fanapt) |
| | Lurasidone (Latuda) |
| | Olanzapine (Zyprexa) |
| | Paliperidone (Invega) |
| | Quetiapine (Seroquel) |
| | Risperidone (Risperidol) |
| | Ziprasidone (Geodon) |

Table 2

*Types of Benzodiazepines*

| Types | Names of Medications |
|---|---|
| Short and Intermediate Acting Benzodiazepines | |
| | Alaprazolam (Xanax) |
| | Estazolam (ProSom) |
| | Lorazepam (Ativan) |
| | Oxazepam (Serax) |
| | Temazepam (Restoril) |
| | Triazolam (Halicon) |
| Long Acting Benzodiazepines | |
| | Clorazepate (Tranxene) |
| | Chlordiazepoxide (Librium) |
| | Chlordiazepoxide-amitriptyline (Limbitrol) |
| | Clidinium-chlordiazepoxide (Lirbrax) |
| | Clonazepam (Klonopin) |
| | Diazepam (Valium) |
| | Flurazepam (Dalmane) |
| | Quazepam (Doral) |

Table 3

*Antidepressants*

| Type | Name of Medications |
|---|---|
| Antidepressants | |
| | Amitriptyline (Elavil) |
| | Amoxapine (Asendin) |
| | Citalopram (Celexa) |
| | Clomipramine (Anafranil) |
| | Desipramine (Norpramin) |
| | Doxepin (Sinequan) |
| | Escitalopram (Lexapro) |
| | Imipramine (Tofranil) |
| | Mirtazapine (Remeron) |
| | Nortriptyline (Pamelor) |
| | Paroxetine (Paxil) |
| | Protriptyline (Vivactil) |
| | Trimipramine (Surmontil) |

The American Geriatrics Society also included a list of drugs that may exacerbate the disease or symptoms list as well.  If a person has a history of falls or fractures, it is strongly recommended for them to not be prescribed anticonvulsants, antipsychotics, benzodiazepines, nonbenzodiazepine hypnotics, selective serotonin reuptake inhibitors or tricyclic antidepressants.  In people with dementia and cognitive impairment, it is strongly recommended they are not prescribed anticholinergics, benzodiazepines, $H_2$-receptor antagonists, Zolpidem, and antipsychotics no matter if they are chronic or as needed (American Geriatric Society, 2012, p.9).  The 2012 American Geriatrics Society Beers Criteria is an imperative piece of information that is used by healthcare providers, educators, and policy-makers, and also as a quality measure.  The panel came to these particular recommendations by determining best-practice guidelines.  The major limitation of this study is due to the fact that older adults take the largest percentage of medications, but are in the least amount of drug trials.  Due to the fact they are not in many trials, it does not allow researchers to obtain the proper data in regards to indications for medication and adverse reactions. This study did not address potentially inappropriate medications that are not unique to aging, and the search strategies may have missed some studies that were not written in English and other studies that are unpublished.  This study had strengths as well.  The strengths included the use of evidence-based practice and the development of a partnership to regularly update criteria. This study had an enormous benefit to the geriatric population because physicians and other prescribers will have a greater insight to the risks and benefits of medications that are regularly prescribed. As the American Geriatrics Society Beers Criteria outlined the imperative information to reduce adverse reactions from medications, Bulat et al. (2008)

found medication management should be the only component of the comprehensive plan to reduce falls and reduce fall-related injuries in the geriatric population. Through medication management and the removal of unnecessary medications, Velde, Stricker, Pols, and Cammen (2006) found by removing the fall-risk-increasing drugs it was the single most effective intervention in preventing falls in the geriatric population. The reduction of fall risk was the greatest with the removal of cardiovascular and psychotropic medications. The updated Beers Criteria by the American Geriatrics Society also played an important role in the study completed by Smith et al. (2013) which found four important factors:

1. Nearly one third of nursing home residents are prescribed one or more antipsychotic medications, a rate that is higher than before nursing home reform legislation was passed.

2. The important role of using nonpharmacological interventions to treat behavioral symptoms in dementia is underscored in the recent Centers for Medicare & Medicaid Services' Partnership to Improve Dementia Care.

3. Step-wise behavioral problem-solving methods include assessing one problem at a time, treating contributing factors, adjusting daily care routines and environmental factors, and tailoring interventions to the person with dementia.

4. Widely different rates of antipsychotic agent use are not explained by diagnoses, behavior severity, or case-mix, suggesting the "prescribing culture" of the nursing facility influences decisions.

By taking these four factors into consideration with the current 2012 Beers Criteria established by the American Geriatrics Society, it allowed for an improved quality of life for patients residing in long term care communities. Prevention of falls is extremely important to improve the patient's quality of life. Agashivala and Wu (2009) concluded that access to appropriate psychoactive drugs is imperative to the wellbeing of many patients who reside in a long term care setting. With this in mind, patients with risk factors should be identified and monitored closely. Many patients must have psychoactive medications to be able to have an improved quality of life and through proper monitoring a therapeutic balance can be achieved.

An observational cohort study by Sterke et al. (2008) analyzed daily drug use and daily doses in a population of nursing home patients with dementia. The data collected from the medical records and nursing home charts included age, gender, and comorbid conditions that are considered potentially causative of falls. The staff was trained to complete the proper forms immediately after the fall occurred. Of the 443 people who reside in the nursing home, only 248 were included in the study. The mean age of the participants was 82 years of age. There were 648 falls during this period of time. There was a significant dose-response relationship found in the use of antipsychotics, anxiolytics, hypnotics, and sedatives, as well as antidepressants. The study found that there was a noticeable increased risk of fall at low doses and there was even more of a fall risk when there was an increased dose of antipsychotics, anxiolytics, hypnotics or sedatives, and antidepressants, and with the combined use of the drugs. Sterke et al. (2012) stated the following:

We found that psychotropics already increased fall risk at a low defined daily dose. The defined daily dose is a statistical measure of drug consumption and is used to standardize the comparative usage of various drugs between themselves or between different health care environments. A prolonged half-life of drugs metabolized by oxidation has been reported in the older age group. (p.591)

Psychotropic drugs metabolized by oxidation should be prescribed with extreme caution in the geriatric population because of the higher plasma concentrations for a given drug dosage (Sterke et al., 2012). The higher plasma concentrations increased the amount of the drug in the system at one time and with prolonged use the risk for falls continuously increases (Sterke et al., 2012). The strength of this study was in relation to the large and detailed data set; due to this they were able to identify the dose-relationship between psychotropic drugs and fall risk. One possible limitation to the study was the behavioral and neuropsychiatric symptoms may have led to an increased risk of falls and resulted in a higher drug dosage. Another limitation is the fact that the study was only completed at one institution instead of a variety. This study is one of the first studies that was completed in dose-response relationship between psychotropic drugs and fall risk in a nursing home setting with patients with dementia. This study indicated higher fall risk due to psychotropic drug use in nursing homes patients with dementia. As with the dosing of psychotropic medications, a study was completed by Echt, Samelson, Hannan, Dufour, and Berry (2013) to examine if there was a correlation between psychotropic drug initiation or increased dosages and falls. Researchers found the risk of falls in the seven days following a psychotropic drug change was similar for antidepressants,

antipsychotics, and benzodiazepines. Researchers also found nursing home residents to be at an increased risk of falling in the days immediately following a psychotropic drug change. Both of these studies showed support towards implementing non-pharmacological interventions prior to initiating a psychotropic drug.

## Antipsychotics

A propensity score-adjusted retrospective cohort study completed by Chatterjee et al. (2011) examined the association between atypical antipsychotic use and risk of falls or fractures. The participants in the study were 50 years or older in age, had initiated a prescription of Risperidone (Risperidol), Olanzapine (Zyprexa) or Quetiapine (Seroquel) from July 1, 2000 to June 30, 2008, and were continuously eligible six months before and at least six months after the index prescription. Only new users of these drugs were included in this particular study to be able to prevent selection bias among prevalent users from early symptom emergence, drug intolerance, and treatment failures. In this study there were 12,145 new users of atypical agents in the study population. There were a total of 417 falls or fractures with at least one hospitalization or emergency room visit after the use of an antipsychotic agent. The study found there were no statistically significant differences with the use of Risperidone (Risperidol), Olanzapine (Zyprexa), or Quetiapine (Seroquel) in regards to falls or fractures. The strengths among the study included its design and analytical approach. The limitations included how the facts were interpreted during the study, because the dispensing data was collected using pharmacy claims, and there is no way to be certain whether the patients actually used the medication. This study indicated future research in regards to overall safety profiles of people taking antipsychotic agents within this particular population. A research study

completed by Barton Flencham (2005) of ambulatory nursing home patients taking Risperidone (Risperidol) and Olanzapine (Zyprexa) found the percentage of patients who took Olanzapine (Zyprexa) were twice as likely to have one more falls than the patients who took Risperidone (Risperidol). The study also found that the patients taking Olanzapine (Zyprexa) has a greater number of adverse events than the patients taking Risperidone (Risperidol).

A study completed by Kamble et al. (2008) found that one in four elderly nursing home patients in the United States were prescribed an antipsychotic agent. Olanzapine (Zyprexa), Risperidone (Risperidol), or Quetiapine (Seroquel) were found to be the most frequently prescribed atypical agents. These atypical agents were also used for off-label uses such as dementia, anxiety, depression, and parkinsonism more often than their approved uses (Kamble et al., 2008). The major recommendation from this particular study was a need to monitor antipsychotic drug use by the elderly in nursing homes within the United States.

In examining typical and atypical antipsychotics, Hien et al. (2005) found atypical antipsychotic medications were not associated with fewer falls than the older, typical antipsychotics through studying geriatric patients residing in aged care facilities. By looking at short- and long-term risks to benefit profiles, it may allow for further elaboration to the use of antipsychotic agents.

In a study by Mehta et al. (2010), a retrospective population-based cohort designed matched on propensity scores involving older adults using atypical and typical antipsychotic agents in the Information Systems LifeLink Health Plan Claims Database. Medical claims from 94 different managed care organizations in the United States that

included 60 million unique patients were used to collect data. A total of 39,587 were new

users of antipsychotics agents between July 2000 and December 2007. To break down

the drug usage, 26,758 used typical antipsychotics and 12,148 used atypical

antipsychotics. The study sample included all older adults aged 50 years or older who

were taking antipsychotic medication. The objective of the study was to examine the risk

of falls and fractures associated with atypical and typical antipsychotic use in older adults

in the United States. The primary outcome measure was the occurrence of hospitalization

or emergency room visit due to a fall or femur fracture within one year of the index date.

The strength of the observational study was in its ability to estimate the effects in a real

world setting. The major strength of this study was the fact that the control of potential

cofounders in the propensity score-matched cohorts.

This particular study found that long-term use of psychotropic medications in the

geriatric population lead to increased falls. The limitation was the fact that the study used

computer recorded information to capture its data. The information was captured in the

computer at the time of dispensing the medication, and not the actual usage of the

medication. The study design and analytical approach were also strengths of the study.

Researchers concluded that the use of atypical antipsychotic agents were not associated

with an increased risk of falls or fractures when compared to the use of the typical

antipsychotics in the geriatric population. The longer the patient was on the antipsychotic

medication, the higher the risk for falls.

In a study performed by Olazaran, Valle, Serra, Cano, and Muniz (2013) came to

the conclusion when psychotropic drugs are highly prescribed there is a much greater risk

associated with falls. The researchers also found the most unsafe profile were for long

acting benzodiazepines, neuroleptics, and psychotropics drugs that were used in combination with each other.

## Benzodiazepines

In a study by Shuto et al. (2009), researchers evaluated the association between medication use and falls.  The study also evaluated the data to identify high risk medications that may have acted as the onset of falls in an acute care setting.  There were a total of 349 patients who fell between March 2003 and August 2005. Data was collected from incident reports and medical records.  The data that was collected included gender, age, weight, height, admission date, time, location of fall, circumstance of fall, severity of injury, comorbidities, medication history, clinical laboratory test, and fall history.  The initial use of antihypertensive, antiparkinsonian, anti-anxiety, and hypnotic agents were associated with an increase in fall risk.  Researchers concluded that healthcare professionals should be more aware of the potential for an increased risk of falls prior to prescribing these medications. Shuto et al. (2009) stated:

It has been reported that the risk of falls was significantly high only among patients exposed to high doses of benzodiazepines, suggesting that dosage rather than half-life is more important in the evaluation of the association between the use of benzodiazepines and falls (p.540).

The major limitation to this study was the information regarding medication use was obtained from prescription data, not actual usage of medication.  The compliance of medication usage was unable to be determined.  The researchers who performed the study

came to the conclusion that there was increased risk of falls when using antihypertensive agents, antiparkinsonian agents, anti-anxiety agents, and hypnotic agents upon initiation of medication. However, there was a higher risk of falls when benzodiazepines were prescribed at a higher dose. Landi et al. (2005) concluded there was no evidence showing there was a decreased number of falls if a short-acting benzodiazepine was prescribed rather than long-acting benzodiazepines. In looking further into benzodiazepine use, Fonad, Robins Wahlin, Winbald, Emani, and Sandmark (2008) found with a higher intake of medications the higher the risk of falls with fractures. It is inevitable to prevent all falls, but by decreasing the amount of antidepressants and sleeping agents, especially benzodiazepines, there was a reduction in the number of falls with fractures.

## Antidepressants

Coupland et al. (2011) performed a cohort study of people age 65 years and older diagnosed with depression. The goal of this study was to identify the association between antidepressant treatment and the risk of several potential adverse outcomes in older people by class of antidepressant, duration of use, and dose. The adverse reactions that were noted during the study included: mortality, attempted suicide/ harm to self, myocardial infarction, stroke, falls, fractures, upper gastrointestinal bleeding, seizures, automobile accidents, and hyponatremia. The study also concluded the fall risk was the highest with selective serotonin reuptake inhibitors and tricyclic antidepressants. However there were higher incidences of falls with selective serotonin reuptake inhibitors. There was also notable risk of fractures with selective serotonin reuptake inhibitors and tricyclic antidepressants. The main limitation to this study was bias, due to

the fact this was an observational study. Researchers concluded there were more adverse outcomes with selective serotonin reuptake inhibitors than in tricyclic antidepressants, and would recommend tricyclic antidepressants to be the drug of choice in geriatrics in regards to treating depression. On the other hand, a study completed by Gribbin, Hubbard, Gladman, Smith, and Lewis (2011), found treating depression in older adults with an serotonin-norepinephrine reuptake inhibitor may be associated with an increased risk of falls. Researchers concluded the fall risk to be very comparable between selective serotonin reuptake inhibitors and tricyclic antidepressants. However researchers did not suggest which antidepressant should be used to treat depression in the geriatric population.

Furthermore in a study completed by Kerse et al. (2008), found a strong association between falls and antidepressants, in particularly selective serotonin reuptake inhibitors, in patients in long term care communities with symptoms of depression. The researchers implicated strategies to prevent falls should be put into place on a routine basis for management of geriatric patients with depression. Nonpharmacological measures should be put into place prior to the initiation of a medication regimen especially with the geriatric population.

## Summary

In regards to the use of psychotropic drugs in particularly antidepressants, typical and atypical antipsychotics and benzodiazepines, there are mixed results as to if there is an increased risk of falls amongst the geriatric population who live in long term care communities. However, there is a particularly higher risk of falls in patients who are prescribed higher dosages of benzodiazepines. Further research needs to be performed to

gain a greater understanding on the risks for falls.  There should be careful consideration

for geriatric patients when prescribing antidepressants, typical and atypical

antipsychotics, and benzodiazepines.

**CHAPTER III**

**Methodology**

Falls in the geriatric population cause the most injuries and may also cause death (Chatterjee et al., 2011). There is mixed research in regards to the effects of prescribing psychotropic medications in the elderly and also in prescribing more than one psychotropic drug (Olazaran et al., 2013). There is little known about the prescribing effects on the elderly and how it affects their fall risk. In order to explore if there is a relationship between psychotropic drugs such as antidepressants, benzodiazepines, and antipsychotics and falls in a long term care community, more research is needed.

**Implementation**

In order to explore the relationship between psychotropic drugs and falls in a long term care community, a retrospective study was completed. This study was completed to investigate the relationships between antidepressants, benzodiazepines, and antipsychotics and falls. Other variables that were included in the study are: age, sex, comorbidities, type of unit, and previous fall history. The purpose of this study was to determine the nature of the relationship. The research determined the type (positive or negative) and the degree of the relationship (Burns & Grove, 2009). The strength varies from -1 (perfect negative correlation) to +1 (perfect positive correlation), with 0 stating there is no relationship present between the variables (Burns & Grove, 2009). Retrospective data was collected using the incident and investigation forms that the facility currently uses after each fall occurs (Appendix A and B).

**Setting**

The study was conducted in a large continue care retirement community in the southeastern United States who serves the geriatric population through all continuums of care including independent living, assisted living, memory care, and skilled nursing.

**Sample**

The target population for the sample in this study were residents who are between the ages of 62 years and 105 years, were prescribed a psychotropic drug, residents reside in a long term care community, and may or may not have had a fall. The sampling consisted of a convenience sampling.

**Design**

A correlational study was indicated to be able to examine relationships among variables. The central tendencies and frequencies were identified to determine if a relationship existed between the variables. The incident reports and investigation sheets were completed by nurses to obtain the data, which includes many different variables. The variables included in the study were age, gender, diagnoses, medications, and if the patient experienced a fall during the study period. All the information regarding the variables was pulled from the incident reports, investigations sheets, and patient's charts.

**Protection of Human Rights**

Permission to complete this study was obtained from the Institutional Review Board (IRB) of Gardner-Webb University. Permission to use the incident report and the investigation form were obtained from the long term care community (Appendix C). Due to the fact the study is retrospective there are no risks to the patient's involved. Patients' and nurses' confidentiality was maintained throughout the study. Confidentiality was

maintained by not collecting patient names, the nurse's names, the units in which they live or work upon, or any other identifying factors.  All resident rights and confidentiality measures were taken into consideration throughout the entire study.

## Instruments

The instruments used to collect the data are documents used currently by the organization (Appendix A & B). Both documents are approved by the state board that licensed the long term care community. Both of the documents have been found beneficial in identifying trends in the facility for falls and being able to improve the fall rates.

## Data Collection

After receiving permission for the study from the university IRB, the incident reports and investigation forms were collected from the facility from July 2012 to April 2013.  A combined list of patients who had prescribed antipsychotics during the time period of the study was received from the contracting pharmacy.  The data was recorded by either the registered nurse or the licensed practical nurse, who was providing care to the patient during the time of the fall.  The primary investigator collected the data from these reports and the patient's charts.

## Data Analysis

The data was collected from the incident reports, investigation sheets, and patient charts. The variables were entered into a computer for analysis utilizing the Statistical Package for the Social Sciences (SPSS, Chicago, IL).  Frequency statistics and measures of central tendency were used to describe the sample.  Correlations between variables of

medications, number of falls, age, gender, and diagnoses were determined by using the

Pearson's Correlation with the significance of 0.05 level.

## Summary

Falls in long term care facilities are inevitable, but by knowing their causes

healthcare professionals can begin to prevent as many falls from occurring. Due to the

vast array of levels of care within this long term care community, a wide variety of

knowledge is available.  By looking at different variables with many different factors

there will be many conclusions to draw upon. Through the detailed incident reports and

investigation sheets, the investigator was able to obtain complete data to perform central

tendency and frequency testing.  From these tests the significance of the variables was

able to be determined.  By being able to look at the different variables, the results may

indicate new methods to be able to improve the lives of the geriatric population who

reside in long term care facilities.

# CHAPTER IV

## Results

The purpose of this study was to explore the relationship of the prescribing effects of psychotropic drugs such as antidepressants, benzodiazepines, and antipsychotics on falls in the geriatric population who live in long term care communities with a diagnosis of depression, dementia, anxiety, delirium, and Alzheimer's disease. The data was collected in a large long term care community in the southeastern United States. The results from this study may have the capability of greatly impacting the lives of geriatric patients who reside in a long term care facility.

## Sample Characteristics

Descriptive statistics were used to describe the demographic data of the study participants. Frequency statistics and measures of central tendency were used to describe the sample. Correlations between variables of medications, number of falls, age, gender, and diagnoses were determined by using the Pearson's Correlation with the significance of 0.05 level. Of the 196 patients, 106 patients met the criteria for the study. The criteria for the study included: age, gender, prescribed psychotropic medications, and potentially a fall. The youngest patient in the study was 65 and the oldest was 104. The mean age was 87.20 with a standard deviation of 7.01. The minimum number of falls was 0 and the maximum number of falls was 23. The mean number of falls was 2.95 with a standard deviation of 4.09. The sample is described in Table 4. There were 20 males in the study which was 18.9%. However, there were 86 (81.1%) females in the study as seen in Table 5.

Table 4

*Descriptive Statistics of Patients*

|  | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| Age | 65 | 104 | 87.20 | 7.01 |
| Number of Falls | 0 | 23 | 2.95 | 4.09 |

Table 5

*Gender Statistics*

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 20 | 18.9% |
| Female | 86 | 81.1% |

The patients live on several different units in the long term care facility depending upon their needs. Within the study, 41 (38.7%) resided in assisted living, 20 (18.9%) in memory care, and 45 (42.5%) resided in skilled nursing, as shown in Table 6. In reviewing the medical records for the patient's in the study, they had many different diagnoses with some being more prevalent than others. Within the sample, the patient's diagnosis was recorded. Table 7 indicates the percentage of sample with specific diagnoses.

Table 6

*Locations of Patients*

|  | N | % |
|---|---|---|
| Assisted Living | 41 | 38.7% |
| Memory Care | 20 | 18.9% |
| Skilled Nursing | 45 | 42.5% |

Table 7

*Patient Diagnoses*

|                     | N  | %     |
|---------------------|----|-------|
| Depression          | 59 | 55.7% |
| Dementia            | 61 | 57.5% |
| Anxiety             | 30 | 28.3% |
| Alzheimer's Disease | 16 | 15.1% |
| Delirium            | 1  | 0.9%  |

Through the study, patient's medications were reviewed. The findings included: typical antipsychotics 101 (95.3%) participants were not taking any, while five (4.7%) participants were taking one. There were no patients who took more than one typical antipsychotic. In the study 88 (83%) patients were not taking any atypical antipsychotics. In reviewing benzodiazepines, there were 51 (48.1%) patients not taking any short or intermediate acting benzodiazepines. Twenty-four participants were not taking any antidepressants. All medication data is reported in Table 8.

Table 8

*Types of Medications*

|  | N | % |
|---|---|---|
| Typical Antipsychotics | | |
| 0 | 101 | 95.3% |
| 1 | 5 | 4.7% |
| Atypical Antipsychotics | | |
| 0 | 88 | 83% |
| 1 | 17 | 16% |
| 2 | 1 | 0.9% |
| Short and Intermediate Acting Benzodiazepines | | |
| 0 | 51 | 48.1% |
| 1 | 55 | 51.9% |
| Long Acting Benzodiazepines | | |
| 0 | 97 | 91.5% |
| 1 | 9 | 8.5% |
| Antidepressants | | |
| 0 | 24 | 22.6% |
| 1 | 67 | 63.2% |
| 2 | 15 | 14.2% |

**Major Findings**

Statistically significant positive correlations were found between age and typical

antipsychotics, dementia and type of unit, atypical antipsychotics and the number of falls,

short and intermediate acting benzodiazepines, delirium and atypical antipsychotics, and

Alzheimer's disease and dementia. There is also a significant negative correlation

between Alzheimer's disease and gender, dementia and the type of unit, and depression

and short and intermediate acting benzodiazepines. A positive significant relationship

between typical antipsychotics and the number of falls, anxiety and long acting

benzodiazepines, and depression and antidepressants, was noted by the researcher in the

study. There was a negative significance between dementia and long acting

benzodiazepines. Table 9 depicts the correlations found in the study.

Table 9

*Pearson Correlation Coefficients*

| | Age | GEN | TOU | NOF | TAP | ATAP | SIAB | LAB | ANTD | DEP | DEM | ANX | ALZ | DEL |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Age | 1.000 | | | | | | | | | | | | | |
| GEN | -0.048 | 1.000 | | | | | | | | | | | | |
| TOU | 0.012 | -0.007 | 1.000 | | | | | | | | | | | |
| NOF | -0.043 | -0.142 | 0.124 | 1.000 | | | | | | | | | | |
| TAP | **0.217** | 0.107 | 0.040 | **0.385** | 1.000 | | | | | | | | | |
| ATAP | -0.099 | 0.035 | -0.173 | **0.204** | 0.121 | 1.000 | | | | | | | | |
| SIAB | -0.044 | 0.018 | 0.040 | **0.202** | 0.125 | 0.053 | 1.000 | | | | | | | |
| LAB | -0.072 | -0.113 | -0.163 | 0.045 | -0.068 | -0.051 | -0.113 | 1.000 | | | | | | |
| ANTD | -0.106 | -0.028 | -0.046 | 0.056 | -0.043 | 0.024 | -0.136 | -0.182 | 1.000 | | | | | |
| DEP | -0.080 | 0.006 | -0.152 | -0.099 | -0.160 | -0.027 | **-0.213** | -0.001 | **0.411** | 1.000 | | | | |
| DEM | -0.062 | -0.024 | **-0.206** | -0.033 | 0.011 | 0.097 | 0.128 | **-0.286** | 0.037 | -0.152 | 1.000 | | | |
| ANX | 0.074 | 0.035 | -0.026 | 0.146 | 0.058 | 0.032 | 0.186 | **0.259** | -0.155 | -0.029 | -0.096 | 1.000 | | |
| ALZ | **-0.307** | **-0.201** | 0.187 | -0.015 | -0.094 | -0.056 | 0.090 | -0.128 | -0.116 | -0.154 | **0.202** | 0.028 | 1.000 | |
| DEL | -0.199 | 0.047 | 0.104 | -0.071 | -0.022 | **0.197** | -0.101 | -0.030 | 0.014 | 0.087 | 0.084 | -0.061 | -0.041 | 1.000 |

Note. Correlations with $p < .05$ are in bold. GEN=gender; TOU= type of unit; NOF=number of falls; TAP= typical antipsychotics; ATAP= atypical antipsychotics; SIAB= short and intermediate acting benzodiazepines; LAB=long acting benzodiazepines; ANTD= antidepressants; DEP= depression; DEM= dementia; ANX= anxiety; ALZ= Alzheimer's disease; DEL= delirium

**Summary**

Relationships were found between certain psychotropic drugs and falls in the

geriatric population. There are several variables that contribute to falls in older adults

and each should be taken into consideration. There was a significant relationship

between the number of falls and typical antipsychotics, atypical antipsychotics, and short

and intermediate benzodiazepines. Medications were the only variables that showed a

direct significance with the number of falls. The other variables, however do contribute

to the overall picture and wellbeing of each patient in the study. From the study that was

completed, a true significance is seen in the medications and falls which can greatly

improve the quality of lives for the patients.

**CHAPTER V**

**Discussion**

Falls in the geriatric population cause the most injuries and may also cause death (Hill & Wee, 2012).  There was mixed research in regards to the effects of prescribing psychotropic medications in the elderly and also in prescribing more than one psychotropic drug.  There was little known about the prescribing effects on the elderly and how it affects their fall risk.  The purpose of this study was to explore the relationship of the prescribing effects of psychotropic drugs such as antidepressants, benzodiazepines, and antipsychotics on falls in the geriatric population who live in long term care communities with a diagnosis of depression, dementia, anxiety, delirium, and Alzheimer's disease.

**Implication of Findings**

Pearson's correlation coefficient revealed several significant relationships between many different variables studied.   Through the statistical analysis, several positive correlations were discovered.  There was a significant relationship between age and typical antipsychotics.  As the population in the study increased in age; the number of typical antipsychotics also increased.  There was also another significant positive relationship between atypical antipsychotics and the number of falls, as well as short and intermediate benzodiazepines and the number of falls.  As the number of prescribed typical antipsychotics and short and intermediate benzodiazepines increased so did the number of falls in the patients.  As the number of incidences of a diagnosis of delirium increased, the number of atypical antipsychotics increased.

There was also a significant positive correlation between Alzheimer's disease and dementia. As the number of cases of Alzheimer's disease increased so did the number of cases of dementia. There was a more significant positive correlation between typical antipsychotics and the number of falls. As the number of typical antipsychotics increased so did the number of falls. There is also a significant positive correlation between anxiety and long acting benzodiazepines. As the number of incidence with a diagnosis of anxiety increased so did the number of prescriptions for long acting benzodiazepines. Another significant positive correlation was found between depression and antidepressants. There is a significant negative correlation between dementia and the type of unit. The patients with a diagnosis of dementia were correlated with either memory care or skilled nursing. Depression and short and intermediate acting benzodiazepines were correlated. The patients with a diagnosis of depression were correlated with the number of prescribed short and intermediate acting benzodiazepines.

Other significant correlations included Alzheimer's disease and age and the diagnosis of dementia and benzodiazepines. Patients with a diagnosis of Alzheimer's disease showed a decrease in their age. This shows that much younger people are diagnosed with Alzheimer's disease and generally do not have as long of a life expectancy. There is also a much negative correlation between dementia and long acting benzodiazepines. Patients without dementia have a decreased number of prescribed benzodiazepines. From the correlations gathered in this study there is much information that can be gathered and applied to nursing care and quality of care for the geriatric population who reside in a long term care setting.

**Application to Theoretical Framework**

The theoretical framework of Albert Bandura guided this retrospective chart analysis study through providing a framework of variables. The behavior which was the fall was the most significant variable in the study and one of the greatest factors that affects the quality of life for older adults. The environmental factors which included the medications and the type of unit in which the patient resided on, provided insight to the medical treatment that was necessary for the patient. The personal factors completed the picture by providing insight through their diagnoses, age, and gender. The Social Cognitive Theory of Albert Bandura allowed the study to have a greater impact on the patient care provided.

**Limitations**

There are limitations to the study that has been performed. Limitations include the small sample size. There was only one facility in the study and the facility only accepts private pay and long term care insurance for the patient's room and board. This particular facility does not accept Medicare or Medicaid funding for the patient's room and board fees. Even with these limitations, the knowledge that has been gained is vital to nursing and the geriatric population.

**Implications for Nursing**

Geriatric nursing is going to have a great impact of the nursing profession for many decades to come, due to the great influx of baby boomers who will be needing long term care in the near future. From this study nursing can gain a greater insight into the care needed when psychotropic medications are prescribed to treat certain diagnoses. Falls are one of the critical events that can occur in an older adult's life and can have the

most detrimental effect to their overall wellbeing.  Nurses need to take a more proactive role in the care of their geriatric patients and take into consideration the whole picture for their care from their age, diagnoses, medications, as well as their fall history and risk, but especially their medications and fall risk.

The data that was collected from the study is beneficial for many providers and employees in the long term care setting.  These employees include the administrator, medical director, and floor nurse. As an administrator it is imperative to understand why falls occur within the facility and the variables that contribute to the fall.  Through identifying the correlations in the study, the administrator along with nurse managers and floor nurses can put new protocols and policies into place, as well as discuss nonpharmacological methods with the medical director and midlevel providers to decrease the number of prescriptions written.  For the medical director and midlevel, this data provides a guide to ensure proper prescribing effects, as well as information on which patients would benefit the most.  The floor nurse benefits greatly from this study because it provides a vast amount of knowledge to enable the nurse to advocate for the patients, as well as knowing what medications to be aware of for patients with certain diagnoses. By giving staff nurses this information it will empower them to provide the best care possible for the patients they provide care for.  Every professional within a long term care facility will be able to greatly benefit from the knowledge obtained from this study, for an administrator's role that creates policies and procedures to the staff nurse who provides the daily care to the patients.

**Recommendations**

Further research is needed to be able to gain a greater understanding of how psychotropic medications affect the geriatric population and their quality of life. The research should include more long term care facilities, a larger population, and also include patients who have Medicare and Medicaid funding to support their living arrangements. To be able to gain a greater understanding of psychotropic medications, they should be isolated to be able to identify the medication that affects the geriatric population and falls the most. Other variables for further research are the combinations of prescribed medications, experience of the nurse and physician providing care for the patient, as well as how long the patient has lived in the facility. By furthering the research about psychotropic medications and falls, there can be a paradigm shift for healthcare providers related to these medications.

**Conclusion**

In the study exploring the relationship between psychotropic medications and falls, it can be concluded that there is a relationship between certain psychotropic medications and falls in the geriatric population. There have also been several other conclusions that have surfaced due to the other variables explored. This was noted through certain diagnoses and frequencies of prescriptions, as well as diagnoses and type of unit. Nursing as a profession can gain a greater understanding of these medications and how it impacts the geriatric patients they care for which would improve the patient's quality of life. Geriatric patients who reside in a long term care setting have a high fall risk but as nurses we can work to remove as many variables that increase their risk for falls on a daily basis.

References

Agashivala, N., & Wu, W. K. (2009). Effects on potentially inappropriate psychoactive medications on falls in US nursing home residents. *Drugs & Aging*, 26(10), 853-860.

Bandura, A. (2004). Health Promotion by Social Cognitive Means. *Health Education & Behavior*, 31(2), 143-164.

Barton Frenchman, I. (2005). Atypical antipsychotics in nursing home patients. *Drugs & Aging*, 22(3), 257-264.

Bulat, T., Castle, S. C., Rutledge, M., & Quigley, P. (2008). Clinical practice algorithms: Medication management to reduce fall risk in the elderly-Part 4, Anticoagulants, anticonvulsants, anticholinergics/bladder relaxants, and antipsychotics. *Journal of the American Academy of Nurse Practitioners,* 20, 181-190.

Burns, N. & Grove, S.K. (2009). The Practice of Nursing Research. St. Louis, Missouri: Saunders.

Chatterjee, S., Chen, H., Johnson, M. L., & Aparasu, R. R. (2011). Risk of falls and fractures in older adults using atypical antipsychotic agents: A propensity score-adjusted, retrospective cohort study. *The American Journal of Geriatric Pharmacotherapy*, 10(2), 83-94.

Coupland, C., Dhiman, P., Morriss, R., Arthur, A., Barton, G., & Hippisley-Cox, J. (2011). Antidepressant use and risk of adverse outcomes in older people: Population based cohort study. *British Medical Journal,* 11(343). doi: 10.1136/bmj.d4551.

Echt, M.A., Samelson, E.J., Hannan, M.T., Dufour, A. B., & Berry, S.B.(2013). Psychotropic drug initiation or increased dosage and the acute risk of falls: a

prospective cohort study of nursing home residents. *BMC Geriatrics*, (22)13, 19-26.

Fonad, E., Robins Wahlin, T. B., Winbald, B., Emami, A., & Sandmark, H. (2008). Falls and fall risk among nursing home residents. *Journal of Clinical Nursing*, 17(1), 126-134.

Gribbin, J., Hubbard, R., Gladman, J., Smith, C., & Lewis, S. (2011). Serotonin-norepinephrine reuptake inhibitor antidepressants and the risk of falls in older people. *Drugs & Aging*, 28(11), 895-902.

Huang, A. R., Mallet, L., Rochefort, C. M., Eguale, T., Buckridge, D.L., & Tamblyn, R. (2012). Medication-related falls in the elderly. *Drugs & Aging,* 29(5), 359-376.

Hawkins, K., Musich, S., Ozminknowski, R. J., Bai, M., Migliori, R., & Yeh, C. (2011). The burden of falling. *Journal of Gerontological Nursing,* 37(8), 36-47.

Hein, L. T., Cumming, R. G., Cameron, I. D., Chen, J. S., Lord, S. R., March, L. M., Schwarz, J., Couteur, D. G., & Sambrook, P. N. (2005). Atypical antipsychotic medications and risk of falls in residents of aged care facilities, *Journal of the American Geriatrics Society*, 53(8), 1290-1295.

Hill, K. D, & Wee, R. (2012). Psychotropic drug-induced falls in older people. *Drugs & Aging,* 29(1), 15-30.
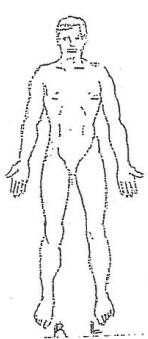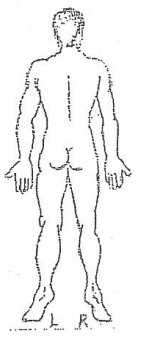
Kamble, P., Sherer, J., Aparasu, R. R. (2008). Antipsychotic drug use among elderly nursing home residents in the United States. *The American Journal of Geriatric Pharmacology*, 6(4), 187-197.

Kerse, N., Flicker, L., Pfaff, J. J., Draper, B., Lautenschlager, N. T., Sim, M., Snowdon, J., & Almeida, O. P. (2008). Falls, depression and antidepressants in later life: Large primary care appraisal. *PLoS One*, 3(6), e2423.

Landi, F., Onder, G., Cesar, M., Barillaro, C., Russo, A. & Bernabei, R. (2005). Psychotropic medications and risk for falls among community-dwelling frail older people: An observational study. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences,* 60(5), 622-626.

Menta, S., Chen, H., Johnson, M. L., & Aparasu, R. R. (2010). Risk of falls and fractures in older adults using antipsychotic agents. *Drugs & Aging,* 27(10), 815-829.

Olazaran, J., Valle, P., Serra, J. A., Cano, P., & Muniz, R. (2013). Psychotropic medications an falls in nursing homes: a cross-sectional study. *Journal of the American Medical Directors Association*, 14(3), 213-217.

Panula, J., Puustinen, J., Jaatinen, P., Vahlberg, T., Aarnio, P., & Kivela, S.L. (2009). Effects of potent anticholinergics, sedatives and antipsychotics on postoperative mortality in elderly patients with hip fracture. *Drugs & Aging,* 26(11), 963-971.

Shuto, H., Imakyure, O., Matsumoto, J., Egawa, T., Jiang, Y., Hirakawa, M., Kataoka, Y., & Yangawa, T. (2010). Medication use as a risk factor for inpatient falls in an acute care hospital: A case-crossover study. *British Journal of Clinical Pharmacology,* 69(5), 535-542. doi: 10.1111/j.1365-2125.2010.03613.x

Smith, M., Schultz, S., Seydel, L., Reist, J., Kelly, M., Weckman, M., Gryzlak, B., & Carnahan, R. (2013). Improving antipsychotic agent use in nursing homes: Development of an algorithm for treating problem behaviors in dementia. *Journal of Gerontological Nursing,* 39(5), 24-35.

Sterke, C. S., Velde, N., Ziere, G., Petrovic, M., & Looman, C. (2012). New insights:

    Dose-response relationship between psychotropic drugs and falls: A study in

    nursing home residents with dementia. *The Journal of Clinical Pharmacology,* 52,

    947-955.

The American Geriatrics Society. (2012). American Geriatrics Society Updated beers

    criteria for potentially inappropriate medication use in older adults. *Journal of the*

    *American Geriatrics Society.* 60(4), 616-631.   doi: 10.1111/j.1532-

    5415.2012.03923.x

Velde, N., Stricker, B., Pols, H., & Cammen, T. (2006). Risk of falls after withdrawal of

    fall-risk-increasing drugs: a prospective cohort study. *British Journal of Clinical*

    *Pharmacology*, 63(2), 232-237.

Appendix A

Incident Report

# INCIDENT/ACCIDENT/REPORT

Person Involved (Last Name)_____ (First Name)_____ (Middle Initial)____ M  F____ Birthdate_____
□  □

| Date of Incident | Time of Incident _____ □AM □PM | Location (indicate room #/bathroom room #/hallway location) □ Resident Rm_____    □ Hallway_____ □ Bathroom_____    □ Other_____ |
|---|---|---|

| Resident's condition prior to Incident | □ Normal    □ Confused    □ Disoriented    □ Other_____ Sedated (Med____    Dose____    Time____ ) |
|---|---|

| Were bed rails ordered? □ Yes  □ No   □ N/A | Bed rails... □ Up   □ Down   □ N/A | Height of bed... □ Up    □ Down    □ N/A |
|---|---|---|
| Equipment Involved? □ Yes   □ No | Safety Device □ Yes □ No □ N/A | Wheelchair/Walker/Mobility Device □ Yes   □ No   □ N/A |
| Property Involved? □ Yes   □ No | If yes, please describe | |

Describe exactly what happened; why it happened; what the causes were.
_____
_____
_____
_____
_____
_____
_____

Type of Incident    □ Observed    □ Unobserved
□ Fall   □ Medication Related   □ IV Related   □ Tx/Test/Procedure Related
□ Food/Beverage Related    □ Elopement   □ Physical Altercation    □ Other_____

Observed--Name, title (if applicable), address and phone number of witness (es)

| Name and Title | Address | Phone Number |
|---|---|---|
| 1) | | |
| 2) | | |

Type of Injury (Indicate on diagram location of injury)
□ None
□ Hemotoma
□ Skin Tear/Abrasion
□ Laceration
□ Burn
□ Swelling
□ Discoloration
□ Other_____
_____

VS  Temp:_____ Blood Pressure:_____ Pulse:_____ Resp:_____

CNA Assigned to Resident _____
Physician Notified-Dr._____ Time____ Notified by_____
Responsible Party Notified-Name_____ Time____ Notified by_____
Did a Dr see Resident? Yes □  No □  Was Resident Sent to a Hospital? Yes □____   No □
Was First Aide Administered? Yes □ (type)_____   No □

Signatures:                                   Date:
Person/Title of Person Completing Report _____
Director of Nursing _____
Administrator _____
Medical Director _____
Date of Review by Fall Management Committee _____
Recommendations:_____
_____

3/09

Appendix B

Investigation Sheet

## FALL INVESTIGATION WORKSHEET

| Instructions- This worksheet is to be completed by the Licensed Nurse following each fall and attached to the Incident Report. |
|---|

Residents Name_____  Date of Fall_____  Time of Fall_____

Current Fall Risk Assessment Score_____  Date Completed_____

| Location | Position of Resident Prior to the Fall | Activity — What was the resident doing at time of fall? | |
|---|---|---|---|
| ◯ Resident Room | ◯ Wheelchair | ◯ Standing | ◯ Sitting |
| ◯ Hallway_____ | ◯ Chair | ◯ Unassisted Ambulation | ◯ Assisted Ambulation |
| ◯ Dining Room | ◯ Geri-chair | ◯ Unassisted Transfer | ◯ Reaching Up/Down |
| ◯ Bathroom | ◯ Toilet | ◯ Going to the BR | ◯ Assisted Transfer |
| ◯ Other_____ | ◯ Other_____ | ◯ Unknown | ◯ Transferring from____ to____ |

### Resident Diagnosis/Condition That May Contribute

| | | | |
|---|---|---|---|
| ◯ Anemia | ◯ Diabetes | ◯ Parkinson's | ◯ Acute Changes |
| ◯ Arrhythmia | ◯ Electrolyte Imbal | ◯ Seizures | ◯ Fall in last 30 days |
| ◯ COPD | ◯ Hypothyroidism | ◯ CVA | ◯ Hearing Problems |
| ◯ CHF | ◯ MI | ◯ TIA | ◯ Dizziness |
| ◯ Coronary Artery | ◯ Neuropathy | ◯ Unsteady Gait | ◯ Med change 5 days |
| ◯ Behavior | ◯ Orthostatis Hypo- | ◯ Visual Problems | ◯ Syncope |
| ◯ Depression | tension | ◯ Current Infection | ◯ Paralysis |
| ◯ Other_____ | ◯ Dementia | ◯ Amputation | ◯ Degenerative Joint |

| Environmental Factors | | Mental Status Prior To Fall | Footware/Equipt. @ Fall |
|---|---|---|---|
| ◯ Spills | ◯ New Admit | ◯ Alert | ◯ Shoes |
| ◯ Equipment | 30 days | ◯ Lethargic | ◯ Slippers |
| ◯ Rugs | ◯ Room | ◯ Confused | ◯ Socks |
| ◯ Clutter | Change 7 days | ◯ Agitated | ◯ Walker |
| ◯ Poor Lighting | ◯ Other_____ | ◯ Sedated | ◯ Wheelchair |
| ◯ Glare | | ◯ Recent Mental Change | ◯ Lift |
| ◯ Foreign Objects | | ◯ Decreased Cognition | ◯ Gait Belt |
| ◯ Uneven Surface | | ◯ Other_____ | ◯ Other_____ |

### Current Medications- May Be Causative

| | | |
|---|---|---|
| ◯ Antipsychotics | ◯ Hypoglycemic Agents | ◯ Antihypertensives |
| ◯ Antianxiety/Hypnotics | ◯ Cardiovascular Meds | ◯ Anticonvulsant Meds |
| ◯ Antidepressants | ◯ Antiparkinsonian Meds | ◯ Diuretics |
| ◯ Narcotics | ◯ Antihistamines | ◯ Laxatives |

### Assistive Devices Used by the Resident

| | | |
|---|---|---|
| ◯ Walker | ◯ Brace | ◯ Other |
| ◯ Cane | ◯ Prosthesis | |
| ◯ Wheelchair | ◯ Mechanical Lift | |

Page 2

# FALL INVESTIGATION
# WORKSHEET

| Resident Interview |
|---|
| How did you feel just prior to the fall (dizzy, weak, SOB, hungry, urgency to void? |

Resident's Decription of Fall-

## Resident/Room Check After the Fall

| | yes | no | | yes | no |
|---|---|---|---|---|---|
| Is resident continent? | ○ | ○ | Alarm in use/functioning? | ○ | ○ |
| Was call light functioning? | ○ | ○ | History of Prior Falls? | ○ | ○ |
| Was call light in reach? | ○ | ○ | Restraint being used? | ○ | ○ |
| Was bed in low position? | ○ | ○ | Last voiding | | |
| Were siderails ordered? | ○ | ○ | Time between last meal and fall. | | |
| Were siderails up? | ○ | ○ | Activity Level Prior to fall | | |

### Evaluation/Intervention (check at least one)

Determination that the fall was likely related to:
○ Cardiovascular ○ Perceptual
○ Neuromuscular ○ Psychiatric/Cognitive
○ Orthopedic ○ Environmental

Signature of Person Completing Assessment _____ Date _____

Interventions Initiated-

Interdisciplinary Recommendations to Prevent Further Falls-

Signature- _____ Date _____

Appendix C

Approval from Facility

**Arbor Acres**
United Methodist Retirement Community

336.724.7921
fax: 336.721.0271
www.arboracres.org

1240 Arbor Road
Winston-Salem
North Carolina
27104-1197

MEMO

To: Gardner-Webb Institutional Review Board

From: Lurana Day, RN, MSN, LNHA

Date: 4/19/13

Please be advised that Arbor Acres Retirement Community is happy to support Lauren Crotts work on her Master's thesis. By granting her access and use of general resident data she will be able to draw some important conclusions. This research information includes Incident Reports and Fall Investigation forms. The information will not identify any specific resident or group of residents; it will be used as generic data.

Feel free to contact me at 336 748-4641 if you have any questions or need any additional information.

Open Hearts. Open Minds. Open Doors.