PHYSICAL THERAPISTS' CLINICAL PRACTICES REGARDING INTRINSIC AND EXTRINSIC FALL RISK FACTORS AND THEIR ATTITUDES TOWARD THE USE OF EVIDENCE-BASED PRACTICE

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The phenomenon of falls among community-dwelling adults—coupled with an aging baby boomer generation and an increasing life expectancy—presents a significant concern for an increased number of unintentional deaths and injuries and their associated costs. The risk factors associated with falling are often categorized as intrinsic and extrinsic.

Physical therapists have a unique opportunity to positively impact issues involving physical dysfunction and to educate their community-dwelling adult patients about the environmental risk factors and interventions that lessen their risk of falling. Abundant evidence-based research exists regarding interventions for the treatment and prevention of falls; however, this research indicates that physical therapists fail to consistently utilize evidence-based practice (EBP) in their daily clinical practices. The diffusion of innovations theory examines how innovations are adopted (Rogers, 2012). However, the innovation of EBP is not always adopted by physical therapists. Lack of time to conduct literature searches was the most common barrier noted by physical therapists for not adopting EBP (Jette et al., 2003; Fruth et al., 2010; Salbach, Jagial, Korner-Bitensky, Rappolt, & Davis, 2007).

This study, which utilized a cross-sectional descriptive research design, provided insight into physical therapists' clinical practices regarding intrinsic and extrinsic fall risks in the treatment of community-dwelling adults aged 65 years and older. It examined physical therapists' attitudes and beliefs toward the use of EBP and identified the barriers to their

adoption of it.

The demographic data provided a descriptive overview of the study respondents. There were 3,523 potential physical therapist respondents, and the study's return rate was 9%(316 respondents. The majority of the respondents held doctoral degrees (49.4%), more than half (55.4%) worked in an outpatient physical therapy clinical setting, and approximately halfindicated that they were American Physical Therapy Association (APTA)-certified instructors.

The results of the study indicated that physical therapists who had more experience displayed a higher level of attention to clinical practices than those with less experience. The physical therapists who were APTA-certified clinical instructors demonstrated a higher level of attention to the intrinsic and extrinsic risks of falling than those who were not APTA-certified instructors. The physical therapists whose highest level of education was a doctorate placed greater importance on the utilization of EBP than respondents with a baccalaureate or master's degree. Although most physical therapists believe that the utilization of EBP holds significant value, they do not always access or apply it. Insufficient time for using EBP was the major barrier noted by most physical therapists.

The results of this study concurred with those of previous studies regarding common barriers to physical therapists' adoption of EBP. Rehabilitation organizations may want to examine methods to promote the use of the most current physical therapy practices based on the evidence revealed in the literature and to explore options for improving staff access to and utilization of EBP research.

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CHAPTER 1

INTRODUCTION

This chapter provides an overview of the problem of falls among community-dwelling older adults, and the costs and risk factors associated with falling. In addition to providing background information related to older adults and falls, this chapter introduces the role of the physical therapists and their use of evidence-based practice (EBP). The need for this study focuses on the application of EBP in the physical therapists' clinical practice in the prevention and treatment of community-dwelling older adults who are at risk for falling. The chapter concludes with the proposed methodology to investigate the physical therapists' current clinical practices in regards to fall risk factors and their use of EBP.

Overview of Falls among Community-Dwelling Older Adults

The phenomena of falls among community-dwelling adults coupled with an aging baby boomer generation present a concern for an increased number of unintentional deaths and injuries. In 2011, the oldest of the baby boomers, defined as those born between 1946 and 1964, turned 65 (Sade, 2012). The United States (U.S.) is expected to see a rapid growth of its older population segment (Vincent & Velkoff, 2010), with the number of adults aged 65 years and older expected to double from 40.2 million in 2010 to 88.5 million in 2050 (United States Census Bureau, 2010). In 2010, 13% of the U.S. population was estimated to be aged 65 and older (United States Census Bureau, 2010), and this number is anticipated to rise to nearly 20% of the population within 30 years (United States Census Bureau, 2010; Vincent & Velkoff, 2010).

Kochanek, Xu, Murphy, Miniño & Kung (2011) revealed that the average life expectancy increased by 0.2 years, from 78.0 in 2008 to 78.2 in 2009 (based on 75.7 years for males and

80.6 for females). The combination of falls among community-dwelling adults, and a rapidly aging population of adults with an increasing life expectancy, presents a serious problem.

Research indicated that falls among older adults is a fairly common problem. Hausdorff, Rios, & Edelber (2001) conducted a study that predicted falls among community-dwelling older adults. After one year, in a follow-up study, 40% of the subjects reported falling (Hausdorff et al., 2001). The results of the aforementioned study closely mirrored statistics published by the Center for Disease Control and Prevention [CDC] (2012), which indicated that one out of three adults aged 65 and older experience at least one fall per year (CDC, 2012).

Injuries and Costs Associated with Falling

Adults aged 65 years and older experience an increased number of unintentional injuries, which are the leading cause of injury deaths. After cardiovascular disease, cancer, stroke, and pulmonary disorders, unintentional injuries are the fifth leading cause of death in older adults, with falls constituting two-thirds of these deaths (Rubenstein 2006). Unintentional falls are also the most common cause of nonfatal injuries and hospital admissions for trauma (CDC, 2012).

Falls present an issue of both direct and personal costs. In 2009, emergency departments treated 2.4 million nonfatal fall injuries among older adults; more than 662,000 of these patients had to be hospitalized (CDC, 2012). Hospitalizations accounted for approximately 60% of the costs of nonfatal fall injuries and emergency department treatment accounted for 20% (Stevens, Corso, Finkelstein, & Miller, 2006).The personal costs to the community-dwelling older adult include long term consequences, such as disability, diminished productivity, reduced quality of life, and possibly death. Stevens et al. (2006) study revealed that “traumatic brain injuries (TBI)

and injuries of the lower extremities were the most frequent and costly injuries"; these accounted for 78% of fatalities and 79% of direct costs (p. 292).

Risk Factors Associated with Community-Dwelling Older Adults Falling

Falls can occur for a variety of reasons (Spirduso, Francis, & MacRae, 2005). According to McMurdo (2001), over 130 risk factors are attributed to falling. Tinneti et al. (1994) identified intrinsic risk factors for falling: 1) postural hypotension, 2) use of sedatives, *3) use of at least four prescription medicines, 4) decreased limb strength or range of motion in* arms or legs, and 5) decreased ability to transfer. Fear of falling is also recognized as a potentially debilitating intrinsic risk factor (Arfken, Lach, Birge, & Miller (1994), and often leads to decreased physical activity, which can lead to a decrease in lower extremity strength and an increased risk of falling.

Extrinsic risk factors for falling are found in the person's living environment. Northridge, Nevitt, Kelsey, & Link (1995) referred to extrinsic risk factors for falling as home hazards or environmental hazards. Examples of extrinsic risk factors include poor lighting, loose carpets, clutter on the floor, or inadequate use of an assistive device, such as a cane (Speechley & Tinetti, 1991).

Christiansen and Juhl (1987) suggested that falls are not part of the normal aging process, but are secondary to underlying physical dysfunction, medications, and environmental hazards. Physical therapists have a unique opportunity to positively impact issues involving physical dysfunction, as well as the opportunity to educate their community-dwelling adult patients about environmental risk factors and interventions that lessen their risk for falling.

The Role of Physical Therapists and Their Use of EBP

Physical therapists not only function as healthcare providers that evaluate and treat injuries or impaired function, but also act as patient educators (American Physical Therapy Association [APTA] , 2010). Education is of considerable importance to patient outcome (Rindflesch, 2009). Rindflesch's qualitative study included interviews with physical therapists and revealed four themes: 1) patient education is physical therapy; 2) patient education is empowerment toward optimal self-management, health, and function; 3) content taught is patient centered; and 4) outcome of patient education is evaluated through function.

The APTA Guidelines for Practice (2010) noted that the physical therapist's role should address risk reduction and prevention. The guidelines stated that the physical therapist's patient/client management role focuses on primary, secondary, and tertiary prevention. The physical therapist addresses disease prevention, assesses the severity of disease, decreases the duration of illness, and promotes rehabilitation and restoration of function in patients with chronic and irreversible diseases. The physical therapist also addresses general health promotion and identifies risk factors for disability that may be independent of the disease or pathology.

Physical therapy practice includes five areas:

Physical therapist practice includes the five essential elements of patient/client management (examination; evaluation; diagnosis; prognosis, including the plan of care; and intervention), The APTA clearly defines the role of the physical therapist and specifically addresses interventions. The APTA Guidelines to Practice (2010) define intervention as:

> Intervention is the purposeful interaction of the physical therapist with the patient/client–and, when appropriate, with other individuals involved in patient/client care–using

> various methods and techniques to produce changes that are consistent with the examination and reexamination of findings, the evaluation, the diagnosis, and the prognosis. Decisions about intervention are contingent on the timely monitoring of patient/client responses to interventions and on the progress made toward anticipated goals and expected outcomes (APTA, 2010).

Ample research is available regarding interventions for the treatment and prevention of falls, founded on evidence-based research. Chang et al. (2004) conducted a review and meta-analysis of interventions to prevent falls in older adults. The results of the study clearly indicated that exercise was the single most effective intervention to prevent falls.

Interventions to prevent falls in older adults are effective in reducing both the risk and rate of falling. The most effective intervention was a multifactorial falls risk assessment and management program, exercise programs were also effective in reducing the risk of falling (Chang et al., 2004). Other interventions included addressing intrinsic risk factors, such as the use of medications and educating the patient about extrinsic risk factors found in the environment.

However, numerous studies indicated that physical therapists do not always use EBP or review related research for various reasons. Fruth et al. (2010) concluded that determinants of the use of EBP included costs, practicality, limited visits secondary to insurance restrictions, and limited time to locate and read EBP research. The inability to analyze the research was also a barrier noted as to why physical therapists do not use EBP or evidence-based interventions (Salbach, et al., 2007). Another study indicated that physical therapists appeared to favor EBP, but were reluctant to change their clinical practices (Stevenson, Phil, Lewis, & Hay, 2004).

Diffusion of Innovations

Diffusion of innovations examines how innovations are adopted (Rogers, 2003). The French sociologist, Gabriel Tarde, studied diffusion research during the 19th century (Kinnunen, J., 1996). Kinnunen defined diffusion as, "the spreading of social or cultural properties from one society or environment to another" (p. 432). Diffusion of innovations is a theory later developed and studied by Everett Rogers (Backer, 2005). The phenomenon of how innovations or evidence-based research are diffused and adopted by physical therapists has been investigated by numerous researchers (Bridges, Bierema, & Valentine, 2007; Dijkers, Murphy, & Kellerman, 2012; Fruth et al., 2010; Harting, Rutten, Rutten, & Kremers, 2009; Jette et al., 2003; Rivard et al., 2010; Salbach et al., 2007).

Rogers (2003) defined diffusion as "the process in which an innovation is communicated over time among members of a social system" (p. 5). For the purpose of this study, the term innovation is used synonymously with EBP. Rogers argued that successful diffusion of innovations requires bringing together both knowledge and direct experience related to the innovation, using informal personal networking to supplement the more formal processes, and using whatever influence one has to champion new ideas (Backer, 2005, p .285).

EBP is defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett et al., 2000, p. 71). The APTA Guidelines describe EBP as accessing, applying and integrating of evidence to guide clinical decision making to deliver the best patient care (2012).

Fruth et al. (2010) studied physical therapists' beliefs and practices regarding EBP, and determined that it is considered important by physical therapists, regardless of age, academic

degree, practice setting, or years of practice. Stevenson et al. (2004) indicated that physical therapists appear to value the concept of using EBP, but are reluctant to adopt innovations found in research into to their clinical practices. Salbach et al. (2007) emphasized the importance of physical therapists' receiving continuing education to improve skills and self-efficacy to examine and critically evaluate the research literature.

Four main elements of diffusion of innovation theory include innovation, communication channels, time, and social system. This study will describe these terms in a context specific to physical therapy. Innovations are the interventions supported by evidence-based research that lessen the risk of community-dwelling adults experiencing a fall. Communication channels denote the methods by which the physical therapists receive information. Common channels of communication include the physical therapists' formal education and training, continuing education, or peer-to-peer conversations. Time refers to the rate at which the physical therapist adapts the intervention. This may occur on a personal level or an organizational level. Social system refers to the culture that exists within the profession of physical therapy, an individual clinic, or healthcare organization.

Social systems include key individuals who recognize the value of an intervention. The individual is often referred to as an opinion leader or change agent. Change agents within an organization might be the administration of a clinic or healthcare organization or individuals who are research savvy. "Knowledge broker" is another term used in the research of EBP; Rivard and colleagues used the term to describe physical therapists who promote evidence-based research among their peers (Rivard et al., 2010).

Common characteristics of innovation include the intervention's relative advantage, compatibility of the intervention, complexity, trialability, and observability. Relative advantage

denotes the perception that a new idea or method is better than the current practice. The physical therapist or social system will evaluate whether an innovation or intervention possesses this characteristic. Compatibility describes the extent to which the intervention is consistent with the physical therapists' existing knowledge and experiences. Complexity raises the question as to whether the new idea is practical or more difficult to implement and include in the intervention. Observabilty of the intervention or idea suggests that the physical therapist or social system observes results positively impacting the treatment of the patient. Rogers (2003) stated that observable and less complex ideas will be adopted more rapidly.

Initially, the physical therapists or individuals are exposed to an innovation or intervention, but lack detailed information. Although there is an increased awareness of the intervention, there is a lack of knowledge. Following awareness, there is an increased level of interest in how the intervention works. This stage of the process involves the individual actively seeking more detailed information. Subsequently, the next phase of the process involves the evaluation of the information in regard to its practicality, and advantages versus disadvantages. Next the information is tested and evaluated to see if the innovation meets expectations. In the event that the evaluation does not meet expectations, more information may be needed to make a decision. Finally, the confirmation stage involves adopting or rejecting the intervention.

Rogers (2003) described three different types of innovation decisions. Optional innovation decisions are an individual's choice to adopt or reject an intervention independently of the decisions made by the rest of the members of a system. Collective innovation decisions are choices to adopt or reject an idea by consensus among members of a system. Authority innovation decisions are choices made by individuals possessing power, high social status, or technical expertise within a system.

Diffusion of Innovations theory discusses the elements related to diffusion, decisions regarding adoption of an innovation, the process of diffusion, and the rate of diffusion. However, this study will focus on the construct of *barriers* to adopting the intervention of EBP. The researcher will specifically focus on physical therapists' attitudes, beliefs, behaviors, and barriers to adopting the use of EBP in their daily clinical practices.

Background of the Problem

Each year, one in every three adults aged 65 and older falls (Chang et al., 2004). Falls can result in moderate to severe injuries, such as hip fractures, with head trauma the leading cause of injury death among this age group (National Safety Council [NSC], 2011). Falls are also the most common cause of nonfatal injuries and hospital admissions for trauma (CDC, 2012). Falls are one of the leading causes of unintentional injuries in the U.S., accounting for approximately 8.9 million visits to the emergency department annually (NSC, 2011). In 2010, over 21,700 older adults died from unintentional fall injuries (CDC, 2012).

Need for the Study

Falls among older adults impact the quality and longevity of life. The problem of falls is likely to become an even bigger issue, based upon estimates that indicate a rapidly growing population segment of those aged 65 and over. Determining physical therapists' patient education and clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults, and utilization of EBP in regard to the treatment of falls and fall prevention could positively impact patient care. Identifying barriers to physical therapists using EBP holds significant value for the patient, in addition to potentially improving the delivery of care provided by the physical therapists. Bridging the gap between clinical practices

and research would enhance the physical therapists' delivery of care and benefit the community-dwelling older adult who is at risk for falling. Jette et al. (2003) suggested that there may not be a need for further research that studies the effectiveness of interventions, but there is a need for research focused on applying the existing data to patients in the clinic.

Significance of the Study

This study provided insight into the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults, and their current use of EBP. The study also identified barriers to physical therapists utilization of EBP. Analysis of the data also provide insight into the differences that exist between the physical therapists' level of training, years of experience, or institution in which their physical therapy degree was received, in regard to clinical education practices and fall prevention for patients 65 years of age and older. Data provided insight into possible changes for current curriculum being taught in existing physical therapists' education programs, and the need for continuing education of physical therapists regarding the prevention and treatment of falls and the use of EBP.

Purpose of the Study

The purpose of this study was to investigate physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults aged 65 years and older, examine their attitudes and beliefs towards the use of EBP, and identify barriers to physical therapists' adopting the innovation of using EBP.

Research Questions

1. What are the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?
2. What are the physical therapists' attitudes and beliefs towards the use of evidence-based practice?
3. Do differences exist among physical therapists' clinical practices about intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?
4. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?
5. Do differences exist among physical therapists' beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?
6. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level towards the use of evidence-based practice?

The researcher's hypothesis is that time, experience and exposure associated with years of physical therapy practice will have the greatest influence on clinical practice regarding intrinsic and extrinsic falls risk factors, and those with an advanced PT degree will be more receptive to utilizing EBP.

Research Design

Descriptive cross-sectional studies analyze information or describe what, how, and/or why something happened at a given point in time (Lauer, 2006, p. 25.). Lauer indicated that descriptive studies investigate treatments, programs, and practices. Isaac and Michael (1995) depict descriptive research as describing existing phenomena. Information collected with a cross-sectional descriptive design is used to make comparisons and evaluations of phenomena. This study used an online survey that investigated the current clinical practices of regarding intrinsic and extrinsic falls risk factors by physical therapists' and their attitudes and beliefs toward the use of EBP in the treatment of community-dwelling older adults and their use of EBP. The instrumentation assessed the physical therapists' educational and clinical practices regarding intrinsic and extrinsic falls risk factors in the treatment of community-dwelling older adults, and examined their attitudes and beliefs regarding the use of EBP.

Sample

Institutional Review Board approval was granted by the Southern Illinois University Human Subjects Committee before implementing pilot study and final study. The researcher led a meeting with a small group of physical therapists prior to conducting the pilot study and final study. The purpose of the meeting was to have practicing physical therapists' assess the draft survey for face validity, readability and procedures. Information gathered at the meeting assisted

in the development of the survey's logistics and the quality of the questions, and sought recommendations for other possible questions to include in the research study questions.

The meeting for developing the survey consisted of five physical therapists who are employed by a local hospital system in Southern Illinois. The physical therapists' participating in the meeting did so on a voluntary basis. A telephone call was made to the rehabilitation administrator at the hospital-based clinic, and an explanation of the study and purpose of the meeting were presented. Subsequently, a request was made to recruit physical therapists for participation in the survey development group.

The researcher conducted a pilot study to test the draft online survey. Recruitment for the pilot study started with a telephone call to the director of internal development at a large Midwestern rehabilitation organization. An explanation of the study was given to the director and a request was made for the director to distribute the online survey to the approximately 184 physical therapists employed by their organization. The director was offered an executive summary of the study findings upon completion of the study.

A cross-sectional descriptive survey study was conducted using a select sample of physical therapists' from seven large rehabilitation organizations based in five states from the Midwest and Mid-South. The large rehabilitation organizations were selected using a Google search. The researcher selected large rehabilitation organizations based in the Midwest and Mid-South based upon geography and the size of the organizations. The organizations selected were all large rehabilitation organizations that the researcher was familiar with and that would most likely employ physical therapists that would work in a variety of physical therapy settings.

Telephone calls were made to each of the organization's designated research contacts (rehabilitation director/research director). The telephone calls offered an explanation of the study

and a request for their organization's participation in the study. The research contacts at each of the organizations were informed that an executive summary of the study will be delivered to them upon completion of the study, in return for their participation.

Data Collection

After IRB approval, pre-survey notification information was e-mailed to the rehabilitation research contacts at each organization participating in the study. The e-mail contained the cover letter for the study, a copy of the Human Subjects Committee's approval, a consent letter, and a copy of the URL for the online survey. Three organizations that participated in the study were e-mailed a copy of the survey prior to the study, as per their request. The request for a copy of the survey was made for the purpose of reviewing the content of the survey.

All organizations that participated in the study submitted a letter of agreement required by the SIUC HSC. The letter of agreement stated that the participating organization agreed to forward the study consent letter and URL to all physical therapists employed by their organization. The research contact for each rehabilitation organization forwarded the consent letter and the URL for the survey in an e-mail to all physical therapists' under their direction. The physical therapists were notified in the consent letter that completion of the online survey established informed consent to participate in this study.

The survey was designed using the online survey tool known as "Survey Monkey." Data collected from the survey was exported to the Statistical Package for the Social Sciences (SPSS) 21.1 (2012) software package for data analysis.

Data Analysis

Pilot study and primary study participants submitted their responses on the "Survey Monkey" survey instrument. Each survey was coded by the researcher and data entered into Excel files. Data were analyzed using the SPSS version 21.0 (SPSS, Inc., 2012). Descriptive statistics (i.e., frequencies, percentages, and measures of central tendency and dispersion where appropriate) were calculated for each item in the survey and for all demographic variables (years practicing physical therapy, years licensed as a physical therapist, highest degree attained, status as a clinical certified specialist, continuing education participation, number of professional organization memberships, status as an American Physical Therapy Association (APTA) certified clinical instructor, hours per week worked, number of patients seen daily, practice setting, experience treating geriatric patients, and types of problems treated).

This study used descriptive statistics (i.e., frequencies, percentages, and measures of central tendency and dispersion where appropriate), analysis of variance (ANOVA), and multiple regression analysis to answer the research questions. Dummy variables were created for years of practice, majority of patients, and practice setting in order to conduct multiple regression analysis.

A factor analysis was conducted on the data sets of clinical practices intrinsic risks, clinical practices extrinsic risks, and evidence-based practice questions to reduce the data sets into a smaller data sets. The three large data sets were reduced into smaller data sets by using principle components method. Cronbach's alpha coefficients were calculated to measure internal consistency reliability of the survey instrument.

Assumptions

The study were be based on the following assumptions:

1. Respondents will be honest in their responses to survey items.
2. Respondents will understand the questions included in the survey.
3. Respondents will accurately respond to questions in the survey.
4. The survey will adequately and accurately measure the proposed content areas.

Limitations

The study was subjected to the following limitations:

1. The researcher will rely on the respondents' self-reporting.
2. Responses might have been influenced by what the respondents perceived was socially desirable.
3. Response rate may not accurately indicate the true number of physical therapists' that actually received the on-line survey.
4. The study will be voluntary.
5. The sample may not be representative of the population.

Delimitations

1. The study will examine self-reported patient clinical practices.
2. The study will contain mostly closed-ended questions.
3. Limited to certain PTs in certain organizations, in certain states.

Definition of Terms

1. Functional Strength and Balance - Strength exercises and functional balance can be divided into several activities such as: 1) maintenance of posture (dynamic, standing, and

sitting); 2) controlled movement of the center of mass during activities, such as reaching or turning; and 3) responding to a destabilizing force, such as a slip or trip and maintaining the center of mass over the base of support without falling (Berg, 1989).

2. Health Literacy - Health literacy is the degree to which individuals understand basic health information and services needed to make appropriate decisions regarding their health (Vanderhoff, 2005).
3. Polypharmacy - The use of more than three or four medications, and is regarded as a significant risk factor for falling in the elderly (Zeire et al., 2006).
4. Psychoactive Medications - Medications capable of affecting the mind, behavior, mood, or emotions (Pountney, 2009).
5. Falls Risk Assessment - A detailed and systematic process to identify an individual's risk factors for falling (Pountney, 2009).
6. Fall - An event which results in a person coming to rest "inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects" (World Health Organization [WHO], 2007).
7. Multifactorial Fall Prevention - Fall Prevention intervention programs developed to reduce falls, multiple falls, injuries secondary to falls, and improving balance, mobility, and balance confidence in a high falls-risk sample (Hill, Moore, Dorevitch, & Day, 2008).
8. Postural Stability - A complex process that involves the rapid, automatic integration of information from the vestibular, somatosensory, visual, and musculoskeletal systems in the presence of cognition, which includes attention and reaction time. (Sherrington, Menz, & Close, 2007).

9. Dynamic Balance - Pertinent internal and external information to react to perturbations of stability and activating muscles to work in coordination to anticipate changes in balance (Spirduso et al., 1995).
10. Activities of Daily Living - Activities related to a person's normal daily routine (Spirduso et al., 1995, p. 226).
11. Functional movements - Functional movements or functional exercise are related to balance and performing activities of daily living in the sense that they incorporate multi-planar movements (Spirduso et al. , 1995, p. 226).
12. Intrinsic Fall Risk Factors - Intrinsic factors are postural hypotension, the use of sedatives, the use of at least four prescription medicines, decreased limb strength or range of motion in the arms or legs, and a decreased ability to transfer (Lord, Sherrington, & Menz, 2001).
13. Extrinsic Fall Risk Factors - Extrinsic factors are due to environmental or external factors (Lord et al., 2001).
14. Opinion Leaders - Individuals within an organization who are considered to be trustworthy or those who hold a high level of status within the organization (Stevenson, et al., 2004).

Summary

Chapter one provided background information about the problem of falls among community-dwelling older adults. The problem of older adults falling affects the life of the one who falls, as well as the family, and carries a significant financial burden. This problem will potentially be magnified as the baby boomer generation reaches their older years and the number of adults aged 65 years and older significantly increases. Injuries associated with community-

dwelling older adults falling are predictable and preventable. Physical therapists play a key role in the treatment and prevention of falls among community-dwelling older adults. Many physical therapists were aware of the risk factors associated with falling, as the literature has clearly defined those risk factors. However, the research indicated that physical therapists do not always utilize EBP in their daily clinical practices. This chapter provided a proposed study and methodology to investigate the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults and their attitudes and beliefs regarding the use of EBP.

CHAPTER 2

LITERATURE REVIEW

Purpose of the Study

The purpose of this study was to investigate physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults aged 65 years and older, examine their attitudes and beliefs towards the use of EBP, and identify barriers to physical therapists' adopting the innovation of using EBP.

Overview

This chapter provided an in-depth review of literature supporting the need for this study. In particular, it discusses the problem of falls experienced by older adults, the growing population of older individuals in the United States, injuries related to falls, costs related to falls, risks factors for falls, and interventions to prevent falls. In addition to providing background information relating to older adults and falls, this chapter investigates the role of physical therapists and their use of EBT and fall prevention methods.

The population of the older adults in the United States is increasing, which suggested that there will be an increase in the need for health and long-term care services (Wiener & Tilly, 2002), and it is expected that growth in the older population segment in the United States will continue to increase rapidly (Vincent & Velkoff, 2010). Subsequently, health care professionals will be faced with the challenges of dealing with a number of health problems that frequently occur among the older population (Tideiksaar, 2009). Between 2010 and 2050 the United States population is projected to increase from 310 million to 439 million (United States Census

Bureau, 2010). The proportion of older adults is smaller in the United States than it is in most of Europe. Nonetheless, the United States is expected to witness an increase of 135 percent in the number of persons aged 65 or older, between the years 2000 and 2050 (Wiener &Tilly, 2002) along with a 350 percent increase in the number of individuals aged 85 years or older (Wiener & Tilly, 2002).

In 2030, the growth rate of the older population is projected to slow, when the last of the "Baby Boomers" turn 65 (Federal Interagency Forum on Aging Related Statistics, 2012). The percentage of Americans aged 65 years or older increased from 4.1% in 1900 to 13.1 percent in 2010. The older population, consisting of persons 65 years or older, was an estimated 40.4 million in 2010 (United States Census Bureau, 2010). Numerous studies cited that approximately one out of every three adults aged 65 or older experiences at least one fall per year (Chang et al., 2004; Hausdorff et al., 2001).

Life expectancy is much greater among older adults in the current generation, compared to previous generations. Approximately 2.6 million Americans turned 65 in 2010; approximately 1.8 million persons 65 or older died. Census estimates indicated an annual net increase of 814,406 persons 65 or older (Federal Interagency Forum on Aging Related Statistics, 2012). The number of adults aged 65 or older are expected to increase from approximately 41 million in 2010 to 71 million in 2030, (United States Census Bureau, 2010). In 2010, 13 percent of the U.S. population consisted of adults aged 65 or older (United States Census Bureau, 2010). Within 30 years, this number is anticipated to rise to near 20% of the population (Vincent & Velkoff 2010; United States Census Bureau, 2010).

The National Vital Statistics Report by Arias (2011) revealed that life expectancy increased by 0.2 years, from 78.0 in 2008 to 78.2 in 2009 (75.7 years for males and 80.6 years

for females), from 2006 to 2007. The older population is expected to grow between the years 2010 and 2030, when the "Baby Boomer" generation reaches 65 years of age. In 2011, those in the first segment of the population of "Baby Boomers" celebrated their 65th birthdays. The combination of a growing number of persons of 65 years or older with an increased life expectancy illustrates the scope of the potential burden on the health care system.

Aging is referred to as a process or group of processes occurring in living organisms that with the passage of time lead to a loss of adaptability, functional impairment, and eventually death (Spirduso et al., 2005). Researchers noted that aging is not a predictable process. Aging depends on a number of factors, including family history (genes), medical history, and lifestyle choices (Nikkanen, 2005). Physiological changes linked with aging occur in all organ systems (Boss & Seegmiller, 1981).

Aging is defined as the chronological time of a person, or the number of units between birth and the time of observation (Spirduso et al., 2005, p. 4). Primary aging refers to chronological maturation of an individual, and secondary aging is a process that includes the primary aging coupled with the effects of disease and the environment (Spirduso et al., 2005, p. 5; Whitbourne & Whitbourne, 2010). Nonetheless, disease and accidents can alter the rate of aging or deterioration (Spirduso et al., 2005, p. 5). Spirduso et al. (2005, p. 5) classified the aging of humans in the later years as "young-old," "old," "old-old," and "oldest-old." Young-old is considered 65 years of age to 74; old is categorized as 75 years of age to 84; old-old is categorized as 85 years of age to 99; and oldest-old is 100 years of age to death. For the purpose of this study the researcher will refer to older adults as individuals 65 years of age and older.

The Problem of Falls Associated with an Aging Population

The problem of community-dwelling older adults falling and the consequences associated with those falls are significant. Källstrand-Ericson, & Hildingh (2009) noted that fall injuries are a major problem, and all Organization for Economic Cooperation and Development countries have reported an increased older population with falls. Unintentional injuries are the fifth leading cause of death among older adults (Rubenstein, 2006).

Falls are a primary cause of injury-related deaths and nonfatal injuries in persons over the age of 65. An estimated one in three people over the age of 65 falls at least one time per year (Hausdorff et al., 2001; Fredrikson, 2004). Falls are common events for a third of community-dwelling people over 65 each year (American Geriatrics Society; British Geriatrics Society and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001; Hornbrook, et al., 1994). Furthermore, researchers noted that older adults are at risk of experiencing a second fall within six months of their first fall (Hausdorff et al., 2001; Hornbrook et al., 1994; Kannus et al., 1999).

The rates of falls and complications associated with falling steadily rise with age and roughly double for persons aged 75 years or older (Rubenstein, 2006). Several studies noted that 50% of community-dwelling older adults over 80 years old, fall each year, and half will fall a second time within a year (O'Loughlin, Robbitaille, Boivin, & Suissa, 1993; Blake et al., 1998).

Falls often lead to injury of the older adult or possible death. Moderate to severe injuries, such as contusions, hip fractures, or head traumas are experienced by 20% to 30% of people who suffer a fall (Alexander, Rivara, & Wolf, 1992; Sterling, O'Connor, & Bonadies, 2001). Forty-six percent of traumatic brain injuries that result in the death of older individuals are directly related

to falls (Stevens et al., 2006). Bell, Talbot-Stern, & Hennessy (2000) reported that the majority of fractures experienced by older adults are caused by falls.

The death rates from falls among older men and women have increased over the past decade (CDC, 2010). Ninety percent of hip fractures among adults aged 65 and older occur secondary to a fall, and one in five hip-fracture patients die within one year of their injury (CDC, 2010).

Older adults falling is not only associated with risk of injury or possible death, but also has financial consequences. Stevens et al. (2006) reported that in the year 2000, 63% of nonfatal injury costs were for hospitalizations; 21% were for emergency room visits, and 16% were for treatment in outpatient medical facilities. Fall-related medical costs for older adult women were 2.3 times higher than for older adult men, for all medical treatment settings. Stevens et al. (2006) also reported that in the year 2000, fall-related fractures accounted for 35% of nonfatal injuries among older adults.

Falling and Associated Injuries Experienced by Older Adults

Falling among community-dwelling older adults presents a significant problem. Numerous researchers have studied the phenomenon of older adults falling. Several studies address the personal costs secondary to the community-dwelling older adult falling and the impact that falls have on the healthcare system.

Falls often account for increased morbidity and mortality rates among older adults (Rubenstein, 2006). Falls are the leading cause of injury-related death and nonfatal injuries and the fifth leading cause of death in older individuals (Alexander et al., 1992; Hornbrook et al.,

1994; Rubenstein, 2006). A study by O'Loughlin et al. (1993) revealed that the incidence rate for falls was 41.4 falls per 1,000 persons.

The majority of fractures experienced by older adults are caused by falls (Bell et al., 2000; Cooper, Campion, & Melton, 1992). Over 95% of hip fractures are caused by falls (Stevens & Sogolow, 2005). Hip-fracture rates increase exponentially with age; individuals 85 years or older are approximately 10 to 15 times more likely to sustain a hip fracture than those 60 to 65 years of age (Samelson, Zhang, Kiel, Hannan, & Felson, 2002; Scott, Dukeshire, Gallagher, & Scanlan, 2001). Wolinsky, Fitzgerald, & Stump's 1997 study assessed the independent effect of hip fracture on mortality and hospitalization, and notes a significant relationship between hip fracture and increased mortality. Furthermore, hip fractures significantly increased the likelihood of subsequent hospitalization (Hall, Williams, Senior, Goldswain, & Criddle, 2000; Wolinsky, Fitzgerald, & Stump, 1997). Magaziner et al. (1989) published data from a report prepared by Baltimore hospitals between 1984 and 1986, that revealed 17.4% of older adults died within 12 months of fracturing a hip.

Traumatic brain injuries (TBI) are another identified injury related to falls. Falls are a principal cause of TBI among older adults (Jager, Weiss, Coben, & Pepe, 2000; Luukinen et al., 2005). Luukinen et al. (2005) study found that fall-related TBI was associated with dementia, and suggests that TBI may accelerate the onset of dementia.

Falls and associated instability can be markers of poor health and declining function (Tinetti, Doucette, Claus, & Marottoli, 1995). In 2010, unintentional injury was the ninth leading cause of death and falls were responsible for 52.4% of the unintentional deaths in persons 65 years of age and older (National Center for Injury Prevention and Control, 2012b).

Nachreiner, Findorff, Wyman, & McCarthy (2007) described the circumstances related to falling reported by community-dwelling older women, and the consequences related to those falls. The majority of falls happened in or around the home and usually occurred during the daytime, while individuals were performing functional activities, such as walking, carrying objects, reaching, or leaning. The experience of falling by an older adult frequently limits participation in normal activities of daily living (Shumway-Cook, Ciol, Hoffman, Dudgeon, Yorkston, & Chan, 2009). Older individuals frequently grab for furniture or other objects to maintain stability while walking (Christiansen & Juhl, 1987). The 2008 study by Roe et al. reported that those persons who reflected on their fall and endeavored to understand why and how it occurred developed strategies to prevent future falls and continued with normal activities of daily living. Individuals who did not reflect on their fall or attempt to understand why it occurred restricted their activities.

On average, female older adults fall more frequently than their male counterparts (De Rekeneire et al., 2003). Statistics indicated that the annual rates of nonfatal injuries for older adult females were approximately 48.4% higher than the rates for older adult males (CDC, 2008a). Older adult females accounted for approximately 75% of hip fractures of older adults admitted to the hospital (CDC, 2008b). However, researchers indicated that fall-related deaths were higher for older adult males compared to older adult females (De Rekeneire et al., 2003; Hornbrook et al., 1994).

Costs Associated with Fall Injuries

The phenomenon of an increasing population of older adults with disabilities presents a significant concern that will affect the U.S. healthcare system. Numerous predictions have been made about the aging segment of baby boomers and their potential impact on the healthcare

system (Spirduso et al., 2005, p. 6), and many concerns have been raised regarding the impact of falls on the federal budget, state budgets, and the overall economy (Hussain & Rivers, 2009).

The aforementioned predictions for growth of the older adult segment of the United States combined with age-related physiological changes presented a noteworthy concern. The incidence of falls, fall-related injuries, and fall-associated costs continue to rise along with the increase in the aging population (Costello & Edelstein; Stevens et al., 2006). Fall-related injuries are the most costly category of injury among older adults (Rizzo et al., 1998). Older individuals who experienced a fall commonly had larger healthcare utilization costs than non-fallers for the year 2002 (Rubenstein et al., 2004; Shumway-Cook et al., 2009).

Community-dwelling older adults do not always discuss their fall with a healthcare provider. Approximately half reported not receiving follow-up services related to the evaluation and management of risk factors for falls (Shumway-Cook et al. 2009). Kannus, Sievänen, Palvanen, Järvinen, & Parkkari (2005) noted that only 20% of older adults seek immediate medical attention after experiencing a fall.

The National Center for Injury Prevention and Control reported that, in 2009, emergency departments treated 2.4 million nonfatal fall injuries; approximately 28% of these patients had to be hospitalized. In 2010, the direct medical cost of falls, adjusted for inflation, was $30 billion (National Center for Injury Prevention and Control, 2012a). The direct medical cost of falls were projected to increase to $43.8 billion by 2020 (NCIPC, 2013).

Costs associated with falling go beyond the monetary expenditures and the burden on the healthcare system. Fall-related injuries and the costs associated with them also affected the community-dwelling older adult's quality of life and ability to live independently (Arfken et al.,

1994; Fletcher & Hirdes, 2004; Legters, 2002; Zijlstra et al., 2005). Fear of falling leads individuals to avoid activities that they are still capable of performing and participating in, such as exercise (Tinetti & Powell, 1993), and, also, to a reduced quality of life (Murphy, Williams, & Gill, 2002; Weaver, 2008).

Risk Factors Associated with Falling

The phenomenon of falling experienced by older adults is complex but largely can be prevented (Nachreiner et al, 2007). Falls are often caused by a combination of intrinsic and extrinsic factors (Bueno-Cavanillas. Padilla-Ruiz, Jiménez-Moleón, Peinado-Alonso, & Gálvez-Vargas, 2000; Campbell, Robertson, Gardner, Norton, & Buchner, 1999; Hutton, 2000; Källstrand-Ericson & Hildingh, 2009; Nachreiner et al., 2007; Pountney, 2009; Rubenstein, 2006; Tinetti et al., 1988). Tinetti et al. (1994) suggested addressing not only strength issues related to falling, but also issues such as medication and other factors present that may increase the chance of falling.

Spirduso et al. (2005) stated that falls may be attributed to age-associated changes or disease-related changes occurring within the older adult or to external hazards such as environmental hazards in the home or community. Risk factors occurring within the older adult, which are due to internal or individual factors, are defined as intrinsic risk factors, and external hazards are defined as extrinsic risk factors (Fredrikson, 2004; Lord, Sherrington, & Menz, 2001; Tideiksaar, 2009).

Tinetti and Speechley (1989) looked at over 60 studies of risk factors for falls and identified over 25 risk factors. Their literature review noted a linear relationship between the number of risk factors a person has and the probability for experiencing a fall. Sherrington,

Menz, and Close (2007) reviewed the evidence-based literature and noted risk factors that are supported by strong evidence of association with risk for falling. These noted risk factors included advanced age, mobility limitations, history of falls, impaired transfer ability, altered gait, poor visual contrast and depth perception, decreased peripheral sensation, reduced muscle strength, poor reaction time, fear of falling, and multiple medical factors ranging from impaired cognition to a number of chronic diseases.

Other risk factors included use of assistive devices, use of certain medications, use of multiple medications (polypharmacy), use of alcohol, and hazardous behaviors (AGS, 2001; Connell, 1996; Fink, Hays, Moore, & Beck, 1996; Mukamal et al., 2004; Pountney, 2009; Tinetti, Speechley, & Ginter, 1988). Rubenstein's 2006 study noted that most falls in older adults are associated with one or more identifiable risk factors, such as weakness, unsteady gait, confusion, and certain medications.

Intrinsic Risk Factors

Many falls that occur among older adults are caused by medical factors that go beyond nonspecific accompaniments of aging. Older adults with chronic illnesses have higher rates of falls than do healthy older adults (Tinetti, Williams, & Mayewski, 1986). Numerous researchers have addressed the association of chronic and acute illness and disease with an increased risk of falling. Lawlor et al. (2003) stated that an older individual may have an increased risk of falls through direct and indirect effects of chronic disease. Noted indirect effects of chronic disease may include diminished physical activity, muscle weakness, and poor balance. Other disease processes or conditions with indirect effect on falls include osteoporosis, dementia, perceptual

difficulties, insufficient amount of subcutaneous tissue (which exposes bone to injury when falling), sensory or motor conditions, and decreased reflexes (Weaver, 2008).

Chronic Illness. Chronic diseases commonly observed in older adults, such as cerebrovascular accidents, Parkinson's disease, osteoarthritis, and conditions associated with cardiovascular disease, could potentially increase the risk of falling among older adults (Dolinis, Harrison, & Andrews, 1997; Lipsitz, 1985; Maire, 1992). Forty percent of people who suffer a cerebrovascular accident experience a fall within a year of the event (Lamb, Ferrucci, Volapto, Fried, & Guralnik, 2003).

Osteoarthritis is a progressive and degenerative disease of the joints that increases risk for falling among older adults (American Geriatrics Society [AGS], 2001; Sherrington et al., 2007). Older adults with osteoarthritis have more than twice the risk for falling (AGS, 2001). Older adults with osteoarthritis presented with diminished standing balance scores and an increased risk of tripping over obstacles (Pandya, Draganich, Mauer, Piotrowski, & Pottenger, 2005). Osteoarthritis affects more than 50% of older adults aged 65, and 70% of adults 75 years of age or older (Verbrugge, Gates, & Ike, 1991; Verbrugge, Lepkowski, & Konkol, 1991).

Osteoporosis is a disease of the bone in which bone mineral density is reduced and the bone is weakened (Spirduso et al., 2005, p. 75), which, consequently, increases the risk for fracture. Da Silva et al. (2010) evaluated "the relationship between falls among older adults' muscle strength, flexibility, and balance and the occurrence of falls in postmenopausal women with and without osteoporosis." Results indicated that 51% of women with osteoporosis had a history of at least one fall within the previous 12 months compared to only 29% of the women without osteoporosis.

Orthostatic (postural) hypotension is a common problem among older adults. This condition is concomitant with significant morbidity and mortality (Gupta & Lipsitz, 2007). Orthostatic hypotension can be acute or chronic in nature and is associated with excessive loss of fluid, use of certain medications, and cardiovascular or neurological factors (Gupta & Lipsitz, 2007). The condition affects 5% to 30% of older adult patients (Lipsitz, 1989; Mader, 1989). A sudden drop in blood pressure can put the adult at risk of falling secondary to the sudden lowering of blood pressure, which occurs with a change of position, such as moving from a sitting to stand posture. Clinical symptoms of orthostatic hypotension present as dizziness or syncope when the person changes position (Jevon, 2001).

Diseases of sensory input contribute directly to an older adult's risk of falling (Lord, Sherrington, Menz, & Close, 2007). Sensory systems that contribute to balance and locomotion include vision, somatosensory system, and vestibular system (Spirduso et al., 2005). These systems work together to provide information that is utilized for maintaining good postural control. Any disruption of these systems will predispose an older adult to an increased risk of falling (Wolfson, Whipple, Amerman, Kaplan, & Kleinberg, 1985).

Wolfson et al. (1985) outlined the following functions of the sensory system's contribution to balance and locomotion: Vision is used to determine the arrangement of the surrounding environment, detect the position of limbs relative to other limbs, position of the body relative to surrounding objects in space, and for navigating while moving around an environment, anticipating surface changes, and avoiding obstacles during locomotion. Somatosensation provides information about spatial position and movement of the body relative to the support surface, and movement of body segments relative to each other. Somatosensation also assists with maintenance of balance and navigation when vision is diminished or not

present. The vestibular system assists with position and movement of the head in space and assists in resolving sensory conflict (Spirduso, et al., 2005, p. 135).

Inattiniemi, Jokelainen, and Luukinen (2009) concluded that addressing concerns of an older adult's poor vision might reduce the risk of falls among older adult home-dwellers. Researchers noted that visual disturbances among adults 65 years and older are caused by glaucoma, macular degeneration, cataracts, and correctable refractive visual impairment (Anand et al., 2003). It is imperative that the vision of the older adult is addressed when considering risk factors for older adults falling. The visual system may compensate for an older adult's decreased proprioceptive input by identifying limb position using sight (Wolfson et al., 1985). The somatosensory system utilizes visual input for maintaining head and body stabilization (Brownlee, Banks, Crosbie, Meldrum, & Nimmo, 1989; Cromwell, Newton, & Forrest, 2002). Hearing also affects stability by the detecting and interpreting of auditory input that helps orient a person in space (Woolf, Kamerow, Lawrence, Medalie, & Estes, 1990).

Spirduso et al. (2005) referred to anticipatory postural control as one's ability to anticipate a perturbation and to reactive postural control as the ability to react to the perturbation. Cognitive system disruptions in attention can escalate risk for falling. Confusion that accompanies cognitive impairment may affect the older adult's ability to interpret sensory input and react to a perturbation (Sherrington et al., 2007; Spirduso et al., 2005).

Muscle Weakness and Postural Control. Age-related physiological changes in strength are a significant contributor to increased risk for falling (American Geriatrics Society; British Geriatrics Society and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001; Bonnefoy, 2004; Moreland, Richardson, Goldsmith, & Clase, 2004; Rose & Waters, 1998). Kronfol (2005) noted that the percentage of body fat increases with age and lean body

mass, including muscle, decreases with age. Impairment of the musculoskeletal system may have a negative effect on stability (Whipple, Wolfson, & Amerman, 1987). Loss of muscle mass can contribute to a decrease in an older adult's ability to perform activities of daily living and is a common risk factor associated with an increased risk for falling (American Geriatrics Society; British Geriatrics Society and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001).

Older adults often experience a decreased level of function and an increased risk of falling, secondary to a physical decline in general fitness. Tinetti et al. (1994) proposed that the number of falls can be reduced by screening individuals, identifying risk factors, and addressing those risk factors. Lewis and Bottomley (1994) described the following as functional limitations associated with increased risk of falling: decreased range of motion, decreased muscular strength, decreased joint mobility, coordination problems, and gait deviations. In addition to functional limitations are medical and other physiological issues that can increase the risk of falling.

Lack of physical activity and exercise can lead to disability and decreased function. Disuse of muscles, rather than disease, results in significant disability related with old age (Lowton, Laybourne, Whiting, Martin, & Skelton). Community-dwelling older adults at risk of falling would benefit from directed group exercise to improve function (Fujisawa et al., 2007). Guralnik, Ferrucci, Simonsick, Salive, and Wallace (1995) found that disability and physical performance measures of nondisabled older adults were related to measures of lower-extremity function. Their study indicated subsequent disability was related to lower scores of lower-extremity function. Smith, Winegard, Hicks, and McCartney (2003) conducted a five-year study of three groups of older adults: two groups who received exercise, and the control group who did

not receive exercise. Older adults in the control group displayed significant decreases in dynamic strength as compared to older adults who received exercise.

Sherrington et al. (2008) conducted a meta-analysis to review the effects of exercise on preventing falls among older adults. Their study discussed the implications of decreased strength and an increased risk for falling. Findings of the study revealed that older adults who experienced a hip fracture, presented with weakness of the quadriceps and increased postural sway.

Vandervoort and Hayes (1989) study summarized the contractile properties of the ankle plantarflexor muscles. The contractile properties were compared between groups of young women and older women. Results were consistent with previous reports that indicated diminished strength and speed of contraction occur in elderly muscle. Vandervoort and Hayes concluded that the aged plantarflexor muscles displayed significant impairment in the ability to generate stabilizing torques about the ankle joint.

Results of the Volpato, Leveille, Blaum, Fried, and Gurlanik (2005) study highlighted the significance of declined strength, function, and fitness, often found in older adults who experience illness. Volpato noted that an increased risk of falling exists among disabled older women with diabetes, independent of recognized fall risk factors. Results of the Volpato study also indicated that pain issues, high body mass index, and poor lower-extremity performance were strong predictors of falling in the diabetic group of older women.

Sarcopenia is described as a condition associated with a loss of muscle mass and is accompanied with poor endurance, slow gait speed, and decreased mobility (Francesco et al., 2012). Moreland et al. (2004) summarized studies that examined muscle weakness and its

relationship to increased falls risk. Their meta-analysis concluded that the lower-extremity strength of older adults should be addressed and that muscle weakness, especially lower-extremity weakness, was a clinical risk factor for falling among the older adult population.

Many changes in function are related to a loss of muscular strength (Fiatarone, Marks, & Ryan,, 1990). Larsson, Grimby, and Karlsson (1979) suggested that decreases in strength begin in the 50 to 59 age range, and are not owing to decreased muscle mass, but a decrease in type II fiber area with increasing age. Vandervoort and Hayes (1989) indicated that there is decrease speed and strength of muscle contraction in the elderly. The aging process is associated with declines in muscle strength, power, and flexibility, as strength is estimated to decrease 20% to 40%, between 20 years of age and 70 years of age (Akima et al., 2001; Brandon, Boyette, Gaasch, & Lloyd, 2000).

Spirduso et al. (2005) noted that age-related intrinsic changes are inevitable, even in healthy, active older adults. The noted changes by Spirduso et al. (2005) impact the balance and mobility of older adults. Postural stability is a complex process that involves the rapid, automatic integration of information from the vestibular, somatosensory, visual, and musculoskeletal systems, in the presence of cognition, which includes attention and reaction time (Sherrington et al., 2007).

Parker, Baker. & Allman (2001) stated that mobility represents a key component in the functional and disability assessment of older adults because it is related to the maintenance of an older adult's autonomy and independence. King, Judge, and Wolfson (1994) conducted a study to determine if the functional base of support decreased with age in persons who had no clinical evidence of diseases that affect balance. Results indicated that functional base of support

decreases with age, in functionally independent community-dwelling adults who are free of clinical evidence of diseases that affect balance.

Balance and postural stability are maintained through a complex integration of multiple neurological systems (Muir, Berg, Chesworth, Klar, & Speechley, 2010; Spirduso et al., 2005). Postural stability involves the integration of sensory input, including vestibular, visual input, somatosensory input, and musculoskeletal systems (Horak, 2006; Sherrington et al., 2007). Any disruption in the ability of the older adult to process sensory input, accompanied by the aforementioned loss of muscle mass associated with aging will negatively impact postural stability.

Acute Illness. Scott, Peck, & Kendall (2004) suggested that acute infectious disease is associated with an increased risk of an individual falling. Infectious disease is often associated with the older adult feeling weak, fatigued, or dizzy. Older individuals who experience acute illness and continue to participate in normal daily activities may have an increased risk for falling (O'Loughlin et al., 1993).

Other medical conditions such as bladder dysfunction, predispose the older adult to looming home hazards while ambulating to and from the toilet (Van Kerrebroeck et al., 2002). Nocturia, which is excessive urination at night, can result in daytime sleepiness. Disrupted sleep, secondary to nocturia, can result in a loss of energy or attentiveness and predispose older adults to an increased risk of falling during the day (Eustice & Wragg, 2005).

Associated Psychological Fall Risk Factors. Four commonly studied fall-related psychological issues are fear of falling (Sherrington et al. 2007; Tinetti, Richman, & Powell, 1990), falls-efficacy (Tinetti et al., 1990), balance confidence (Fortinsky, Panzer, Wakefield, &

Into, 2009; Powell & Myers, 1995), and feared consequences of falling (Yardley & Smith, 2002). Sherrington et al. (2007) also noted that impaired selective attention and risk taking are related psychological risk factors for falling.

Fear of falling is recognized as both a cause and consequence of falls among older adults (Miller et al., 2003). Fear is known as a potentially debilitating intrinsic risk factor (Arfken et al., 1994; Harding & Gardner, 2003) and a predictor of falls (Kloseck et al., 2007). Fear of falling is defined as "a lasting concern about falling that leads to older adults avoiding activities that they remain capable of performing" (Tinetti & Powell, 1993, p. 36). Fear of falling is frequently a cause of inactivity of an older adult and is seen commonly in individuals who have previously experienced a fall. Older individuals will often grab for furniture or other objects to maintain stability while walking, secondary to their fear of falling (Christiansen & Juhl, 1987; Lee, 2008).

Roe et al. (2008) study examined the experiences of older adults who suffered a recent fall and offers possible considerations that could add to service development. Development of strategies to prevent future falls and continue with normal daily activities resulted when older adults considered how and why they had fallen (Roe et al., 2008). Fortinsky (2010) stated that fall-efficacy screening may assist in fall-prevention program referral decisions. Austin, Devine, Dick, Prince, & Bruce (2007) noted that early intervention may be beneficial for the prevention of fear of falling.

Fear of falling may be a rational concern that reflects the older adult's recognition of their reduced functional status or in some situations, the older adult may overestimate their lack of ability to perform functional activities secondary to a fear of falling that is irrational (Delbaere, Close, Brodaty, Sachdev, & Lord, 2010). Nonetheless, fear of falling is noted as a

concern that should be addressed (Arfken et al., 1994; Harding & Garner, 2003; Kloseck et al., 2007).

In one study older adults who did not reflect on how their fall occurred restricted their activities and remained in fear of falling. Weaver (2008) stated that a consequence of fear of falling again may reduce the probability that an older adult will "participate in beneficial activities such as exercise, isolation lack of social contact, decreased quality of life, changes or adaptations to lifestyle or daily routines, loss of confidence, increased anxiety distress."

Older adults' fear of falling needs to be evaluated (Legters, 2002), as early intervention may be beneficial for the prevention of an older adult's fear of falling (Austin et al., 2007). Inattiniemi et al. (2009) study concluded that addressing feelings of anxiety, nervousness, or fear may be helpful in preventing falls among the most elderly home-dwellers.

Associated Medication Fall Risk Factors. Researchers have indicated that taking certain medications or combinations of medications may increase an older adult's risk for falling. Older adults take more medication than the general population and have an increased risk for drug-interaction effects (Dorman Marek & Antle, 2008). Tinetti et al. (1994) suggested addressing the older adult's use of medications, as well as other risk factors that may contribute to an increased risk of falling. Certain classes of medications and the number of medications taken contribute to the falls risk of older adults (Ray, Griffin, & Shorr, 1990). Medications associated with elevated fall risks include antidepressants, antipsychotics, antihypertensive medications, cardiac medications, analgesics, antihistamines, and gastro-intestinal-histamine antagonists (Allain et al., 2005; Thapa, Gideon, Cost, Milam, & Ray, 1998).

Older adult's use of multiple medications (Polypharmacy) increased their risk of falling (Källstrand -Ericson & Hildingh 2009; Pountney 2009). Older adults have an increased occurrence and severity of health problems, usually resulting in an increased use of medication (Rosenberg & Moore, 1997). Researchers indicated that using three or more medications increases the older adult's chances for falling (Leipzig, Cumming, & Tinetti, 1999; Tinetti et al., 1994). Another study by Robbins et al. (1989) indicated that taking four or more medications and changes in dose are associated with an increased risk of older adults falling. Wilson et al. (2007) reported that 41% of older adults reported take five or more prescription medications.

Rhalimi, Helou, & Jaecker (2009) conducted a study to identify medications that may increase the risk of falls of older adults who were recently hospitalized. The study indicated that the use of Zolpidem, a medication used to treat insomnia and meprobamate, an anti-anxiety medication and calcium channel antagonists, which are often used for hypertension, were associated with an increased risk of falling in recently hospitalized patients aged 65 years and older.

Darowski, Chambers, & Chambers. (2009) noted that antidepressants may contribute to an older adult's risk of falling. Antidepressants may cause sedation and impaired reaction times, impaired balance, insomnia, orthostatic hypotension, and cardiac function disturbance, which may increase an older adult's risk of a falling.

Inattiniemi, Jokelainen, & Luukinen (2009) concluded that the prevention of falls among community-dwelling older adults should include appropriate attention to their use of antipsychotic drugs. Cummings, Robin, & Black (1998) indicated that older adults 65 years of age and older that take psychotropic medications appear to have two times the risk of falling

compared to those not taking psychotropic medications. Trials have demonstrated that a gradual withdrawal of psychotropic drugs is associated with a decreased risk of older adults falling (Lawlor et al., 2003).

Medications used for the treatment of cardiac conditions may escalate the risk of older adults falling (Podrid, 1991) Antihypertensive medications may cause side effects of orthostatic hypotension, dizziness, reduced mental alertness, and fatigue that may increase the risk of older adults falling. The use of diuretics was the only antihypertensive medication that appeared to increase independently the risk of an older adults falling (Leipzig et al., 1999). The use of diuretics may increase the risk of falling, secondary to adverse effects of dehydration, electrolyte imbalances, and the urgency to rush to the bathroom.

Researchers have not associated non-steroidal anti-inflammatory drugs (NSAIDS) to having an increased risk of falling (Ray et al., 1990), but state that NSAIDS might have a relationship with an older adult's disease state. Tinetti et al. (1994) noted one study that indicates the use of NSAIDS, cardiac, and psychotropic medications in combination increase the risk of falling compared to those not taking this particular combination of medications. Nonetheless, medications and combinations of medications taken appear to be a concern that needs to be addressed when considering risk factors for an older adult's falling. Inattniemi et al. (2009) concluded that the appropriate use of antipsychotic drugs may help decrease the risk for falls of community-dwelling older adults.

Risky Behavior. Braun (1998) conducted a study of community-dwelling older adults' perceptions of falling as a health problem. Braun indicated that older adults perceived falls to be preventable and understood the risk of falling, but did not deem themselves as susceptible to

falling. Fortinsky, Panzer, Wakefield, and Into (2009) conducted a study that examines older adults' balance confidence. Results indicated that between 26% and 42% of adults, 62 years of age or older with a fall history sampled were non-steroidal overconfident, whereas 10% were classified as timid.

Researchers indicated that engaging in risky behaviors may contribute to an increased risk for falling (Braun, 1998; Connell, 1996; Nachreiner, Findorff, Wyman, & McCarthy2007; Scott, Dukeshire, Gallagher, & Scanlan, 2001; Tinetti, Speechley, & Ginter, 1988). Kloseck, Crilly, and Gibson (2008) noted that some older adults will take more risks than others will, in order to accomplish what they perceive as important. Other older adults may accept their limitations and adjust their activities, whereas others may overreact and accept their dependency.

Tinetti et al. (1988) conducted a one-year study of 336 community-dwelling older adults, who were at least 75 years of age. The study results indicated that hazardous behaviors accounted for approximately 5% of all falls, and that older adults may attempt to perform activities without being aware of their strength, balance, or physical abilities.

Engaging in activities beyond one's physical ability, lack of attention to surroundings, and improper use of assistive devices are behaviors that increase an older adult's risk for falling (Connell, 1996; Scott et al., 2001). Other examples of hazardous behaviors related to older adults falling are wearing inappropriate footwear, such as loose fitting shoes, shoes with slippery soles, shoes with high heels, or shoes with thick soles; carrying objects in both hands; rushing; reaching for objects navigating in a dark room; and attempting to don or doff pants in a standing position with inadequate balance (Connell, 1996; Nachreiner et al., 2007; Scott et al., 2001). Nachreiner

et al. (2007) emphasized the importance of an older adult's need for an increased awareness of risks, including behavioral risks.

Falls Risk and Assistive Devices. Researchers have indicated that the use of an assistive device, such as a cane or wheeled walker, may benefit the older adult, but it can also present a potential fall risk for the older adult (Bradley& Hernandez, 2011). Assistive devices, such as canes, crutches, and walkers, can be used to increase a patient's base of support, to improve balance, and to increase activity and independence. Bradley and Hernandez (2011) stated that the older adult should be properly fitted for an assistive device, and receive proper instruction on the use of the device.

Tideiksaar (2009) stated that assistive devices and wheelchairs may contribute to falls. An older adult is at an increased risk of falling with the improper use of a wheel chair. Examples of risk associated with wheel chair use are improper transfers and forgetting to lock the wheel brakes when sitting down or standing up (Tideiksaar, 2009). Assistive devices such as canes or wheeled walkers pose risks that occur secondary to improper use of the device or incorrect sizing of the device (Tideiksaar, 2009).

Some older adults may view the use of an assistive device positively as a mechanism to regain or maintain independence, or negatively as a sign of lost function and independence (Gitlin, 1995). Phillips and Zhao (1993) listed common factors for the abandonment of an assistive device, beyond the stigma of being a sign of loss of independence as lack of consideration for use of an assistive device, poor device performance, and change in the ambulatory needs of the older adult.

Risk Associated with Older Adults' Use of Alcohol. Alcohol consumption presents another potential risk factor for falls among older adults (Heuberger, 2009; Mukamal et al., 2004) Consuming 14 or more drinks per week has been linked with having an elevated risk of subsequent falls in older adults (Mukamal et al., 2004). Older adults' use of alcohol can be associated potentially with an increased fall risk for reasons other than intoxication and poor judgment. Alcohol associated risks may be due to multiple factors, such as impaired cognition, postural hypotension, dehydration, fatigue, or electrolyte disturbances (Soriano, DeCherrie, & Thomas, 2007).

Vestal et al. (1977) addressed fall risks associated with alcohol use and age-related physiological changes, such as decreased lean mass and decreased (body water) fluid volume. Decreased fluid volume presents a problem for the older adult who consumes alcohol since alcohol is distributed in body water and processed by the liver. Other age-related physiological changes that increase the effects of alcohol in older adults were decreased blood flow to the liver and slower renal clearance (Resnick, 2003). Keary et al. (2008) indicated that alcohol consumption has been associated with several adverse neurocognitive outcomes in older adults that could potentially increase an older adult's risk for falling.

Older adults having an increased number of comorbid conditions and increased use of medications, combined with alcohol consumption was described as another fall risk (Heuberger, 2009). A study by Pringle, Ahern, and Heller (2006) estimated that 77% of older adults take at least one alcohol-interactive medication.

Researchers cited the aforementioned risks with an increase in the population of baby boomers reaching their older adult years as a concern. Heuberger (2009) suggested that baby boomers have a prevailing belief that alcohol intake improves health. Prevalence of alcohol

consumption in older adults is expected to increase, because baby boomers are more likely to drink and are heavier drinkers than previous elderly cohorts (Patterson & Jeste, 1999).

Extrinsic Risk Factors Associated with Older Adults Falling

Christiansen and Juhl (1987) suggested that falls are not part of the normal aging process but occur secondary to underlying physical dysfunction, medications, and environmental hazards. Extrinsic risk factors for falling are found in and around the older adult's living environment. The majority of falls experienced by older adults occur in common surroundings, while performing normal daily activities (Tideiksaar, 2009).

Numerous researchers referred to extrinsic risk factors for falling as home hazards (Christiansen & Juhl, 1987; Northridge et al., 1995). Researchers noted that the majority of fall-related injuries among older adults occur inside the home (Kochera, 2002; National Safety Council, 2011; Starzell, Owens, Mulfinger, & Cavanagh., 2002; Tinetti et al., 1988). Tinetti et al., (1995) stated that among older community-dwelling adults who experienced a fall in the home, the majority were mobile, but unsteady on their feet.

Common examples of extrinsic risk factors include poorly fitting, slippery shoes; clutter on the floor; or inadequate use of an assistive device, such as a cane; slippery floors; and poor lighting (Speechley & Tinetti, 1991; Stevens et al., 2001; Thapa et al., 1996). Other noted extrinsic falls risk factors are loose rugs, raised doorways, shelves too low or high, pets, low toilet seat, lack of stair handrails, poor stair design, lack of bathroom grab bars, low bed or chair, and obstacles or tripping hazards (Unsworth & Mode, 2003).

Examples of fall-related activities associated with extrinsic factors may include tripping or slipping while walking, carrying heavy or bulky objects, transferring from one location or

position to another, or while ambulating up and down steps (Campbell et al., 1990; Ellis & Trent, 2001; Stevens et al., 2001;). Thapa et al. (1996) noted that falls among older non-ambulatory individuals have an increased probability of occurring during transfers or use of faulty or improperly fitting equipment. Ill health and moving around in an unfamiliar environment are also factors that increase the risk of falling among older adults (Nazarko, 2008, 2012).

Interventions to Prevent Falls

Researchers have addressed the topic of fall prevention, with studies ranging from the investigation of individual fall prevention plans to community-based programs, based on a single intervention and multifactorial interventions. Physical therapists can play a major role in the prevention of falls, to combat the potentially growing problem among community-dwelling older adults. Shumway-Cook et al. (2009) concluded that many health care professionals may be missing opportunities to provide information to older adults in regard to the prevention of falls.

Nazarko (2006) noted key points for fall prevention, including the evaluation of the older adult to identify risk factors and modify them whenever possible. The modification of risk factors has been found to improve the quality of life and diminish the risk of falling. The CDC (2012) recommendations for preventing falls among older adults included advice to exercise regularly, to review medications with a pharmacist or doctor, to visit the eye doctor one time per year at a minimum and to update their eyeglasses to maximize their vision, and to assess the older adult's living environment for potential environmental fall hazards.

Characteristics of successful fall-prevention interventions include identifying and addressing the older adult's fall risk factors. Tinetti et al. (1994) proposed that fall events experienced by older adults can be reduced by screening individuals, identifying risk factors

present, and addressing those risk factors. Successful fall-prevention programs involve a systematic fall risk assessment and targeted interventions Rubenstein (2006).

Bunn, Dickinson, Barnett-Page, Mcinnes, and Horton (2008) noted that fatalism, denial and underestimation of the risk of falling, no previous history of exercise, fear of falling, and negative health expectations are barriers to prevention interventions. Bunn et al. (2008) also indicated that low-intensity exercise, greater education, participation in decision making, and perception of the programs as relevant and life-enhancing facilitated participation, were all noted as facilitators for adherence to fall-prevention interventions.

Education of Community-Dwelling Older Adults. Effectiveness of an intervention depends on compliance of the older adult with the recommended fall-prevention strategies. Education regarding falls and the prevention of falls is of considerable importance when working with community-dwelling older adults. Shumway-Cook, Ciol, Hoffman, Dudgeon, Yorkston, and Chan (2009) conducted a study and found that 74% of older adults who had experienced a fall reported that their health care provider attempted to determine why they fell; 61% reported that their health care provider discussed preventing future falls. These results suggested that a significant number of older adults who fall are not discussing the event or prevention of falls with a health care provider. The results of the Shumway-Cook et al. (2009) study are troubling, since the success of fall-prevention interventions are essentially dependent upon the actions of the older adult and their families to implement suggested fall-prevention strategies (Tideiksaar, 2009).

Understanding how the older adult learns is of considerable importance when attempting to empower and educate the older adult and their family about fall-prevention strategies. Truluck

and Courtenay (1999) suggested that not all older adults are active learners, as was previously suggested in the literature, but with age, that some have a tendency to come to be more reflective and observational. Truluck and Courtenay conducted a study to ascertain how older adults prefer to learn, and to understand the relationship of gender, age, and educational level to these preferences. The study found that participants between the ages of 55 to 65 learn by feeling and doing; participants between the ages of 66 to 74 preferred learning by feeling and watching; and participants aged 75 or older preferred learning by thinking and watching.

Zurakowski, Taylor, and Bradway (2006) suggested that becoming a more effective patient educator involves knowledge of specific teaching strategies and understanding of the older adult's learning style. The physical therapist or health care professional should consider what the patient needs to know, what behaviors need to be changed, and assess the patients mastery of the information provided when planning and implementing an effective patient education program (Best, 2001). It is also crucial for the physical therapist or healthcare professional to ascertain the health literacy level of the older adult and to communicate health information using language that the patient can understand (Billek-Sawhney & Reicherter, 2005).

Community-Based Fall Prevention Interventions. Older adults may participate in community-based group interventions to prevent falls or receive individual one-on-one care, such as physical therapy. Robitaille et al. (2005) examined the effectiveness of a group-based exercise to improve balancing ability among older adults and concluded that structured, group-based exercise programs offered by community organizations are effective in improving balancing ability among community-dwelling older adults.

Older adults may have success in a community-based group exercise intervention to prevent falls, because of the support they find in relationships with other older adults. Social relationships and group cohesion appear to be key factors in determining exercise adherence of the typical senior adult. Social support from friends in a community is a significant predictor of older adult exercise adherence (Oka, King, & Young, 1995).

One example of a community-based fall-prevention intervention called "Stepping On" exemplifies the typical community-based fall-prevention program. The fall-prevention program "Stepping On" was designed to improve fall self-efficacy, encourage behavioral change, and reduce falls (Clemson, Cumming, Kendig, Swann, Heard, & Taylor, 2004). Components of the multifactorial community-based program addressed improving lower-limb balance and strength; home, community, environmental, and behavioral safety; encouraging visual screening and making vision corrections; and encouraging a review of medications. Clemson et al. conducted a study to determine the effectiveness of the "Stepping On" program and conclude that cognitive-behavioral learning in a small-group environment can diminish falls.

Intrinsic Fall Prevention Interventions. The screening and identification of intrinsic fall risks is of the upmost importance when developing and implementing fall-prevention interventions. Tinetti et al. (1994) suggested that preventative interventions that are likely to be effective in the reduction of falls include preventative programs that address comprehensive diagnosis and treatment of health problems. Fall risks that occur among older adults are caused by medical factors that go beyond nonspecific accompaniment of aging (Tinetti, Williams, & Mayewski, 1986). Therefore, addressing the identified fall risks would be ideal for developing the most effective intervention.

The physical therapist's screening of the older adult patient should include the recognition of cerebrovascular accidents, Parkinson's disease, osteoarthritis, and conditions associated with cardiovascular disease because those conditions can also potentially increase the risk among older adults (Dolinis, Harrison, & Andrews, 1997; Lipsitz, 1985; Maire, 1992).

Other disease processes of concern included osteoporosis (Spirduso et al., 2005, p. 75; Campbell et al., 2005; CDC, 2012; Da Silva, 2010), disease affecting sensory input (Spirduso et al,, 2005; Wolfson et al., 1985), vision (Anand et al., 2003; Brownlee et al., 1989; Cromwell et al., 2002; Inattiniemi et al., 2009), hearing (Woolf et al., 1990), postural control (Sherrington et al., 2007; Spirduso et al., 2005), changes in strength (American Geriatrics Society; British Geriatrics Society and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001; Bonnefoy, 2004; Moreland et al., 2004; Rose & Waters, 1998; Whipple et al.,1987), decline in general fitness (Lewis & Bottomley, 1994; Tinetti et al., 1994); acute infections (Scott et al., 2008), bladder dysfunction (Van Kerrebroeck et al., 2002), and nocturia (Eustice & Wragg, 2005).

The recognition of fear and the older adult's confidence to perform activities of daily living is of great importance when designing an intervention to prevent falls (Tinetti, et al., 1990). Other psychological concerns included falls-efficacy (Tinetti et al., 1990), balance confidence (Fortinsky et al., 2009; Powell & Myers, 1995), and feared consequences of falling (Yardley & Smith, 2002).

Withdrawal of antipsychotic medication in combination with an exercise program, resulted in a 66% reduction in fall risks (Campbell et al., 1999), which indicated that reviewing medications is of great importance in the planning of a fall-prevention intervention (Allain et al.,

2005; Cumming, 1998; Darowski et al., 2009; Inattiniemi et al., 2009; Källstrand-Ericson & Hildingh, 2009; Lawlor et al., 2003; Leipzig et al., 1999; Podrid, 1991; Pountney, 2009; Ray et al., 1990; Rhalimi et al., 2009; Robbins et al., 1989; Thapa et al., 1998; Tinetti et al., 1994).

Risky behavior presents another concern for the health care professional when designing a fall-prevention intervention (Braun, 1998; Connell, 1996; Fortinsky et al., 2009; Nachreiner et al., 2007; Scott et al., 2001; Tinetti et al., 1988). Proper use of assistive devices and properly fitting assistive devices should be addressed when planning a fall-prevention intervention (Bradley& Hernandez, 2011; Gitlin, 1995; Phillips & Zhao, 1993; Tideiksaar, 2009). The use of alcohol can put the older adult at risk for falling, and it may produce a synergistic effect with medications being taken by the older adult (Heuberger, 2009; Keary et al., 2008; Mukamal et al., 2004; Patterson & Jeste, 1999; Pringle et al., 2006; Resnick, 2003; Soriano et al., 2007; Vestal et al., 1977).

The aforementioned list of intrinsic fall risk factors recognizes the most common risk factors identified in the literature, but it is not exclusive of all risk factors that may exist. However, researchers recommended screening the individual to identify any potential risk factors present, so that the most effective fall-prevention strategy can be developed to lessen the risk of falling.

Exercise Versus Physical Activity. According to the National Institutes of Health Consensus Development Panel, physical activity is described as movement generated by skeletal muscles, requiring energy expenditure and producing general health benefits (1996). The NIH Consensus Development Panel described exercise as a type of physical activity, which is planned, systematized, and involves repetitive movement for the purpose of improving or

maintaining one or more components of physical fitness. Community-based exercise prevention programs or physical therapy interventions have the benefit of being structured and supervised by a trained professional. Programs that promote physical activity may be more advantageous than structured exercise interventions because fewer resources are required (Opdenacker, Delecluse, & Boen, 2011).

Limited studies were found that addressed promoting physical activity as an intervention to prevent falls. However, promoting physical activity does possess benefits that may make an older adult less likely to experience a fall. Promoting physical activity was shown to improve cardiorespiratory fitness and functional performance (Opdenacker et al., 2011). According to Sherrington et al., promoting physical activity in older adults enhanced the sleep of residents of an older-adult care facility, which may decrease the likelihood of an adult experiencing a fall (2007, p. 256). Other benefits of physical activity include decreasing the rate of bone loss and managing arthritis (CDC, 2011). Estabrooks, Glasgow, and Dzewaltowski (2003) stated that physical activity may also delay the onset of other potentially debilitating diseases, such as stroke. Brawley, Rejeski, & King (2003) noted that when promoting physical activity among older adults, program providers should consider the implementation of individualized programs that recognize barriers to older adults participating in physical activities.

Exercise-Based Fall Prevention. Numerous researchers have addressed the effects of aging on the strength and functioning of older adults. Larsson, Grimby, and Karlsson (1979) suggested that decreases in strength begin in the 50 to 59 age range and are not due to decreased muscle mass but a decrease in the type II fiber area that occurs with increasing age. The aging process is associated with decrements in muscle strength, power, and flexibility, as strength is estimated to decrease 20% to 40% between 20 years of age and 70 years of age (Akima et al.,

2001). Lowton et al. (2010) suggested that disability associated with old age is a result of disuse of muscles rather than disease. A review of the literature on exercise as an intervention to prevent falls and the benefits associated with counteracting the effects of disuse on the muscle atrophy of older adults supports the claim of Chang et al. (2004) that exercise is an effective intervention.

Exercise alone is an effective intervention to prevent falls (Chang et al., 2004). However, the benefits of exercise in the prevention of falls appear to be short-term in nature, thus if the exercise program is not continued on a daily basis. Brandon, Boyette, Lloyd, and Gaasch (2004) reported that a moderate-intensity resistive-training program is effective for increasing strength in older adults and that the strength gains are retained for the extent of the intervention. Recommendations for exercise that extend beyond normal physical therapy exercise should be recommended for older adults as a measure to decrease fall risks and improve geriatric comprehensive functions (Fujisawa et al., 2007).

Benefits of Exercise

Rose (2008) described three roles that exercise and physical activity play in regard to the functioning and fitness of older adults. Physical activity and exercise play a primary role in preventing the onset of disease and system impairments that lead to decreased functioning and increased risk of an older adult falling. The secondary benefits of exercise are that it retards the progression of disease and related impairments, and its tertiary benefits include restoration of function and improvement in activities of daily living.

Improved muscular strength, flexibility, coordination, balance, proprioception, reaction time, and improved gait occur with strength and balance training (Kannus et al., 1999). Brandon

et al. (2004) reported that a moderate-intensity resistive-training program is effective for increasing strength in older adults and that the strength gains are retained for the extent of the intervention. Several studies indicated that exercise was a successful intervention for preventing falls (Fujisawa, 2007; Hauer et al., 2001; Kalapotharakos et al., 2004; Hill, Moore, Dorevitch, & Day, 2008; Sherrington, Whitney, Lord, Herbert, Cumming, & Close, 2008; Waddington & Adams, 2004; Weerdesteyn, De Niet, Van Duijnhoven, & Geurts, 2008). Numerous studies indicated that exercise is successful in improving function and activity levels (Brandon et al., 2004; Binder et al., 2002; Fujisawa 2007; Guralnik, Ferrucci, Simonsick, Salive, & Wallace, 1995; Hauer et al., 2001; Marijke, Jong, Stevens, Bult, & Schouten, 2001; Silsupadol, Shumway-Cook, Lugade, Donkelaar,; Weerdesteyn, Nienhuis, & Duysens, 2008).

Marijke et al. (2001) reported that the main objective of functional strength exercise is to maintain or improve mobility and performance associated with normal activities of daily living. Exercises are designed in a functional manner, and they incorporate various movements in various planes. An example of a functional exercise is dual-task training, which is performing an exercise that requires the participant to perform two tasks simultaneously, such as standing on a piece of foam while throwing or catching a ball, or walking while carrying an object. Dual-task training was determined to be effective for improving the gait speed of older adults with impaired balance (Silsupadol et al., 2009).

Tai Chi is also noted as a common method of exercise-based fall-prevention intervention recommended in the literature. Harling and Simpson (2008) stated that evidence suggests that older adults participating in a Tai Chi program may reduce their fear of falling, but evidence is lacking for the use of Tai Chi to reduce the incidence of older adults falling (Harling & Simpson, 2008; Lin, Hwang, Wang, Chang, & Wolf, 2006; Waddington & Adams, 2004; Zijlstra et al.,

2007). Another study did indicate that Tai chi was not only effective in improving strength, but also effective in reducing the risk of falling in older adults that lived in a residential care facility (Choi, Moon, & Song, 2005).

Barriers and Facilitators to Exercise

Chang et al. (2004) indicated that exercise is the most successful single intervention to prevent falls among older adults. Understanding and addressing potential barriers to an older adult participating in exercise may help with the planning of an exercise intervention. The likelihood of an older adult complying and benefiting from a prescribed home exercise program may depend upon the amount of exercises that they are prescribed. Older adults may be overwhelmed if given too many exercises. Henry, Rosemond, and Eckert (1999) suggested that prescribing fewer exercises will improve the older adult's probability of having success with exercise.

Physical disabilities associated with chronic disease are often reported as barriers to exercise participation (Brawley, Rejeski, & King, 2003). Barriers to participation in exercise noted in the research include poor perceived health, lack of time, poor health, and pain and fear of pain (Clark, 1999a, 1999b; Hays & Clark, 1999; Lian, Gan, Pin, Wee & Ye 1999). Other noted barriers to exercise included poor advancing age, depressed affect, smoking cigarettes, lack of finances, increased body weight, and lack of transportation (King & King, 2010).

Marijke et al. (2001) suggested that older adults may have a cautious attitude toward exercise and may be more likely to not comply with prescribed exercise secondary to lack of supervision and social contacts. Factors that influence older adult exercise participation include good health status, advancing age, and cultural self-consciousness (Sin, LoGerfo, Belza, &

Cunningham, 2004). Lim and Chutka (2006) suggested that the focus of intervention should be placed on exercise and improving balance, and not on restricting risky activity. Schutzer and Graves (2004) reported that the physician plays a key role in initiating motivating older adults to participate in exercise.

Extrinsic Fall Prevention Interventions. Most older adults live in homes that have at least two probable fall hazards (Gill, Williams, Robison, & Tinetti, 1999). Circumstances surrounding falls experienced by the participants revealed that 62% of the reported falls occurred in or around the home during the daytime while performing tasks that involved walking, leaning, reaching, and carrying objects (Nachreiner et al., 2007). The majority of falls related to injuries among older adults occurred inside the home (Kochera, 2002; Startzell et al., 2002; Tinetti et al., 1988). Nachreiner et al. (2007) concluded that circumstances surrounding falls may be potentially modifiable through education, home hazard modification, exercise, and medical management.

Tse (2005) investigated the effectiveness of environmental modification as an intervention to prevent falls. Tse conducted a review of the literature from 1993 to 2004. Tse indicated that some evidence exists to support the use of environmental hazard removal or modification as an intervention to prevent falls among older adults, particularly in conjunction with multifactorial programs targeted toward older adults who have a history of falling.

Nachreiner et al. (2007) also concluded that circumstances surrounding falls may be potentially modifiable through education, home hazard modification, exercise, and medical management. Assessment for home hazards is often couple with other components of a multifactorial intervention program that includes other components, such as education on fall prevention, assessment by a physical therapist, and exercise (Diener & Mitchell, 2005.)

Environmental assessment and modification is often performed by a home health nurse, or a home health physical therapist. The home health nurse or physical therapist should assess and make recommendations for environmental risks identified in the older adult's home. Common environmental hazards that should be noted, including poorly fitting, slippery shoes; clutter on the floor; inadequate use of an assistive device, such as a cane; slippery floors; poor lighting (Speechley & Tinetti, 1991; Stevens et al., 2001; Thapa et al., 1996); loose rugs; raised doorways; shelves too low or high; pets; low toilet seat; lack of stair handrails; poor stair design; lack of bathroom grab bars; low bed or chair; and obstacles or tripping hazards (National Safety Council [NSC], 2011; Unsworth & Mode, 2003).

Multifactorial Fall Prevention Intervention. Multifactorial fall-prevention interventions are comprehensive in nature and include the combination of a variety of interventions. Successful fall-prevention programs involve a systematic fall risk assessment and targeted interventions (Rubenstein, 2006). Characteristics of successful fall-prevention interventions included identifying and addressing the older adult's fall risk factors (Gillespie et al., 2033; Tinetti et al., 1994).

The CDC recommendations for preventing falls among older adults included advice to exercise regularly, review medications with a pharmacist or doctor, visit the eye doctor one time per year at a minimum and update eyeglasses to maximize vision, and assess the older adult's living environment for potential environmental fall hazards (2012). Nachreiner et al. (2007) stated that circumstances' surrounding falls may be potentially modifiable through education, home hazard modification, exercise, and medical management. Nachreiner et al. indicated that a multifactorial, multidisciplinary fall-prevention program could be effective both in reducing the incidence of risk of falling in people over 75 and the number of falls sustained.

Review of the literature indicated that numerous studies support the use of multifactorial interventions (Campbell & Robertson, 2007; Costello et al., 2008; Diener & Mitchell, 2005; Gillespie et al., 2003; Hill, Moore, Dorevitch, & Day, 2008; Kannus et al., 1999; Rose, 2008; Tinetti et al., 1994; Worm, Vad,, Pugguard, Lauritsen, Kragstrup, 2001). O'Loughlin, Robitaille, Boivin, and Suissa (1993) stated that the content of each multifactorial intervention program varies between multifactorial fall-prevention studies.

Multifactorial fall-prevention interventions were effective for individual patients. However, targeted single fall-prevention interventions were not as effective, as multifactorial interventions in community programs designed for at risk populations (Campbell & Robertson, 2007). Multifactorial programs were discovered to be effective in the prevention of falls of those with previous fall history (Costello et al., 2008). Multifactorial interventions that include exercise as a key component may be appropriate for older adults with a high risk of falling (Rose, 2008). Another study by Diener and Mitchell concluded that a multifactorial prevention program was beneficial for frail older adults (2005).

Multifactorial intervention programs developed after a clinical fall risk-assessment appear to be effective in reducing falls, multiple falls, injuries secondary to falls, and in improving balance, mobility, and balance confidence in a high-fall-risk sample (Hill et al., 2008). Sor iano et al. (2007) stated that systemic reviews and meta-analyses demonstrate that multifactorial interventions prevent falls in cognitively intact older adults. Other studies indi cated that effective prevention of falls did not occur in cognitively impaired older adults (Jensen et al., 2003; Wilson et al., 2003).

Multifactorial interventions that included medication reduction resulted in a reduction in risks for falls for older adults (Gillespie et al., 2003). Multifactorial fall prevention programs are more likely to be successful because usually result from multiple risk factors (Campbell et al., 1999).

Researchers also indicated that multifactorial interventions were not always the most effective falls prevention intervention (Jensen et al 2003; Mahoney et al., 2007; Salminen et al., 2009; Vind, Andersen, Pedersen, Jorgensen, Schwarz, 2009). Mahoney et al. (2007) conducted a study with the objective of decreasing the rate of falls in high-risk community-dwelling older adults. Findings of the study demonstrate that a multifactorial approach was not successful in decreasing falls.

Shumway-Cook et al. (2009) noted that some participants refused physical therapy in Mahoney et al.'s study. Explanations for participants refusing physical therapy included difficulty traveling, worry about cost, and disbelief in its effectiveness. Mahoney et al. also reported inconsistency among physical therapists regarding the frequency, intensity duration, and duration of physical therapy needed to diminish falls. Shumway-Cook et al. (2009) suggested a need in the profession of physical therapy for consistent identification and implementation of fall management for physical concerns, such as decreased strength and impaired balance and gait, among older adults.

Vind et al. (2009) study of the effectiveness of an outpatient multifactorial fall-prevention intervention on the reduction of falls in high-risk older adults who experienced at least one injurious fall did not prove to be effective. However the study by Vind et al. (2009) excluded individuals who experienced a fall caused by external forces, alcohol intoxication, a person's not

living locally or being institutionalized, a lack of ability to walk, a terminal illness, impaired communication, or being diagnosed with dementia—which raises the question, would such an intervention be effective with those were excluded from the study had they been allowed to participate? The authors noted that one limitation of the study was that only 35.5% of those invited agreed to participate. Those who did participate were younger than, and not as likely to be hospitalized, as those who declined to participate. The authors also addressed the issue of adherence and the implications of an intervention being successful. If the participant does not adhere with the suggested intervention, then it is probable that the outcome will not reduce the identified risk factors associated with an increased risk of falling. Questions of the effectiveness and success of exercise interventions are dependent on factors outside the therapists control, such as compliance or adherence to the exercise plan prescribed (Campbell et al., 2005).

It should be noted that there are several limitations or difficulties in implementing multifactorial interventions to prevent falls among older adults, including the requirement of these programs for multidisciplinary health care professionals with different expertise and issues with coordination and reimbursement for services (Costello & Edelstein, 2008).

Summary of Interventions. In summary, managing falls should take a preventative approach that encompasses the wide range of contributing risk factors that relate to the older adults and the environments in which they live (Weaver, 2008). Successful fall-prevention programs should include a systematic fall risk-assessment and targeted interventions (Rubenstein, 2006). Most falls result from multiple risk factors. Therefore, it is assumed that multifactorial fall-prevention strategies will be most effective.

Research indicated that interventions addressing a single risk factor are as effective in reducing falls as interventions with multiple components (Campbell, 2007). The single most effective intervention to prevent falls is exercise (Chang et al., 2004). Other researchers suggested that multifactorial programs were not effective (Mahoney et al., 2007; Vind et al., 2009).

Questions regarding the limitations of studies on multifactorial interventions were raised by the authors themselves. Moreover, other studies indicated that multifactorial programs are effective in the prevention of falls of those with previous fall history (Costello et al., 2008). However, the success of an intervention hinges on the education and empowerment of the older adult to follow through and adhere to recommendations made by trained healthcare professionals (Shumway-Cook et al., 2009; Tideiksaar, 2009).

Physical Therapists' Role

The American Physical Therapy Association (APTA) defines the profession of a physical therapist in the document:

> "Today's Physical Therapists: A Comprehensive Review of a 21st-Century Health Care Profession," which states, "Physical therapists are health care professionals who maintain, restore, and improve movement, activity, and health enabling an individual to have optimal functioning and quality of life, while ensuring patient safety and applying evidence to provide efficient and effective care." (APTA, 2011)

Physical Therapists' Practice Settings

Typical work settings for physical therapists include the following:

1. Acute Care—provides physical therapy to individuals who are admitted to a hospital for short-term patient care for various reasons.
2. Sub-acute Rehab Care—practice settings include rehabilitation hospitals and sub-acute facilities. Rehabilitation Hospitals provide care to individuals who are admitted to a facility or rehabilitation unit. Sub-acute rehabilitation is provided to individuals who are admitted to a special hospital that provides medical and/or rehabilitation care.
3. Extended Care Facility/Nursing Home/Skilled Nursing—facilities provide care for individuals who are admitted to a facility that typically cares for elderly patients and provides long-term care.
4. Outpatient Clinic—provides care for individuals who visit a physical therapist in a clinic, office, or other health care facility.
5. School/Preschool—provides care on-site within an educational environment.
6. Wellness/Prevention/Sports/Fitness—provides care for individuals with a focus on wellness.
7. Home Health—provides care for the individual at their place of residence.
8. Hospice—provides care for patients in the last phases of incurable disease so that they may maintain functional abilities for as long as possible, and manage pain.
9. Industrial Rehab—provides care for individuals with a primary goal of helping them return to work.
10. Local, State, and Federal Government—provides care for patients associated with the Veteran's Health Administration (VHA), Department of Defense, and Indian Health Service (IHS).

11. Research Center—conducts research to improve patient/client care outcomes and support the body of knowledge in the field of physical therapy.

(Adapted: Physical Therapist Careers Overview [APATA], 2013)

Physical Therapists' Education and Licensure

Currently, licensed physical therapists hold terminal degrees ranging from a bachelor's degree to doctoral level degree (Graham, Burton, Little, & Wallace, 2011). The APTA "Vision 2020 statement" stated that the goal of the APTA is for physical therapy services to be provided by physical therapists that hold a doctor of physical therapy degree (APTA, 2012). According to the Commission on Accreditation in Physical Therapy Education (CAPTE), the majority of existing physical therapy education programs in the United States are authorized to award a doctoral level degree in physical therapy, as of to date. Upon graduation from an accredited physical therapy program, physical therapists are required to obtain licensure in the state for which they plan to practice (APTA, 2011).

Physical Therapists' Role Delineation

Physical therapists integrate five elements of patient care for the purpose of improving and restoring the function of their patient (APTA, 2009). The APTA guidelines statement noted elements of practice by the physical therapists including examination of the patient, evaluation of the patient, diagnosis, prognosis, and development and implementation of treatment interventions. A physical therapist's examination includes a review of the patient's history, systems review, tests, and measurements.

The APTA Guidelines for Practice noted that the physical therapists and patient interaction begin with an initial evaluation and examination of the patient. Initial evaluation and

examination of the patient includes a thorough review of the patient's history, systems review, and special tests and measurements. The physical therapist synthesizes the initial evaluation and examination findings to determine the diagnosis and prognosis (APTA, 2009). Following the initial evaluation, physical therapists establish short-term and long-term goals (O'Sullivan & Schmitz,1994) that meet the patient's desired goals and functional needs for restoration or maintenance of function (APTA, 2013, p.9).

Physical Therapists' Role as an Educator and Consultant

Physical therapists also function as educators and consultants (Ohtake, 2010). In addition to the aforementioned functions of physical therapists, Ohtake described additional key roles of the educator and the consultant. The role of being an educator provides an opportunity for the physical therapists to educate and inform patients about their conditions. Ohtake indicated that strategies can be taught by the physical therapist to improve the patient's physical functioning and suggest lifestyle changes to empower the patient to achieve their health care goals.

Research Utilization by Physical Therapists

Physical therapists are involved in scientific and research activities (Ohtake, 2010). Numerous researchers have addressed the use of EBP by physical therapists concerning the prevention of falls among older adults (Bridges et al., 2007; Jette et al., 2003; Miller, McKibbon, & Haynes, 2003; Salbach et al., 2007; Schreiber et al., 2009.). The innovation of using EBP is not new to physical therapy; nonetheless, therapists do not always use or seek evidence-based practice in the daily care of their patients. Fruth et al. (2010) indicated that physical therapists do not always use EBP or research for various reasons. Resistance to the adoption or utilization of EBP by physical therapists occurs for a variety of reasons (Schreiber & Stern, 2005).

Rogers's (2003) diffusion of innovations (DOI) examined how innovations are adopted. The phenomenon of how the innovation of using EBP research is adopted by physical therapists has been examined by several researchers (Bridges et al., 2007; Dijkers, Murphy & Kellerman, 2012; Fruth et al., 2010; Harting et al., 2009; Jette et al., 2003; Rivard et al., 2010; Salbach et al., 2007).

Diffusion of Innovation and Evidence-Based Practice

Kinnunen (1996) defined diffusion as, "the spreading of social or cultural properties from one society or environment to another." Diffusion of innovations as a theory was later developed and studied by Everett Rogers (Backer, 2005). Rogers (2003, p.5) defined diffusion as the process in which an innovation is communicated over time among members of a social system. Diffusion of innovations has developed into a theory that has broad application and that is researched and applied to a wide variety of fields examining how technology is either adopted or rejected (Wright & Bennetts, 2006).

APTA Guidelines for Practice described EBP as "access to, and application and integration of evidence to guide clinical decision making to provide best practice" (2012). Numerous researchers noted that EBP in the field of physical therapy is ever present in the research literature, but not always adopted by physical therapists for many reasons (Barnard & Wiles, 2001; Bridges et al., 2007; Dijkers et al., 2012; Fruth et al., 2010; Harting et al., 2009; Jette et al., 2003; Mikhail, Korner-Bitensky, Rossignot, & Dumas, 2005; Rivard et al., 2010; Salbach et al., 2007). Barriers is the common term used by researchers to describe why physical therapists do not adopt or use EBP in their daily clinical practice (Jette et al., 2003; Richter & Austin, 2012; Schreiber et al., 2009). This study will addressed the process of DOI in a context

specific to physical therapy. Innovation is one and the same as EBP supported by the physical therapy research literature.

Four main elements of DOI theory include the innovation, communication channels, time, and social system (Rogers, 2003). Communication channels denote the methods that the physical therapists use to receive information. Examples of communication channels may include peer-to-peer conversations (Robinson, 2011); literature search reviews; continuing education classes; and in-services (Stevenson, Phil, Lewis, & Hay, 2004). Time refers to the rate at which the physical therapists adopt the intervention. Adopting of the use of an innovation may occur on a personal level or an organizational level (Rogers, 2003, p. 22). Social system refers to the culture that exists within the profession of physical therapy, an individual clinic, or a healthcare organization.

Common characteristics of innovation include the relative advantage of the interventions, the compatibility of the interventions, and the complexity, triability, and observability of the interventions (Harting et al., 2009; Rogers, 2003). Does the physical therapist or organization perceive a new idea or use of EBP as possessing a relative advantage? Relative advantage refers to the perception that a new idea or use of EBP is better than the current practice. Compatibility describes the extent to which the intervention is consistent with the physical therapists existing knowledge and experiences. Complexity raises the question as to whether the use of EBP is practical or more difficult to implement and include in the in the physical therapists daily clinical practice. Observability of the use of EBP suggests that the physical therapist or organization observes results as affecting positively the daily physical therapists clinical practices and treatment of the patient. Rogers (2003, p.16) stated that observable and less complex ideas will be adopted more rapidly.

Categories of adopters described by Rogers were innovators, early adopters, early majority, late majority, and laggards (2003, p. 282–284). Innovators are those who are committed to trying a new idea (Robinson, 2011), or in the case of physical therapists using EBP. Early adopters tend to be entrenched in the local social system and promote innovations among their peers (Robinson 2011). An example of an early adopter within the physical therapy social system would be a "knowledge broker" of new ideas, treatments, or interventions that are evidence-based (Rivard et al., 2010).

Organizational use of "knowledge brokers" to disseminate ideas and research was addressed in a study by Rivard et al. (2010). Rivard et al. defined knowledge broker activities within an organization as promoting self-learning, assessing educational needs, presenting formal in-services, facilitating small-group discussions, and acting as a liaison with various stakeholders.

Rogers described early majority adopters as those who deliberately will eventually adopt new ideas (2003, p.283). Robinson (2011) described early majority adopters as those who are pragmatists and do not act without solid proof of benefits. Early majority adopters do not assume a leadership role in the DOI process (Rogers, 2003, p. 283).

Rogers described late majority adopters of an innovation as being skeptical and therefore usually unwilling to adopt an innovation until most within their social system have adopted an it (2003, p. 284). Robinson (2011) described late majority adopters as conservative pragmatists who do not take risks and do not feel comfortable with a new idea.

Lastly, laggards are described as those who will be the last group within a social system to adopt an innovation (Robinson, 2011; Rogers, 2003, p. 284). Laggards tend to operate based

on past experiences and are wary of change agents or knowledge brokers and their promotion of new ideas or research (Rogers, 2003, p. 284). Stevenson et al. (2004) stated that physical therapists rely on courses and in-services for information, rather than actively using the EBP research found in the literature.

Organizations involve key individuals that recognize the value and promote the use of EBP. The individual is often referred to as an opinion leader or change agent. Opinion leaders or change agents within an organization might be the management of a clinic or healthcare organization, or a physical therapist who is research savvy. Rivard et al. (2010) described the aforementioned opinion leader or change agent as a "knowledge broker" to describe physical therapists that promote EBP among their peers.

Rogers (2003, p. 28) described three different types of innovation decisions. Rogers defined optional innovation decisions as choices to adopt or reject made by an individual independent of the decisions made by the rest of members of a system. Collective innovation decisions are choices to adopt or reject an idea by consensus among members of a system. Authority innovation decisions are choices to adopt or reject innovations made by individuals possessing power, high social status, or technical expertise within a system.

The innovation decision process involves five stages: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003, p. 169). The first two stages (knowledge stage and persuasion stage) are mental in nature (Harting et al., 2009). Initially, the physical therapist is exposed to an innovation or use of EBP in their clinical practice, but lacks information. There is an increased awareness of the innovation (Harting et al., 2009) or use of EBP during the knowledge stage. Rogers termed the second stage of the innovation decision process as the

"persuasion stage" (2003, p.174–175), during this stage, the physical therapists considers the relative advantage, compatibility, complexity, triability, and observability of the use of EBP or the innovation (Harting et al., 209).

Harting et al. (2009) described the next three stages of the innovation process (decision stage, persuasion stage, and confirmation stage) as behavioral stages. The decision stage involves the physical therapists experiencing increased skills and trying the use the innovation or the EBP (Harting et al. 2009; Rogers, 2003, p. 177). During this stage the physical therapists or individual will adopt or reject the use of EBP or the innovation (Rogers, 2003, p. 177).

Rogers stated that the implementation stage occurs when an innovation is put to use (2003, p. 179). "Implementation" would be when the physical therapist decides to apply the use of EBP in their daily clinical practices. Harting et al. (2009) noted that previous positive experiences and social influences may facilitate the decision to implement or, in contrast, that perceived barriers might impede the processes of implementing an innovation.

Rogers described the confirmation stage of the adoption process as when the choice to use an innovation requires reinforcement for the innovation decision. The decision to adopt is not always the terminal stage in the innovation decision process (2003, p. 189), as sometimes the physical therapists may experience barriers or other reasons to reverse their decision to adopt the use of EBP.

Physical Therapists' Use of Evidence-Based Practice

Evidence-based practice applied to the clinical practice of physical therapists became a common topic of research interest since the mid-1990s (Schreiber & Stern, 2005). The APTA (2013) defined EBP as:

> "Access to, and application and integration of evidence to guide clinical decision making to provide best practice for the patient/client. Evidence-based practice includes the integration of best available research, clinical expertise, and patient/client values and circumstances related to patient/client management, practice management, and health care policy decision making. Aims of evidence-based practice include enhancing patient/client management and reducing unwarranted variation in the provision of physical therapy services."

According to Sackett et al. (2000), "EBP is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (p. 3).

Evidence-based practice researchers indicated that although many physical therapists view EBP as valuable, many are reluctant to utilize EBP in their daily clinical practice (Bridges et al., 2007; Jette et al., 2003; Salbach et al., 2007; Schreiber, Stern, Marchetti, & Provident, 2009). Physical therapists who are members of APTA, largely display a positive attitude regarding the value of EBP (Barnard & Wiles, 2001; Jette et al., 2003; Kamwendo, 2002; Salbach et al., 2007). Bridges et al. (2007) reported that physical therapists who have been licensed longer were less likely to adopt EBP and physical therapists with a higher degree of education were more likely to adopt EBP.

Salbach et al. (2007) reported that 78% of physical therapists in their study agreed that research findings are useful. Barnard and Wiles (2001) noted that physical therapists' viewed engaging in the activity of reading research literature as valuable. A study by Stevenson et al. noted that physical therapists reported mainly utilizing continuing education courses and in-service training for clinical practice information; whereas utilization of literature, research, and

journals appeared to be of low priority for physical therapists (2004). Some physical therapists viewed EBP as evidence, being facts from research, whereas other physical therapists view EBP as anecdotal evidence from clinical experience (Barnard & Wiles, 2001).

Physical Therapists Guideline for Falls Evaluation and Prevention

The American Physical Therapy Association published a "physical therapist's guide to falls." The guidelines suggested that physical therapists should address the patient's medical history, use of medications, vision, conduct a home safety assessment, screen the patient's abilities, check the patient's heart rate, take blood pressure measurements while the patient changes position (from sitting to standing), address footwear assessment and assess the patient for any nervous system disorders or disease. In addition to the aforementioned the guidelines suggested that the physical therapist measure leg strength, gait and balance (APTA, 2014).

The physical therapists should design a treatment plan based on the evaluation results, as well as, educate the patient on how to best manage their risks for falling. Fear of falling should also be addressed by the physical therapist and determination of what activities and exercises are safe for the patient to participate in should also be determined (APTA, 2014).

Physical Therapists Knowledge of Fall Risk Factors

Peel, Brown, Lane, Milliken, and Patel (2008) examined home health physical therapists knowledge and clinical practices regarding fall risk factors and interventions. Peel et al. (2008) study suggested that home health physical therapists are generally knowledgeable about fall risk and fall-prevention interventions. However, slightly less than half of the surveyed physical therapists did not link interventions with specific risk factors. Less than half of the physical

therapists in the study reported the practice of referring patients to other health care providers to address fall risk factors.

Ruchinskas, Macciocchi, Howe, and Newton (2001) examined rehabilitation professionals' capacity to identify risk factors for patient falls. Results of the Ruchinskas et al. study indicated that clinicians appeared mindful of predictors of fall risks, but required cueing to use them consistently. Ruchinskas et al. suggested that interdisciplinary teams would benefit from education regarding fall risk factors. Baetens, Peersman, and Cambier (2009) noted that physical therapists viewed falls as a threat that required risk screening and prevention. However, the physical therapists' perceptions of the need for screening were lower, and the actual implementation of screening even less.

Barriers to use of Evidence-Based Practice by Physical Therapists

Numerous researchers noted that physical therapists reported that lack of time was a common barrier to accessing EBP (Jette et al., 2003; Richter & Austin, 2012; Schreiber, et al., 2009). Jette et al.'s (2003) study examined physical therapists' beliefs, attitudes, knowledge, and behaviors toward the use of EBP. Results of the study indicated that 46% of the respondents reported lack of time was the most significant barrier to the use of evidence in practice and 67 percent of the respondents rated lack of time as one of the three most common barriers to using EBP. Salbach et al. (2007) reported that the majority of physical therapists have Internet access at work, but only 8 percent reported that they were allowed work time to search and analyze the literature.

Other barriers to physical therapists' use of EBP were lack of education, negative perceptions about research and physical therapists' role in EBP, and low self-efficacy to perform

EBP (Salbach et al., 2007). Another barrier to the use of EBP was that physical therapist reported the inability to utilize research findings with patients possessing unique characteristics as barriers (Jette et al., 2003). Bridges et al. (2007) suggested that the use of EBP interferes with patient care, and needs to be made more "user friendly."

The APTA 2010 vision statement "Vision 2020" noted that EBP is the access to, integrating and applying evidence to direct clinical decision making and provide best practice for the patient. According to Schrieber & Stern (2005) physical therapists use of EBP will not occur if physical therapists do not know or understand the evidence, do not have confidence in the evidence or know how to apply research findings.

Summary

A review of literature indicated that falls are a problem among community-dwelling older adults. Falling affects the lives of community-dwelling older adults and carries a significant financial burden. Injuries associated with community-dwelling older adults falling are predictable and largely preventable. Physical therapists play a key role in the treatment and prevention of falls among community-dwelling older adults. Numerous risk factors associated with community-dwelling older adults falling and interventions to prevent falls have been studied, as indicated by a review of the EBP research literature. However, physical therapists do not always utilize EBP research in their daily clinical practices. Diffusion of innovations theory addresses how an innovation is diffused within a social system or an organization and is either adopted or rejected. Physical therapists do not always adopt the use EBP research in their daily clinical practice for various reasons. The purpose of this study is to analyze the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults,

and their attitudes and beliefs of physical therapists' towards the use of EBP in the treatment of fall prevention, with patients who are community-dwelling adults aged 65 years and older.

CHAPTER 3

METHODS

This chapter outlines the protocol for implementing this study. Research design, theoretical framework, sample selection, data collection, instrumentation, pilot study, primary study, and data analysis are discussed.

Purpose of the Study

The purpose of this study was to investigate physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults, examine their attitudes and beliefs towards the use of EBP, and identify barriers to physical therapists' adopting the innovation of using EBP.

Research Questions

The following research questions were addressed using a descriptive cross- sectional research design:

1. What are the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?
2. What are the physical therapists' attitudes and beliefs towards the use of evidence-based practice?
3. Do differences exist among physical therapists' clinical practices about intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?

4. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?
5. Do differences exist among physical therapists' beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?
6. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level towards the use of evidence-based practice?

The researcher's hypothesis is that time, experience and exposure associated with years of physical therapy practice will have the greatest influence on clinical practice regarding intrinsic and extrinsic falls risk factors, and those with a higher PT degree will be more receptive to utilizing EBP.

Research Design

The research questions were addressed using a descriptive cross-sectional research design. Isaac and Michael (1997) define the purpose of a descriptive study is to describe an area of interest factually and accurately. Lauer (2006) stated that a cross-sectional study divides a population into subgroups for the purposes of comparison and drawing conclusions about the differences. Meltzoff (1998) stated that cross-sectional research examines what is occurring at a given point in time, as opposed to longitudinal studies that examine what is occurring over a given period of time. In this study, the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults, and the physical therapists' attitudes and beliefs towards the use of EBP were described.

Human Subjects

According to the United States Department of Health and Human Service's Code of Federal Regulations, all studies using human subjects must be reviewed and approved by an institutional review board. Permission to conduct this study was obtained from Southern Illinois University's Human Subjects Committee prior to any data collection. After reading the research cover letter, completion of the online survey implied informed consent (2010).

Theoretical Framework

Rogers's (2003) diffusion of innovations theory described how an innovation is diffused and adopted among a social system or organization. Rogers described the different types, ranging from early adopters, who are quick to adopt and laggards, who are reluctant and the last to adopt an innovation. Rogers noted that innovations are not adopted at the same rate by members of an organization or social system, and sometimes are rejected.

Factors described by Rogers that may influence the adoption of EBP by physical therapists include the promotion of EBP by key individuals or knowledge brokers, the complexity of adopting EBP, the compatibility of using EBP, and the ability to test the use of EBP before adopting it. The diffusion model may provide insight as to why some innovations, such as utilizing EBP are adopted, as well as a guide to organizational opinion leaders who try to influence the adoption of EBP.

Previous studies indicated that the use of EBP is rejected by physical therapists for a variety of reasons. Lack of time was cited by physical therapists as a common barrier in their daily clinical practices (Jette et al., 2003; Richter & Austin, 2012; Schreiber et al., 2009). Other barriers to physical therapists applying EBP were: lack of education; negative perceptions about research and the physical therapists' role in EBP; low self-efficacy to perform EBP (Salbach et al., 2007); the inability to utilize research findings with patients possessing unique characteristics (Jette et al., 2003); and the disruption of time utilized for patient care (Bridges et al., 2007).

The research indicated that the physical therapists' knowledge of fall-related risk factors is fairly high, but utilizing the knowledge of fall-related risk factors in the prevention of falls does not always occur. According to Ruchinskas et al. (2001), clinicians appear to be aware of predictors of fall risks, but need prompting to use them consistently. Another study by Peel et al. (2008) suggested that home health physical therapists are generally knowledgeable about fall risks, but do not always link interventions with specific risk factors. It is worth investigating the relationships that exists between the application of knowledge by the physical therapists in their daily clinical practices and the physical therapists' attitudes and beliefs towards the use of EBP.

The study examined physical therapists' clinical practices regarding risk factors associated with falls among community-dwelling older adults and their attitudes and beliefs towards the use of EBP. Examination of the physical therapists' attitudes and beliefs towards the use of EBP may identify potential barriers that affect the adoption of the innovation of EBP in their daily clinical practices.

Research Methods

Trochim (2001) stated that survey research is one of the most important areas of measurement in applied social research. Isaac and Michael (1995) indicated that survey research is one of the most commonly used techniques for data collection in the behavioral sciences. Lauer (2006) noted that survey research is widely used in descriptive studies and generates data necessary to answer the research questions.

A search for large rehabilitation organizations located in the Midwest and Mid-South was conducted using a Google search. Results of the search produced a list of large rehabilitation organizations, ranging from hospital-based rehabilitation institutes to large rehabilitation organizations that had numerous outpatient clinics. Telephone calls were made to key research contacts (primarily rehabilitation directors and research directors) at each of the selected organizations. A general overview of the study was explained to the research contact at each organization. After providing an explanation of the study, the research contacts were asked if they would be willing to participate in the study by distributing an online survey via e-mail to all physical therapists' under their direction. The organizations were offered an executive summary of the study findings in return for their participation in the study.

The executive summary will provide a brief overview of the study. Included in the summary will be a brief statement of the problem, a description of the sample, descriptive tables that described items and responses to the items related to physical therapists' clinical practices regarding intrinsic and extrinsic falls risk factors and their attitudes towards the use of EBP. The summary will conclude with a concise analysis, main conclusions derived from the study, and practical implications of the study results, as they apply to the day-to-day operations of a rehabilitation organization.

The survey instrument and consent letter for this study was distributed electronically to the designated research contact at each of the selected participating organizations for the pilot study and primary study. The research contact at each of the participating organizations forwarded the e-mail containing the consent letter/study URL to physical therapists employed by their organization. One large Midwest rehabilitation organization agreed to participate in the pilot study and seven large rehabilitation organizations located throughout the Midwest and Mid-South agreed to participate in the primary study. Two of the participating organizations distributed the consent letter/study URL to their affiliated clinical sites that were outside the selected Midwest and Mid-South region.

The use of an online survey was chosen for several reasons after an initial effort was made to access physical therapists' with a mailed survey, via a mailing list that was to be purchased from the American Physical Therapy Association (APTA). The decision was made to electronically distribute the research survey after contemplating the costs involved with distributing a mail survey.

The advantages considered by using an online survey were speed and timeliness, convenience, low administration costs, controlled sampling, access to a large sample, and required completion of answers (Evans & Mathur, 2005). Van Selm and Jankowski (2006) stated that online surveys reduce costs and time, allow ease of access to a large number of potential respondents, and provide the participants with anonymity. The disadvantages considered by using an electronically distributed survey were receiving a lower response rate and participants perceiving the survey as junk mail (Evans & Mathur, 2005).

It was assumed by the researcher that the problems of a potential low response rate and participating physical therapists' considering the survey as junk e-mail could be reduced. The assumption was that if participants received an e-mail from a trusted individual within their organization, such as a rehabilitation director or research director, the likelihood of their participation would increase.

Study Sample

A descriptive cross-sectional survey study was conducted using a select sample of physical therapists' from five Midwest and Mid-South states. Physical therapists' received an electronically distributed survey that was e-mailed to each of the participating organization's research contacts.

The research contacts received an e-mail providing a copy of the Human Subjects Committee's approval, a consent letter, and a copy of the URL for the online survey. Two of the research contacts requested that data be aggregated for their specific company, for the purpose of comparing their organization to the final study results. The participating organization's research contacts agreed to forward the study consent letter/study URL for the survey via company e-mail

to all physical therapists under their direction. The decision to provide data specific to each company was determined by the researcher to be potential deterrent to physical therapists' avoiding participation in the study and therefore not promised to be part of the executive summary.

According to the United States Department of Labor: Bureau of Labor Statistics (2013), in 2012, approximately 26,000 physical therapists' held active licenses in the states of the organizations that participated in this study. The selected participating sample of physical therapists' for this study was estimated to be 3,500. The breakdown of the physical therapist's areas of practice included acute care physical therapy, inpatient physical therapy, outpatient physical therapy, and home health physical therapy.

The sample selected was chosen because of ease of access. The organizations selected for the study offered a sample of opportunity or a convenience sample (Meltzoff, 1998). The sample also appeared to offer diversity, as the rehabilitation organizations participating in the study employed physical therapists' that represent the main areas of physical therapy practice.

Data Collection

On July 22, 2013, an e-mail that contained the study consent letter and study URL was sent to the research contact for the large Midwest rehabilitation organization that participated in the pilot study. The research contact was sent a study reminder e-mail at the end of week one and a second study reminder e-mail was sent at the end of week two. The study was open for a total of twenty-four days, and was closed on August 14, 2013.

The same procedure was repeated with six of the seven organizations participating in the primary study. On September 2, 2013, an e-mail that contained the study consent letter and study

URL was sent to the research contacts for six the large Midwest and Mid-South rehabilitation organizations that participated in the primary study. The seventh rehabilitation organization entered the study at the beginning of the second week. The delay for the seventh organization joining the study was due to pending corporate approval for participation in the study. The six organizations received a study reminder e-mail at the end of the first week and all seven organizations participating in the primary study received a study reminder e-mail at the end of the second week of the study. The study was open for a total of twenty-four days, and was closed on September 25, 2013.

The physical therapists' were notified in the consent letter that completion of the online survey was voluntary and established informed consent to participate in this study. The consent letter was approved by the Southern Illinois University Humans Subjects Committee and reassured the study participants that their responses were confidential.

The survey was designed using the online survey tool known as "Survey Monkey." Survey Monkey is one example of the many online survey products that exist on the market today. Online or Internet-based surveys allow the researcher to create and deliver surveys in a timely manner and view results as they accumulate (Buchanan & Hvizdak, 2009). Internet-based surveys have the ability to require a response to a question before a study participant is allowed to advance to the next question (Albaum, Wiley, Wiley, & Smith, 2011). The ability to require a response before advancing to the next question is known as "forced answering." Albaum et al. (2001) noted that the forced answer feature can essentially eliminate respondent error due to item non-response, but may cause the study participant to entirely opt out of taking the survey.

Kittleson and Brown (2005) noted that high response rates with web-based or e-mail surveys may be difficult to achieve due to the perception that the e-mail messages may be spam

or unwanted. In consideration of the possible perception of a survey being an unwanted e-mail, the researcher contacted key individuals within the selected organizations to distribute the e-mail containing the survey URL. The assumption is that receiving an e-mail from a trusted person within the organization will increase the likelihood that the physical therapists' will consider reading the e-mail and possibly participate in the survey.

It should be noted that one goal of the researcher was to not allow the study participant to skip questions, however, some physical therapists' skipped questions. The surveys returned with a few missing responses were kept for data analysis, but a combined total of four surveys from the pilot study and primary study were returned with more than two-thirds of the questions incomplete. The four partially answered surveys were removed and not utilized for data analysis. Other surveys removed from data analysis were four surveys submitted by physical therapist assistants. The surveys submitted by the physical therapist assistants were removed because the study was designed to investigate physical therapists' clinical practices and use of EBP.

Instrumentation

The researcher developed questions based on known intrinsic and extrinsic risk factors for community-dwelling older adults falling that were noted in the literature. Questions were developed based on individual risk factors stated in the research, and adding the question about the physical therapists' clinical practices of addressing each of the most common risk factors for falling.

The researcher also performed a search for existing instruments that measure physical therapists' attitudes and beliefs towards the use of EBP. Salbach et al. (2007) published an article titled, "Practitioner and organizational barriers to evidence based practice of physical therapists

for people with stroke." The study by Salbach et al. (2007) examined the physical therapists' education, attitudes and beliefs, and perceived role towards the use of EBP. An e-mail was sent to the primary author of the article, Nancy Salbach, and an e-mail response was received granting permission to use the existing instruments found in the article. The researcher decided to only use portions of the survey specific to the research questions for this study.

The researcher developed and conducted a meeting with five physical therapists for review of the draft survey. The specific purpose of the meeting with the small group of physical therapists was to have practicing physical therapists' assess the draft survey for face validity. Information gathered at the meeting was utilized in the development of the survey's logistics, quality of questions, and collecting recommendations for other possible questions to include in the research study questions. Access to the group of five physical therapists was granted by the rehabilitation administrator at a hospital located in Southern Illinois.

Following the physical therapists' meeting for survey development, a panel of three experts reviewed the modified post-physical therapists' meeting group survey draft for content and construct validity. The researcher was seeking a consensus (of at least two experts) among the expert panel regarding the design and questions on the survey. The panel of experts consisted of three Ph.D. level physical therapists with experience as professors and researchers. After evaluation of the survey by the group of five physical therapists' and expert panel, survey items were transferred to an online survey form using Survey monkey. The online survey was administered as part of the pilot study to identify any logistical problems, assess potential response rates, and identify any other potential problems prior to conducting the primary study.

The survey instrument (see Appendix F) was comprised of four sections that included physical therapists' demographic data, information regarding physical therapists' intrinsic clinical practices, physical therapists' extrinsic clinical practices, and physical therapists' attitudes and beliefs towards the use of EBP. Section one was designed to measure the physical therapist demographic data (see Table 1). Section two was designed to measure the physical therapists' clinical practices regarding intrinsic falls risk factors in the treatment of community-dwelling older adults (see Table 2). Section three was designed to measure the physical therapists' clinical practices regarding extrinsic falls risk factors in the treatment of community-dwelling older adults (see Table 3), and a fourth section was designed to measure physical therapists' attitudes and beliefs towards the use of EBP (see Table 4.).

Demographic questions in section one (see Table 1) included ordinal data for items (1 - 3). Questions for items (1 -2) addressed the number of years that the physical therapist had been practicing physical therapy and the number of years that they have been licensed as a physical therapist. Responses for items (1-2) were: 1 = (≤ 5 years), 2 = (6 – 10) years, 3 = (11-15) years, 4 = (16-20) years, 5 = (21-25) years, and 6 = (≥ 26 years). Item 3 inquired about highest physical therapy degree attained by the physical therapist. Responses for item (3) were: 1 = Baccalaureate, 2 = Master's, 3 = Doctorate, and 4 = Other.

Items (4-7) collected nominal data regarding the physical therapists' status as a certified clinical specialist in the physical therapy field, participation in continuing education courses, membership status with professional practice oriented organizations, and their status as a certified APTA clinical instructor. Responses for item 4 was: 1 = No and 2 = Yes. Responses for items (5-7) were: 1 = Yes and 2 = No.

Open ended questions regarding hours per week worked and number of patients seen daily were collected for items (8 and 9). These questions were later scaled with intervals for the purpose of data analysis (see data analysis section). Items (10 - 12) collected nominal data regarding the type of primary type of facility where the physical therapist treats patients, the majority type (geriatric, not geriatric) of patients seen, and a description of the types of problems seen. Responses for item (10) regarding primary type of facility offered the following responses: 1 = Acute Care Hospital, 2 = Acute Rehabilitation, 3 = Sub-acute Rehabilitation, 4 = Skilled Nursing Facility, 5 = Privately Owen Outpatient Clinic, 6 = Facility-based Outpatient Clinic, 7 = Home Care, 8 = School System, 9 = University, 10 = Industrial, and 11 = Other.

Table 1

Description of Demographic Questions (Survey Section One)

Item	Questions
1	For how many years have you been a licensed physical therapist?
2	For how many years have you been practicing physical therapy?
3	What is your highest physical therapy degree attained?
4	Are you a clinical certified specialist in the physical therapy field?
5	Do you regularly (once per year) participate in continuing education courses, webinars, or online education/classes?
6	Do you belong to one or more professional practice oriented organizations (e.g., APTA)?
7	Are you a certified clinical instructor by the APTA for physical therapist students/physical therapist assistant students/interns/residents?
8	On average, how many hours do you work per week?
9	On average, how many patients do you see daily?

Table 1 continued

10	Which of the following best describes the primary facility where you provide most of your patient care?
12	Which of the following best describes the types of problems you see?

Section two of the survey examined physical therapists' clinical practices regarding intrinsic risk factors in the treatment of community-dwelling older adults aged 65 years and older (see Table 2). All items (13 – 25) in this section were designed to collect interval data. The questions in section two used a frequency scaling method and were close-ended. The responses offered for items (13 – 25) were: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 =Always.

Table 2

Description of Clinical Practice for Intrinsic Risks (Survey Section Two)

Item	Questions
13	Do you consistently examine the patient or ask in the patient history about visual impairments (acuity, depth perception, etc...) that may increase their risk of experiencing a fall?
14	Do you educate (verbal or written instructions) the patient about balance and gait issues (decreased proprioception, slow righting reflexes, decreased muscle tone) that may contribute to an increased risk of falling?
15	Do you consistently assess the patient for psychological issues that may increase their risk for falling, such as fear of falling or cognitive impairment?
16	Do you inquire about any changes in the patient's mental status (Alzheimer's disease and dementia, impaired judgment, poor reasoning, etc...) with the patient or patient's family/caregiver?

Table 2 Continued

17	Do you consistently examine or ask in the patient history about medical conditions (acute Illness, infections, changes in blood pressure, etc…) that may increase the patient's risk for falling?
18	Do you consistently examine the patient for weakness of the core muscles?
19	Do you consistently examine the patient for weakness of the lower extremity muscles?
20	Do you consistently review the patient's current use of medications for any that would increase the community-dwelling older adult patient's risk for falling?
21	Do you consider the patient's use of multiple medications as a possible risk factor for falling?
22	Do you identify if the patient is taking antihypertensive medication?
23	Do you identify if the patient is taking psychiatric medication (antidepressant or antipsychotic)?
24	Do you educate the patient about the possible risks for falling associated with the use of alcohol?
25	Do you educate the patient or patient's family/caregiver about the increased risks for falling associated with risky behaviors, such as climbing ladders, walking without a needed assistive device, etc..?

Section three of the survey examines physical therapists' clinical practices regarding extrinsic risk factors in the treatment of community-dwelling older adults aged 65 years and

older (see Table 3). All items (26 – 30) in this section were designed to collect interval data and use a frequency scaling method. Item twenty-six was composed of nine items (26a – 26i) regarding the physical therapist clinical practices of educating the patient about their physical environment at home of providing literature regarding home safety. Responses for items (26a – 26i) were: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 =Always.

Item (27) inquired about the physical therapist consistently examining the patient for need of an assistive device. Item (28) questioned whether the physical therapist educated the patient regarding footwear. Item (29) addressed the physical therapist inquiring about potential environmental hazards that the patient may encounter outside their home. Item (30) asked the physical therapist if they examined the patient for the possible need of an ankle foot orthosis. Items (27 – 30) responses were: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 =Always.

Table 3

Description of Clinical Practice for Extrinsic Risks (Survey Section Three)

Item	Questions
26	Do you discuss with the patient about their physical environment at home or provide literature regarding home safety about the following items?
26a	Poor Lighting
26b	Doorways
26c	Bathtubs/Showers Grab Bars
26d	Bedside Table
26e	Pets

Table 3 continued

26f	Rugs/Carpeting
26g	Handrails
26h	Spills, such as a wet floor
26i	Ambulation of Stairs
27	Do you consistently examine the patient for their need of an assistive device?
28	Do you educate the patient about appropriate footwear, addressing items such as proper fit, slip resistant soles, etc..?
29	Do you inquire about potential environments (such as loose gravel, uneven walkways, curbs not clearly marked, etc...) that the patient may encounter outside the home, for the purpose of identifying possible risks for falling?
30	Do you examine the patient for the possible need of an ankle foot orthosis, if the patient demonstrates a foot drop?

Section four of the survey examined the physical therapists' attitudes and beliefs towards the use of EBP (see Table 4). Survey items 31 through 38 used a Likert style agreement scaling method. The questions were close-ended and offered the following responses: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 =Strongly Agree. Items 39 through 40 were open ended questions that asked about how many peer reviewed or professional articles the physical therapist read per month and how often they and how often the professional literature was consulted for the best clinical practices. Items 41a through 41h also used a Likert style scaling method. The Responses for items 41a through 41h were in response to the question of how much the following potential barriers limit your use of evidence- based practice. Please

refer to (table x for the specific questions for items 41a through 41h). Responses for items 41a through 41h used a Likert style scaling method and were as follows: 1 = No Impact, 2 = Little Impact, 3= Moderate Impact, 4 = Limited, and 5 = Extremely Limited. In hindsight the researcher would change the language of the responses for items 41a through 41h to improve clarity, even though the responses for section four of the survey were noted as understandable by the participants of the physical therapists' survey development meeting and by the panel of experts.

Table 4

Description of Evidence-Based Practice Questions (Survey Section Four)

Item	Questions
31	Application of evidence-based practice is necessary in the practice of physical therapy.
32	Literature and research findings are useful in my day-to-day clinical practices.
33	I need to increase the use of evidence in my daily practice.
34	The adoption of evidence-based practice places an unreasonable demand on physical therapists.
35	I am interested in learning or improving the skills necessary to incorporate evidence-based practice into my daily clinical practices.
36	Evidenced-based practice improves the quality of patient care.
37	My reimbursement rate will increase if I incorporate evidence-based practice into my practice.
38	Evidence-based practice helps me make decisions about patient care.

Table 4 continued

39	In a typical month, how many peer reviewed or professional articles do you read?
40	In a typical month, how often do you consult professional literature for the best clinical practices (e.g., APTA Journal, Journal of the American geriatrics society) in the process of clinical decision making?
41	Please indicate how much the following potential barriers limit your use of evidence-based practice in your daily clinical practices.
41a	Insufficient time.
41b	Lack of information resources.
41c	Lack of research skills.
41d	Lack skills to critically appraise the literature.
41e	Lack of generalizability of the literature findings to my patient population.
41f	Lack of understanding of statistical analysis.
41g	Lack of interest in researching the literature.
41h	Lack access to professional literature at work or home.

Factor Analysis

Factor analysis is a multivariate statistical method used to reduce larger sets of variables into underlying smaller components within the domain (Watson & Thompson, 2006, Floyd & Widaman, 1995). The researcher performed a factor analysis using principle components analysis for the purpose of creating subscales that fit together. Principle components analysis technique it the most commonly used technique used for data reduction (Boslaugh, 2013, p. 291).

The survey contained three large scales: Clinical practices intrinsic risks, Clinical practices extrinsic risks, and Evidence-based practice. The scales were analyzed using the principle components technique to determine the fit of items within each scale. Subsequently subscales were created for internal consistency analysis to determine the reliability of each scale and subscale.

Factor analysis of clinical practice intrinsic risks (see Table 5) and clinical practices extrinsic risks (see Table 6) revealed that items within each of the aforementioned tables fit together. These items were determined to be a good fit and later analyzed for internal consistency.

Table 5

Factor Analysis Clinical Practices

Intrinsic Risks Component Matrix

	Component		
	1	2	3
13. Visual impairment_	.580	.259	-.435
14. Balance/Gait	.634	.290	.052
15. Psychological issues	.619	.307	-.124
16. Mental status	.648	.448	-.183
17. Medical conditions	.724	.022	.015
18. Weakness core	.453	-.090	.606
19. Weakness lower extremity	.421	.201	.687
20. Medication use	.670	-.512	-.057

Table 5 continued

21. Multiple medications	.631	-.250	-.063
22. Antihypertensive medications	.697	-.544	-.047
23. Psychiatric medications	.671	-.522	-.090
24. Alcohol use	.537	.270	-.244
25. Risky behavior	.608	.347	.235

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

Table 6

Factor Analysis Clinical Practices

Extrinsic Risks Component Matrix

	Component		
	1	2	3
26a. Poor lighting_	.744	-.272	.052
26b. Doorways_	.768	-.353	.126
26c. Bathtub/Shower grab bars	.783	.023	-.313
26d. Bedside table	.697	-.438	.212
26e. Pets	.755	-.249	.026
26f. Rugs/Carpet	.836	.040	-.331
26h. Handrails	.820	.125	-.343
26h. Spills/Wet floor	.789	-.245	-.018
26i. Stairs	.747	.312	-.261

Table 6 continued

27. Assistive device	.540	.560	.120
28. Footwear	.676	.283	.379
29. Environment outside	.645	.048	.470
30. Ankle foot orthosis	.456	.549	.185

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

A factor analysis was then performed on the items within the evidence-based practices scale (see Table 7). Principle components analysis revealed five subscales within the larger scale. Items (30 – 38) fit together, as these items were questions focusing on physical therapists' beliefs regarding evidence-based practice. Items (39 and 40) fit together, as items that focused on physical therapists' behaviors towards the use of evidence-based practice. Items (41b and 41h) were items that fit together and focused on evidence-based practice resources and access. Items (41c – 41g) were items that fit together and centered on evidence-based practice skill and interest. Item (41a) was not a good fit with any of the other items within the large evidence-based practice scale. This particular item addressed this is barrier of insufficient time. Thus the researcher decided to analyze this item independently.

Table 7

Factor Analysis Evidence-Based

Practice Component Matrix

Item	Component 1	Component 2	Component 3
31. Necessary	.421	.544	-.190
32. Useful	.510	.506	-.073
33. Need to increase use	.225	.594	-.067
34. Unreasonable demand	.535	.155	-.038
35. Improving skills	.468	.536	.007
36. Improves quality of care	.623	.533	.057
37. Increase reimbursement	.358	.270	.210

Table 7 continued

38. Patient care decisions	.675	.388	-.003
39. Prof. Lit. read monthly	.446	-.331	.343
40. Lit. consults monthly	.501	-.228	.459
41a. Insufficient time	-.188	.273	-.126
41b. Lack resources	-.475	.376	-.434
41c. Lack research skills	-.580	.482	.343
41d. Lack appraisal skills	-.562	.486	.449
41e. Lack generalizability	-.391	.251	.337

Table 7 continued

41f. lack understanding	-.456	.397	.595
41g. lack interest	-.662	.248	-.086
41h. Lack access	-.454	.346	-.495

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

Validity and Reliability

The survey was evaluated for face validity by conducting a meeting, comprised of five physical therapists at a hospital located in Southern Illinois. In addition to evaluating the face validity of the survey, the survey development meeting was utilized for testing the time and ease of taking the survey. All participation by the physical therapists in the meeting was on a voluntary basis.

The researcher coordinated and lead the survey development meeting. The physical therapists' participating in the meeting were asked to provide written suggestions regarding logistics of the survey, assessment of the quality of the survey questions, and recommendations for new questions. Information gathered from the meeting was synthesized, and changes to the survey were made prior to forwarding the survey to an expert panel for evaluation of face, content, and construct validity.

The research instrument was evaluated for face, content, and construct validity by a panel of experts, comprised of three persons with expertise in instrument development, physical therapy, and geriatrics. Each panel member received a copy of the survey, formatted to include a section for comments. Members of the panel were asked to mark retain, delete, or revise for each item, or suggest other questions that may be appropriate.

According to Meltzoff (1998), face validity is used to determine if the survey measures what it is meant to measure. Meltzoff noted that measuring face validity is usually not enough. Therefore, content and construct validity was also evaluated by the panel of experts. Content validity evaluates whether the survey contains items from which conclusions can be drawn (Isaac & Michael, 1995). Meltzoff (1998) stated that content will be considered valid if the panel of experts agrees (at least two of the three) that each item is appropriate, and all relevant content areas have been appropriately addressed. Construct validity is the extent to which the survey adequately assesses what it claims to be measuring (Elmes Kantowitz, & Roediger, 2006). The panel reviewed the survey and made suggestions for the final survey draft.

Elmes et al. (2006) stated that in addition to validity, a survey's measurements must be reliable. A pilot test was conducted to determine instrument reliability. Reliability refers to the consistency of measurements (Elmes et al., 2006; Isaac & Michael, 1995). Internal consistency on the physical therapists' clinical practices regarding intrinsic and extrinsic risk factors in the treatment of community-dwelling older adults, and their attitudes and beliefs towards the use of EBP questions, were measured by calculating a coefficient of reliability known as Cronbach's alpha coefficient (see Table 8). The researcher used the Statistical Package for the Social Sciences (SPSS) to determine the internal consistency of the survey, and aimed for a reliability coefficient of .70 or greater.

Internal consistency reliability estimates revealed that the scales and subscales analyzed with principle components analysis technique all had a reliability coefficient of .70 or greater (see Table 8). Clinical practices intrinsic risks had the highest reliability coefficient at .915 and evidence-practice behaviors had a reliability coefficient of .717, which was the lowest estimate for all scales and subscales that were analyzed. The (N) for each scale and subscale was different

secondary to physical therapists' skipping questions and removal outliers, as the removal of outliers with be addressed in the data analysis section.

Table 8

Internal Consistency Reliability Estimates

Chronbach's Alpha (P< .05)

Subscale	N	Primary Study
Clinical Practices Intrinsic Risks (Items 13 - 25)	316	.856
Clinical Practices Extrinsic Risks (Item 26 - 30)	300	.915
Evidence-Based Practice Beliefs (Items 31 – 38)	307	.790
Table 8 continued		
Evidence-Based Practice Behaviors (Items 39 – 40)	305	.717
Evidence-Based Practice Resources/Access (Items 41c, 41d,41e, 41f and 41g)	301	.782
Evidence-Based Practice Skills/Interest (Items 41b and 41h)	305	.787

*Cronbach's Alpha

Pilot Study

Elmes et al. (2006) defined pilot testing a study as preliminary research that allows the researcher to discover problems in the research design subsequent to the full-scale study. Isaac and Michael (1995) note that a pilot study allows the researcher to appraise the planned analytical and statistical procedures. According to Elmes et al. (2006), pilot testing is also valuable for identifying technical glitches that may affect the administration of the final study.

Access to the sample of physical therapists' for the pilot study used the same format of recruitment as the primary study. Approximately 184 physical therapists' employed by a large rehabilitation organization in the Midwest participated in the pilot study. The rehabilitation organization's research contact was provided a description of the study via a telephone call. The director of internal development was informed that their organization would receive an executive summary of the study findings upon completion of the study, in return for their participation in the pilot study.

The research contact was e-mailed a cover letter that described the study, a copy of the Human Subjects approval, and a copy of the consent to participate letter that contained the URL to access the survey. The research contact received a follow up e-mail that contained the consent letter/study URL document and a note that confirmed the time frame for the pilot study. The pilot study consent letter that contained the study URL was to be distributed to the organization's physical therapist on July 22, 2013 and a pilot study cut-off date August 14, 2013 was also noted.

The purpose of the pilot study was to test the delivery of the survey to a small sample and test the logistics of using Survey Monkey. No statistical analysis was performed on the pilot study data. The same set of questions were used for the pilot study and primary study.

Primary Study

Access to the sample of physical therapists' for the primary study used the same format of recruitment as the pilot study. Approximately 3,339 physical therapists' employed by seven large rehabilitation organizations located in the Midwest and Mid-South participated in the primary study. The research contact at each rehabilitation organization was provided a description of the study via a telephone call. Each of the rehabilitation organizations participating in the study were informed that their organizations would receive an executive summary of the study findings upon completion of the study, in return for their participation in the primary study.

All research contacts were-mailed a cover letter that described the study, a copy of the Human Subjects approval, and a copy of the consent to participate letter that contained the URL to access the survey. Each research contact received a follow up e-mail that contained the consent letter/study URL document and a note that confirmed the time frame for the primary study. The primary study consent letter that contained the study URL was to be distributed to the organization's physical therapist on September 2, 2013 and a pilot study cut-off date September 25, 2013 was also noted.

The purpose of the pilot study was to test the delivery of the survey to a small sample and test the logistics of using Survey Monkey. No statistical analysis was performed on the pilot study data. The same set of questions were used for the pilot study and primary study.

Data Analysis

Pilot study and primary study participants submitted their responses on the "Survey Monkey" survey instrument. The resulting data from the pilot study were combined for data analysis. Each survey was coded by the researcher and the data were entered into an Excel file.

Data were analyzed using the SPSS, version 21.0 (SPSS, Inc., 2012). Descriptive statistics (i.e., frequencies, percentages, and measures of central tendency and dispersion where appropriate) were calculated for each item in the survey and for all demographic variables (years practicing physical therapy, years licensed as a physical therapist, highest degree attained, status as a clinical certified specialist, continuing education participation, number of professional organization memberships, status as an American Physical Therapy Association (APTA) certified clinical instructor, hours per week worked, number of patients seen daily, practice setting, experience treating geriatric patients, and types of problems treated).

This study used descriptive statistics (i.e., frequencies, percentages, and measures of central tendency and dispersion where appropriate), ANOVA, and multiple regression analysis to answer the research questions. Factor analysis was used to determine scales and subscales for data analysis. Cronbach's alpha coefficients were calculated to measure internal consistency reliability of the survey instrument.

Boslaugh (2013) described an outlier as "a data point or observation whose value is quite different from the others in a data set being analyzed" (p. 96). Hodge & Austin (2004) noted that removal of outliers can eliminate their contaminating effect on the data. It should be noted that items 9, 39 and 40 received responses that were extreme outliers. The researcher decided to remove outliers that were more than three standard deviations from the mean. Item 9 asked on average, how many patients do you see daily? One physical therapist indicated that they saw forty patients daily, when the mean number of patients seen daily was 8.52. Item 39 asked in a typical month, how many peered reviewed articles do you read? The mean number of articles read was 3.53. Responses more than three standard deviations from the mean ranging from twenty articles read monthly to sixty articles read monthly were removed. Item 40 asked in a

typical month, how many times do you consult the professional literature for the best clinical practices? The mean number of consultations of peer reviewed articles was 2.36. Six responses indicated twenty consultations of professional literature were more than three standard deviations from the mean and subsequently removed from the data analysis.

An example of one extreme outlier was an answer of sixty-one professional articles read monthly for item (39). This same respondent that answered that insufficient time was a barrier to using EBP. The same respondent also answered one for the number of professional literature consultations per month. The researcher questioned as to why there was inconstancy of answers regarding the large response for item (39). Other individuals reported a large number for number of patients seen daily, but also noted that they worked as clinical instructors with students. Nonetheless, outliers can skew the data and the researcher decided to remove all outliers.

Table 9

Summary of Data Collection and Analysis Procedures

Research Question	**Survey Items**	**Data Analysis**
1. What are the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?	Table 2, Items 13 - 25 Table 3, Items 26 - 30	Descriptive Statistics
2. What are the physical therapists' attitudes and beliefs towards the use of evidence-based practice?	Table4, Items 31 - 40	Descriptive Statistics

Table 9 continued

3. Do differences exist among physical therapists' clinical practices about intrinsic (DV) and extrinsic (DV) falls risk in the treatment of community-dwelling older adults based on their years of practice (IV), majority type of patients seen (IV), practice setting (IV), being an APTA certified clinical instructor (IV) and educational level (IV)?	Table 2, Items 13 - 25 Table 3, Items 26 - 30	ANOVA for years of practice, practice setting and educational level.
4. How much do physical therapists' years of practice (IV), majority type of patients seen (IV), being an APTA certified clinical instructor (IV) and educational level (IV) predict their clinical practices regarding intrinsic (DV) and extrinsic (DV) falls risk in the treatment of community-dwelling older adults?	Table 2, Items 13 –25 Table 3, Items 26 - 30	Linear Regression Analysis
5. How much do physical therapists' years of practice (IV), majority type of patients seen (IV), being an APTA certified clinical instructor (IV) and educational level (IV) predict their beliefs (DV), behaviors(DV), perceived resources/access (DV), and skills/interest (DV) regarding their use of evidence-based practice based on their years of practice (IV), majority type of patients seen (IV), practice setting (IV), being an APTA certified clinical instructor (IV) and educational level (IV) towards the use of evidence-based practice?	Table 4, Items 31 - 40	Linear Regression Analysis

Summary

This chapter provided an overview of the descriptive cross-sectional research design and sampling technique proposed for this study. Specifics regarding access to the study population

and the initial development of the instrument; including the use of a physical therapists' meeting for survey development, use of an expert panel, pilot testing, and the primary study were presented. This chapter also included the data collection procedure and a description of the statistical analysis to calculate the answers to each research question.

A descriptive cross-sectional survey research design was utilized to develop the research questions for this study. The researcher received permission to use portions of an existing instrument and created the remainder of the instrument designed to answer the research questions. The survey was reviewed in instrument development meeting with group of physical therapists and evaluated by a panel of three experts for the relevance of the content. Following the evaluation for face, content, and construct validity, the survey was pilot tested among a group of 184 physical therapists employed by a large Midwest rehabilitation organization. The purpose of the pilot study was to test the logistics for the delivering the survey to the rehabilitation originations and use of collecting data with Survey Monkey. Statistical analyses included descriptive statistics and ANOVAs to determine if statistically significant differences exist among groups based on selected demographic variables.

Multiple regression was used to evaluate the relationships between a set of independent variables (educational level, years of experience, being an APTA certified clinical instructor, and practice setting) and the physical therapists' educational and clinical practices regarding intrinsic and extrinsic falls risk factor in the treatment of community-dwelling older adults, and their attitudes and beliefs towards the use of EBP.

CHAPTER 4

RESULTS

This chapter presents a detailed description of the results from the study. Specifically, demographic characteristics of the sample solicited for completion of the study are described. Additionally, results pertaining to the statistical analyses conducted for the study are reported. Additional results include factor analysis, internal consistency reliability estimates, descriptive measures, ANOVAs, and multiple regression analyses conducted for the study.

Purpose of the Study

The purpose of this study was to investigate physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults aged 65 years and older, examine their attitudes and beliefs towards the use of EBP, and identify barriers to physical therapists' adopting the innovation of using EBP.

Summary of Demographics

The pilot study sample was comprised of a potential respondent pool of 184 physical therapists that were employed by a large Midwest rehabilitation organization. A total of 38 surveys were returned by August 14, 2013 via the Survey Monkey online survey tool. One survey was only partially complete and therefore eliminated from the data. A total 37 completed surveys (20.1% response rate) were added to the final set of data for analysis.

The primary study sample was comprised of a potential respondent pool of 3,339 physical therapists that were employed by seven large Midwest and Mid-South rehabilitation organizations. A total of 286 surveys were returned by September, 25 2013 via the Survey

Monkey online survey tool. Seven of the surveys returned in the primary study were eliminated. Three of the surveys eliminated were only partially complete and four of the surveys eliminated were completed by physical therapists assistants and therefore eliminated from the data. A total of 279 completed surveys with a response rate of (8.3%) were added to the data set for analysis.

Survey responses from the pilot study were added to primary study responses for a total of 316 responses (9% response rate) out of a potential respondent pool of 3,523 physical therapists (see Figure 1). A total of 8 survey responses were eliminated from the combined pilot study and primary study response pool for the aforementioned reasons of being partially completed and surveys submitted by unqualified respondents. It is important to note that the purpose of the pilot study was to test the logistics of sending the e-mail containing the study consent letter/study URL and testing the use of Survey Monkey. Questions for the primary study were the same as those delivered in the pilot study.

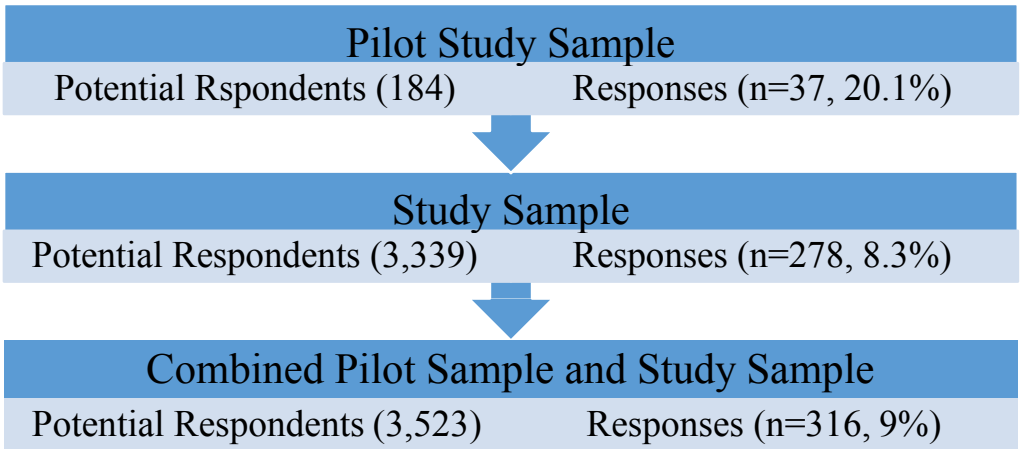

Figure 1: *Description of Sample*

Demographic data were collected in section one of the survey and were comprised of twelve items. Descriptive statistics (Mean, Frequencies, and Percentages) were calculated for items (1-12). Item one inquired about years of practice as a physical therapist (see Table 10). Ninety-two of the respondents

(29.1%) had fewer than five years of experience as a practicing physical therapist. Approximately half of the respondents (53.2%) had eleven or more years of experience as practicing physical therapists.

Table 10

Item 1: For how many years have you been practicing physical therapy? (Mean, Frequencies and Percentages)

	Frequency	Percent
≤ 5 years	92	29.1
6 –10 years	56	17.7
11 – 15 years	54	17.1
16 – 20 years	45	14.2
21 – 25 years	26	8.2
≥ 26 years	43	13.6
Total	316	100.0

Note. Number of Responses (316), M = 2.96

Item two inquired about how many years the respondent was licensed as a physical therapist (see Table 11). Ninety-four of the respondents (29.7%) had fewer than five years of experience as a licensed physical therapist. Approximately half of the respondents (46.8%) had ten or fewer years of experience as a licensed physical therapists. Responses for items one and two did not mirror each other. Possible explanations could be that some individuals practiced physical therapy as a physical therapists assistant prior to becoming a licensed physical therapist or in some cases individuals may be a licensed physical therapist, but no longer practice secondary to assuming management responsibilities.

Table 11

Item 2: For how many years have you been a licensed physical therapist? (Mean, Frequencies and Percentages)

	Frequency	Percent
5 years or less	94	29.7
6 to 10 years	54	17.09
11 to 15 years	56	17.1
16 to 20 years	39	12.3
21 to 25 years	29	9.2
26 or more years	44	13.9
Total	316	100.0

Note. Number of Responses (316), M = 2.96

Educational level demographics were attained in item three (see Table 12). Item three asked the physical therapist what was their highest physical therapy degree attained. The majority of respondents (49.4%) held a doctoral level physical therapy degree. Eleven respondents (3.5%) answered "other." Those who responded as "other" indicated that they received a bachelor degree plus a certificate in physical therapy.

Table 12

Item 3: What is your highest physical therapy degree attained?(Mean, Frequencies and Percentages)

	Frequency	Percent
Baccalaureate	61	19.3
Master's	88	27.8
Doctorate	156	49.4
Other	11	3.5
Total	316	100.0

Note. Number of Responses (316), M = 2.37

The physical therapist's status as a clinical specialist in the physical therapy field was addressed in item four (see Table 13). Only seventy-four (23.4%) were certified as a clinical specialist. Examples of clinical specialist certifications held included: lymphedema, orthopedics, women's health, wound care, cancer rehabilitation, geriatrics, and neurologic. Having a certified clinical specialist certification in the physical therapy field provides formal recognition of the physical therapists who have advanced clinical knowledge, experience, and skills in a specific area of physical therapy.

Table 13

Item 4: Are you a clinical certified specialist in the physical therapy field?

(Mean, Frequencies and Percentages)

	Frequency	Percent
Yes	74	23.4
No	242	76.6
Total	316	100.00

Note. Number of Responses (316), M = 1.23

Item five inquired about the continuing education practices of physical therapists' (see table 14). An overwhelming majority (312, 98.7%) of physical therapists indicated that they participated in at least one continuing education course per year. This is to be expected since continuing education hours are required for maintenance of licensure.

Table 14

Item 5: Do you regularly (once per year) participate in continuing education courses, webinars, or online education/classes?

(Mean, Frequencies and Percentages)

	Frequency	Percent
Yes	312	98.7
No	4	1.3
Total	316	100.0

Number of Responses (316), M = 1.01

Item six inquired about physical therapists' status regarding membership with professional practice-oriented organizations. Approximately half of the study participants (167,

52.8%) indicated that they belong to one or more professional practice oriented organizations, such as the APTA.

Table 15

Item 6: Do you belong to one or more professional practice-oriented organizations (e.g., APTA)? (Mean, Frequencies and Percentages)

	Frequency	Percent
Yes	167	52.8
No	149	47.2
Total	316	100.00

Number of Responses (316), M = 1.47

The researcher inquired about physical therapists' status as a certified clinical instructor by the APTA with item seven. Less than of half of the study respondents (132, 41.8%) indicated that they were a certified clinical instructor by the APTA.

Table 16

Item 7: Are you a certified clinical instructor by the APTA for physical therapist students, physical therapist assistant students/interns/residents? (Mean, Frequencies and Percentages)

	Frequency	Percent
Yes	132	41.8
No	184	58.2
Total	316	100.0

Number of Responses (316), M = 1.58

Item eight asked physical therapists how many hours they worked per week (see Table 17). The mean number of hours worked per week was (38.62) hours per week. The majority of

physical therapists (177, 56%) indicated that they worked between thirty-one to forty hours per week. The number of respondents who reported they work forty-one to fifty hours per week was (75, 23.7%).

Table 17

Item 8: On average, how many hours per week do you work?

(Mean, Frequencies and Percentages)

	Frequency	Percent
1 to 10 hours	3	1.0
11 to 20 hours	15	4.7
21 to 30 hours	36	11.4
31 to 40 hours	177	56.0
41 to 50 hours	75	23.7
51 to 60 hours	10	3.2
Total	316	100.0

Number of Responses (316), M = 1.58

Table 18

Item 9: On average, how many patients do you see daily?

(Mean, Frequencies and Percentages)

	Frequency	Percent
Do Not Treat Patients in a Typical Week	14	4.4
1 to 5 Patients in a Typical Week	35	11.1
6 to 10 Patients in a Typical Week	192	60.8
11 to 15 Patients in a Typical Week	68	21.5
16 to 20 Patients in a Typical Week	6	1.9
Greater Than 20 Patients in a Typical Week	1	.3
Total	316	100.0

Note. Number of Responses (316), M = 3.06
Mean number of patients treated daily was 8.52 patients per day.

Responses to Item ten described the primary facility where the physical therapist provided patient care (see Table 19). More than half of the respondents (55.4%) worked in outpatient clinics. Privately owned outpatient clinics accounted for (44, 13.9%) and facility-based outpatient clinics accounted for (131, 41.5%) of the physical therapists employed by outpatient clinics. Twelve respondents worked in home care was (3.8%).

Table 19

Item 10: Which of the following best describes the primary facility where you provide most of your patient care? (Mean, Frequencies and Percentages)

	Frequency	Percent
Acute care hospital	43	13.6
Acute rehabilitation	60	19.0
Sub-acute rehabilitation	13	4.1
Skilled nursing facility	13	4.1
Privately owned outpatient clinic	44	13.9
Facility-based outpatient clinic	131	41.5
Home care	12	3.8
Total	316	100.0

Note. N= 316, Mean = 4.25

Item eleven asked physical therapists about their experience treating geriatric patients (see Table 20). Individuals who responded do not treat patients was (13, 4.1%). The overwhelming majority of physical therapists (300, 94.9%) reported experience treating geriatric patients. Physical therapists that indicated treating geriatrics as their primary patient population was (139, 44%).

Table 20

Item 11: Which of the following best describes the majority of patients you treat?

(Mean, Frequencies and Percentages)

	Frequency	Percent
Do Not Treat Patients	13	4.1
No experience treating geriatric patients	3	.9
Treat primarily geriatric patients	139	45.6
Experience treating geriatric patients, but majority fall in to other age group	161	50.9
Total	316	100.0

Number of Responses (316), Mean = 3.42

Item twelve inquired about the types of problems seen by physical therapists (see Table 21). The question specifically asked the physical therapist to choose what best describes the types of problems they see. It is important to note that many respondents added a response listing multiple problems seen beyond their primary choice for type of problem. Orthopedic (150, 47.5%) and neurological (87, 27.5%) problems were the primary problem types with the highest number of responses. Oncologic (5, 1.6%) and integumentary (2, .6%) were the problems with the lowest number of responses.

Table 21

Item 12: Which of the following best describes the types of problems you see? (Mean, Frequencies and Percentages)

	Frequency	Percent
Do not treat patients	11	3.5
Neurologic	87	27.5
Oncologic	5	1.6
Orthopedic	150	47.5
Sports Medicine	7	2.2
Cardiovascular/Respiratory	18	5.7
Integumentary	2	.6
Other	36	11.4
Total	316	100.0

Number of Responses (316) M = 3.94

Research Questions and Results

This section will provide an overview of the results for the research questions. Descriptive analyses, analyses of variance (ANOVA), and Multiple regression analyses were conducted to answer the specific questions.

Research Question One. What are the physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?

Questions for section two of the survey addressed clinical practices regarding intrinsic falls risk factors (see Appendix D). Items (13-25) asked questions that specifically addressed clinical practices regarding intrinsic falls risk factors (see Table 22). Overall physical therapists

demonstrated a high level of attention to balance and gait (N = 316, 263 responded always or often, 83.2%), medical conditions (N = 316, 272 responded always or often, 86%), weakness of the core (N = 316, 261 responded always or often, 82.5%), lower extremity muscles (N = 316, 312 responded always or often, 98.7%), and risky behavior (N = 316, 275 responded always or often, 87%).

Responses to questions regarding attention to medications garnered a slightly lower response than the aforementioned clinical practices regarding intrinsic falls risk factors. Responses to medication use were as follows: Review patient's current use of medications for any that would increase the community-dwelling older adult patient's risk for falling (N = 316, 196 responded always or often, 62%), antihypertensive medications (N = 316, 233 responded always or often, 73.7%), psychiatric medications, and (N = 316, 182 responded always or often, 56%).

Other questions that demonstrated a slightly lower level of attention included: psychological issues (N = 316, 208 responded always or often, 65.8%), and mental status (N = 316, 208 responded always or often, 65.8%).

The lowest level of attention was given to clinical practices regarding intrinsic falls risk factors for vision (N = 316, 135 responded always or often, 42.7%) and alcohol use (N = 316, 78 responded always or often, 24%).

Table 22

Clinical Practices Intrinsic Risks (Mean, Standard Deviation and Frequencies)

Item	M	sd	A	O	S	R	N
13. Vision	3.10	1.12	57	78	99	68	14
14. Balance and Gait	4.23	.83	140	123	41	11	1
15. Psychological issues	3.87	1.04	107	101	77	23	8
16. Mental Status	3.85	.99	96	112	76	29	3
17. Medical Conditions	4.40	.84	184	88	32	10	2
18. Weakness Core	4.24	.93	154	107	37	13	5
19. Weakness Lower Extremity	4.84	.48	272	40	2	2	2
20. Medication	3.72	1.09	89	107	73	38	9
21. Multiple Medications	3.93	1.02	107	118	63	19	8
22. Antihypertensive Medication	4.08	1.02	139	94	58	18	7
23. Psychiatric Medication	3.95	1.00	113	69	69	24	4
24. Alcohol Use	2.70	1.09	18	58	94	104	42
25. Risky Behavior	4.28	.81	144	131	31	7	3
Total	51.41	7.54					

Note. A (Always) = 5; O (Often) = 4; S (Sometimes) = 3; R (Rarely) = 2; N (Never) = 1. Clinical practice intrinsic risks grand mean score = 3.94. The higher the score, the greater the attention given to clinical practices regarding intrinsic risks for older adults falling.

Questions for section three of the survey addressed clinical practices regarding extrinsic falls risk factors (see Appendix D). Items (26a-26i) asked the physical therapist if they discussed with the patient about their physical environment at home or provided literature regarding home safety (see Table 23). Items from this series of questions that demonstrated a high level of

attention included: bath/shower grab bars (N = 309, 259 responded always or often, 83.8%), rugs/carpets (N = 309, 274 responded always or often, 88.6%), handrails (N = 310, 270 responded always or often, 87%), and stairs (N = 308, 290 responded always or often, 94%).

Items from this series of questions that received a slightly lower level of attention included: poor lighting (N = 310, 209 responded always or often, 67.4%), doorways (N = 309, 191 responded always or often, 61.8%), bedside table (N = 310, 106 responded always or often, 51.6%), pets (N = 311, 206 responded always or often, 66.2%), and spills/wet floors (N = 311, 183 responded always or often, 58.8%).

Items (27-30) received a high level of attention and addressed the following clinical practices regarding extrinsic falls risk factors: assistive device (N = 311, 305 responded always or often, 98%), footwear (N = 311, 277 responded always or often, 89%), environment outside the home (N = 311, 243 responded always or often, 78.1%), and ankle foot orthosis (N = 311, 274 responded always or often, 88.1%).

Table 23

Clinical Practices Extrinsic Risks (Mean, Standard Deviation and Frequencies)

Item	M	sd	A	O	S	R	N
26a. Poor Lighting	3.78	1.09	87	122	61	25	15
26b. Doorways	3.64	1.11	74	117	65	40	13
26c. Bath/Shower Grab Bars	4.18	.84	124	135	35	13	2
26d. Bedside Table	3.33	1.20	54	106	63	63	24
26e. Pets	3.76	1.09	87	119	57	38	10
26f. Rugs/Carpet	4.40	.77	165	109	30	2	3
26g. Handrails	4.40	.76	156	114	34	5	1
26h. Spills/Wet Floors	3.61	1.17	82	101	70	41	17
26i. Stairs	4.49	.70	177	113	14	1	3
27. Assistive Device	4.83	.50	267	38	4	0	2
28. Footwear	4.34	.78	152	125	27	3	4
29. Environment Outside	4.12	..91	125	118	51	14	3
30. Ankle Foot Orthosis	4.44	.86	192	82	25	7	5
Total	53.32	7.98					

Note. A (Always) = 5; O (Often) = 4; S (Sometimes) = 3; R (Rarely) = 2; N (Never) = 1. Range for n = 308 to 311, Clinical practice extrinsic risks grand mean score = 4.10. The higher the score, the greater the attention given to clinical practices regarding extrinsic risks for older adults falling.

Research Question Two. What are the physical therapists' attitudes and beliefs towards the use of evidence-based practice?

Questions for section four of the survey addressed physical therapists' attitudes and beliefs towards the use of evidence-based practice (see Appendix D). Items thirty-one through thirty-eight inquired about physical therapists' beliefs towards evidence-based practice (see Table 24). Statements that reflected a high level of agreement regarding physical therapists' beliefs towards evidence-based practice were: Application is necessary in the practice of physical therapy (N = 307, 277 responded strongly agree or agree, 90.2%), literature and research findings are useful in my day-to-day clinical practices (N = 307, 258 responded strongly agree or agree, 84%), need to increase the use of evidence in my daily practice (N = 307, 231 responded strongly agree or agree, 75.2%), interested in learning or improving the skills necessary to incorporate EBP into my daily clinical practices (N = 307, 259 responded strongly agree or agree, 84.3%), improves the quality of patient care (N = 307, 270 responded strongly agree or agree, 87.9%), and EBP helps me make decisions about patient care (N = 307, 273 responded strongly agree or agree, 88.9%).

Item thirty-four was reversed and indicated that the belief of adoption of EBP does not place an unreasonable demand on physical therapists (N = 307, 28 responded strongly agree or agree, 9.1%). Item thirty-seven reported that physical therapists had a lower level of agreement, regarding the statement that reimbursement rate will increase if EBP is incorporated into daily clinical practice (N = 307, 105 responded strongly agree or agree, 32.2%)

Table 24

EBP Beliefs (Mean, Standard Deviation and Frequencies)

Item	M	sd	SA	A	N	D	SD
31. Application Necessary	4.39	.99	183	94	12	2	16
32. Lit./Research Findings Useful	4.10	.91	106	152	33	5	11
33. Need for EBP in Practice	3.90	.84	66	165	56	17	3
34. (R) Adoption EBP Unreasonable	2.14	.93	5	23	58	144	77
35. Interested in Incorporating EBP	4.14	.75	100	159	40	7	1
36. EBP Improves Quality of Care	4.29	.74	132	138	32	3	2
37. EBP Improves Reimbursement	3.12	1.12	39	66	118	57	27
38. EBP Patient Care Decision Making	4.20	.76	107	166	23	8	3
Total	31.97						

Note: *n* = sample size, *M* = mean, *sd* = standard deviation
Items were coded on a 1-5 scale (1 = Strongly Agree to 5 = Strongly Disagree)
*(Number of missing responses) Missing responses occurred secondary to removal of outliers and skipped answer.
Grand Mean 3.79 n = 307

Items thirty-nine and forty asked about physical therapists' behaviors towards evidence-based practice (see Table 25). The majority of physical therapists reported reading one to three professional literature articles per month (N = 305, 187, 61.3%). Others responded: read four to six professional literature articles per month (N = 305, 64. 20.9%), read ten or more professional literature articles per month (N = 305, 29, and 9.5%). The majority of physical therapists reported consulting professional literature/research one to three times per month (N = 306, 194, 63.4%), other responses to the number of consultations four to six time per month (N = 306, 35.

11.4%). Only (N = 306, 14, 4.6%) of physical therapists reported consulting the professional literature/research seven or more times per month.

Table 25

EBP Behaviors (Mean, Standard Deviation and Frequencies)

Item	M	sd	0	1 To 3	4 To 6	7 To 9	10 To 12	13 To 15
39. Prof. Lit. Read Typical Month	2.88	2.70	32	187	64	8	25	4
40. Lit. Consult Typical Month	1.97	2.16	65	191	35	5	9	0
Total	4.85	4.86						

Note, n = 305 for item 39 and n = 306 for item 40. M Grand mean 2.43

Items (41a – 41h) asked physical therapists to indicate how much the following potential barriers limit their use of EBP in their daily clinical practices (see Appendix D). Item (41a) inquired about the barrier of insufficient time (see Table 26). This item was analyzed separately since factor analysis indicated that it did not fit with any of the scales or subscales. Physical therapists indicated that time was a barrier to their use of EBP: The majority of physical therapists reported that time for EBP was either extremely limited or limited (N = 307, 204 reported extremely limited or limited, and 66.4%). Only a small percentage of physical therapists indicated that insufficient time had little impact on their use of EBP (N = 307, 32 reported little impact or no impact, 10.4%)

Table 26

EBP Barrier of Time (Mean, Standard Deviation and Frequencies)

Item	M	sd	EL	L	MI	LI	NI
41a. Insufficient Time	3.91	1.06	113	91	71	25	7

Note. N = 307, A (Always) = 5; O (Often) = 4; S (Sometimes) = 3; R (Rarely) = 2; N (Never) = 1.

Items (41b and 41h) inquired about barriers of resources and access to evidence-based practice by physical therapists (see Table 27). Slightly more than half of the physical therapists reported that lack of information and resources were not a barrier ((N = 306, 183 responded limited impact or no impact, 59.8%). A slightly higher number of physical therapists reported that lack of access to professional literature was not a major barrier (N = 305, 201 responded limited impact or no impact, 65.9%). A small number of physical therapists reported that lack of resources and information was an issue (N = 306, 40 responded extremely limited or limited, 13.1%) and a limited number of physical therapists reported that lack of access to professional literature was an issue (N = 305, 46 responded extremely limited or limited, 15.1%).

Items (41c -41g) focused on barriers of EBP skills and interests (see Table 27). Physical therapists did not report items (41c – 41d) as significant barriers limiting their use of EBP in their daily clinical practices. Physical therapists reported lack of research skills (N = 305, 231 responded as having little impact or no impact, 75.7%) and lack skills to critically appraise the literature (N = 305, 249 responded as having little impact or no impact, 81.6%).

Items from (41e – 41g) were reported to have a slightly greater impact as a barrier limiting their use of EBP. Physical therapists reported lack of generalizability of the literature findings to my patient population (N = 305, 174 responded as having little impact or no impact, 57%), lack of understanding of statistical analysis (N = 306, 203 responded little impact or no

impact, 66.3%), and lack of interest in researching the literature (N = 304, 190 responded little impact or no impact, 62.5%),

Table 27

EBP Barriers of Resources/Access (Mean, Standard Deviation and Frequencies)

Item	M	sd	EL	L	MI	LI	NI
41b. Lack Resources/Information	2.23	1.07	5	35	83	86	97
41h. Lack Access to Prof. Literature	2.13	1.15	10	36	58	82	119
Total	4.36	2.22					

Grand Mean 2.18 n= (305 -306)

Table 28

EBP Skills/Interests (Mean, Standard Deviation and Frequencies)

Item	M	sd	EL	L	MI	LI	NI
41c. Lack Research Skills	1.90	.97	5	16	53	102	129
41d. Lack Skills to Appraise Lit.	1.80	.87	2	12	42	115	134
41e. Generalizability of Lit.	2.39	1.09	10	41	80	100	74
41f. Understanding of Stat Analysis	2.20	1.02	8	30	57	129	74
41g. Interest in researching literature	2.20	1.04	8	23	83	96	94
Total	10.49	4.99					

Grand Mean 2.10 n= (304 -306)

Research Question Three. Do differences exist between physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding intrinsic falls risk based on years of practice as a physical therapists. Statistically significant differences in physical therapists' clinical practices regarding intrinsic falls risk existed between the respondent's years of practice (see Table 29). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists who practiced physical therapy for twenty-six or more years demonstrated a higher level of attention to clinical practices regarding intrinsic falls risks (M = 55.67, SD = 5.73) than those who had practiced for five years or less (M = 49.48, SD = 7.11), six to ten years (M = 50.43, SD = 7.42), eleven to 15 years (M = 51.28,SD = 7.16), and sixteen to twenty years (M = 51.13,SD = 9.31), as well as physical therapists who practiced for twenty-one to twenty-five years (M = 54.04 , SD = 6.38) demonstrated a higher level of attention to clinical practice regarding intrinsic falls risk than physical therapists who practiced for five years or less (M = 49.48, SD = 7.11), and those who practiced six to ten years (M = 50.43, SD = 7.42). Table 30 provides a summary of the post hoc analysis.

Table 29

ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on Years of Practice (N = 316)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1363.23	5	272.65	5.11	**
Within Groups	16549.11	310	53.38		
Total	17912.34	315			

**P< .05, **<.0

Table 30

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Intrinsic Falls Risk Based on Years of Practice (N = 316)

Years Of Practice (I)	Years Of Practice (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
≤ 5 years	6 –10 years	-.95	1.24	1.00	-4.61	2.71
	11 – 15 years	-1.80	1.25	1.00	-5.50	1.91
	16 – 20 years	-1.66	1.33	1.00	-5.59	2.28
	21 – 25 years	-4.56	1.62	.08	-9.36	.24
	≥ 26 years	-6.20*	1.35	**	-10.19	-2.20
6 –10 years	≤ 5 years	.95	1.24	1.00	-2.71	4.61
	11 – 15 years	-.85	1.39	1.00	-4.97	3.27
	16 – 20 years	-.70	1.46	1.00	-5.03	3.62
	21 – 25 years	-3.61	1.73	.57	-8.74	1.52
	≥ 26 years	-5.25*	1.48	.01	-9.63	-.86
11 – 15 years	≤ 5 years	1.80	1.25	1.00	-1.91	5.50
	6 –10 years	.85	1.39	1.00	-3.27	4.97
	16 – 20 years	.14	1.47	1.00	-4.21	4.50
	21 – 25 years	-2.76	1.74	1.00	-7.92	2.40
	≥ 26 years	-4.40	1.49	.05	-8.81	.02
16 – 20 years	≤ 5 years	1.66	1.33	1.00	-2.28	5.59
	6 –10 years	.70	1.46	1.00	-3.62	5.03
	11 – 15 years	-.14	1.47	1.00	-4.51	4.22
	21 – 25 years	-2.91	1.80	1.00	-8.23	2.42
	≥ 26 years	-4.54	1.56	.06	-9.15	.07
21 – 25 years	≤ 5 years	4.56	1.62	.08	-.24	9.36
	6 –10 years	3.61	1.73	.57	-1.52	8.74
	11 – 15 years	2.76	1.74	1.00	-2.40	7.92

	16 – 20 years	2.91	1.80	1.00	-2.42	8.23
	≥ 26 years	-1.64	1.82	1.00	-7.01	3.73
≥ 26 years	≤ 5 years	6.20*	1.35	.**	2.20	10.19
	6 –10 years	5.25*	1.48	.01	.86	9.63
	11 – 15 years	4.40	1.49	.05	-.021	8.81
	16 – 20 years	4.54	1.56	.06	-.07	9.15
	21 – 25 years	1.64	1.82	1.00	-3.73	7.01

*. The mean difference is significant at the 0.05 level. ** P < .001

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding intrinsic falls risk based on highest physical therapy degree attained. Statistically significant differences in physical therapists' clinical practices regarding falls risk did not exist between the respondents highest physical therapy degree attained (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding intrinsic falls risk based on being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice behaviors did exist between being a certified APTA clinical instructor and not being an instructor (see Table 31). Bonferroni Post Hoc Analysis were not ran because there were fewer than three groups.

Table 31

ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on being a Certified APTA Instructor (N = 316)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	301.046	1	301.046	5.367	.021
Within Groups	17611.29	314	56.087		
Total	17912.34	315			

*P< .05, **P<.001

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding intrinsic falls risk based on majority of type of patient seen by the physical therapist. Statistically significant differences in physical therapists' clinical practices regarding intrinsic falls risk existed between the respondents' majority type of patient seen (see Table 32). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists who have no experience treating geriatric patients (M = 35, SD = 12.17) demonstrated a lower level of attention to clinical practices regarding intrinsic falls risks than those who do not treat geriatric patients (M = 52. 62, SD = 7.44), physical therapists who treat primarily geriatric patients (M = 52, SD = 7.2), and physical therapists who have experience treating geriatric patients, but the majority of their patients fall into another age group (M = 51.11,SD = 7.46). Table 33 provides a summary of the post hoc analysis.

Table 32

ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on Majority of Patients (N = 316)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	890.06	3	296.69	5.44	**
Within Groups	17022.28	312	54.56		
Total	17912.34	315			

*P< .05, **P< .01

Table 33

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Intrinsic Risk Based on Majority of Patients (N = 316)

Majority Patients (I)	Majority Patients (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Do Not Treat	No experience	17.62*	4.73	**	5.05	30.18
	Geriatric	.62	2.14	1.00	-5.07	6.30
	Experience/other	1.51	2.13	1.00	-4.15	7.16
No experience	Do Not Treat	-17.62*	4.73	**	-30.18	-5.05
	Geriatric	-17.00*	4.31	**	-28.44	-5.56
	Experience/other	-16.11*	4.30	**	-27.53	-4.68
Geriatric	Do Not Treat	-.62	2.14	1.00	-6.30	5.07
	No experience	17.00*	4.31	**	5.56	28.44
	Experience/other	.90	.86	1.00	-1.38	3.17
Experience/ other	Do Not Treat	-1.51	2.13	1.00	-7.16	4.15
	No experience	16.11*	4.30	**	4.68	27.53
	Geriatric	-.90	86	1.00	-3.17	1.38

*. The mean difference is significant at the 0.05 level. **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding intrinsic falls risk based on practice setting of the physical therapist. Statistically significant differences in physical therapists' clinical practices regarding intrinsic falls risk existed between the respondents practice setting (see Table 34). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose practice setting was home care (M = 57.92, SD = 4.25) demonstrated a higher level of attention to clinical practices regarding intrinsic falls risks than those whose practice setting was acute care hospital (M = 49.14, SD = 7.91), physical therapists whose practice setting was privately owned outpatient

clinic (M = 50.27, SD = 7.30), and physical therapists whose practice setting was facility-based outpatient clinic (M = 50.98, SD = 7.86). Table 35 provides a summary of the post hoc analysis.

Table 34

ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on Practice Setting (N = 316)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1047.67	6	174.61	3.2	**
Within Groups	16864.67	309	54.58		
Total	17912.34	315			

*P< .05, **P<.01

Table 35

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Intrinsic Risk Based on Practice Setting (N = 316)

Practice Setting (I)	Practice Setting (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Acute Care Hospital (ACH)	AR	-3.73	1.48	.25	-8.25	.80
	SAR	-2.32	2.34	1.00	-9.49	4.84
	SNF	-5.17	2.34	.58	-12.33	2.00
	POOC	-1.13	1.58	1.00	-5.99	3.72
	FBOC	-1.84	1.30	1.00	-5.82	2.14
	HC	-8.78*	2.41	**	-16.17	-1.39

Table 35 Continued

Acute Rehab (AR)	ACH	3.73	1.48	.25	-0.80	8.25
	SAR	1.41	2.26	1.00	-5.52	8.33
	SNF	-1.44	2.26	1.00	-8.37	5.48
	POOC	2.59	1.47	1.00	-1.90	7.09
	FBOC	1.89	1.15	1.00	-1.64	5.42
	HC	-5.05	2.34	0.63	-12.21	2.11
Sub-acute Rehab (SAR)	ACH	2.32	2.34	1.00	-4.84	9.49
	AR	-1.41	2.26	1.00	-8.33	5.52
	SNF	-2.85	2.90	1.00	-11.72	6.03
	POOC	1.19	2.33	1.00	-5.96	8.33
	FBOC	0.48	2.15	1.00	-6.10	7.07
	HC	-6.46	2.96	0.63	-15.52	2.61
Skilled Nursing Facility (SNF)	ACH	5.17	2.34	0.58	-2.00	12.33
	AR	1.44	2.26	1.00	-5.48	8.37
	SAR	2.85	2.90	1.00	-6.03	11.72
	POOC	4.04	2.33	1.00	-3.11	11.18
	FBOC	3.33	2.15	1.00	-3.25	9.91
	HC	-3.61	2.96	1.00	-12.67	5.45
Privately Owned O.P. Clinic (POOC)	ACH	1.13	1.58	1.00	-3.72	5.99
	AR	-2.59	1.47	1.00	-7.09	1.90
	SAR	-1.19	2.33	1.00	-8.33	5.96
	SNF	-4.04	2.33	1.00	-11.18	3.11
	FBOC	-0.70	1.29	1.00	-4.65	3.24
	HC	-7.64*	2.41	0.03	-15.01	-0.27
Facility-Based O.P. Clinic (FBOC)	ACH	1.84	1.30	1.00	-2.14	5.82
	SAR	-0.48	2.15	1.00	-7.07	6.10
	SNF	-3.33	2.15	1.00	-9.91	3.25
	POOC	0.70	1.29	1.00	-3.24	4.65
	HC	-6.94*	2.23	0.04	-13.77	-0.11
	ACH	1.84	1.30	1.00	-2.14	5.82
Home Care (HC)	ACH	8.78*	2.41	**	1.39	16.17
	AR	5.05	2.34	0.66	-2.11	12.21
	SAR	6.46	2.96	0.63	-2.61	15.52
	SNF	3.61	2.96	1.00	-5.45	12.67
	POOC	7.64*	2.41	0.03	0.27	15.01
	FBOC	6.94*	2.23	0.04	0.11	13.77

*. The mean difference is significant at the 0.05 level. **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding extrinsic falls risk and years of practice as a physical therapists. Statistically significant differences in physical therapists' clinical practices regarding extrinsic falls risk existed between the respondent's years of practice as a physical therapists (see Table 36). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists who had been practicing for twenty-six years or more demonstrated a higher level of attention to clinical practices regarding extrinsic falls risks (M = 52.25, SD = 6.76) than those who had been practicing for five years or less (M = 46.33, SD = 6.76). Table 37 provides a summary of the post hoc analysis.

Table 36

ANOVA Results: Mean Difference of Clinical Practices Extrinsic Risk Based on Years of Practice (N = 303)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	848.17	5	169.63	2.739	.019
Within Groups	18392.15	297	61.93		
Total	19240.32	302			

*P< .05

Table 37

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Extrinsic Risk Based on Years of Practice (N = 303)

Years of Practice (I)	Years of Practice (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	6 –10 years	-2.29	1.34	1.00	-6.26	1.67
	11 – 15 years	-2.70	1.38	.77	-6.78	1.39
≤ 5 years	16 – 20 years	-1.61	1.44	1.00	-5.87	2.64
	21 – 25 years	-3.13	1.78	1.00	-8.39	2.14
	≥ 26 years	-5.42*	1.55	**	-10.01	-.82
	≤ 5 years	2.29	1.34	1.00	-1.67	6.26
	11 – 15 years	-.40	1.52	1.00	-4.91	4.10
6 –10 years	16 – 20 years	.68056	1.58	1.00	-3.98	5.34
	21 – 25 years	-.83500	1.89	1.00	-6.44	4.77
	≥ 26 years	-3.12500	1.68	.96	-8.10	1.85
	≤ 5 years	2.70	1.38	.773	-1.39	6.78
	6 –10 years	.40	1.52	1.00	-4.10	4.91
11 – 15 years	16 – 20 years	1.08	1.61	1.00	-3.68	5.85
	21 – 25 years	-.43	1.92	1.00	-6.12	5.25
	≥ 26 years	-2.72	1.71	1.00	-7.79	2.35
	≤ 5 years	1.61	1.44	1.00	-2.64	5.86
	6 –10 years	-.681	1.58	1.00	-5.34	3.98
16 – 20 years	11 – 15 years	-1.08	1.61	1.00	-5.85	3.68
	21 – 25 years	-1.52	1.96	1.00	-7.32	4.29
	≥ 26 years	-3.81	1.76	.470	-9.01	1.40
	≤ 5 years	3.13	1.78	1.00	-2.14	8.39
	6 –10 years	.84	1.89	1.00	-4.77	6.44
21 – 25 years	11 – 15 years	.43	1.92	1.00	-5.25	6.12
	16 – 20 years	1.52	1.96	1.00	-4.29	7.32
	≥ 26 years	-2.29	2.05	1.00	-8.35	3.77

Table 37 continued

	≤ 5 years	5.42*	1.55	**	.8245	10.01
	6 –10 years	3.13	1.68	.96	-1.8495	8.10
≥ 26 years	11 – 15 years	2.72	1.71	1.00	-2.3485	7.79
	16 – 20 years	3.81	1.76	.47	-1.4014	9.01
	21 – 25 years	2.29	2.05	1.00	-3.7724	8.35

*. The mean difference is significant at the 0.05 level. **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding extrinsic falls risk and highest physical therapy degree attained. Statistically significant differences in physical therapists' clinical practices regarding extrinsic falls risk did not exist between the respondents highest physical therapy degree attained (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding extrinsic falls risk and being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice behaviors did exist between being a certified APTA clinical instructor not being an instructor (see Table 38). Bonferroni Post Hoc Analysis were not ran because there were fewer than three groups.

Table 38

ANOVA Results: Mean Difference of Clinical Practices Extrinsic Risk Based on being a Certified APTA Instructor (N = 303)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	615.309	1	615.309	9.944	.002
Within Groups	18625.008	301	61.877		
Total	19240.317	302			

*P< .05

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding extrinsic falls risk based on majority of type of patient treated by the physical therapist. Statistically significant differences in physical therapists' clinical practices regarding extrinsic falls risk existed between the respondents majority type of patient seen (see Table 39). Bonferroni Post Hoc Analysis did not reveal any significant differences between physical therapists' clinical practices regarding extrinsic falls risk practices and majority of type of patient's treated by the physical therapist. The level of significance was (.08) between physical therapists' clinical practices regarding extrinsic falls risk practices when comparing physical therapists' that treated geriatric patients (M = 49.85, SD = 8.63) and physical therapists' that do not have experience treating geriatric patients (M = 38.33, SD = 7.51). Table 40 provides a summary of the post hoc analysis.

Table 39

ANOVA Results: Mean Difference of Clinical Practices Extrinsic Risk Based on Majority of Patients (N = 303)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	546.13	3	182.05	2.912	.035
Within Groups	18694.18	299	62.52		
Total	19240.32	302			

*P< .05

Table 40

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Extrinsic Risk Based on Majority of Patients (N = 303)

Majority of Patients (I)	Majority of Patients (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lowe Bound	Upper Bound
Do Not Treat (DNT)	NEG	10.85	5.15	.22	-2.83	24.53
	PG	-.66	2.48	1.00	-7.25	5.92
	EGO	1.04	2.47	1.00	-5.51	7.60
No Experience Geriatric (NEG)	DNT	-10.85	5.15	.22	-24.53	2.83
	PG	-11.51	4.61	.08	-23.77	.74
	EGO	-9.80	4.61	.21	-22.05	2.44
Primarily Geriatric (PG)	DNT	.66	2.48	1.00	-5.91	7.25
	NEG	11.51	4.61	.08	-.74	23.77

Table 42 continued

	EGO	1.71	.93	.41	-.77	4.18
Experience	DNT	-1.04	2.47	1.00	-7.60	5.5134
Geriatric/	NEG	9.80	4.61	.21	-2.44	22.05
Other (EGO)	PG	-1.71	.93	.41	-4.18	.77

* The mean difference is significant at the 0.05 level. **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' clinical practices regarding extrinsic falls risk based on practice setting of the physical therapist. Statistically significant differences in physical therapists' clinical practices extrinsic falls risk existed between the respondents practice setting (see Table 41). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose practice setting was home care (M = 54.45, SD = 4.70) demonstrated a higher level of attention to clinical practices regarding extrinsic falls risks than those whose practice setting was privately owned outpatient clinic (M = 46.49, SD = 8.28), and physical therapists whose practice setting was facility-based outpatient clinic (M = 47.4, SD = 8.24), as well as physical therapists' whose practice setting was acute rehabilitation (M = 52.33, SD = 6.04) demonstrated a higher level of attention to clinical practices regarding extrinsic falls risks than those whose practices settings were: acute care hospital (M = 47.27, SD = 8.72), privately owned outpatient clinic (M = 46.49, SD = 8.28), and facility-based outpatient clinic (M = 47.4, SD = 8.24). Table 42 provides a summary of the post hoc analysis.

Table 41

ANOVA Results: Mean Difference of Clinical Practices Extrinsic Risk Based on Practice Setting (N = 303)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1958.13	6	326.36	5.59	.0000016
Within Groups	17282.19	296	58.39		
Total	19240.32	302			

*P< .05

Table 42

Bonferroni Post Hoc Analysis: Mean Difference of Clinical Practices Extrinsic Risk Based on Practice Setting (N = 303)

Practice Setting (I)	Practice Setting (J)	Mean Difference (I-J)	S	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Acute Care Hospital (ACH)	AR	-5.07*	1.57	0.03	-9.86	-.27
	SAR	-5.81	2.43	0.37	-13.26	1.65
	SNF	-4.12	2.43	1.00	-11.57	3.34
	POOC	0.78	1.67	1.00	-4.33	5.89
	FBOC	-0.13	1.38	1.00	-4.35	4.08
	HC	-7.19	2.60	0.13	-15.14	0.77
Acute Rehab (AR)	ACH	5.07*	1.57	0.03	0.27	9.86
	SAR	-0.74	2.35	1.00	-7.94	6.45
	SNF	0.95	2.35	1.00	-6.25	8.15
	POOC	5.85*	1.54	**	1.12	10.58
	FBOC	4.933*	1.22	**	1.19	8.68
	HC	-2.12	2.52	1.00	-9.83	5.59

Table 44 continued

Sub-Acute Rehab (SAR)	ACH	5.81	2.43	0.37	-1.65	13.26
	AR	.744	2.35	1.00	-6.45	7.94
	SNF	1.692	3.00	1.00	-7.49	10.88
	POOC	6.589	2.42	0.14	-0.82	14.00
	FBOC	5.677	2.23	0.24	-1.15	12.50
	HC	-1.378	3.13	1.00	-10.97	8.22
Skilled Nursing Facility (SNF)	ACH	4.12	2.43	1.00	-3.34	11.57
	AR	-0.95	2.35	1.00	-8.15	6.25
	SAR	-1.69	3.00	1.00	-10.88	7.49
	POOC	4.90	2.42	0.92	-2.52	12.31
	FBOC	3.99	2.23	1.00	-2.84	10.81
	HC	-3.07	3.13	1.00	-12.66	6.52
Privately Owned O.P. Clinic (POOC)	ACH	-0.78	1.67	1.00	-5.89	4.33
	AR	-5.85*	1.54	**	-10.58	-1.12
	SAR	-6.59	2.42	0.14	-14.00	0.82
	SNF	-4.90	2.42	0.92	-12.31	2.52
	FBOC	-0.91	1.35	1.00	-5.05	3.23
	HC	-7.97*	2.58	0.05	-15.88	-0.05
Facility-Based O.P. Clinic (FBOC)	ACH	0.13	1.38	1.00	-4.08	4.35
	AR	-4.93*	1.22	**	-8.68	-1.19
	SAR	-5.68	2.23	0.24	-12.50	1.15
	SNF	-3.99	2.23	1.00	-10.81	2.84
	POOC	0.91	1.35	1.00	-3.23	5.05
	HC	-7.06	2.40	0.08	-14.42	0.31
Home Care (HC)	ACH	7.19	2.60	.13	-.77	15.14
	AR	2.12	2.52	1.00	-5.59	9.83
	SAR	1.38	3.13	1.00	-8.22	10.97
	SNF	3.07	3.13	1.00	-6.52	12.66
	POOC	7.97*	2.58	0.05	0.05	15.88
	FBOC	7.06	2.40	0.08	-0.31	14.42

*. The mean difference is significant at the 0.05 level. **P< .01

Research Question Four. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults?

Multiple linear regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree (Doctorate), being a certified APTA clinical instructor, and majority of patients types seen (Treat geriatric patients) predicted physical therapists' clinical practices regarding intrinsic falls risk (see Table 43). There were significant positive correlations between the physical therapist having eleven or more years of practice (P = .03) and clinical practices regarding intrinsic falls risk, as well as a significant correlation between being a certified APTA instructor (p = .02) and physical therapists' clinical practices regarding falls risk. Approximately 5% of the variance (R^2 = .057) of physical therapists' clinical practices regarding intrinsic falls risk can be explained by their years of practice (11 or more years of practice), highest PT degree (Doctorate), being a certified APTA clinical instructor, and majority of patients types seen (Treat geriatric patients).

Table 43

Summary of Multiple Regression Analysis for Clinical Practices Intrinsic Risk (N = 290)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	2.47	1.11	.17	2.22	.03
Doctorate PT Degree Attained	.62	1.10	.04	.57	.57
Certified APTA Clinical Instructor	2.17	.90	.14	2.42	.02
Primarily Treat Geriatric Patients	.78	.86	.05	.91	.37

Note. R^2 = .057

Multiple regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree (Doctorate), being a certified APTA clinical instructor, and majority of patients types seen (Treat geriatric patients) predicted physical therapists' clinical practices regarding extrinsic falls risk (see Table 44). There was a significant positive correlations between being a certified APTA clinical instructor ($p = .02$) and physical therapists' clinical practices regarding extrinsic falls risk. Approximately 5% of the variance ($R^2 = .057$) of physical therapists' clinical practices regarding extrinsic falls risk can be explained by years of practice (11 or more years of practice), highest PT degree (Doctorate), being a certified APTA clinical instructor, and majority of patients types seen (Treat geriatric patients)

Table 44

Summary of Multiple Regression Analysis for Clinical Practices Extrinsic Risk (N = 280)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	2.29	1.20	.15	1.90	.058
Doctorate PT Degree Attained	1.04	1.81	.07	.88	.378
Certified APTA Clinical Instructor	-2.98	.97	-.18	-3.08	.002
Primarily Treat Geriatric Patients	-1.53	.93	.10	-1.64	.103

Note. $R^2 = .059$

Research Question Five. Do differences exist between physical therapists' beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based

practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level?

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice beliefs and years of practice as a physical therapist. Statistically significant differences in physical therapists' evidence-based practice beliefs did not exist between the respondent's years of practice as a physical therapist (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice beliefs based on highest physical therapy degree attained. Statistically significant differences in physical therapists' evidence-based practice beliefs existed between the respondents' highest physical therapy degree attained (see Table 45). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose highest degree attained was a doctorate (M = 32.86, SD = 3.91) indicated a higher level of importance regarding evidence-based practice beliefs than those whose highest physical therapy degree was a baccalaureate (M = 30.52, SD = 5.20) and those highest physical therapy degree was a masters (M = 31.29, SD = 4.76). Table 46 provides a summary of the post hoc analysis.

Table 45

ANOVA Results: Mean Difference of Evidence-Based Practice Beliefs Based on Highest PT Degree (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	280.49	3	93.50	4.73	**
Within Groups	5985.18	303	19.75		
Total	6265.67	306			

*P< .05, **P< .01

Table 46

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Beliefs Based on Highest PT Degree (N = 307)

Highest PT Degree (I)	Highest PT Degree (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Baccalaureate	Master's	-.77	.76	1.00	-2.79	1.25
	Doctorate	-2.34*	.70	**	-4.18	-.50
	Other	-1.85	1.47	1.00	-5.74	2.05
Master's	Baccalaureate	.77	.76	1.00	-1.25	2.79
	Doctorate	-1.57	.60	.05	-3.15	.02
	Other	-1.08	1.42	1.00	-4.85	2.70
Doctorate	Baccalaureate	2.34*	.69	**	.49	4.18
	Master's	1.57	.60	.05	-.02	3.15
	Other	.49	1.39	1.00	-3.19	4.18
Other	Baccalaureate	1.87	1.47	1.00	-2.05	5.74
	Master's	1.08	1.42	1.00	-2.70	4.85
	Doctorate	-.49	1.39	1.00	-4.18	3.19

*. The mean difference is significant at the 0.05 level.

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice beliefs based on being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice behaviors did not exist between being a certified APTA clinical instructor not being an instructor (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice beliefs based on majority of patient type seen. Statistically significant differences between evidence-based practice beliefs did not exist between the respondent's majority type of patient seen (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice beliefs based on physical therapy practice setting. Statistically significant differences in evidence-based practice beliefs did not exist between the respondent's physical therapy practice setting (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice behaviors based on years of practice. Statistically significant differences in physical therapists' evidence-based practice behaviors did not exist between years of practice (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in physical therapists' evidence-based practice behaviors based on highest physical therapy degree attained. Statistically significant differences in physical therapists' evidence-based practice behaviors existed between the respondents highest physical therapy degree attained (see Table 47). Bonferroni Post Hoc Analysis did not reveal any significant differences in physical therapists' evidence-based practice behaviors between the respondents highest physical therapy degree attained. The level of significance was (.08) between evidence-based practice

behaviors when compared to physical therapists who responded physical treated geriatric patients (M = 49.85, SD = 8.63) and physical therapists that do not have experience treating geriatric patients (M = 38.33, SD = 7.51). Table 48 provides a summary of the post hoc analysis.

Table 47

ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on Highest PT Degree (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	170.50	3	56.83	3.09	.027
Within Groups	5539.31	301	18.40		
Total	5709.80	304			

*P< .05

Table 48

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Behaviors Based on Highest PT Degree Attained (N = 305)

Highest PT Highest PT Degree (I)	Highest PT Highest PT Degree (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Baccalaureate	Master's	-.19	.74	1.00	-2.14	1.76
	Doctorate	-1.59	.67	.11	-3.37	.20
	Other	-1.89	1.42	1.00	-5.65	1.87
Master's	Baccalaureate	.19	.74	1.00	-1.76	2.14
	Doctorate	-1.40	.58	.10	-2.93	.14
	Other	-1.70	1.37	1.00	-5.34	1.95
Doctorate	Baccalaureate	1.59	.67	.11	-.20	3.37
	Master's	1.40	.58	.10	-.14	2.93
	Other	-.30	1.34	1.00	-3.86	3.25
Other	Baccalaureate	1.90	1.42	1.00	-1.87	5.65
	Master's	1.70	1.37	1.00	-1.95	5.34
	Doctorate	.31	1.34	1.00	-3.25	3.86

*. The mean difference is significant at the 0.05 level.

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice behaviors based on being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice behaviors did not exist between being a certified APTA clinical instructor or not being an instructor (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice beliefs based on majority of patient types seen. Statistically significant

differences in evidence-based practice beliefs did not exist between majority of patient types seen (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice beliefs based on physical therapy practice setting. Statistically significant differences in evidence-based practice beliefs did not exist between the respondent's physical therapy practice setting (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice perception of insufficient time based on years of practice. Statistically significant differences in evidence-based practice perception of insufficient time did not exist between years of practice (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice perception of insufficient time based on highest physical therapy degree attained. Statistically significant differences in evidence-based practice perception of insufficient time did not exist between respondent's highest physical therapy degree attained (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice perception of insufficient time based on being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice perception of insufficient time did not exist between being a certified APTA clinical instructor or not being an instructor (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in in evidence-based practice perception of insufficient time based on majority of patient type seen. Statistically significant differences in evidence-based practice beliefs did not exist between majority of patient types seen (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice perception of insufficient time based on practice setting Statistically significant differences in evidence-based practice perception of insufficient time existed between the respondents' physical therapy practice setting (see Table 49). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose practice setting was skilled nursing facility (M = 4.69, SD = .63) indicated a higher level of importance regarding evidence-based practice beliefs than those whose practice setting was acute care hospital (M = 3.67, SD = 1.17) Table 50 provides a summary of the post hoc analysis.

Table 49

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Practice Setting (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14.17	6	2.36	2.15	.048
Within Groups	330.10	300	1.10		
Total	344.26	306			

*P< .05

Table 50

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Perception of Insufficient Time Based on Practice Setting (N = 307)

Primary Facility (I)	Primary Facility (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Acute Care Hospital (ACH)	AC	-.22	.21	1.00	-.87	.42
	SAR	.21	.33	1.00	-.80	1.23
	SNF	-1.02*	.33	.05	-2.04	-.00
	POOC	-.33	.23	1.00	-1.02	.37
	FBOC	-.27	.19	1.00	-.84	.30
	HC	.01	.34	1.00	-1.04	1.06
Acute Rehab (AC)	ACH	.22	.21	1.00	-.42	.87
	SAR	.44	.32	1.00	-.551	1.42
	SNF	-.80	.32	.29	-1.78	.19
	POOC	-.103	.21	1.00	-.75	.54
	FBOC	-.047	.17	100	-.56	.46
	HC	.23	.33	1.00	-.80	1.25
Sub-acute Rehab (SAR)	ACH	-.21	.33	1.00	-1.23	.80
	AC	-.43	.32	1.00	-1.42	.55
	SNF	-1.23	.41	.06	-2.50	.03
	POOC	-.54	.33	1.00	-1.56	.48
	FBOC	-.48	.31	1.00	-1.42	.45
	HC	-.21	.42	1.00	-1.50	1.08
Skilled Nursing Facility (SNF)	ACH	1.02*	.33	.05	***	2.04
	AC	.80	.32	.294	-.19	1.78
	SAR	1.23	.41	.063	-.03	2.50
	POOC	.70	.33	.796	-.33	1.71
	FBOC	.75	.31	.314	-.19	1.69
	HC	1.03	.42	.318	-.26	2.31

Table 64 continued

Privately owned O.P Clinic (POOC)	ACH	.33	.23	1.00	-.37	1.02
	AC	.10	.21	1.00	-.54	.75
	SAR	.54	.33	1.00	-.48	1.56
	SNF	-.69	.33	.80	-1.71	.33
	FBOC	.06	.19	1.00	-.51	.62
	HC	.33	.34	1.00	-.72	1.38
Facility-Based O.P. clinic (FBOC)	ACH	.27	.19	1.00	-.30	.84
	AC	.05	.17	1.00	-.46	.56
	SAR	.48	.31	1.00	-.45	1.42
	SNF	-.75	.31	.31	-1.69	.19
	POOC	-.06	.19	1.00	-.62	.51
	HC	.28	.32	1.00	-.69	1.25
Home Care (HC)	ACH	-.01	.34	1.00	-1.06	1.04
	AC	-.23	.33	1.00	-1.25	.79
	SAR	.21	.42	1.00	-1.08	1.50
	SNF	-1.03	.42	.31	-2.31	.26
	POOC	-.33	.34	1.00	-1.38	.72
	FBOC	-.28	.32	1.00	-1.25	.69

*. The mean difference is significant at the 0.05 level. **P< .01, ***< .01

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice perception of resource/access based on years of practice. Statistically significant differences in evidence-based practice resource/access did not exist between the respondent's years of practice (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resources/access based on highest physical therapy degree attained Statistically significant differences in perception of evidence-based practice resources/access existed between the respondents' highest physical therapy degree attained (see Table 51). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose highest physical therapy degree attained was a masters (M = 4.77, SD = 2.13) indicated a higher level

of importance regarding evidence-based practice resources/access than those whose highest physical therapy degree attained was a baccalaureate (M = 2.91, SD = 1.30) Table 52 provides a summary of the post hoc analysis.

Table 51

ANOVA Results: Mean Difference of Perception of Evidence-Based Practice Resource/Access Based on Highest Degree (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	48.85	3	16.28	4.12	.007
Within Groups	1189.48	301	3.95		
Total	1238.33	304			

*P< .05

Table 52

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Resources/Access Based on Highest PT Degree (N = 305)

Highest PT Degree (I)	Highest PT Degree (J)	Mean Difference (I-J)	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Baccalaureate	Master's	-.14	.34	1.00	-1.05	.76
	Doctorate	.49	.31	.71	-.34	1.31
	Other	1.72	.61	.06	-.03	3.46
Master's	Baccalaureate	.14	.34	1.00	-.76	1.05
	Doctorate	.63	.27	.12	-.08	1.34
	Other	1.86*	.64	.02	.17	3.55
Doctorate	Baccalaureate	-.49	.31	.71	-1.31	.34
	Master's	-.63	.27	.12	-1.34	.08
	Other	1.23	.62	.29	-.42	2.88
Other	Baccalaureate	-1.72	.66	.06	-3.46	.03
	Master's	-1.86*	.64	.02	-3.55	-.168
	Doctorate	-1.23	.62	.29	-2.88	.42

*. The mean difference is significant at the 0.05 level.

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resource/access based on being a certified APTA clinical instructor. Statistically significant differences in perception of evidence-based practice resource/access did not exist between being a certified APTA clinical instructor or not being instructor (see Table 53).

Table 53

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Resource/Access Based on being a Certified APTA Instructor (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	53.02	1	53.02	13.55	**
Within Groups	1185.31	303	3.91		
Total	1238.33	304			

*P< .05, **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resource/access based on majority of patient types seen. Statistically significant differences in perception of evidence-based practice resource/access did not exist between majority of patient types seen (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resource/access based on physical therapy practice setting. Statistically significant differences in perception of evidence-based practice resource/access did not exist between physical therapy practice setting (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resource/access based on years of practice. Statistically significant differences in perception of evidence-based practice resource/access exist between physical therapy practice setting (see Table 54).) Table 55 provides a summary of the post hoc analysis.

Table 54

ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Years of Practice (N = 301)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	177.52	5	35.50	2.71	.021
Within Groups	3865.29	295	13.10		
Total	4042.81	300			

*P< .05

Table 55

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Skills/Interests Based on Practice Setting (N =301)

Practice Setting (I)	Practice Setting (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Acute Care Hospital (ACH)	AR	1.88	.75	.270	-.42	4.17
	SAR	1.48	1.15	1.00	-2.05	5.01
	SNF	2.33	1.15	.926	-1.20	5.85
	POOC	1.87	0.79	.392	-0.55	4.29
	FBOC	1.11	0.65	1.000	-0.89	3.10
	HC	-1.37	1.19	1.000	-5.00	2.27
Acute Rehab (AR)	ACH	-1.88	0.75	0.270	-4.17	0.42
	SAR	-0.40	1.12	1.000	-3.82	3.03
	SNF	0.45	1.12	1.000	-2.97	3.88
	POOC	-0.01	0.74	1.000	-2.27	2.26

Table 72 Continued

	FBOC	-0.77	0.59	1.000	-2.57	1.04
	HC	-3.24	1.15	0.111	-6.78	0.30
Sub-acute Rehab (SAR)	ACH	-1.48	1.15	1.000	-5.01	2.05
	AR	0.40	1.12	1.000	-3.03	3.82
	SNF	0.85	1.42	1.000	-3.50	5.19
	POOC	0.39	1.14	1.000	-3.12	3.89
	FBOC	-0.37	1.05	1.000	-3.60	2.86
	HC	-2.85	1.45	1.000	-7.28	1.59
Skilled Nursing Facility (SNF)	ACH	-2.33	1.15	0.926	-5.85	1.20
	AR	-0.45	1.12	1.000	-3.88	2.97
	SAR	-0.85	1.42	1.000	-5.19	3.50
	POOC	-0.46	1.14	1.000	-3.97	3.05
	FBOC	-1.22	1.05	1.000	-4.45	2.01
	HC	-3.69	1.45	0.236	-8.13	0.74
Privately Owned O.P. Clinic (POOC)	ACH	-1.87	0.79	0.392	-4.29	0.55
	AR	0.01	0.74	1.000	-2.26	2.27
	SAR	-0.39	1.14	1.000	-3.89	3.12
	SNF	0.46	1.14	1.000	-3.05	3.97
	FBOC	-0.76	0.64	1.000	-2.72	1.20
	HC	-3.23	1.18	0.137	-6.85	0.39
Faculty-Based O.P. Clinic (FBOC)	ACH	-1.11	0.65	1.000	-3.10	0.89
	AR	0.77	0.59	1.000	-1.04	2.57
	SAR	0.37	1.05	1.000	-2.86	3.60
	SNF	1.22	1.05	1.000	-2.01	4.45
	POOC	0.76	0.64	1.000	-1.20	2.72
	HC	-2.47	1.09	0.512	-5.82	0.88
Home Care (HC)	ACH	1.37	1.19	1.000	-2.27	5.00
	AR	3.24	1.15	0.111	-0.30	6.78
	SAR	2.85	1.45	1.000	-1.59	7.28
	SNF	3.69	1.45	0.236	-0.74	8.13
	POOC	3.23	1.18	0.137	-0.39	6.85
	FBOC	2.47	1.09	0.512	-0.88	5.82

* The mean difference is significant at the 0.05 level.

Analyses of variance (ANOVA) were calculated to determine differences in perception of evidence-based practice resource/access based on highest PT degree. Statistically significant differences in perception of evidence-based practice resource/access exist between

physical therapy practice setting (see Table 56). Specifically, Bonferroni Post Hoc Analysis revealed that physical therapists' whose highest physical therapy degree attained was a doctorate indicated a higher level of importance regarding evidence-based practice skills/interest than those whose highest physical therapy degree attained was a master's or baccalaureate. Table 57 provides a summary of the post hoc analysis.

Table 56

ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Highest Degree (N = 301)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	353.79	3	117.93	9.49	**
Within Groups	3689.02	297	12.42		
Total	4042.81	300			

*P< .05

Table 57

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Behaviors Based on Highest PT Degree (N = 301)

Highest PT Degree (I)	Highest PT Degree (J)	Mean Difference (I-J)	Standard Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Baccalaureate	Master's	-.13	.61	1.00	-1.74	1.49
	Doctorate	2.13*	0.55	**	0.67	3.60
	Other	0.79	1.16	1.00	-2.30	3.88
Master's	Baccalaureate	0.13	0.61	1.00	-1.49	1.74
	Doctorate	2.26*	0.48	**	0.98	3.53
	Other	0.92	1.13	1.00	-2.09	3.92
Doctorate	Baccalaureate	-2.13*	0.55	**	-3.60	-0.67
	Master's	-2.26*	0.48	**	-3.53	-0.98
	Other	-1.34	1.10	1.00	-4.26	1.58
Table 74 continued						
Other	Baccalaureate	-0.79	1.16	1.00	-3.88	2.30
	Master's	-0.92	1.13	1.00	-3.92	2.09
	Doctorate	1.34	1.10	1.00	-1.58	4.26

*. The mean difference is significant at the 0.05 level. **P< .01

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice skills/interests based on being a certified APTA clinical instructor. Statistically significant differences in evidence-based practice skills/interests did not exist between being a certified APTA clinical instructor and not being an instructor (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice skills/interests based on majority of patient types seen. Statistically significant differences in evidence-based practice skills/interests did not exist between majority of patient types seen (see Appendix E).

Analyses of variance (ANOVA) were calculated to determine differences in evidence-based practice skills/interests based on practice setting. Statistically significant differences in evidence-based practice skills/interests existed between the respondents' physical therapy practice setting (see Table 58). Specifically, Bonferroni Post Hoc Analysis did reveal any differences between respondent's practice settings. Physical therapists' whose practice setting was home care (M = 13.0, SD = 2.98) reported the greatest lack of evidence-based practice resources /skills when compared to other practice settings. Overall, physical therapists did not report evidence-based practice resources/skills as being limited or extremely limited. Table 59 provides a summary of the post hoc analysis.

Table 58

ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Practice Setting (N = 301)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	200.14	6	33.36	2.55	.020
Within Groups	3842.67	294	13.07		
Total	4042.81	300			

*P< .05

Table 59

Bonferroni Post Hoc Analysis: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Practice Setting (N = 301)

Primary Facility (I)	Primary Facility (J)	Mean Difference (I-J)	S E	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Acute Care Hospital (ACH)	AR	1.87	.749	.270	-.42	4.17
	SAR	1.48	1.15	1.000	-2.05	5.01
	SNF	2.33	1.15	.926	-1.20	5.85
	POOC	1.87	0.79	.392	-0.55	4.29
	FBOC	1.11	0.65	1.000	-0.89	3.10
	HC	-1.37	1.19	1.000	-5.00	2.27
Acute Rehab (AR)	ACH	-1.87	0.75	.270	-4.17	0.42
	SAR	-0.39	1.12	1.000	-3.82	3.03
	SNF	0.45	1.12	1.000	-2.97	3.87
	POOC	-0.01	0.74	1.000	-2.27	2.26
	FBOC	-0.77	0.59	1.000	-2.57	1.04
	HC	-3.24	1.15	.111	-6.78	0.30
Sub-Acute Rehab (SAR)	ACH	-1.48	1.15	1.000	-5.01	2.05
	AR	0.39	1.12	1.000	-3.03	3.82
	SNF	0.85	1.42	1.000	-3.50	5.19
	POOC	0.39	1.14	1.000	-3.12	3.89
	FBOC	-0.37	1.05	1.000	-3.60	2.85
	HC	-2.85	1.45	1.000	-7.28	1.59
Skilled Nursing Facility (SNF)	ACH	-2.33	1.15	.926	-5.85	1.20
	AR	-0.45	1.12	1.000	-3.87	2.97
	SAR	-0.85	1.42	1.000	-5.19	3.50
	POOC	-0.46	1.14	1.000	-3.97	3.05
	FBOC	-1.22	1.05	1.000	-4.45	2.01
	HC	-3.69	1.45	.236	-8.13	0.74

Table 59 continued

Privately Owned O.P. Clinic (POOC)	ACH	-1.87	0.79	.392	-4.29	0.55
	AR	0.01	0.74	1.000	-2.26	2.27
	SAR	-0.39	1.14	1.000	-3.89	3.12
	SNF	0.46	1.14	1.000	-3.05	3.97
	FBOC	-0.76	0.64	1.000	-2.72	1.20
	HC	-3.23	1.18	.137	-6.85	0.38
Facility-Based O.P. Clinic (FBOC)	ACH	-1.11	0.65	1.000	-3.10	0.89
	AR	0.77	0.59	1.000	-1.04	2.57
	SAR	.37	1.05	1.000	-2.85	3.60
	SNF	1.22	1.05	1.000	-2.01	4.45
	POOC	0.76	0.64	1.000	-1.20	2.72
	HC	-2.47	1.09	.512	-5.82	0.88
Home Care (HC)	ACH	1.37	1.19	1.000	-2.27	5.00
	AR	3.24	1.15	.111	-0.30	6.78
	SAR	2.85	1.45	1.000	-1.59	7.28
	SNF	3.69	1.45	.236	-0.74	8.13
	POOC	3.23	1.18	.137	-0.38	6.85
	FBOC	2.47	1.09	.512	-0.88	5.82

*. The mean difference is significant at the 0.05 level.

Research Question Six. How much do physical therapists' years of practice, majority type of patients seen, being an APTA certified clinical instructor and educational level predict their beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of evidence-based practice based on their years of practice, majority type of patients seen, practice setting, being an APTA certified clinical instructor and educational level towards the use of evidence-based practice?

Multiple regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree, being a certified APTA clinical instructor, and majority of patients types seen predict physical therapists' evidence-based practice beliefs (see Table 60). There were significant positive correlations between the physical therapists' attaining a doctorate in physical therapy degree and evidence-based practice beliefs

(P = .002), as well as a significant negative correlation between physical therapists primarily treating geriatric patients and physical therapists' evidence-based practice beliefs (p = .04). Approximately 6% of the variance (R^2 = .059) of physical therapists' evidence-based practice beliefs can be explained by the four predictor variables of years of practice (11 or more years of practice), highest PT degree being a doctorate, being a certified APTA clinical instructor, and primarily treating geriatric patients as the majority of patients types seen.

Table 60

Summary of Multiple Regression Analysis for Evidence-Based Practice Beliefs (N = 282)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	.39	.69	.04	.56	.576
Doctorate PT Degree Attained	2.11	.67	.23	.3.14	.002
Certified APTA Clinical Instructor	-.17	..56	-.02	-.31	.759
Primarily Treat Geriatric Patients	1.09	.54	.12	2.05	.042

Note. R^2 = .057

Multiple regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree, being a certified APTA clinical instructor, and majority of patients types seen predict physical therapists' evidence-based practice behaviors (see table 61). There were significant positive correlations between the physical therapists' years of practice being eleven or more years and evidence-based practice behaviors (P < .01), as well as a significant positive correlation between physical therapists highest degree attained be a doctorate of physical therapy and physical therapists' evidence-

based practice behaviors (P< .001). Approximately 8% of the variance (R^2 = .084) of physical therapists' evidence-based practice behaviors can be explained by the four predictor variables of years of practice (11 or more years of practice), highest PT degree being a doctorate, being a certified APTA clinical instructor, and primarily treating geriatric patients as the majority of patients types seen.

Table 61

Summary of Multiple Regression Analysis for Evidence-Based Practice Behaviors (N = 280)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	2.09	.66	.24	3.20	**
Doctorate PT Degree Attained	2.80	.64	.32	4.40	***
Certified APTA Clinical Instructor	-.85	.53	-.10	-1.60	.112
Primarily Treat Geriatric Patients	.62	.51	.07	1.22	.224

Note. R^2 = .084, **P< .01***P< .001

There were no significant correlation between the physical therapists' evidence-based practice perception of insufficient time and years of practice (11 or more years of practice), highest PT degree, being a certified APTA clinical instructor, and majority of patient types seen (see Table 62). Approximately 1% of the variance (R^2 = .017) of physical therapists' evidence-based practice perception of insufficient time can be explained by the four predictor variables of years of practice (11 or more years of practice), highest PT degree being a doctorate, being a

certified APTA clinical instructor, and primarily treating geriatric patients as the majority of patients types seen.

Table 62

Summary of Multiple Regression Analysis for Evidence-Based Practice Physical Therapists' Perception of Insufficient Time (N = 282)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	-.03	.16	-.01	-.17	.867
Doctorate PT Degree Attained	.09	.16	.04	.56	.580
Certified APTA Clinical Instructor	.16	.13	.08	1.23	.219
Primarily Treat Geriatric Patients	.17	.13	.08	1.40	.172

Note. $R^2 = .017$

Multiple regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree, being a certified APTA clinical instructor, and majority of patients types seen predict physical therapists' evidence-based practice resources/access (see Table 63) There were significant positive correlation between the physical therapists' being a certified APTA clinical instructor and evidence-based practice resources/skills ($P < .01$), as well as a significant positive correlation between physical therapists highest degree attained be a doctorate of physical therapy and physical therapists' evidence-based practice resources/access ($P < .001$). Approximately 9% of the variance ($R^2 = .092$) of physical therapists' evidence-based practice resources/access can be explained by the four predictor variables of years of practice (11 or more years of practice), highest PT degree being a

doctorate, being a certified APTA clinical instructor, and primarily treating geriatric patients as the majority of patients types seen.

Table 63

Summary of Multiple Regression Analysis for Evidence-Based Practice Perception of Resources/Access (N = 280)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	-.58	.30	-.14	-1.93	.054
Doctorate PT Degree Attained	-.99	.30	-.24	-3.34	.001
Certified APTA Clinical Instructor	.87	.25	.21	3.56	.00044
Primarily Treat Geriatric Patients	-.06	.24	-.01	-024	.810

Note. $R^2 = .092$

Multiple regression analyses were conducted to determine how well (IV) years of practice (11 or more years of practice), highest PT degree, being a certified APTA clinical instructor, and majority of patients types seen predict physical therapists' evidence-based practice skills/interests (see Table 64) There was a significant positive correlations between highest degree attained be a doctorate of physical therapy and physical therapists' evidence-based practice skills/interests ($P < .001$). Approximately 10% of the variance ($R^2 = .106$) of physical therapists' evidence-based practice skills/interest can be explained by the four predictor variables of years of practice (11 or more years of practice), highest PT degree being a doctorate, being a certified APTA clinical instructor, and primarily treating geriatric patients as the majority of patients types seen.

Table 64

Summary of Multiple Regression Analysis for Evidence-Based Practice Perception of Skills/Interest (N = 276)

Variable	B	SE(B)	β	t	Sig. (p)
Eleven or more Years of PT Practice	-.45	.54	-.06	-.85	.399
Doctorate PT Degree Attained	-2.59	.52	-.36	-4.97	.000001
Certified APTA Clinical Instructor	-.04	.44	-.01	-.10	.924
Primarily Treat Geriatric Patients	-.17	.42	-.02	-.41	.683

Note. $R^2 = .106$

Summary

This chapter presented results of statistical analyses of data collected from 316 physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults aged 65 years and older, their attitudes and beliefs toward the use of EBP, and barriers to physical therapists' adopting the innovation of using EBP. Respondents in this study were employed by eight large rehabilitation organizations located in the Midwest and Mid-South. The physical therapists participating in the study practiced in a variety of settings and had different levels of education ranging from a baccalaureate with a physical therapists certificate to a doctorate. The sample also included respondents that had years of practice ranging from less than five years as a licensed physical therapist to more than 26 years or more as a licensed physical therapist.

Results of this study indicated that several of the analyses of variance and regressions calculated in this study were statistically significant. However, the effect sizes for the analyses of variance and the R2 for the regressions were small. Cohen (1969, p23) described an effect size of 0.2 as 'small' , an effect size of 0.5 is described as 'medium', and an effect size of 0.8 as "large." A possible explanation for the small effect size calculations could be related to the researcher not addressing other variables that may have produced a lager difference between the means.

This study addressed variables such educational level, years of practice, status as an APTA-clinical instructor, type of the majority of patients treated, and clinical practice setting. The study did not account for other variables that could account for the differences. Other variables such as: where the physical therapists received their education, the physical therapists' personality, type of organization that employed the physical therapists, types of continuing education received by the physical therapists', or where the physical therapists received their clinical training may have demonstrated a larger effect size.

CHAPTER 5

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This chapter discusses implications from the results, limitations of the study, lessons learned and recommendations for health educators. Additionally, sections are devoted to recommendations for improving the study, as well as suggestions for future research and practice.

Purpose of the Study

The purpose of this study was to investigate physical therapists' clinical practices regarding intrinsic and extrinsic fall risk in the treatment of community-dwelling older adults aged 65 years and older. The study examined their attitudes and beliefs towards the use of and identified barriers to physical therapists' adopting the innovation of using EBP.

Summary

The risk of falls among older community-dwelling adults carries significant consequences. The phenomenon of falls among community-dwelling adults coupled with an aging baby boomer generation potentially increases the number of unintentional deaths and injuries.

Falls can occur for a variety of reasons, according to Donaldson and Kahn (2002), and over 130 risk factors are attributed to falling. Christiansen and Juhl (1987) suggested that falls are not part of the normal aging process, but are secondary to underlying physical dysfunction, medications, and environmental hazards. The reasons are often classified as intrinsic and extrinsic risks for falling.

Risk factors for falling that occur within the older adult population, which are due to internal or individual factors, are defined as intrinsic risk factors (Fredrikson, 2004; Lord et al., 2001; Tideiksaar, 1997). Northridge et al. (1995) referred to extrinsic risk factors for falling as home hazards or environmental hazards. Examples of extrinsic hazards include poor lighting, loose carpets, cluttered floors, or inadequate use of an assistive device (Speechley & Tinetti, 1991).

Physical therapists are not only healthcare providers that evaluate and treat injuries or impaired function, but also act as patient educators and consultants (APTA, 2012; Ohtake, 2010). Physical therapists have access to the community-dwelling older adult population and can have an impact on the prevention of falls, as supported by EBP.

Several researchers have addressed the use of EBP by physical therapists concerning the prevention of falls among older adults (Bridges et al., 2007; Jette et al., 2003; Miller, McKibbon, & Haynes, 2003; Salbach et al., 2007; Schreiber et al., 2009.). The innovation of using EBP in physical therapy is not new; nonetheless, therapists do not always use or seek EBP in the daily care of their patients.

EBP is defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett et al., 2000, p. 3). Ample research is available regarding interventions for the treatment and prevention of falls, founded on evidence-based research. Numerous EBP studies indicate that addressing intrinsic and extrinsic risk factors for falls can decrease the likelihood that a community-dwelling older adult will experience a fall.

The diffusion of innovations theory examines how innovations, such as EBP, are adopted (Rogers, 2003). The APTA Guidelines describe EBP as accessing, applying, and integrating evidence to guide clinical decision making to deliver the best patient care (2013). Fruth et al. (2010) studied physical therapists' beliefs and practices regarding EBP, and determined that they do consider it important.

However, numerous studies indicated that physical therapists do not always use EBP or review related research for various reasons. Stevenson et al. (2004) indicated that physical therapists appear to value the concept of using EBP, but are reluctant to adopt innovations found in research into their clinical practices. Fruth et al. (2010) concluded that determinants of the use of EBP included costs, practicality, limited visits secondary to insurance restrictions, and limited time to locate and read EBP research. The inability to analyze the research was also a barrier noted as to why physical therapists do not use EBP or evidence-based interventions (Salbach et al., 2007).

This study provided insights into the physical therapists' clinical practices regarding intrinsic and extrinsic fall risk factors in the treatment of community-dwelling older adults, as well as physical therapists' attitudes towards the use of EBP. The study also identified barriers to the physical therapists' utilization of EBP. Analysis of the data may also provide insight into the differences that exist between the physical therapists' years of experience, educational level, possessing APTA clinical instructor certification, predominant type of patients seen, and practice setting, regarding intrinsic and extrinsic fall risk factors in the treatment of community-dwelling older adults in their clinical practices. Data may provide insight into possible changes for current curriculum being taught in existing physical therapists' education programs, and the possible

need of continuing education for physical therapists regarding the prevention and treatment of falls and the use of EBP.

The following research questions were addressed in this study:

1. What are the physical therapists' clinical practices regarding intrinsic and extrinsic fall risk in the treatment of community-dwelling older adults?

2. What are the physical therapists' attitudes and beliefs towards the use of EBP?

3. Do differences exist among physical therapists' clinical practices regarding intrinsic and extrinsic fall risk in the treatment of community-dwelling older adults based on their years of practice, predominant type of patients seen, practice setting, possessing APTA clinical instructor certification, and educational level?

4. How much do physical therapists' years of practice, predominant type of patients seen, possessing APTA clinical instructor certification, and educational level predict their clinical practices regarding intrinsic and extrinsic fall risk in the treatment of community-dwelling older adults?

5. Do differences exist between physical therapists' beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of EBP based on their years of practice, predominant type of patients seen, practice setting, possessing APTA clinical instructor certification, and educational level?

6. To what degree do physical therapists' years of practice, predominant type of patients seen, possessing APTA clinical instructor certification, and educational level predict their

beliefs, behaviors, perceived resources/access, and skills/interest regarding their use of EBP?

Discussion and Findings

The study investigated physical therapists' clinical practices regarding intrinsic and extrinsic falls risk in the treatment of community-dwelling older adults aged 65 years and older, examine their attitudes and beliefs towards the use of EBP, and identify barriers to physical therapists' adopting the innovation of using EBP.

Results from the study indicated that over all physical therapists' displayed a high level of attention to clinical practices regarding risks for community-dwelling older adults falling. However, there were significant differences in clinical practices based upon years of physical therapy practice.

Other significant findings revealed in the study were regarding physical therapists' attitudes toward EBP and their use of EBP. The majority of physical therapists' reported that insufficient time to access and analyze EBP literature was a major barrier to utilizing EBP in their daily clinical practices. Overall, physical therapists' indicated that they thought EBP was valuable, but did not always appear to have adequate time to access or review the professional literature. Results from the study also indicated that were significant difference in attitudes toward EBP based up the highest physical therapy degree attained.

Findings Regarding Clinical Practices

Overall, physical therapists display a high level of attention to intrinsic risks for falling, extrinsic risks for falling regarding items that addressed balance and gait, muscle strength,

medical issues, and risky behavior that can put the community-dwelling older adult at risk for falling. These findings were similar to the study by Peel, Brown, Lane, Milliken and Patel (2008) on fall prevention knowledge and practice patterns among home health physical therapists, which concluded that, in general, home health physical therapists are knowledgeable regarding fall risk assessment and interventions to prevent falls.

However, physical therapists did not display as high a level of attention when it came to other intrinsic risks, such as the use of medication, putting the community-older adult at risk for falling, psychological issues, mental issues, poor vision, and alcohol use by the community-dwelling older adult. The findings indicate a higher level of attention appears to center around items that are typically strengths of most physical therapists, such as issues that are directly related to the examination and the development of a plan that uses treatment techniques to promote movement, pain reduction, restoration of function, and prevention of disability (APTA, 2013).

Physical therapists displayed a high level of attention to extrinsic risks for falling commonly found in the home, such as grab bars in the shower/tub, loose rugs and carpet, stairs, and hand rails. Other items that received a high level of attention from the physical therapists included assistive device usage, footwear, the environment outside the home, and ankle-foot orthosis.

A slightly lower level of attention was displayed by the physical therapists regarding extrinsic risks for falling that included poor lighting, doorways, bedside table, pets, and spills/wet floors. It is interesting to note that poor lighting for extrinsic risks and attention to the

potential intrinsic risk of poor vision were both given lower levels of attention by physical therapists.

Findings Regarding use of EBP

Items found in section four of the survey addressed physical therapists' attitudes and beliefs and behaviors towards the use of EBP, as well as addressed their perception of insufficient time, resources/access, and their skills/interest towards the use of EBP.

Jette et al. (2003), Schreiber et al. (2007), and Stevenson et al. (2004) indicated that physical therapists view EBP as valuable to the practice of physical therapy**.** Similarly, this study found that physical therapists' attitudes towards EBP reflected a high level of agreement regarding the necessity of applying it in their daily practice. The usefulness of literature and research findings in the physical therapists' day-to-day clinical practices, the need to increase the use of evidence in the daily practice of physical therapy, and a necessity of improving skills to incorporate EBP were also given a high level of importance by the respondents.

EBP was also thought to improve the quality of patient care, and was viewed as helpful in making decisions about patient care. Further, the adoption of EBP was not viewed as placing an unreasonable demand on physical therapists. Physical therapists had a lower level of agreement regarding the statement that reimbursement rate will increase if EBP is incorporated into daily clinical practice.

EBP behavior items indicated that the majority of physical therapists read a minimal number of EBP professional literature articles per month. More than half of the physical therapists read one to three articles per month. Less than 10% of the physical therapists reported reading 10 or more articles per month. Consultation of the literature one to three times per month

was noted by slightly more than half of the respondents. Less than 5% of the respondents indicated that they consult the literature seven or more times per month.

Physical therapists indicated that time was a barrier to their use of EBP, even though they placed a high level of importance on EBP. The majority of physical therapists reported that time for EBP was either extremely limited or nonexistent. Only a small percentage of physical therapists indicated that insufficient time had little impact on their use of EBP. The issue of insufficient time for EBP was noted as a significant barrier to physical therapists in several studies. Stevenson et al.'s (2004) study regarding physical therapists' attitude towards the use of EBP indicated that they need sufficient time in their daily work to integrate it. Schreiber et al.'s (2007) study of strategies to promote EBP use in pediatric physical therapy revealed that most physical therapists constantly cited a lack of time as a barrier to using EBP. Jette et al. (2003) noted that a lack of time was the greatest barrier to using EBP. Fruth et al. (2010) reported the top three barriers to using EBP were the lack of time, lack of access to literature, and research in specific areas, with the lack of time being the primary barrier to clinician's use of EBP. Salbach et al.'s (2007) study regarding practitioner and organizational barriers to EBP of physical therapists treating stroke patients indicated that only 8% of physical therapists were given time at work to access, explore, and appraise the literature.

Items that addressed resources and access to EBP indicated that slightly more than half of the physical therapists did not view access, information, and resources to EBP as a barrier. A small number of physical therapists reported that the lack of resources and information was an issue and a limited number of physical therapists reported that the lack of access to professional literature was an issue. Jette et al. (2003) concurred that the majority of physical therapists in their study in regard to their beliefs, attitudes, knowledge, and behaviors in the use of EBP noted

that having access to research was not an issue. Stevenson et al. (2004) reported that they did not have confidence regarding their ability to critically appraise the literature or perform literature searches.

Physical therapists as a whole reported that the lack of research skills and the skills to critically appraise the literature were not an issue. They did have a higher level disagreement in regard to generalizability of research findings as it applied to their patient population, as slightly less than half of the respondents viewed this as an issue. Results of this study closely mirrored a study conducted by Jette et al. (2003) that indicated approximately 30% of physical therapists in their study rated generalizability of research findings to their specific patient population and difficulty applying research findings to individual patients as important barriers. The ability to understand statistical analysis and interest in researching the literature were not seen as an issue by slightly more than half of the respondents.

Years of experience as a physical therapist appeared to impact the level of attention given to intrinsic risks for falling. Statistically significant differences in physical therapists' clinical practices regarding intrinsic fall risk existed based on the respondents' years of practice. Physical therapists with 26 or more years of experience demonstrated a higher level of attention to intrinsic fall risk clinical practices than those who had practiced 15 years or less. Physical therapists who practiced for 21 to 25 years demonstrated a higher level of attention to intrinsic fall risk clinical practices than physical therapists who practiced for 10 years or less.

Physical therapists who were APTA-certified clinical instructors demonstrated a higher level of attention to intrinsic and extrinsic risks for falling than those who were not APTA-certified instructors. Also, experience treating geriatrics appeared to make a difference in regard

to clinical practices related to intrinsic and extrinsic fall risk. Physical therapists who had no experience treating geriatric patients demonstrated a lower level of attention in this area compared to all other groups, and physical therapists who had been practicing for 26 or more years displayed a high level of attention to extrinsic risks for falling when compared to those practicing for five years or less.

Practice setting also appeared to make a difference in regard to clinical practices concerning intrinsic risk factors. Home care physical therapists demonstrated a higher level of attention to intrinsic fall risks when compared to outpatient physical therapists and acute care hospital physical therapists. Practice setting also appeared to influence the level of attention given to extrinsic risks for falling. Both acute rehabilitation and home care physical therapists demonstrated a higher level of attention to extrinsic risks when compared to outpatient physical therapists. Acute care physical therapists also demonstrated a higher level of attention to fall risks when compared to acute care hospital physical therapists.

Jette et al. (2003) suggested that newly licensed physical therapists believe that they have skills in information retrieval and appraisal, as opposed to physical therapists with baccalaureate degrees or those who have been licensed and practicing longer that did not indicate strong skills with information retrieval and appraisal. Ruchinskas et al.'s (2001) study regarding clinical decision making in the prediction of falls suggested that clinical decision making was not impacted by the level of education or years of experience, but a lack of appreciation for empirically validated predictive fall factors and the inability to apply research when determining fall risk.

Results of this study indicated that a higher physical therapy degree presented significant differences in the physical therapists' EBP beliefs. Specifically, physical therapists whose highest degree was a doctorate placed a higher level of importance on EBP than those whose highest physical therapy degree was a baccalaureate or master's degree. The physical therapists' perception of EBP resources/access based on the highest physical therapy degree attained also demonstrated statistically significant differences. Physical therapists whose highest physical therapy degree was a master's placed a higher level of importance on resources/access than those whose highest physical therapy degree was a baccalaureate.

Statistically significant differences were revealed regarding the perception of insufficient time for EBP based on practice setting. Physical therapists whose practice setting was in a skilled nursing facility placed a higher level of importance on EBP than those whose practice setting was in an acute care hospital Differences in EBP skills/interests based on practice setting existed between respondents' practice settings. Physical therapists whose practice setting was home care reported the greatest lack of EBP resources/skills when compared to other practice settings.

Other Findings. Multiple regression analyses was conducted to determine the extent to which years of practice (11 or more), highest PT degree (doctorate), APTA clinical instructor certification, and predominant patient type (treat geriatric patients) predicted physical therapists' clinical practices regarding intrinsic and extrinsic falls risk. The analyses revealed very little predictive value among the independent variables. Approximately 5% of the variance of physical therapists' clinical practices regarding intrinsic fall risk and 5% of the variance for extrinsic fall risk was explained by the aforementioned independent dummy variables.

Multiple regression analyses were conducted to determine the extent to which years of practice (11 or more years of practice), highest PT degree (doctorate), APTA clinical instructor certification, and predominant patient type (treat geriatric patients) predicted physical therapists' EBP beliefs, behaviors, perception of insufficient time, resources/access, and skills/interest.

The analyses revealed little predictive value among the independent variables. Of the variances among the physical therapists, the following could be explained by the independent dummy variables: 6% for EBP beliefs; 8% for EBP behaviors; 1% for EBP perception of insufficient time; 9% for EBP perception of resources/access; and 10% ($R^2 = .106$) for the physical therapists' EBP skills/interest.

Conclusions

The following conclusions were drawn, based on this study:

1. Physical therapists' years of experience appeared to play a greater role in regard to clinical practices for intrinsic and extrinsic fall risk. Those who had more years of experience displayed a higher level of attention to clinical practices when compared to physical therapists with less experience. It is important to note that previous studies indicate that physical therapists' knowledge of fall-related risk factors is fairly high, but utilizing the knowledge of fall-related risk factors in the prevention of falls does not always occur. According to Ruchinskas et al. (2001), clinicians appear to be aware of predictors of fall risks, but need prompting to assess them consistently.
2. The findings in regard to EBP beliefs mirrored those identified in previous literature. On the whole, the physical therapists in this study indicated that EBP was an important part of their practice. However, much like the findings of previous studies, physical therapists

indicated time for researching EBP was limited. Findings from this study were similar to those from a study conducted by Fruth et al. (2010), who concluded that determinants of the use of EBP included costs, practicality, limited visits secondary to insurance restrictions, and limited time to locate and read EBP research. Lack of time was also cited as a reason by physical therapists as a common barrier in their daily clinical (Jette et al., 2003; Richter and Austin, 2012; and Schreiber et al., 2009).

3. Physical therapists have little time to research or consult the professional literature during scheduled work hours. However, the majority of physical therapists indicated that understanding statistics and critically appraising the literature is not an issue. Once again, it appears that insufficient time is a factor in accessing and researching the professional literature.

4. This researcher assumes that the vast majority of respondents did not see resources and access to EBP as a barrier secondary to their place of employment. All participants in the study were employed by large rehabilitation organizations that have the resources.

Limitations

1. The sample may not be representative of the population of physical therapists practicing within the United States (US). For example, in 2010, the APTA indicated that 6.8% of physical therapists reported home health as their primary practice setting (APTA, 2011); in this study, 3.8% of physical therapists reported home health as their primary practice setting. In the sample of physical therapists for this study, 13.9% reported privately-owned outpatient clinics as their primary practice, while the APTA (2011) indicated that 33.6% of physical therapists reported privately-owned outpatient clinics as their primary

setting. Physical therapists responding to this survey study indicated a higher percentage for facility-based outpatient therapy as their primary practice setting (41.5%), as opposed to the APTA (2011) report which indicated that 20.9% of physical therapists listed facility-based outpatient physical therapy as their primary practice setting. Further, in this study, 4.1% reported skilled nursing facilities as their primary setting, which closely mirrored the percentage reported by the APTA (2011) report, which was 5.1%.

2. Access to a sample beyond large rehabilitation organizations may have offered different results by including physical therapists who were employed by smaller organizations. The researcher found it difficult to access a larger sample of physical therapists that would encompass the entire country and that included physical therapists employed by both large and small rehabilitation organizations. Limiting the study to larger organizations may have an effect on responses to questions regarding EBP since larger organizations tend to have the ability to offer greater resources and place strong emphasis on conducting research.

3. Response rate may not accurately indicate the true number of physical therapists' that actually received the on-line survey. The survey was distributed via e-mail to the primarily rehabilitation directors and research directors at each of the selected organizations with the understanding that they would forward the electronic survey to physical therapist under their direction. There is no way to verify if all potential respondents received the e-mail. Possible reasons that the e-mail was not forwarded or received include; physical therapists' may been on vacation, absent from work due to illness, or they did not access the e-mail from their director.

4. Self-reported data produced responses regarding clinical practices and EBP behavior and beliefs may have been reported in a socially desirable manner, irrespective of the physical therapists' actual clinical practice, EBP behavior, and beliefs.

5. Results of this study indicated that several of the analyses of variance and regressions calculated in this study were statistically significant. However, the effect sizes for the analyses of variance and the R2 for the regressions were small. Cohen (1969, p23) described an effect size of 0.2 as 'small' , an effect size of 0.5 is described as 'medium', and an effect size of 0.8 as "large." A possible explanation for the small effect size calculations could be related to the researcher not addressing other variables that may have produced a larger difference between the means. This study addressed variables such educational level, years of practice, status as an APTA-clinical instructor, type of the majority of patients treated, and clinical practice setting. The study did not account for other variables that could account for the differences. Other variables such as: where the physical therapists received their education, the physical therapists' personality, type of organization that employed the physical therapists, types of continuing education received by the physical therapists', or where the physical therapists received their clinical training may have demonstrated a larger effect size.

Recommendations for Future Research

1. This study indicated that physical therapists practicing for a greater number of years had a higher level of attention towards clinical practices involving intrinsic and extrinsic fall risk factors. Why did this occur? Does exposure from working with experienced peers within certain organizations play a greater role regarding clinical practices than educational level or years of experience? What role do knowledge brokers within

organizations play in regard to the dissemination of information and what influence do they have on the clinical practices of physical therapists within their organizations?

2. The researcher would recommend a qualitative study that consists of interviews with physical therapists from a variety of practice settings to specifically address these questions. In addition to interviewing physical therapists from a variety of practice settings, it would also be recommended that physical therapists with varying levels of education and years of experience be interviewed to gain insight into the different perspectives that may exist regarding these questions.
3. In this study, 49.45% of the physical therapists reported a doctoral level degree as their highest physical therapy degree, as opposed to the 2010 APTA report that indicated 21.4% held a doctoral degree as their highest level of education (15.2% reported having a DPT). Why would physical therapists with a doctoral level physical therapy degree place a higher level of importance on EBP as opposed to those holding a lower PT degree? Since the APTA is moving toward a doctoral level education for all physical therapy programs, and most of the newer graduates hold doctoral degrees as opposed to those who have been practicing for longer period of time, does being youthful and more computer savvy play a greater role regarding the use of EBP than having a doctoral level degree? The APTA reported in 2010 that 29.9% of currently practicing physical therapists had five or less years of experience, which was very similar to this study, which reported that 29.1% of physical therapists indicated five or less years of experience.
4. The gap between clinical research and clinical application is an apparent issue that exists among practicing physical therapists. Beyond the barriers of insufficient time for using

EBP and lacking research skills, some physical therapists believe that the application of research results are not generalizable to their patient population. Jette et al. (2003) noted that research needs to be written in an understandable style. Future research that seeks ways to make the results understandable and that are delivered to physical therapists in a timely manner may enhance the use and application of research findings among practicing physical therapists.

Recommendations for Practice

It appears the value of research and the use of EBP are appreciated by most physical therapists. However, what can organizational leaders and administrators do to diffuse the use of the EBP innovation among their physical therapy staff? Noted barriers to consider regarding the physical therapists' use of EBP are the lack of time for accessing and researching the innovation, the lack of ability to critically appraise and apply the literature, and the generalizability of the research to specific diagnoses treated by physical therapists.

The primary barrier of the lack of time to access and research EBP is certainly an issue that appears in numerous research studies. Organizational leaders may need to investigate the most efficient methods that would allow their employees to gain access to EBP research findings. Fruth et al. (2010) suggested that the impact of this barrier could be reduced by organizations synthesizing and presenting information to the physical therapists.

How can the apparent disconnect or gap between researchers and clinicians be closed? Writing research in terms that can be easily interpreted by clinicians may also help with the adoption of EBP research. Rivard et al. (2010) suggested that organizations using knowledge brokers to disseminate information facilitate knowledge transfer to physical therapists.

The issue of physical therapists not adopting EBP appears to occur for numerous reasons. Some reasons for not adopting EBP may exist at the larger organizational level and/or on a personal or individual level. Continuing education opportunities, access to literature databases, designated time during work hours to research the literature, journal clubs, and relying upon organizational leaders or knowledge brokers to disseminate information are all possible solutions for closing the gap between research and the application of evidence into the physical therapists' daily clinical practices. However, physical therapists are not the only clinicians that need to stay current on EBP, but Physical therapists assistants (PTA) need to be involved in the utilization of EBP.

Physical therapist assistants provide physical therapy services under the direction and supervision of the physical therapist. The PTA implements the patient's intervention (treatment), obtains data related to the interventions provided, and make modifications in selected interventions, either to progress the patient as directed by the physical therapist or to ensure patient safety and comfort (APTA, 2013).

The PTA may be the primary person that treats the community-dwelling older adult patient that is at risk for falling. Therefore, the education of all staff regarding the use EBP is of the utmost importance, not just focusing on the physical therapist.

Organizational leaders may consider the use of knowledge brokers to function as a "mentor" and facilitate the adoption of EBP by physical therapists. Rivard et al. (2010) described the use of knowledge brokers as mechanism to disseminate or facilitate the use of EBP by physical therapists. The term knowledge broker can used interchangeably with the term opinion leader, as defined by Rogers (2003). Rogers (2003, p. 27) defined opinion leaders as individuals who that influence the decisions of others to adopt innovations. Rogers noted that opinion leaders may be informal leaders that are trusted by others

within the organization. The knowledge broker or onion leader may be a physical therapists that stays current with research and is trusted by their peers.

Knowledge brokering is the process of building relationships, exposing needs, exchanging ideas and sharing evidence that will allow individuals to perform their jobs better. The knowledge broker is an individual within an organization that may act as a catalyst for translating the knowledge found within evidence-based practice research. Rivard et al. (2010) noted that knowledge translation has been defined as "a dynamic and iterative process that includes the synthesis, dissemination and application of knowledge to improve health, provide more effective health services, and products and strengthen the healthcare system" (p. 1581). Knowledge transfer occurs in a stages and may utilize the use of journals, professional in-services, e-mail messages, continuing education courses or the opinion leader (knowledge broker) leading by example, and acting as a mentor.

The organization or knowledge broker may lead a journal review club. The journal review club would meet at a regularly scheduled time; and would review and discuss the literature as a staff. Other methods of translating knowledge would be to schedule a monthly professional in-service for the physical therapy staff. The organization or knowledge broker would identify staff needs for specific evidence-based topics and provide an in-service on the identified topics.

Organizational leaders may need to analyze the current state of their organizations' methods of delivering EBP information and identify the barriers that exist within their organizations. Understanding their organizational needs and current barriers to delivering and utilizing EBP within their organizations will enhance their ability to develop the most effective strategies for delivering evidence-based information, as well as potentially augment the adoption of EBP by their physical therapists.

Organizational leaders may want to promote the concept of using physical therapists as educators within the community, patients, and among their peers. Physical therapists are health care professionals who maintain, restore, and improve movement, activity, and health of their patients (APTA, 2011). Elements of practice by the physical therapists include examination of the patient, evaluation of the patient, diagnosis, prognosis, and development and implementation of treatment interventions (APTA, 2009). However, the physical therapist role goes beyond the treatment and evaluation of patients, and includes the role of health promotion and education. Ohtake (2010) noted that physical therapists also function as educators and consultants.

The role of being an educator provides an opportunity for the physical therapists to educate and inform patients about their conditions. Ohtake (2010) indicated that strategies can be taught by the physical therapist to improve the patient's physical functioning and empower the patient to achieve their health care goals. Physical therapists may also be utilized as health promoters within community-based programs, such as the National Council on Aging "Falls Free Initiative" program.

Health educators can play a role in the prevention of falls by promoting and conducting community-based fall prevention programs. Health educators and healthcare professionals may conduct community-based fall prevention programs in the community in a variety a locations. Examples of sites that may typically host a community-based fall prevention program are health facilities, senior service provider facilities, churches, or healthcare facilities (CDC, 2008).

An example of a community-based fall-prevention program, such as "Stepping On", was designed to improve fall self-efficacy, encourage behavioral change, and reduce falls (Clemson,

Cumming, Kendig, Swann, Heard, & Taylor, 2004). Health educators can communicate the importance of fall prevention and increase awareness of the issue of falling within the community. The health educator or healthcare professional will typically address: fall risk factors, how to improve lower extremity strength and balance, environmental and behavioral safety. Other area of education provided by the program include advising the community-dwelling older adult about the importance of visual and medical screenings.

Lastly, the researcher would recommend that patient is provided a thorough medical history form, including a segment that focusses on vision. The medical history form will not only provide the patient an opportunity to tell their medical history, but also prompt the physical therapists to address all pertinent issue, such as vision.

Researchers noted that visual disturbances among adults 65 years and older are caused by glaucoma, macular degeneration, cataracts, and correctable refractive visual impairment (Anand et al., 2003). Menant, St. George, Sandery, & Fitzpatrick (2009) reported that older adults contact more obstacles while walking with their attention divided when wearing multifocal glasses**.** This may occur secondary to the older adult not pitching their head forward, but viewing objects through the lower segment of multifocal glasses, .resulting in blurred vision. Inattiniemi, Jokelainen, and Luukinen (2009) concluded that addressing concerns of an older adult's poor vision might reduce the risk of falls among older adult home-dwellers.

Final Thoughts

Proactively evaluating patients' fall risks and addressing patients' deficits may reduce the risk of community-dwelling older adults falling. Overall, physical therapists appear to have a good understanding of the fall risks associated with community-dwelling older adults. However, the number of

years the physical therapist has been practicing appears to have a greater bearing on the attention given to patients' fall risks than the physical therapist's educational level.

Physical therapists also appear to believe that utilizing EBP holds great value, but they do not always access or apply EBP in their daily clinical practices for a variety of reasons. The most common barrier to physical therapists accessing and applying EBP appears to be the barrier of time.

The findings in this study suggest that best clinical practices are not always used by all physical therapists based upon years of experience. The findings also suggest that EBP is not always accessed and applied by physical therapists in their daily clinical practices. Rehabilitation organizations may want to examine methods for promoting the use of the most current physical therapy practices that are based on evidence, and explore options for improving the access and application of EBP research by their physical therapy staff.

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APPENDICES

APPENDIX A

SIU Southern Illinois University
CARBONDALE

HUMAN SUBJECTS COMMITTEE
OFFICE OF SPONSORED PROJECTS ADMINISTRATION
WOODY HALL – MAIL CODE 4709
900 SOUTH NORMAL AVENUE
CARBONDALE, ILLINOIS 62901

siuhsc@siu.edu
618/453-4533
618/453-8038 FAX

ospa.siu.edu/human

HSC Approval letter (exempt)

To: Michael Stroud

From: Jane L. Swanson, Ph.D.
Chair, Human Subjects Committee

Date: July 11, 2013

Subject: *Physical Therapists' Clinical Practices Regarding Intrinsic and Extrinsic Falls Risk in the Treatment of Community-Dwelling Older Adults: Perceived Attitudes and Beliefs Towards the Use of Evidence Based Practice. (Pilot Study and Study).*

Protocol Number: 13277

The revisions to the above referenced study have been approved by the SIUC Human Subjects Committee. The study is determined to be exempt according to 45 CFR 46.101(b)2. This approval does not have an expiration date; however, any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Your Form A approval is enclosed.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is FWA00005334.

JS:kr

Cc: Stephen L. Brown

APPENDIX B

PILOT STUDY COVER LETTER

August 2013

Dear Participant,

Thank you in advance for your participation in this survey. The purpose of the online survey is to gather information about physical therapists' clinical practices regarding fall related risk factors and their use of evidence-based practice. In addition, there are a few demographic questions. The survey can be accessed at (https://www.surveymonkey.com/s/SIUCPTFINALSTUDY).

The survey will take 10-15 minutes to complete. All responses will be kept anonymous. Only people directly involved with this project will have access to the surveys.

Completion of this online survey indicates voluntary consent to participate in this study. Please click on the URL (https://www.surveymonkey.com/s/SIUCPTFINALSTUDY) to take the survey.

Your employer was contacted regarding this study and agreed to forward the e-mail containing the study consent letter to all physical therapists' employed by your organization. If you would like to have your name removed from any future mailings, please respond with that request. If you do not respond to this email or return the opt-out message, you will be contacted again within the next two weeks.

Questions about this study can be directed to me or my dissertation advisor, Dr. Stephen Brown, Department of Health Education, SIUC, Carbondale, IL 62901-4310*. Phone (618) 453-2777. (* 4-digit SIU mail code)

Thank you for taking the time to assist me in this research.

Michael Stroud, M.S., PTA, ATC, CSCS

Doctoral Candidate in Health Education

Southern Illinois University Carbondale

Carbondale, IL 62901

618-549-0721 (wk.)

E-mail: stroud@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX C

PRIMARY STUDY COVER LETTER

September 2013

Dear Participant,

Thank you in advance for your participation in this survey. The purpose of the online survey is to gather information about physical therapists' clinical practices regarding fall related risk factors and their use of evidence-based practice. In addition, there are a few demographic questions. The survey can be accessed at (https://www.surveymonkey.com/s/SIUCPTFINALSTUDY).

The survey will take 10-15 minutes to complete. All responses will be kept anonymous. Only people directly involved with this project will have access to the surveys.

Completion of this online survey indicates voluntary consent to participate in this study. Please click on the URL (https://www.surveymonkey.com/s/SIUCPTFINALSTUDY) to take the survey.

Your employer was contacted regarding this study and agreed to forward the e-mail containing the study consent letter to all physical therapists' employed by your organization. If you would like to have your name removed from any future mailings, please respond with that request. If you do not respond to this email or return the opt-out message, you will be contacted again within the next two weeks.

Questions about this study can be directed to me or my dissertation advisor, Dr. Stephen Brown, Department of Health Education, SIUC, Carbondale, IL 62901-4310*. Phone (618) 453-2777. (* 4-digit SIU mail code)

Thank you for taking the time to assist me in this research.

Michael Stroud, M.S., PTA, ATC, CSCS

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This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX D

POST HOC POWER ANALYSIS

Regression Analysis	R^2	N	# Predictors	Observed Statistical Power	
CPIR	.057	282	4	.93	
CPER	.084	280	4	.99	
EBP Belief	.017	282	4	.39	
EBP Behavior	.092	280	4	.99	
EBP Time	.106	270	4	.99	
EBP Resource/Access	.057	290	4	.93	
EBP Skill/Interests	.059	280	4	.93	

Analyses of Variance	Cohen's D	N	Observed Power[b]
Clinical Practices Intrinsic Risk Based on Years of Practice	.08	316	.99
Clinical Practices Intrinsic Risk Based on Highest PT Degree Attained	.02	316	.6
Clinical Practices Intrinsic Risk Based on being a Certified APTA Instructor	.02	316	.64
Clinical Practices Intrinsic Risk Based on Majority of Patients	.05	316	.94
Clinical Practices Intrinsic Risk Based on Practice Setting	.06	316	.92
Clinical Practices Extrinsic Risk Based on Years of Practice	.04	303	.82
Clinical Practices Extrinsic Risk Based on Highest PT Degree Attained	.01	303	.25
Clinical Practices Extrinsic Risk Based on being a Certified APTA Instructor	.03	303	.88
Clinical Practices Extrinsic Risk Based on Majority of	.03	303	.69

Patients			
Clinical Practices Extrinsic Risk Based on Practice Setting	.1	303	.99
Evidence-Based Practice Beliefs Based on Years of Practice	.03	307	.57
Evidence-Based Practice Beliefs Based on Highest PT Degree Attained	.04	307	.9
Evidence-Based Practice Beliefs Based on being a Certified APTA Instructor	No difference Between groups	307	.05
Evidence-Based Practice Beliefs Based on Majority of Patients	.02	307	.97
Evidence-Based Practice Beliefs Based on Practice Setting	.02	307	.35
Evidence-Based Practice Behaviors Based on Years of Practice	.02	305	.39
Evidence-Based Practice Behaviors Based on Highest PT Degree Attained	.02	305	.72
Evidence-Based Practice Behaviors Based on being a Certified APTA Instructor	.01	305	.44
Evidence-Based Practice Behaviors Based on Majority of Patients	Minimal difference Between groups	305	.87
Evidence-Based Practice Behaviors of Insufficient Time Based on Practice Setting	.02	305	.77
Evidence-Based Practice Perception of Insufficient Time Based on Years of Practice	.03	307	.63
Evidence-Based Practice Perception of Insufficient Time Based on Highest PT Degree Attained	.02	307	.61
Evidence-Based Practice Perception of Insufficient	Minimal difference	307	.21

Time Based on being a Certified APTA Instructor	Between groups		
Evidence-Based Practice Perception of Insufficient Time Based on Majority of Patients	.01	307	.87
Evidence-Based Practice Perception of Insufficient Time Based on Practice Setting	.04	307	.77
Perception of Evidence-Based Practice Resource/Access Based on Years of Practice.	.02	305	.41
Perception of Evidence-Based Practice Resource/Access Based on Highest Degree Attained.	.04	305	.85
Perception of Evidence-Based Practice Resource/Access Based on being a Certified APTA Instructor	.04	305	.96
Perception of Evidence-Based Practice Resource/Access Based on Majority of Patients	.01	305	.89
Perception of Evidence-Based Practice Resource/Access Based on Practice Setting	.04	305	.71
Evidence-Based Practice Skills/Interest Based on Years of Practice	.14	301	.82
Evidence-Based Practice Skills/Interest Based on Highest Degree Attained	.09	301	.99
Evidence-Based Practice Skills/Interest Based on being a Certified APTA	Minimal difference Between groups	301	.21
Evidence-Based Practice Skills/Interest Based on Majority of Patients	.05	301	.09
Evidence-Based Practice Skills/Interest Based on	Minimal difference	301	.84

Practice Setting	Between groups		

APPENDIX E

LIST OF ANOVA TABLES FOR VARIABLES THAT

DID NOT HAVE SIGNIFICANT EFFECTS

TABLE		**PAGE**
1	*ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on Highest PT Degree Attained*	126
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8	*ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on being a Certified APTA Instructor*	
9	*ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on Majority of Patients*	
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11	*ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Years of Practice*	
12	*ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Highest PT Degree*	
13	*ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on being a Certified APTA Instructor*	

14 ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Majority of Patients

15 *ANOVA Results: Mean Difference of Perception of Evidence-Based Practice Resource/Access Based on Years of Practice*

16 *ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Resource/Access Based on Majority of Patients*

17 *ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Resource/Access Based on Practice Setting*

18 *ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Being an APTA Certified Clinical Instructor*

19 *ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Majority of Patients*

Table 1

ANOVA Results: Mean Difference of Clinical Practices Intrinsic Risk Based on Highest PT Degree Attained (N = 316)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	402.22	3	134.07	2.39	.069
Within Groups	17510.12	312	56.12		
Total	17912.34	315			

*P< .05, ** P<.001

Table 2

ANOVA Results: Mean Difference of Clinical Practices Extrinsic Risk Based on Highest PT Degree Attained (N = 303)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	172.410	3	57.470	.901	.441
Within Groups	19067.907	299	63.772		
Total	19240.317	302			

*P< .05

Table 3

ANOVA Results: Mean Difference of Evidence-Based Practice Beliefs Based on Years of Practice (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	168.05	5	33.61	1.66	.144
Within Groups	6097.63	301	20.26		
Total	6265.67	306			

*P< .05

Table 4

ANOVA Results: Mean Difference of Evidence-Based Practice Beliefs Based on being a Certified APTA Instructor (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.07	1	.07	.003	.955
Within Groups	6265.61	305	20.54		
Total	6265.67	306			

*P< .05

Table 5

ANOVA Results: Mean Difference of Evidence-Based Practice Beliefs Based on Majority of Patients (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	118.67	3	39.56	1.95	.122
Within Groups	6147.00	303	20.29		
Total	6265.67	306			

*P< .05

Table 6

ANOVA Results: Mean Difference of Evidence-Based Practice Beliefs Based on Practice Setting (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	109.18	6	18.20	.89	.505
Within Groups	6156.50	300	20.52		
Total	6265.67	306			

*P< .05

Table 7

ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on Years of Practice (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	91.78	5	18.36	.98	.432
Within Groups	5618.02	299	18.79		
Total	5709.80	304			

*P< .05

Table 8

ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on being a Certified APTA Instructor (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	61.48	1	61.48	3.3	.070
Within Groups	5648.33	303	18.64		
Total	5709.80	304			

*P< .05

Table 9

ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on Majority of Patients (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.44	3	8.81	.47	.706
Within Groups	5683.37	301	18.88		
Total	5709.80	304			

*P< .05

Table 10

ANOVA Results: Mean Difference of Evidence-Based Practice Behaviors Based on Practice Setting (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	111.31	6	18.55	.99	.434
Within Groups	5598.50	298	18.79		
Total	5709.80	304			

*P< .05

Table 11

ANOVA Results: Mean Difference of Evidence-Based Practice

Perception of Insufficient Time Based on Years of Practice (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.25	5	2.05	1.85	.103
Within Groups	334.01	301	1.11		
Total	344.26	306			

*P< .05

Table 12

ANOVA Results: Mean Difference of Evidence-Based Practice

Perception of Insufficient Time Based on Highest PT Degree (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.28	3	2.76	2.49	.061
Within Groups	335.98	303	1.11		
Total	344.26	306			

*P< .05

Table 13

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on being a Certified APTA Instructor (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.53	1	1.53	1.36	.244
Within Groups	342.73	305	1.12		
Total	344.26	306			

*P< .05

Table 14

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Insufficient Time Based on Majority of Patients (N = 307)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.43	3	1.14	1.02	.386
Within Groups	340.83	303	1.13		
Total	344.26	306			

*P< .05

Table 15

ANOVA Results: Mean Difference of Perception of Evidence-Based Practice Resource/Access Based on Years of Practice (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	23.27	5	4.65	1.15	.337
Within Groups	1215.06	299	4.06		
Total	1238.33	304			

*P< .05

Table 16

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Resource/Access Based on Majority of Patients (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.74	3	2.92	.71	.545
Within Groups	1229.58	301	4.09		
Total	1238.33	304			

*P< .05

Table 17

ANOVA Results: Mean Difference of Evidence-Based Practice Perception of Resource/Access Based on Practice Setting (N = 305)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	46.13	6	7.69	1.92	.077
Within Groups	1192.20	298	4.00		
Total	1238.33	304			

*P< .05

Table 18

ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Being an APTA Certified Clinical Instructor (N = 301)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.51	1	17.51	1.30	.255
Within Groups	4025.30	299	13.46		
Total	4042.81	300			

*P< .05

Table 19

ANOVA Results: Mean Difference of Evidence-Based Practice Skills/Interest Based on Majority of Patients (N = 301)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.43	3	3.14	.23	.874
Within Groups	4033.38	297	13.58		
Total	4042.81	300			

*P< .05

APPENDIX F

SURVEY

Physical Therapists' Demographics

The following section inquires about personal demographic information.

***1. For how many years have you been practicing physical therapy?**

- ≤ 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- 21 – 25 years
- ≥ 26 years

***2. For how many years have you been a licensed physical therapist?**

- ≤ 5 years
- 6 – 10 years
- 11 – 15 years
- 16 – 20 years
- 21 – 25 years
- ≥ 26 years

***3. What is your highest physical therapy degree attained?**

- Baccalaureate
- Master's
- Doctorate
- Other

Other (please specify)

***4. Are you a clinical certified specialist in the physical therapy field?**

- No
- Yes

If so, in which specialty?

_____

***5. Do you regularly (once per year) participate in continuing education courses, webinars or online continuing education/classes?**

- ◯ Yes
- ◯ No

***6. Do you belong to one or more professional practice-oriented organizations (e.g., APTA)?**

- ◯ Yes
- ◯ No

If yes, please list:

***7. Are you a certified clinical instructor by the APTA for physical therapist students/physical therapist assistant students/interns/residents?**

- ◯ Yes
- ◯ No

***8. On average, how many hours per week do you work?**

***9. On average, how many patients do you see daily?**

***10. Which of the following best describes the primary facility where you provide most of your patient care?**

- ◯ Acute care hospital
- ◯ Acute rehabilitation
- ◯ Sub-acute rehabilitation
- ◯ Skilled nursing facility
- ◯ Privately owned outpatient clinic
- ◯ Facility-based outpatient clinic
- ◯ Home care
- ◯ School system
- ◯ University
- ◯ Industrial
- ◯ Other

Other (please specify)

***11. Which of the following best describes the majority of patients you treat?**

- ◯ Do not treat patients
- ◯ No experience treating geriatric patients (65 + y)
- ◯ Treat primarily geriatric patients (65 + y)
- ◯ Experience treating geriatric patients (65 + Y), but majority of patients fall into other age group

Please note primary age population that you treat, if other than geriatric patients.

***12. Which of the following best describes the types of problems you see? Mark one box in each section.**

- ◯ Do not treat patients
- ◯ Neurologic
- ◯ Oncologic
- ◯ Orthopaedic
- ◯ Sports Medicine
- ◯ Cardiovascular/pulmonary
- ◯ Integumentary
- ◯ Other

Other (please specify)

_____

_____

Clinical Practices

This section of the questionnaire will inquire about your clinical practices regarding intrinsic risk factors for falling among community-dwelling older adults.

***13. Do you consistently examine the patient or ask in the patient history about visual impairments (acuity, depth perception, etc...) that may increase their risk of experiencing a fall?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***14. Do educate (verbal or written instructions) the patient about balance and gait issues (decreased proprioception, slow righting reflexes, decreased muscle tone) that may contribute to an increased risk of falling?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***15. Do you consistently assess the patient for psychological issues that may increase their risk for falling, such as fear of falling or cognitive impairment?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***16. Do you inquire about any changes in the patient's mental status (Alzheimer's disease and dementia, impaired judgment, poor reasoning, etc...) with the patient or patient's family/caregiver?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***17. Do you consistently examine or ask in the patient history about medical conditions (acute illness, infections, changes in blood pressure, etc...) that may increase the patient's risk for falling?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***18. Do you consistently examine the patient for weakness of the core muscles ?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***19. Do you consistently examine the patient for weakness of the lower extremity muscles ?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***20. Do you consistently review the patient's current use of medications for any that would increase the community-dwelling older adult patient's risk for falling?**

- Always
- Often
- Sometimes
- Rarely
- Never

***21. Do you consider the patient's use of multiple medications as a possible risk factor for falling?**

- Always
- Often
- Sometimes
- Rarely
- Never

***22. Do you identify if the patient is taking antihypertensive medication?**

- Always
- Often
- Sometimes
- Rarely
- Never

***23. Do you identify if the patient is taking psychiatric medication (antidepressant or antipsychotic)?**

- Always
- Often
- Sometimes
- Rarely
- Never

***24. Do you educate the patient about the possible risks for falling associated with the use of alcohol?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

***25. Do you educate the patient or patient's family/caregiver about the increased risks for falling associated with risky behaviors, such as climbing ladders, walking without a needed assistive device, etc..?**

- ◯ Always
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

Clinical Practices

This section of the questionnaire will inquire about your clinical practices regarding extrinsic risk factors for falling among community-dwelling older adults.

***26. Do you discuss with the patient about their physical environment at home or provide literature regarding home safety about the following items?**

	Always	Often	Sometimes	Rarely	Never
Poor lighting	○	○	○	○	○
Doorways	○	○	○	○	○
Bathtub/showers Grab bars	○	○	○	○	○
Bedside table	○	○	○	○	○
Pets	○	○	○	○	○
Rugs/carpeting	○	○	○	○	○
Handrails	○	○	○	○	○
Spills, such as a wet floor	○	○	○	○	○
Ambulation of Stairs	○	○	○	○	○

***27. Do you consistently examine the patient for their need of an assistive device?**

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

***28. Do you educate the patient about appropriate footwear, addressing items such as proper fit, slip resistant soles, etc..?**

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

*29. Do you inciuire about potential environments (sueh a.s loose , wel, uneven walkways, eurlts not clearly rmark ed. ete.) that the patient may eneounter outsi4e the home, for the purpose of i4entifying possiltle risks for falling?

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*Jo. D-yew examie the patient fer the pessill e neecl ef an ank e f H-t erthesi-5, if the patient demon-s-trates a f-t 4rojp?

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Evidenee-llased Practi-ee

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e11u e'lld t i X eCl orxt1t 111''n:,1mui:ottomm,;n:tyØNe.ll'.Qolelef :,cu.

*1t. Application of eviti,e.nce-ltase4 ptactice is necessary in the practice of physical therapy.

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* 12:. Literature ancl tesearehfihlfings are useful in my clay--t ➖cb)' clinical practices.

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*n. I ne,ecl to increase the iase of eviclenee in my tLaity practice.

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Qal0l"W.-_

*34.. The adoption of eviclence-base4 practice places an unreasonable clemancl on physical thetapists.

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Qal0l"W.-_

*1s.I am intetesteo4 in leanii"9 ot improving the skills nee>essary to incorpotate evidence - ltase4 practice into my daily clinical practiees.

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*16.. Evidenced-lt.ase4 practice, improves the ciuality of patient care.

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O —
Qa...-W .._.

*11.My teimbwsernent rate will inctease if I incorporate evitl,e.nce-basecl. practice into my practice .

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*1e..Evidence-based practice helps rne m.tke decisions about patient care,

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Qa...-W .._.

39.In a typical rnonth,how many peer reviewed or professional articles do you read?

*40,.tn a typical month, how often do you consult professional literature for the best clinical practices (g'! APTA Joun.al,JCMLn,al of the American ,eriatrics society) in the proc'°ss of clinical dectSion making?

*'

t. Please indicate how much the following potential bal"riers lirnit your use of evi4ence-
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Moderate lmpac 4 Limited ,$ Extremly Limited)

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nd"Uol	O	O	O	O	O
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APPENDIX G

EXPERT PANEL

John F. Greany, Ph.D., PT, RCEP, FAACVPR, Associate Professor

Dr. Greany received his Ph.D., Rehabilitation Science and Gerontology from the University of Minnesota and his Bachelor of Science, Physical therapy, from the University of Wisconsin-La Crosse. Dr. Greany is Certified in Complete Decongestive Therapy (Lymphedema), American College of Sports Medicine Registered Clinical Exercise Physiologist, and a Fellow of the American Association of Cardiovascular and Pulmonary Rehabilitation. His research interests are cardiovascular and pulmonary rehabilitation, aging issues: screening instruments for fall risk, and physical activity for special populations (Autism Spectrum Disorders).

Jan Rogers, Ph.D., Physical Therapist Assistant Program Director

Dr. Rogers received her Ph.D. from, Health Education, Southern Illinois University, Carbondale and her Associate in Applied Science, Physical Therapist Assistant from Southern Illinois University Carbondale. Dr. Rogers is a licensed physical therapists assistant in Illinois and Indiana, and a Certified APTA Clinical Instructor. She retired from her position as the Director of the Physical Therapy Assistant Program at Southern Illinois University Carbondale, and professor in the College of Applied Sciences at Southern Illinois University Carbondale, in 2013. Research interests focused on ergonomics, clinical faculty development, and new curriculum development.

Dale Pape, Rh.D., PT

Dr. Pape received her Rh. D., Rehabilitation from Southern Illinois University Carbondale and her Bachelor of Science, Physical Therapy, from St. Louis University. Dr. Pape has been a physical therapist since 1976 and is currently working as a physical therapist in home health. Her former experiences include serving as the Administrative director of Rehabilitation Services at Southern Illinois Healthcare and clinical professor for the Physical Therapist Assistant Program at Southern Illinois University Carbondale, as well as experience working as a physical therapist in pediatrics, acute care physical therapy, home health, and outpatient physical therapy. Her research interests need to be added.

VITA

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Bachelor of Science, Physical Education, Athletic Training Specialization, Dec 1991

College of DuPage, Glenn Ellyn, IL:
Associate of Applied Science, Physical Therapist Assistant, June 1998

Southern Illinois University Carbondale, Carbondale, IL:
Master of Science, Rehabilitation Administration and Services, May 2002

Dissertation/Thesis/Research Paper Title:
Master's Research Paper (2002): Coping Strategies and Prevention of Job Stress and Burnout of Human Service Professionals.

Major Professor: Stephen Brown