A Survey of Older Adult Curricular Content and Instructional Methods Used in Accredited Entry-Level Physical Therapy Educational Programs in the United States

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Abstract

The older adult population of the United States is projected to reach over 77 million by the year 2034 (United States Census, 2019). Physical therapy professionals play a major role in providing prevention, rehabilitation, and wellness services. Accredited physical therapy education programs (physical therapist and physical therapy assistant) follow general content guidelines; however, these guidelines do not provide targeted instructional content related to the complex care needs of older adults. Information on physical therapy curricula related to older adults is lacking.

Objectives: This research study investigated older adult curricula in accredited entry-level physical therapist (PT) and physical therapist assistant (PTA) education programs. The study provided new knowledge regarding curricular delivery and instructional methods utilized. Areas of opportunity in physical therapy education programs were identified that may lead to curricular changes and influence the preparation of physical therapy providers for older adult care.

Methodology and Results: This cross-sectional quantitative study utilized an email solicitation with an embedded electronic link to the 12-item survey. One hundred and seventy-three completed surveys (29.47% response rate) were received from the 587 accredited entry-level physical therapy education (PT and PTA) program directors in the United States from August 25 to September 30, 2021. Significant differences were found between program type and instructor type, time dedicated, instructional strategies, and resources utilized to teach older adult content.

Keywords: physical therapy education, older adult curricular content, instructional methods

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List of Abbreviations

ACAPT…….…… American Council of Academic Physical Therapy

APTA…… American Physical Therapy Association

CAPTE……... Commission on Accreditation in Physical Therapy Education

CDC……... Centers for Disease Control and Prevention

PT……... Physical Therapist

PTA…… Physical Therapist Assistant

List of Operational Definitions

Learner assessment…… Feedback on performance (written and oral) (J. Stevens, 2018; St. Clair, 2015)

Learner engagement…….. Learners attend and actively participate in the educational experience (St. Clair, 2015)

Instructional methods…… Types of strategies for knowledge and skill development and content delivery (McLeod, 2019)

Older adult……. Defined as > 65 years old (CDC, 2015)

Chapter One

Aging is a process influencing all aspects of life and independence. By 2030, 20% of the United States population is estimated to be age 65 and older (Centers for Medicare & Medicaid [CMS], 2020). As the population of older adults grows, health care education must include specific training and knowledge targeting this population's care.

Health care providers provide wellness and prevention strategies, tailor management approaches, and anticipate potential care needs. This chapter outlines the problem and significance of the lack of knowledge of older adult curricular content and instructional methods for physical therapist and physical therapist assistant entry-level education. This study sought to provide insights on older adult curricular content and instructional methods used in accredited entry-level physical therapy educational programs in the United States.

Introduction

The United States is aging, and health care education and training are lagging behind (Mercer Health Provider Advisory, 2018; United States Department of Health and Human Services, 2020a). The profession of physical therapy focuses on providing care to maximize function and quality of life skills. Comprehensive older adult content and experiences are not an educational requirement for physical therapy students; therefore, a focus on older adult issues may be lacking in entry-level physical therapy programs and training. Entry-level physical therapy education provides a general foundation for knowledge, skill development, and future clinical practice. This research study analyzed older adult curricular content and instructional methods from the 587 accredited entry-level physical therapy (physical therapist and physical therapist assistant) educational programs in the United States over a 5-week period in the fall of 2021. The electronic survey was sent to the accredited entry-level physical therapy education programs' directors. The study

requested curricular content information specific to older adults' topics, instructional methods, and strategies used to engage students in preparing for clinical practice in the care of older adults. The findings of the study provided the information on the current state of older adult content and instructional methods and may influence future physical therapy education curricular and training decisions.

Statement of Problem

By 2030, one in five individuals in the United States will be 65 or older (U.S. Census, 2019). The health care workforce and their services are not prepared to care for an aging population (Mercer, 2018). According to the National Council on Aging (2021), approximately 80% of older adults have at least one chronic disease and over 68% have at least two or more chronic conditions. As the proportion of the older adult population grows, the physical therapy professional must be prepared to meet the demands of their care needs.

Standards for older adult clinical education, training, and practice have not been established for the physical therapy profession. Currently, there are only general content areas to address lifespan rehabilitation needs provided by the Commission on Accreditation in Physical Therapy Education (CAPTE) and recommended professional competencies. CAPTE provides general educational content guideline standards for entry-level physical therapy programs. The educational guideline standards for entry-level physical therapy programs are provided in Appendix A, and the guidelines for physical therapy assistant programs are provided in Appendix B.

Aging is a process and physical therapy professionals address body system changes, movement patterns, and mobility to promote quality of life. Caring for older adults requires specific and intentional inclusion of nutrition, pharmacology, medical screening, complex

medical care, comorbidity and chronic disease management, advocacy, communication techniques, cognitive training, and older adult and interprofessional team interactions in the entry-level preparation of physical therapy professionals (Dean & Duncan, 2016). The current lack of education and training specific to older adult care negatively impacts the quality of care provided and the outcomes of that care (Bardach & Rowles, 2012; Dean & Duncan, 2016). There is a lack of literature detailing the education and training of entry-level physical therapy professionals for the care of older adults.

Purpose of the Research

The purpose of this research study was to examine older adult content and instructional methods from accredited entry-level physical therapy programs (physical therapist and physical therapist assistant) in the United States. This information was used to analyze where and how older adult content is included in physical therapy curricula and training. Assessment of the differences in older adult topics and instructional methods based on program type (physical therapist or physical therapist assistant) provided insights into the educational preparedness of physical therapy students for older adult clinical practice. Determining content and instructional areas of strength and areas of opportunity in physical therapy education programs may lead to educational changes and positively impact future older adult care.

Significance of the Research

Entry-level physical therapy education prepares physical therapists at the clinical doctorate level and physical therapist assistants at the associate degree level. These professional health care providers are expected to provide competent and effective care to patients upon graduation and passage of a knowledge-based national examination. Patient care across the lifespan requires a diverse scope of breadth and depth of knowledge and

skills. As the older adult population increases, physical therapy professionals will need to have a strong foundation of knowledge and skills related to aging. Aging is individualized and the functional skills to maximize life engagement require specific knowledge and training to provide effective and efficient care and positive outcomes.

Physical therapy curricular content and instructional methods related to older adults are lacking in the literature and educational guidelines. This research proposed to analyze older adult content and instructional strategies from accredited entry-level physical therapy programs (physical therapist and physical therapist assistant) in the United States. Information and analysis of older adult content curricula in physical therapist and physical therapist assistant entry-level educational programs are absent in the literature. Investigating physical therapy education's curricular content and instructional methods related to older adults provides a baseline of new knowledge to describe the readiness of students for older adult clinical practice. Defining the types of older adult content and instructional methods within physical therapy education provides the opportunity to identify areas of potential improvement, which may lead to educational changes and influence future older adult care. The findings of this research study will be disseminated to the Commission on Accreditation in Physical Therapy Education (CAPTE), the American Council of Academic Physical Therapy, and the American Physical Therapy Association.

Research Questions and Hypotheses

This research provided an overview of older adult curricular content and instructional methods used in accredited entry-level physical therapy educational programs in the United States. The research questions aligned with the survey questions and support data collection and analysis. Each research question aimed to collect the necessary information related to accredited entry-level physical therapy educational programs' older

adult content and instructional methods. The research questions focused on determining older adult content topics, instructor type, estimated time percentage spent, curricular areas the content is located, curricular instructional categories used for content, course delivery methods, content delivery methods, learner engagement strategies used to each content, learner assessments related to content, and resources employed to teach older adult content. The physical therapist and physical therapist assistant entry-level educational programs were assessed for differences in older adult content and instructional methods. This study's research questions were as follows:

Content-Related

- Research Question 1: Which older adult topics are taught in accredited entry-level physical therapy programs in the United States?
- Research Question 2: Who teaches content regarding the older adult population in accredited entry-level physical therapy programs in the United States?

Time and Curricular Areas

- Research Question 3: How much estimated instructional time is dedicated to older adult content in accredited entry-level physical therapy programs in the United States?
- Research Question 4: Which curricular areas are older adult content included in accredited entry-level physical therapy programs in the United States?
- Research Question 5: Which curricular instructional categories are used to teach older adult content in accredited entry-level physical therapy programs in the United States?

Methods of Delivery

- Research Question 6: Which methods of course delivery of content regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?
- Research Question 7: Which methods of content delivery regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?

Instructional Strategies and Assessments

- Research Question 8: Which instructional strategies are employed to engage learners in older adult content in accredited entry-level physical therapy programs in the United States?
- Research Question 9: Which learner assessments of older adult knowledge and skills are used in accredited entry-level physical therapy programs in the United States?

Resources

- Research Question 10: Which resources are employed to teach content regarding older adults in accredited entry-level physical therapy programs in the United States?

Differences Between Programs

- Research Question 11: Are there differences in older adult content instructor type based on accredited entry-level physical therapy program type (PT or PTA) in the United States?

    - RQ 11 Hypothesis: There are significant differences in older adult content instructor type based on accredited entry-level physical therapy program type (PT or PTA) in the United States.

- Research Question 12: Are there differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy type (PT or PTA) in the United States?
    - RQ 12 Hypothesis: There are significant differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 13: Are there differences in curricular areas where content regarding the older adult population is included based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 13 Hypothesis: There are significant differences in curricula areas where older adult content is taught based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 14: Are there differences in curricular instructional categories of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 14 Hypothesis: There are significant differences in curricular instructional categories of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 15: Are there differences in course delivery of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States?

    - RQ 15 Hypothesis: There are significant differences in course delivery of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.

- Research Question 16: Are there differences in methods of content delivery regarding the older adult population based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 16 Hypothesis: There are significant differences in methods of content delivery of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 17: Is there a difference in older adult content topics taught based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 17 Hypothesis: There are significant differences in older adult topics taught based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 18: Are there differences in learner engagement strategy methods of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 18 Hypothesis: There are significant differences in learner engagement methods of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 19: Are there differences in learner assessment of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States?

    - RQ 19 Hypothesis: There are significant differences in learner assessment of older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.
- Research Question 20: Are there differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States?
    - RQ 20 Hypothesis: There are significant differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type (PT or PTA) in the United States.

The research questions sought to answer where and how older adult content in physical therapy curricula is presented, and which instructional methods are employed. Analysis included determining differences in content topics, instructional methods, and resources between physical therapy and physical therapist assistant program types. This study provided new knowledge and analysis regarding the preparedness of physical therapy students for caring for older adults. The next chapter provides a review of the literature supporting the need to study older adult curricula in physical therapy education.

Chapter Two

This chapter details the findings from the literature on the aging of the United States population, the state of readiness of health care and providers for caring for older adults, the physical therapy profession and education, the research's theoretical framework, and gaps in the literature related to older adult curricular content and instructional strategies in physical therapy education. Information on physical therapy curricular content and instructional strategies related to older adults is lacking. To prepare to care for the older adult population, the field of physical therapy needs to focus on entry-level education targeting the specific instructional content and training required to address their complex needs.

Review of the Literature

Brief Overview of Older Adults

By 2034, the older adult population in the United States is estimated to grow to over 77 million (United States Census, 2019). One in five individuals in the United States will be 65 or older by 2030 and by 2034, the number of older adults (65+ years) will be greater than the number of individuals aged 18 and younger (U.S. Census, 2019). The overall life expectancy for an individual living in the United States is 78.7 years as of 2018 (Xu et al., 2020). The Centers for Disease Control and Prevention (CDC) WONDER online database analysis (2021) describes characteristics of the older adult population in the United States as changing. By 2050, more than 20% of the United States population will be age 65 or older. This older population is anticipated to be more ethnically diverse and live in more suburbs and rural areas as compared to the 2019 data (CDC, 2021a). The older population will have a higher prevalence of obesity and chronic conditions and will need more health care and caregiving support (CDC, 2021b).

Costs Associated with Aging

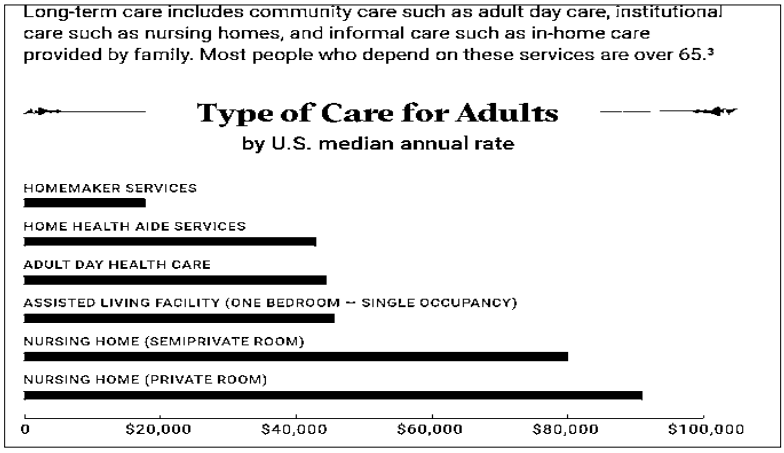
The population of older adults is growing, and the cost of aging is rising. According to the Centers for Medicare & Medicaid (CMS, 2020), personal health care spending in 2014 for individuals who were 65 and older (15% of the United States population) was approximately 34% of the total health expenditure in the United States. Health expenditures include health insurance, medical services, medications, and medical supplies. By 2030, the number of adults aged 65 and older is estimated to be 20% and associated with increased health expenditures (CMS, 2020). The United States Bureau of Labor Statistics reported in the Consumer Expenditure Survey (2018) that the highest health care expenditures are consistently for individuals 65 years and older (Chalise, 2020). Households spent 18.3% of their health care expenditures on medical services in 2018 (CMS, 2020). In 2019, Medicare spending grew to over $799.4 billion, which is 21% of the entire National Health Expenditure of the United States (CMS, 2020). Expenditures grew over 6 percent for hospital services and almost 5 percent for clinical services in 2019. The National Health Expenditure data from the Centers for Medicare & Medicaid Services (2020) indicated that the largest portion of total health care spending was provided by the federal government (29.0%) and households (28.4%) in 2019.

The George Washington University's Milken Institute School of Public Health (2018) analyzed the cost of aging and determined that cost of care significantly increases as the United States population ages. Women tend to outlive men and therefore per gender, more care and costs are spent on women as they age (George Washington University's Milken Institute of Public Health, 2018). The United States Department of Health and Human Services (2020) predicts that seven out of 10 individuals will require long-term care in their lifetime. The following figures illustrate the amount spent on care based on the

type of care (hospital, home health, care facilities, and retirement communities) by age range. Nursing home care has the highest cost when compared to homemaker, home health aide services, adult day care, and assisted living. The costs are expressed in the billions for figures two, three, and four and reflect the annual costs. The figures are used with permission from the George Washington University Milken Institute School of Public Health's website content with proprietary notices and citations provided.

Figure 1

Type of Care for Individuals Over Age 65

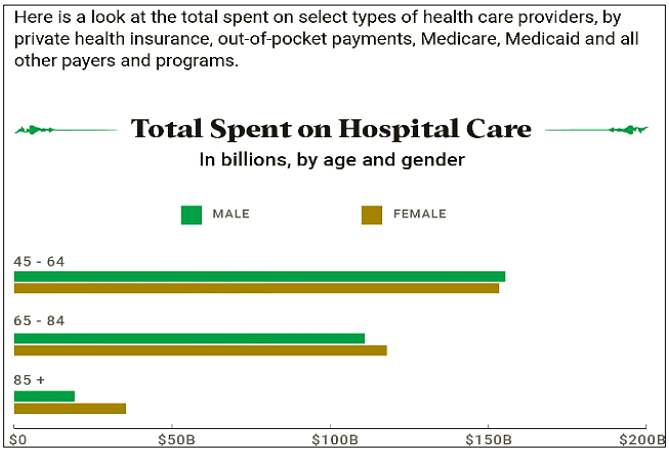


Note. United States dollars spent on care type for adults and older adults.

George Washington University Milken Institute School of Public Health. (2018). *The growing cost of aging in America, part 3: Sources of care.* https://onlinepublichealth.gwu.edu/resources/cost-of-aging-types-of-care/

Figure 2

Total Spent on Hospital Care

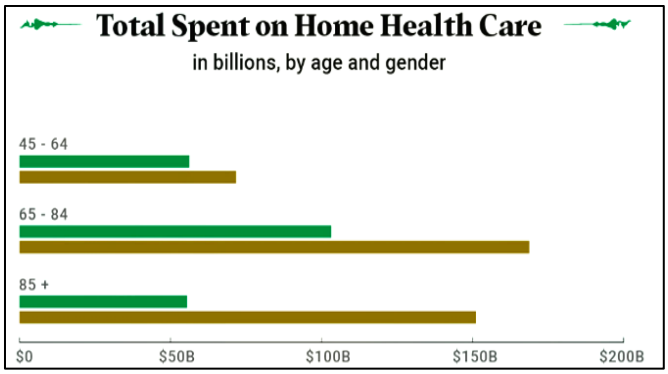


Note. Green line represents the billions spent for the male gender and the gold line represents the billions spent for the female gender.

George Washington University Milken Institute School of Public Health. (2018). *The growing cost of aging in America, part 3: Sources of care.* https://onlinepublichealth.gwu.edu/resources/cost-of-aging-types-of-care/

Figure 3

Total Spent on Home Health Care

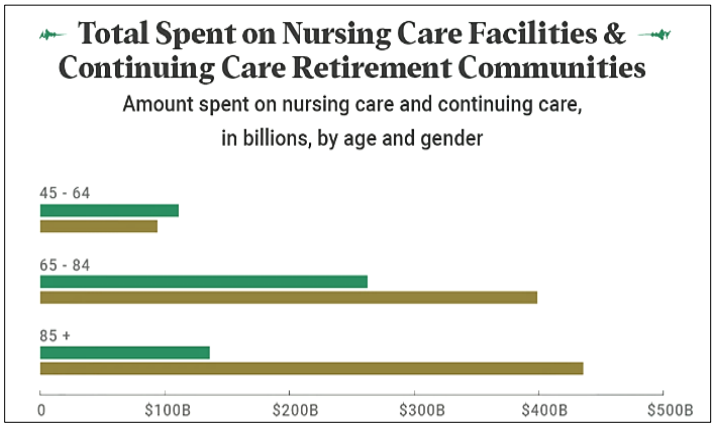


Note: Green line represents billions spent for the male gender and the gold line represents the billions spent for the female gender.

George Washington University Milken Institute School of Public Health. (2018). *The growing cost of aging in America, part 3: Sources of care.* https://onlinepublichealth.gwu.edu/resources/cost-of-aging-types-of-care/

Figure 4

Total Spent on Nursing Care Facilities and Continuing Care Retirement Communities



Note: Green line represents the billions spent for the male gender and the gold line represents the billions spent for female gender.

George Washington University Milken Institute School of Public Health. (2018). *The growing cost of aging in America, part 3: Sources of care.* https://onlinepublichealth.gwu.edu/resources/cost-of-aging-types-of-care/

Age-associated costs are rising significantly as the population ages. Care services and types of care expenditures impact the financial, social, and physical health of adults aged 65 and older.

Health Concerns in Older Adults

The normal aging process includes body system changes, which manifest as a decrease in visual acuity, vestibular function impairments, loss of muscle mass and strength, slowing of reaction and gait speed, reduction in short-term memory and cognitive

processing speed (Jaul & Barron, 2017). These system changes place individuals at risk for falls. Falls are one of the leading causes of death in the adult population of the United States. Approximately 482,283 deaths are attributed to falls of American adults between the ages of 20 and 85 plus (CDC, 2020a). Falls can be devastating to adults due to cascade of decreased mobility, loss of independence, and functional decline over time (Stevens, 2013). The CDC found that from 2001 to 2018 of the 1,532,217 non-fatal injuries in the in the United States' population age 20-85 plus ,106,012,173, were due to falls (CDC, 2020b).

Falls are the leading cause of fatal and non-fatal injuries in older adults and falls increase the burden of care (CDC, 2020b; Florence et al., 2018). The costs of falls (injury, confidence, and morbidity) impact individuals, communities, health care organizations, and society. According to the CDC, in 2015 Medicare reported that the cost of falls was over $31 billion, and it is estimated that this figure will rise to around $54.9 billion by the middle of 2020 (CDC, 2017). Fall risk factors can be identified, and physical therapy can assess and address these factors. Optimizing mobility and functional abilities are key components to health and wellness. Older adults are relying on health care providers to address care needs and to assist with optimizing mobility and daily function. The physical therapy profession focuses on quality of life activities and mobility to maximize function, manage pain, and prevent disability (American Physical Therapy Association, 2021d).

The National Council on Aging (2021) reports approximately 80% of older adults to have at least one chronic disease and over 68% have at least two or more chronic conditions. Chronic conditions last more than one year and require ongoing management or limit physical activities of daily living, which may include bathing, mobility, and eating (CDC, 2021b). The most common chronic conditions include diabetes, cardiovascular disease, stroke, arthritis, cancer, obesity, kidney disease, cancer, asthma, substance use

disorders, depression, and dementia (CDC Health Ranking, 2021). Osteoarthritis is the most common arthritis form in the older adult population (National Institute on Aging, 2017). This disease affects all genders and is frequently cited as the main cause of physical disability impairing activities of daily life.

According to the CDC United Health Foundation's *America's Health Ranking Senior Report* (2021), the percentage of Medicare beneficiaries age 65 plus and enrolled in the fee-for-service program with four or more chronic conditions is 41%. The risk factors for many chronic diseases and conditions may be modifiable with lifestyle and behavior changes (CDC, 2021b; National Council on Aging, 2021). Promoting physical activity is encouraged for prevention, management, and rehabilitation of many chronic conditions. Physical inactivity accounts for approximately 11% of the total health care expenditures in the United States, which is estimated to be close to $117 billion annually (CDC, 2021b).

The United States Department of Health and Human Services' Healthy People 2030 guidelines (PA-05) promote physical activity as a means to meet the minimal aerobic and muscle strengthening activities needed to maintain health. The minimum activity level for an adult to be considered active is at least 150 minutes a week of moderate intensity aerobic exercise and to participate at least 2 days a week in muscle strengthening activity (United States Department of Health and Human Services, 2017). Over 75% of adults age 65 and older are not active and do not meet the guideline's minimum activity level (CDC, 2021b). According to the United States Department of Health and Human Services' National Health Interview Survey (2017), ranking health and well-being as free of disability, only 60.5% of the individuals who were age 65 to 74 indicated they were disability-free. This same survey reported for the age group of 75 to 84 as free of disability at 54% and for individuals age 85 and older, only 25.5% rated as free of disability.

Arthritis, cardiovascular disease, stroke, diabetes, and other medical conditions, and neuromuscular injuries affect the quality of life and well-being. The Arthritis Foundation promotes physical therapy as a means to keep individuals active and moving (Arthritis Foundation, 2021). Physical therapy services address the effects of aging body systems, inactivity, chronic health conditions, impairments, and disabilities to maximize function and movement for individuals across the lifespan.

State of Older Adult Health Care and Providers

In 2008 the Institute of Medicine (name changed to National Academy of Medicine in 2015) published *Retooling for an Aging America: Building the Healthcare Workforce.* This report's conclusion described a health care workforce that is not ready to provide adequate services to older adults. Dzau et al. (2017) published health care service concerns in *Vital Directions for Health and Health Care: Priorities from a National Academy of Medicine Initiative.* This report highlighted the fundamental challenges of inefficiencies, costs, fragmented delivery of care, health inequities, innovation barriers, new health threats, and a population that is rapidly aging. Older adults require more complex care and require a workforce that has the skills to provide effective and efficient services (Dzau et al., 2017; Rowe et al., 2016). Rowe et al. (2016) described older adults as at risk for poor health outcomes due to limited access to health services and the limited number of older adult care trained health care workers. The majority of Medicare expenditures are spent on the management of chronic conditions in the older adult population (Rowe et al., 2016). The number of health care providers trained to address the needs of older adults is inadequate, and the financial limitations associated with reimbursement from Medicare and Medicaid decrease the willingness of professionals to work with older adults (Rowe et al., 2016). Insufficient availability of trained health care faculty and health care clinicians

specifically in the medical and allied health disciplines is a significant factor in the lack of older adult competence-based care (Dzau et al., 2017; Rowe et al., 2016).

By 2030, one out of every five individuals in the United States will be age 65 or older (U.S. Census, 2019). Health care services for older adults will be in demand. Mercer Health Provider Advisory (2018) published *Demand for Health Care Workers Will Outpace Supply by 2025*, which details the need for health care employees to care for the older complex and sicker patient population. The United States Department of Health and Human Services (USDHHS) *Strengthening the Entry-Level Health Care Workforce: Finding a Path* (2020) report outlined challenges to entry-level health care workers and job quality. Poorly defined and weak training standards related to educational training and job requirements are cited as significant causes of inconsistencies in workforce training, education, and practice (USDHHS, 2020).

Health care employment opportunities are expected to grow in the United States, and by 2026, 2.3 million new health care-related jobs are anticipated (Mercer Health Provider Advisory [HPA], 2018). Mercer HPA (2018) predicted a significant shortage of caregivers and skilled health care workers by 2025. According to the Bureau of Labor Statistics (2021), one of the fastest-growing occupations anticipated for 2019 to 2029 is physical therapist assistants with a growth rate projection of 33%. Physical therapists' employment is projected to grow 18% from 2019 to 2029 (Bureau of Labor Statistics, 2021).

Physical Therapy Profession

Physical therapy aims to improve and restore mobility and function, manage pain, educate, maximize independence, and prevent injury. Physical therapists and physical therapist assistants are licensed professionals with education and clinical training to work

with individuals across the lifespan. Physical therapy encourages physical activity as a component of overall health and well-being. Regular physical activity is beneficial to the mental, physical, and social health of individuals, and promotes prevention and management of many chronic conditions including heart disease, diabetes, obesity, depression, and pain that can be addressed by physical therapy (American Physical Therapy Association, 2021a). Physical therapy involves creating a patient-centered plan of care designed to address specific functional movements and mobility skills. Techniques of manual therapy, modalities to address pain and motion, equipment prescription, home/work environment modifications, education of patient and caregivers, and exercises may be employed. Physical therapy plays a significant role in the management of chronic conditions of osteoarthritis, cardiovascular disease, and diabetes (Boisonnault & Vanwye, 2020; Harris-Hayes et al., 2019). Physical therapy professionals screen for complications, assist with patient education, and promote physical activity, which are key components of chronic disease management (Boisonnault & Vanwye, 2020; Harris-Hayes et al., 2019).

The physical therapy profession emphasizes effective evidence-based non-invasive interventions to promote movement and mobility (Bernhardsson et al., 2017; Sharp & Herrman, 2021). With value-based reimbursement payment models on the rise, physical therapy reduces costs and demonstrates improved patient outcomes of a variety of conditions including musculoskeletal pain and movement dysfunction (Patel, 2019). Both physical therapists and physical therapist assistants screen and provide interventions based on the patient's needs. Physical therapists directly assess and create a plan of care for each patient. Physical therapist assistants practice under the supervision of a physical therapist and the plan of care established by the physical therapist. The American Physical Therapy Association (APTA) classifies physical therapists as neuromuscular experts in patient care

and promotes physical therapists as primary care providers (APTA, 2021i; Boisonnault & Vanwye, 2020). Currently all states, the District of Columbia, and the United States Virgin Islands allow physical therapists to evaluate and treat within their practice act, and to provide services without a referral from other health care professionals (APTA, 2021j; Boisonnault & Vanwye, 2020). The physical therapy profession can offer differential diagnosis, medical system screenings, diagnostic musculoskeletal imaging, and education on health management (Boisonnault & Vanwye, 2020). As direct access to physical therapy services expands, therapists will need to demonstrate proficiency in independent clinical decision-making and the skills to address their patients' health care needs.

Physical Therapy Workforce

According to the Federation of State Boards of Physical Therapy (2019) statistics reported in the APTA's Physical Therapy Workforce Analysis (2020), there were 312,716 licensed physical therapists and 127,750 licensed physical therapist assistants in the United States. In 2019, physical therapists were employed in approximately 258,200 jobs. The largest work settings employing physical therapists were:

- outpatient offices at 33%.
- acute care/hospitals at 26%.
- home health care services at 11%.
- self-employed and contract workers at 8%.
- skilled nursing centers and residential care facilities at 6% (Bureau of Labor Statistics, 2021).

In 2019, physical therapist assistants were employed in approximately 98,700 jobs. The largest work settings employing physical therapist assistants were:

- outpatient offices at 46%.

- acute care/hospitals at 23%.
- skilled nursing centers and residential care facilities at 10%.
- home health care services at 10%.
- physician offices at 5% (Bureau of Labor Statistics, 2021).

All settings listed include older adult patients. Licensed physical therapists and physical therapist assistants provide services across the lifespan and the care continuum.

Professional Physical Therapy Pathway for Older Adult Practice Proficiency

APTA is a national organization created to support the profession of physical therapy. Membership in the APTA is not required for physical therapists and physical therapist assistants. The APTA provides resources, research publications, advocacy, continuing education, advanced specialization pathways, and clinical practice-related support. In the United States, a licensed physical therapist or physical therapist assistant can practice without membership to the APTA.

According to APTA (2021), physical therapy scopes of practice are comprised of three components: professional, jurisdictional, and personal. The professional component is developed as a student and continues throughout their career and includes knowledge related to evidence-based practice frameworks. The jurisdictional component is governed by the licensed therapist (PT/PTA) state with rules outlined in the state's practice act. The personal component is guided by the education and training an individual therapist obtains.

In May 2021, the APTA's Academy of Geriatric Physical Therapy Task Force on Best Practice (2021) published a white paper seeking input and feedback on six principles outlining advocating for the care of older adults. The paper defines best practice as evidenced-based care reflecting an anti-ageist belief, incorporating an individual-centered framework, and encompassing safe, efficient, and effective care (APTA, 2021f).

- Principle 1: Utilized person centered-care to elicit and prioritize the individual's preferences, values, and goals to drive the plan of care.
- Principle 2: Strive for anti-ageist practice.
- Principle 3: Conduct a holistic assessment and evaluations utilizing sound outcome measures that help inform the treatment plan and relate to the patient's stated goals.
- Principle 4: Provide positive outcomes of physical therapy care by completing intervention(s) that are based on the best available evidence.
- Principle 5: Prioritized physical activity to promote health, well-being, chronic disease management, and enhance mobility.
- Principle 6: Champion interprofessional collaborative practice that is inclusive of patients and their caregivers (APTA Academy of Geriatric Physical Therapy Task Force on Best Practice, 2021).

The white paper focuses on clinically practicing physical therapy professionals. Entry-level education is not specifically addressed in the white paper. The foundation of evidence-based care and best practice begins as a student and incorporating these principles as infrastructure into educational programs is critical (Agency for Healthcare Research and Quality, 2021; Lehane et al., 2019). Physical therapy entry-level education lacks the guidance for the standards of knowledge and skills related to older adult care.

Through the APTA's American Board of Physical Therapy Specialties (2021), advanced specialization and certification can be achieved in the areas of acute care, geriatrics, cardiovascular/pulmonary, oncology, orthopaedic, neurology, electrophysiology, woman's health, sports pediatrics, and wound management for physical therapists who are

in clinical practice. Physical therapists do not have to belong to the APTA to apply for specialization certification (APTA, 2021e). To achieve specialization certification, licensed physical therapists seek additional education, training, and clinical experience, which include over two years of full-time clinical practice, documentation of more than 2,000 hours of direct patient contact in the specialty area along with the passage of a specialty knowledge examination (APTA, 2021e).

According to the APTA's PTA Advanced Proficiency Pathways (2021), physical therapist assistants can pursue advanced proficiency only if they are an APTA member and a licensed PTA. The pathway areas include acute care, cardiovascular/pulmonary, geriatrics, oncology, orthopaedic, pediatrics, and wound management. A PTA can independently pursue advanced training in clinical areas; however, they are not eligible to pursue the APTA's advanced proficiency certification and acknowledgment unless they are a member of the APTA (APTA, 2021c). To apply for PTA advanced proficiency certification requires an additional 60 hours of coursework, documentation from a supervising physical therapist, documented mentored clinical experiences, and proof of 2,000 clinical hours of work experience in the content area (APTA, 2021c).

Entry-level physical therapists and physical therapist assistants do not have mandated knowledge and skill requirements for clinical practice in the care of older adults. Entry-level physical therapy professionals are trained as generalists. As there is not a required standard set of physical therapy proficiencies for the care of older adults, the foundational education in older adult health care must occur during the initial professional education and training. Entry-level education is vital in preparing physical therapists and physical therapist assistants to treat older adults in their clinical practice.

Physical Therapy Education

CAPTE is the agency responsible for accrediting entry-level physical therapist and physical therapist assistant educational programs. The educational guide standards for entry-level physical therapy programs are provided in Appendix A, and the guidelines for physical therapy assistant programs are provided in Appendix B. These educational guide standards provide general information pertaining to patient evaluation, assessment, intervention, documentation, the delegation of services, and elements of the plan of care, which is to be applied across the lifespan and the care continuum. CAPTE is an independent agency whose mission is to ensure and promote excellence in the United States physical therapy education (CAPTE, 2021).

CAPTE accredits physical therapist educational programs at the clinical doctoral degree level offered by institutions of higher education in the United States. Physical therapy programs are an average of 3 years and may follow traditional or hybrid education models. Physical therapist assistant education programs are at the associate degree level and are an average of 2 years' duration as a traditional education model and are offered by institutions of higher education in the United States (CAPTE, 2021). There is interest in the development of bachelor's degree programs for physical therapist assistant education; however, the additional cost burden and time considerations have left this potential pathway as an alternative educational model that individual institutions can pursue (Faraclas et al., 2017). Entry-level physical therapy education programs provide didactic, laboratory, clinical experiences, and training. Older adult experiences are not an educational requirement and may be lacking in entry-level physical therapy programs and training. Once an individual completes a physical therapy education program (PT or PTA), they are eligible to take a national general knowledge-based exam.

The National Physical Therapy Exam (NPTE) is administered by the Federation of State Boards of Physical Therapy (Federation of State Boards of Physical Therapy, 2021). There are two types of NPTE, one for physical therapists and one for physical therapist assistants. National examination passage is required to practice as a physical therapist or physical therapist assistant in the United States. Once an individual has passed the NPTE, they apply to practice in one or more states. Once licensure is approved by the state, an individual can clinically practice. A physical therapy assistant must work under the supervision of the same state-licensed physical therapist. Licensure is overseen and managed by individual state regulatory boards (Federation of State Boards of Physical Therapy, 2021). There is not a required national oversight organization for physical therapy professional clinical practice.

Clinical Education Theoretical Framework

Educational theories in medical and health care education focus on teacher-centered and learner-centered course designs and instructional strategies (Badyal & Singh, 2017). Mastering skills and demonstrating knowledge are components of learning that can be addressed through various education theoretical foundations. Behaviorism theory is teacher-centered and utilized in structuring responses to learning experiences in a set learning environment (Badyal & Singh, 2017). Structured learning assists with gaining knowledge and mastering specific skills during introductory medical foundational content (Badyal & Singh, 2017; McLeod, 2019). In a dynamic clinical setting, context and setting may vary and require the application of knowledge in an evolving situation. The constructivism theory is learner-centered and emphasizes the teacher as a facilitator who guides the learner in environments and when the context may vary (Badyal & Singh, 2017; McLeod, 2019). Learners build a foundation of knowledge and apply the knowledge to

skills and experiences. Clinical education prepares learners for dynamic interactions and critical problem-solving integrates knowledge, skill development, and application to various learning situations (Badyal & Singh, 2017).

Constructivism theory provides a theoretical framework for instructional design and content in professional clinical education (McLeod, 2019). The principles of constructivism highlight that learning is influenced by experiences and perceptions, and constructivism emphasizes actively engaging learners in the process of obtaining and applying knowledge (McLeod, 2019; Sarita, 2017; St. Clair, 2015). Physical therapy educators incorporate real-world applications and instructional strategies into the curricular design, teaching methods, and student engagement (St. Clair, 2015). Active learning facilitates student-centered education and engagement with curricular content (Bada & Olusegun, 2015; St. Clair, 2015). Learners become familiar with and relate to content that is meaningful and relevant. Learning is contextual and builds upon a foundation of knowledge and experience (J. Stevens, 2018). As the segment of the older adult population continues to expand, physical therapists must be prepared. Evidence-based content and experiences specific to older adults should be expanded in entry-level physical therapy programs. These experiences provide knowledge that influences how information is learned, processed, and applied (Sarita, 2017). Learners will construct perceptions and link educational experiences to their professional practice (Bada & Olusegun, 2015). The entry-level physical therapy educational content, learning, and instructional strategies will directly influence problem-solving and clinical skills (Bada & Olusegun, 2015).

Constructivism lays the foundation for adult learners in clinical education and practice. Duane and Satre (2014) promoted constructivism learning as an instructional tool for skill development in nursing students and can be applied to physical therapy and

physical therapist assistant students. Collaborative learning with case-based or problem-based activities and peer-mediated solutions enhances active learning and engagement in the content areas (Duane & Satre, 2014). Literature discussing professional knowledge and skills training of health care providers related to older adults' care is limited. This research incorporates survey questions based on the constructivism learning theory, which promotes active learning strategies. Through investigation of older adult content and instructional methods in physical therapy curricula, targeted strategies may be developed to improve the training of entry-level physical therapy professionals.

Missing Older Adult Content Elements in Entry-Level Physical Therapy Education

Wyman et al. (2018) described the prevalence of negative attitudes towards older adult patients among health providers as age-based disparities are present in the diagnostic and treatment of older adults. The authors cited the lack of older adult-specific training and education of health care professionals as the main reasons for age-based discrimination and poor geriatric health outcomes (Wyman et al., 2018). Bardach and Rowles (2012) found that older adult health professional training varied across disciplines. The lack of specific older adult content is described for nursing, physician and physician assistant studies, pharmacy education, dentistry, and physical therapy curricula. Students with limited exposure to older adults in training may be less confident in providing care, develop biases that hinder care, and impair advocating for older adults (Bardach & Rowles, 2012).

One leader in older adult education is the United States Department of Veterans Affairs. This organization has established 20 Geriatric Research Education and Clinical Centers (GRECC) in the United States to provide education, training, and experiences for health care disciplines and Veteran Administration staff (United States Department of Veterans Affairs, 2021). Research opportunities, clinical experiences, and training within a

medical center provide health care students directed experience with interdisciplinary older adult care. These opportunities foster understanding of older adult care needs and provide encouragement to consider working with older adults in clinical practice. Unfortunately, these opportunities are limited in number and availability. Few educational institutions are affiliated with the Geriatric Research Education and Clinical Centers, and most health care professional programs do not have access for their students.

To promote the expansion of older adult content in the medical curricula, Meiboom et al. (2018) performed a computer-assisted concept mapping method study incorporating medical students, curricula designers, and physicians from eight medical schools. The study included group sessions to brainstorm, prioritize topics, and cluster response computer analysis to determine themes. Curricula that is patient-centered includes positive role models, content representative of older adults, and professional interactive experiences to promote understanding of older adult care needs (Meiboom et al., 2018). The literature supports the need for older adult content and exposure in health care curricula and training (Bardach & Rowles, 2012; Meiboom et al., 2018). Knowledge and skills related to older adult health care require intentional inclusion in professional curricula.

Entry-level physical therapy education emphasizes generalist preparation for clinical practice. As the population of older adults grows, awareness, knowledge, and skills must include specific training and education targeting this population’s care. Aging is a natural process and tends towards a higher prevalence of chronic conditions (Burlacu, et al., 2021; CDC, 2021b). According to Burlacu et al. (2021), social isolation and comorbidities seem associated with the risk of death for older adults. For an older adult with comorbidities and Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the cause of the COVID-19 pandemic, there was a higher-than-expected level of

mortality (Burlacu et al., 2021). The pandemic was multi-factorial and highlights the older adult population as high risk for adverse effects of social isolation, comorbidities, limited medical care, and limited physical activity (Burlacu, et al. 2021; Dzau et al., 2021; Roy et al., 2020).

Chronic conditions and non-communicable diseases are interconnected with individual health conditions, environment (social and physical), and behaviors (Magnusson, et al. 2019). Constructivism and population health perspectives can assist in framing education and training to address health inequities and to promote prevention strategies in physical therapy education (Magnusson et al,. 2019). Dean and Duncan (2016) proposed physical therapy education and practice continue to move towards holistic collaborative patient-centered care. Care should be viewed as a continuum of health across settings and include lifestyle management skills, and accountability for functional status (Dean & Duncan, 2016). Dean and Duncan (2016) emphasized the need for the physical therapy curricula to engage students in intentional instruction on the functional management of the rapidly growing older population of individuals with complex chronic diseases.

Blackwood and Sweet (2017) explored first-year physical therapy students' perceptions of older adults and found evidence of ageism. The study found by including interactive experiences with older adults in the educational process, a constructive framework for positive perceptions can be nurtured. The researchers recommend didactic and scheduled interprofessional clinical experiences for all students to prepare for clinical practice (Blackwood & Sweet, 2017). Intentional interprofessional experiences should be integrated into curricula to promote knowledge and skills to strengthen confidence regarding future clinical practice with older adults (Black & Sweet, 2017; Holmes et al.,

2018). Preparing entry-level physical therapists and physical therapist assistants requires targeted instructional strategies that include curricular content emphasizing the knowledge and skills to evaluate and treat older adults.

APTA has highlighted the need for increased awareness and training to care for older adults over the past 10 years. In 2014, the APTA published proposed competencies for the care of older adults. Six competency domains are described and include health promotion and safety, evaluation and assessment, care planning and coordination across the care spectrum, interdisciplinary and team care, caregiver support, health care systems, and benefits (APTA, 2014). These are recommended competencies for physical therapy professionals; however, they are not required in physical therapy education training or clinical practice. This research strives to identify content and instructional strategies utilized in physical therapy education to determine the current state of preparedness for the older adult patient population.

Gaps in the Literature Related to Older Adult Physical Therapy Education

Granick et al. (1987) published the only questionnaire on older adult curricular content in physical therapy education to date. This questionnaire surveyed only physical therapy programs, and in the 1980s, physical therapy programs consisted of bachelor's and master's degree levels of entry-level education. Physical therapist assistant entry-level programs were not surveyed. The physical therapy educational programs and clinical practice skills have changed and grown since the questionnaire's publication in 1987. There has been more emphasis on interprofessional team care and interactive educational opportunities in physical education over the past 15 years (Dean & Duncan, 2016; Sarita, 2017). There is a gap in the research on older adult care in physical therapy education that

reflects the current entry-level physical therapy program degree levels and educational experiences for physical therapists and physical therapist assistants.

Standardized older adult clinical education, training, and practice have not been established for the physical therapy profession. Currently, there are only general content areas to address the lifespan rehabilitation needs by CAPTE and recommended professional competencies. CAPTE provides general educational content guidelines for entry-level physical therapy programs. The educational guide standards for entry-level physical therapy programs are provided in Appendix A, and the guidelines for physical therapy assistant programs are provided in Appendix B. As the proportion of the older adult population grows, the physical therapy professional will need to be prepared to address their care needs. There is a lack of information detailing older adult curricular content and instructional strategies in physical therapy education. This research aimed to collect information on entry-level physical therapy programs' older adult content and instructional methods. The methodology for the research is provided in Chapter Three.

Chapter Three

This chapter describes the variables of interest and outlines the methodology of the study of older adult content in accredited entry-level physical therapy educational programs in the United States. This cross-sectional electronic survey study collected data on older adult content and instructional methods from participating accredited physical therapist and physical therapist assistant entry-level education programs in the fall of 2021. The survey questionnaire was developed specifically to collect information on content topics, curricular areas, and instructional strategies related to the older adult population. This questionnaire was validated and reviewed by experts prior to use. The survey questionnaire is provided in Appendix C. The data coding of variables and the linkage of the research questions to the survey questions are provided in Appendix D.

Methodology

Study Design

A cross-sectional quantitative survey study analyzed data collected from the survey responses from entry-level physical therapy education (PT and PTA) program directors in the fall of 2021. CAPTE provides free access to the all the physical therapy education program directors' email contact information on their website. The program director/interim director email addresses were collected on August 18, 2021, from the CAPTE compiled list of accredited physical therapy and physical therapist assistant programs in the United States. Initial email requesting participation in the survey occurred on August 25, 2021, after receiving Radford University's Institutional Review Board approval. The participants received an email request describing the study and the embedded questionnaire link. Consent to participate acknowledgement was the first page of the survey. Appendix F provides the consent form. The Qualtrics web-based survey

software (www.qualtrics.com) was utilized for the creation and delivery of the electronic questionnaire. The initial invitation to participate in the survey occurred on August 25, 2021, with follow-up email reminders for non-responders on August 30, September 6, and September 13. The survey remained open for responses until September 30, 2021. The electronic questionnaire with 11 fixed response questions underwent quantitative data analysis.

Target Population

A study participation and questionnaire request was sent electronically to each accredited program director of entry-level physical therapy programs, Doctor of Physical Therapy (DPT) and physical therapist assistant (PTA), in the United States. CAPTE includes all PT and PTA accredited programs with program directors' email addresses listed on their website (https://www.capteonline.org/programs). CAPTE provides free access to a comprehensive list of the accredited United States DPT programs (233 programs) and PTA programs (354 programs) with the program director/interim director emails as of August 18, 2021. The total programs included for this study was 587. Programs on probation were not included. The accredited program contact list is updated yearly.

Inclusion Criteria

Accredited entry-level physical therapy (DPT and PTA) education programs in the United States as of August 18, 2021.

Exclusion Criteria

- Non-fully accredited entry-level physical therapy (DPT and PTA) education programs as of August 18, 2021.

- Accredited post-professional transition programs in physical therapy education that allow licensed physical therapists and physical therapist assistants to pursue a clinical Doctor of Physical Therapy degree.
- All non-entry-level physical therapy programs.
- Entry-level physical therapy education programs located outside of the United States.

Sample Size

There is no previous research literature on physical therapy programs related to older adult curricular content time estimates with a t-test analysis. Statistical analysis required at least 25 responses per group (PT and PTA program type groups) to be sufficient to find a small to medium effect size per expert opinion (F. Dane, personal communication, July 8, 2021). For analysis of the association determination chi-square was utilized with the population size of 587 (total accredited PT and PTA programs listed with CAPTE as of August 18, 2021), with 95% confidence level, an estimate effect size of 0.5, and power of 0.8 required 128 survey responses [64 surveys for each program type] (AI-Therapy Statistics, 2021; Fincham, 2008; Qualtrics, 2021a; University of California, 2021). The response size of approximately 128 programs or 21.81% with at least 64 responses from each program type was the minimum required for inferential analysis for this study (AI-Therapy Statistics, 2021; Qualtrics, 2021a; University of California, 2021). The response rate of this survey was 173 or 29.46% and each program type was represented by more than 64 completed questionnaires.

Instrument

The survey developed by Granick et al. (1987) was created in 1984 and included only physical therapist programs. Physical therapist assistant programs were not included.

The original questionnaire was mailed to physical therapy education program directors listed in CAPTE in 1984. There have not been published research questionnaires related to curricular older adult content in the education of the physical therapy professional since 1987. All physical therapy programs lead to a clinical doctorate in the United States as of 2020 (APTA, 2021g, 2010). Physical therapist assistant (PTA) programs are at an associate degree level (APTA Becoming a PTA, 2021). As instructional methods and educational degree changes have occurred and because of the need to expand the study to include physical therapist assistant programs, this researcher created a new survey. The questionnaire for this research study is provided in Appendix C.

The survey questionnaire included elements of the constructivism theory of learning and the questionnaire questions are aligned with the proposed research questions. Instructional strategies and deliveries are listed in questions four, five, six, and seven with responses relating to lecture, project assignment, and whether the content is allocated to a specific course or content is integrated in multiple courses and experiences. Older adult content topics choices were listed in question eight. Learner engagement was addressed in question nine with responses inclusive of format and activities. Learner assessment choices in question ten included responses ranging from multiple choice testing, group projects, and skills competencies. The table of data codes for the study's variables and the linkage of the research and questionnaire questions are provided in Appendix D.

Several intentional survey design strategies were utilized to enhance response rates, decrease potential order effects, and gather information on older adult content in entry-level physical therapy programs. The questionnaire was 12 questions designed to take 7-10 minutes to complete. Funneling questions in a logical flow with the largest question response choices located towards the middle of the questionnaire along with randomization

of response choices assists with minimizing potential order effects and question choice fatigue (American Educational Research Association, 2021; Artino el at., 2014; Pew Research Center, 2021; Qualtrics, 2020). The select-all response choice was the most frequently used question answer option to collect more information than a one forced-choice option (Pew Research Center, 2021). The questionnaire underwent a Qualtrics computer assisted analysis for readability, flow, survey length, and response time prior to pilot testing.

Sauermann and Roach (2012) discussed web survey response rates and survey design approaches to increase participation and improve quality of survey-based research. The authors recommended personalization of participant invitations, offering incentives to participate, effective timing of contacting participants, and wording changes of follow-up reminders as means to improve response rates. Qualtrics software web-based survey builder tool allowed for personalization and tracking of invitations and reminders (Qualtrics, 2021b). This research questionnaire was released for 2 to 3 weeks after the start of the fall semester with personalized invitations and reminders. Reminders were sent approximately every 7 days with maximum of three additional requests to participate, and each reminder had slightly modified wording to encourage participation (Nulty, 2008; Qualtrics, 2021b; Zong, 2021). To maximize the response rate to reach the target number for analysis, up to three reminder emails with the questionnaire link were sent to non-responders. A global response rate incentive was offered in the initial invitation and in the reminder emails, which was a statement indicating a $100 donation to the Arthritis Foundation (qualified 501(c)(3) EIN 58-1341679 organization) if a 60% response rate was achieved. Less than a 60% response rate was achieved; therefore, a donation was not required.

Validity Testing

Validity of this research questionnaire, *Older Adult Curricula in Physical Therapy Education Questionnaire*, was supported by a review by experts in qualitative and educational research literature, recently retired physical therapy educational program directors, and certified geriatric physical therapy specialists. According to Higgins and Straub (2006), content validity can be determined by literature review, personal reflection and research, and critique of the instrument by experts. The questions were reviewed, and feedback was incorporated. Questionnaire reviewers for the initial assessment of validity included the following individuals (n = 8):

- 2 health professions researchers (qualitative and mix methods expertise)
- 1 PTA director (current)
- 1 PTA program director, retired less than one year ago
- 1 PT program director, retired less than 3 months
- 1 health sciences professor with expertise in higher education
- 2 certified geriatric physical therapy specialist faculty members in PT programs

A pilot of the questionnaire for additional feedback and content validity review was conducted after the initial face validity was established. The pilot of the questionnaire was sent to two CAPTE site reviewers who are faculty members of physical therapy programs as well as recently retired program directors, and program directors of emerging physical therapy programs.

Pilot of Questionnaire for feedback and content validity was sent to the following individuals (n = 30):

- 2 CAPTE site reviewers (active) who are full-time faculty of PT and PTA programs

- 7 PT/7 PTA faculty members responsible for teaching geriatric content in programs
- 1 PTA program director, retired less than one year ago
- 1 PT program director, retired less than 3 months
- Target of 12 PT/PTA program directors of emerging programs (not yet have full accreditation status)

The pilot test response rate was nine out of 30, which is not considered an adequate number for statistical analysis of the small sample for reliability and validity testing (National Council for the Social Studies, 2021). The pilot study's responses provided feedback and indicated question content validity.

Data Collection

The research questionnaire, *Older Adult Curriculum in Physical Therapy Education Questionnaire*, was created utilizing the Qualtrics survey web-based software. The researcher had access to Qualtrics survey software under an educational institutional license. An electronic Uniform Resource Locator (URL) web address link was created by Qualtrics for distribution of the questionnaire to the accredited program directors of Doctor of Physical Therapy programs and physical therapist assistant programs in the United States. The email introduction requested study participation and a link to the consent and questionnaire. The consent acknowledgement indicated that by clicking on the NEXT button icon located at the bottom of the consent web page, the participant agreed to participate in the study. The survey questions appeared in the following web pages. The Qualtrics software logs the URL used to access the online survey. Since the URLs were personalized for each unique email address, Qualtrics had a record of which respondents had completed the survey. This process facilitated targeting follow-up email reminders to complete the questionnaire since subsequent reminders went only to those who had not

already opened the survey. Data for analysis was aggregated based on program type and not on individual physical therapy programs.

Access to the Qualtrics-based study data was limited to the researcher with single sign-on authentication (Qualtrics, 2021b). The survey data was coded in numbers for ease of translation to IBM SPSS version 28 statistical software for analysis. The table of data codes for analysis of the study variables is provided in Appendix D.

Data Analysis

Contingency tables with tallied variable frequencies for all variables created from the 173 survey responses were created by Microsoft Excel spreadsheet (2021). Frequency counts are provided with each of research questions 1-10. Cross tabulations and chi-square analysis results were performed using SPSS statistical software, version 28 (https://www.ibm.com/products/spss-statistics).

Descriptive Analysis

Descriptive analysis based on percentages and frequency distributions was performed. Creation of contingency tables of the frequency distribution and percentage of dedicated instructional time included the variables of curricular areas, curricular instructional categories, course delivery, content delivery methods, content topics, engagement methods, learner assessment, and employed resources based on program type.

Inferential Statistical Analysis

For data analysis, data coding of the Qualtrics questionnaire responses allowed for statistical analysis by IBM SPSS statistical software package version 28. The study's independent variables were the program types, physical therapy (PT) or physical therapist assistant (PTA). The study's dependent variables were instructor type, instructional time percentage, curricular areas, curricular instructional categories, course delivery, content

delivery methods, content topics, engagement methods, learner assessments, and employed resources. The table of data coded for analysis of the study's variables linked to the survey questionnaire and research questions is provided in Appendix D.

For the continuous interval variable of estimated time, the statistical t-test was utilized to assess for differences between program types. The nominal/categorical variables were analyzed using the chi-square test to compare and determine the relationship and significance of the dependent variables in the two groups (PT and PTA programs). Variable determination and set up for data analysis utilizing chi-square tests were as follows:

- Independent Variable: Program Type (PT program and PTA program)
- Dependent Variables:
    - instructor type (faculty, adjunct, guest lecturer)
    - instructional time percentage dedicated to older adult content
    - curricular area (clinical sciences, clinical experience, etc.)
    - curricular instructional categories (didactic, research, etc.)
    - course delivery (one course, integrated)
    - content delivery (lecture, lab, online, etc.)
    - content topics (imaging, mental health, functional screening, etc.)
    - engagement methods (case-based, interactive media, etc.)
    - learner assessment (multiple choice, projects, portfolio, etc.)
    - employed resources (certified specialists, contemporary clinical resources, etc.)

For statistical test analysis, the probability value (p) was used to reject the null hypothesis. If the p-value was less than 0.05, it would reject the null hypothesis that there was no difference or association and conclude that a significant difference or association

did exist. If the p-value was larger than 0.05, then it would conclude that no significant difference or association existed. The table of data coded for analysis of the study's variables linked to the survey questionnaire and research questions is provided in Appendix D.

Institutional Review Board

An Institutional Review Board (IRB) application was approved on August 25, 2021, under protocol number 2021-245. The study's title in the IRB application is *A Survey of Older Adult Curricular Content and Instructional Methods Used in Accredited Entry-Level Physical Therapy Educational Programs in the United States*. Dr. F. J. Everhart was the primary investigator and Julia Castleberry was listed as the student researcher. Appendix E contains the IRB approval letter, and Appendix G is the consent acknowledgement to participate in the study.

Study Considerations

Limitations

There has been only one questionnaire published regarding older adult content in physical therapy educational programs. The Granick et al. (1987) questionnaire asked general topic questions, and the study population did not include physical therapist assistant programs. The questionnaire was limited to validity testing by a few experts in the physical therapy profession and reliability was not reported. The Granick et al. (1987) questionnaire served as a starting point to explore content topic development for this research's survey. The entry-level physical therapy educational programs and clinical practice skills have changed since the questionnaire's publication in 1987. A new questionnaire was created for this research study to reflect the current entry-level physical therapy program degree levels and changes in instructional methods.

The creation of the new questionnaire instrument relied on literature searches and expert reviews. The lack of a proven standardized instrument to survey physical therapy education programs was a limitation of this study. The Pew Research Center (2021) and Qualtrics (2020) provided guidelines for survey question creation, survey flow, and enhancement of response rates. The recommendations of funneling questions, placing the largest question close to the middle of the survey, randomizing response choices, and targeting a short survey with 15 or less questions assisted in the study's questionnaire development (Pew Research Center, 2021; Qualtrics, 2020). The Pew Research Center (2020) emphasized the need for a logical order to questions and the use of concrete and simple wording of questions and answer choices. There is a tendency to select the first item on a list and randomization of response choices assists with decreasing potential order effects (Pew Research Center, 2021). Although "select all that apply" responses may not yield specific best answer responses, they do provide more information than forced-choice questions (Pew Research Center, 2021). This questionnaire's primary aim was to collect and analyze information on older adult curricula topics and instructional methods in entry-level physical therapy education; therefore, the majority of its question response options (eight out of 12 questions) are comprised of "select all that apply."

Survey research hinges on participant response. Sauermann and Roach (2012) discussed web survey response rates and survey design approaches to increase participation and improve quality of survey-based research. The authors recommended personalization of participant invitations, offering incentives to participate, effective timing of contacting participants, and wording changes of follow-up reminders as means to improve response rates. The Qualtrics software web-based survey builder tool allowed for personalization and tracking of invitations and reminders (Qualtrics, 2020). This research questionnaire

was released for 2-3 weeks after the start of the fall semester with personalized invitations and reminders. Reminders were sent approximately every 7 days with a maximum of three delivered to potential participants with slightly modified wording to encourage participation (Nulty, 2008; Qualtrics Research Center, 2021; Zong, 2021). A global response rate incentive was offered in the initial invitation and in the reminder emails, which was a statement indicating a $100 donation to the Arthritis Foundation (qualified 501(c)(3) EIN 58-1341679 organization) if a 60% response rate was achieved. Inferences based on this study's data were dependent on the response rate and completeness of the survey.

Participants were assumed to answer honestly and complete the entire survey. By indicating that the results are de-identified based on program type and a statement indicating that the researcher would not collect individual internet protocol [IP] addresses, the expectation was participants would believe their individual responses were anonymous and confidential (Simon, 2011). The responses were aggregated, and the summary of results analyzed and reported. Knowledge of older adult content is lacking in the literature, and this study highlighted the importance of gaining insights regarding physical therapy education's preparedness to care for the growing older adult population. This study collected responses during the fall of 2021, and surveys were limited to a one-time submission. The information collected was from entry-level physical therapy programs and did not include older adult content in the transition and post-professional physical therapy programs.

Delimitations

This study was limited to entry-level physical therapy education programs. One consideration related to the target population was access to contact information. All

accredited entry-level physical therapy education programs in the United States are registered with CAPTE. All program directors and their email contact information are posted and updated yearly on the organization's website every January. This study sent every accredited entry-level physical therapy (Doctor of Physical Therapy and physical therapist assistant) program a request to participate along with the survey web-based link. Non-entry-level physical therapy educational programs and physical therapy programs located outside of the United States were not included in the subject pool. Post-professional or transition programs where a physical therapist has a bachelor's degree or a master's degree in physical therapy and pursues a transitional Doctor of Physical Therapy degree were not surveyed as they are not entry-level to the physical therapy profession. Programs that a physical therapist assistant can pursue to become a Doctor of Physical Therapy were not included in the survey sample as they are not entry-level to the profession of physical therapy. The results of this study provided insights of older adult content and instructional methods utilized in entry-level physical therapy education program as of the fall of 2021.

Chapter Four

This chapter provides the results and analysis of the cross-sectional electronic survey study on the older adult curriculum of participating entry-level accredited physical therapist and physical therapist assistant education programs in the fall of 2021. Over 173 survey responses were collected over a 5-week period from August 25 to September 30, 2021. Descriptive and inferential statistical analyses were performed and provided insights into older adult content, curricular areas, and instructional methods within entry-level physical therapy education. The questionnaire, *Older Adult Curriculum in Physical Therapy Education Questionnaire*, is provided in Appendix C. The table of data codes of variables and linkage to research and questionnaire questions is provided in Appendix D.

Results

Sample

The electronic survey was sent to 587 entry-level accredited physical therapy programs, 233 physical therapist (PT) and 354 physical therapist assistant (PTA). One hundred and seventy-three questionnaires were completed by 84 PT programs and 89 PTA programs, resulting in a 29.47% response rate.

Recruitment Strategies

Several recruitment strategies were utilized to enhance response rates. The questionnaire was designed to take 7-10 minutes to complete. The initial request to participate in the survey was timed for delivery a few weeks after the beginning of the start of most programs of the fall semester. Personalization of email reminders to participate and the offer of a global incentive if a 60% response rate was achieved encouraged participation.

Demographics

The sample was comprised of accredited entry-level physical therapy programs in the United States. All 50 states and the District of Columbia have physical therapy and physical therapy assistant programs. Individual programs were not identified in the collection of responses; and therefore, specific state representation is not known. Overall, 587 entry-level accredited physical therapy programs, 233 PT) and 354 PTA were sent a request to participate. A total of 173 programs responded, which included 84 PT programs and 89 PTA programs representing multiple states. Table 1 depicts the number of physical therapy program types located by geographic region in the United States.

Table 1

Geographical Region Distribution of Accredited Programs in the United States

Region of the United States	Doctor of Physical Therapy Programs	Physical Therapist Assistant Programs
South Atlantic DE, DC, FL, GA, MD, NC, SC, VA, WV	46	76
Middle Atlantic NJ, NY, PA	36	38
East North Central IL, IN, MI, OH, WI	35	67
West North Central IA, KS, MN, MO, NE, ND, SD	24	35
West South Central AR, LA, OK, TX	27	42
New England CT, ME, MA, NH, RI, VT	19	14
Pacific AK, CA, HI, OR, WA	21	26
East South Central AL, KY, MS, TN	13	27
Mountain AZ, CO, ID, MT, NV, NM, UT, WY	12	29
Total	**233**	**354**

Commission on Accreditation in Physical Therapy Education. (2021). Aggregated Program Data/2020 Programs Fact Sheet. www.capteonline.org/resources

Results of the Study

The total questionnaire response rate used in statistical analysis was 29.47% (173/587 completed questionnaires). Cross tabulations and chi-square and T-test analysis were calculated using SPSS statistical software, version 28. For statistical test analysis, the probability value (p) was used to determine a significant difference or association. If the p-value was less than 0.05, it was concluded that a significant difference or association did exist. If the p-value is larger than 0.05, then it was concluded that no significant difference or association existed. Table 9 provides a summary of the results (p. 82).

Descriptive Analysis

Content-Related

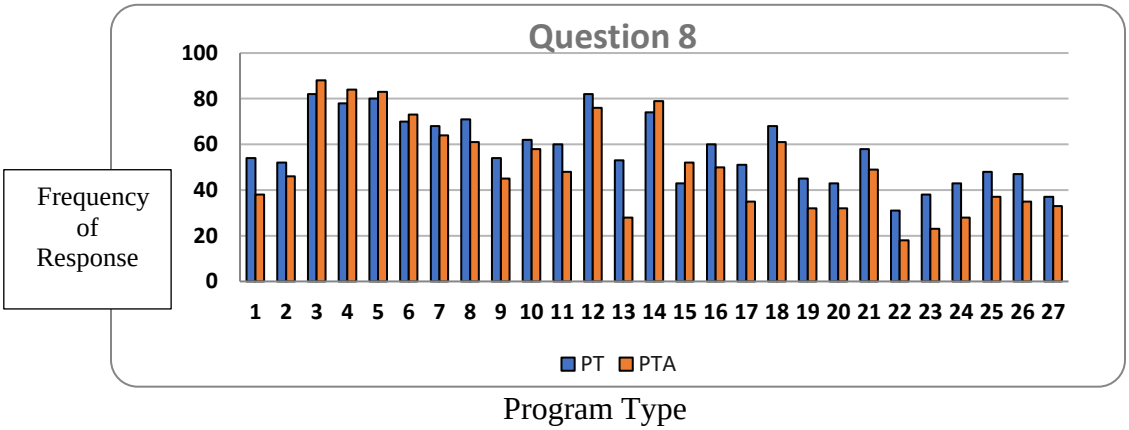
Research Question 1

Which older adult topics are taught in accredited entry-level physical therapy programs in the United States? (Questionnaire Question 8)

The participants were able to choose "select all that apply" for responses. The range of total count responses was 49 to 170 for content topics. The combined program total count indicated medical conditions, mental health, disease prevention and health promotion, and functional screenings were the most often taught older adult content topics. Figure 5 illustrates the range of topics. Table 2 outlines the most frequent responses and the least chosen response option. Having a "select all that apply" with 27 response options may have encouraged participants to check each choice. The ability to determine specific topics of focus for a particular program or program type may be compromised.

Figure 5

Frequency of Content Topics by Program Type



Note: n = 173 (84 PT programs and 89 PTA programs)

Response Options for Older Adult Content Topics Taught
1 = Theories of aging
2 = Strategies for reaching
3 = Medical conditions
4 = Mental health
5 = Disease prevention and health promotion
6 = Psychosocial factors of care
7 = Pharmacology considerations
8 = Imaging
9 = Nutrition
10 = Communication
11 = Cognitive screening
12 = Functional screenings
13 = Frailty screenings
14 = Fall risk screening
15 = Treatment modalities
16 = Environmental screenings and modification
17 = Care planning
18 = Discharge planning
19 = Community Resources
20 = Caregiver support
21 = Interdisciplinary and team care
22 = Legislation
23 = Economic issues
24 = Healthcare systems and benefits
25 = Third-party reimbursement
26 = Advocacy
27 = Diversity

Table 2

Frequency of Selected Responses for Research Question One

Topics with the Most Responses	Analysis	Results N=173 89 PTA programs & 84 PT programs
Medical Conditions	Frequency	PTA programs 98.88% PT programs 97.62%
Disease Prevention and Health Promotion	Frequency	PTA programs 93.26% PT programs 95.24%
Mental Health	Frequency	PTA programs 94.38% PT programs 92.86%
Functional Screenings	Frequency	PTA programs 85.39% PT programs 97.62%
Topic with the Least Response		
Legislation	Frequency	PTA programs 20.23% PT programs 36.90%

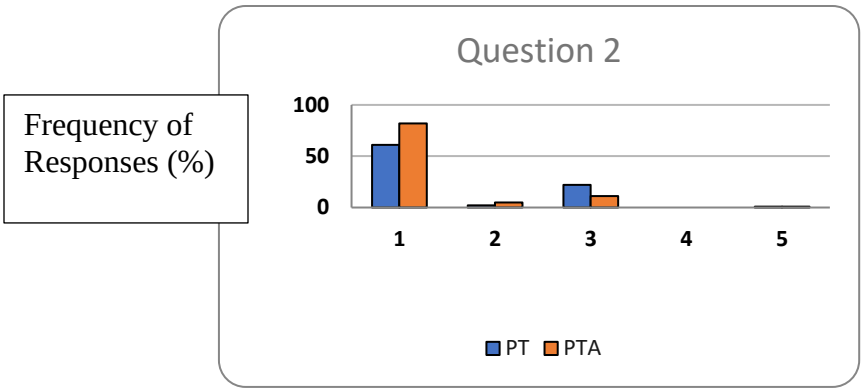
Research Question 2

Who teaches content regarding the older adult population in accredited entry-level physical therapy programs in the United States? (Questionnaire Question 2)

The participants responded to the "select all that apply" instructions indicating who teaches older adult content in their program's curriculum. Five options were provided and included full-time faculty, part-time faculty, adjunct instructor, guest clinical lecturer, and contracted content expert. The majority of PT and PTA programs (82.66%) indicated that full-time faculty/instructors primarily teach older adult content in their curriculums. PT programs reported full-time faculty/instructors were utilized in 72.62% (61/84 programs) of the responding programs and PTA programs reported 92.13% (82/89 programs) of older adult content was taught by full-time faculty/instructors. According to the respondents of this survey, guest clinical lecturers were not utilized to teach older adult content in PT and PTA programs. Figure 6 illustrates the frequency of instructor types.

Figure 6

Frequency of Instructor Type by Program Types



Note: n=173 (84 PT programs and 89 PTA programs)

Response Options for Instructor Type
1 = Full-time faculty
2 = Part-time faculty
3 = Adjunct instructor
4 = Guest Clinical Lecturer
5 = Contracted Content Expert

Research Question 3

How much estimated instructional time is dedicated to older adult content in accredited entry-level physical therapy programs in the United States?

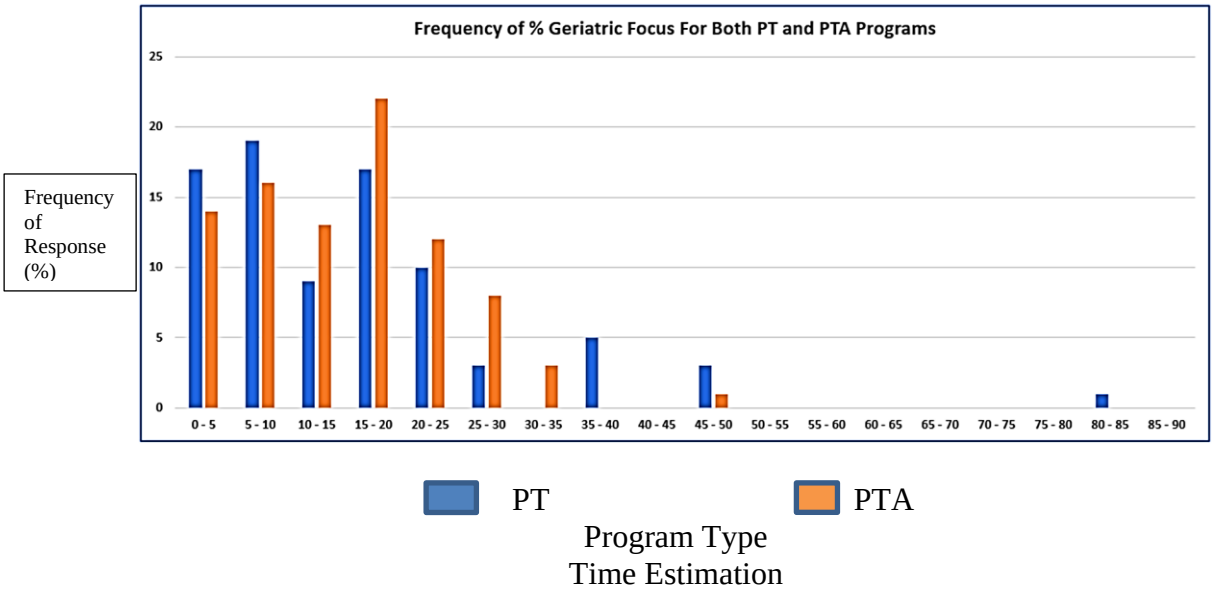
(Questionnaire Question 3)

The participants responded with an estimated percentage of the instructional time dedicated to older adult content within the program's curriculum. One response was allowed. The mean total time percentage of 17.54% (range of 1 to 85%) was reported as spent on older adult content for the 171 combined PT and PTA programs. The PTA programs reported mean time estimated as 20.88% and PT programs reported a mean of 14% of time dedicated in their curriculum to older adult content. Both programs had one higher time percentage data point outlier. The PT program had one report of 85% and PTA program had one report of 50% as the percentage of time spent on older adult content. Two

programs did not give a response to this question. The outliers and having only 171 responses may potentially skew the mean percentage slightly higher than what is the actual mean of time spent on older adult content in physical therapy education programs. Figure 7 illustrates the time estimation frequency by program type.

Figure 7

Frequency Estimated Time by Program Type



Note: n = 171 (PT programs = 83 and PTA programs = 88)

Research Question 4

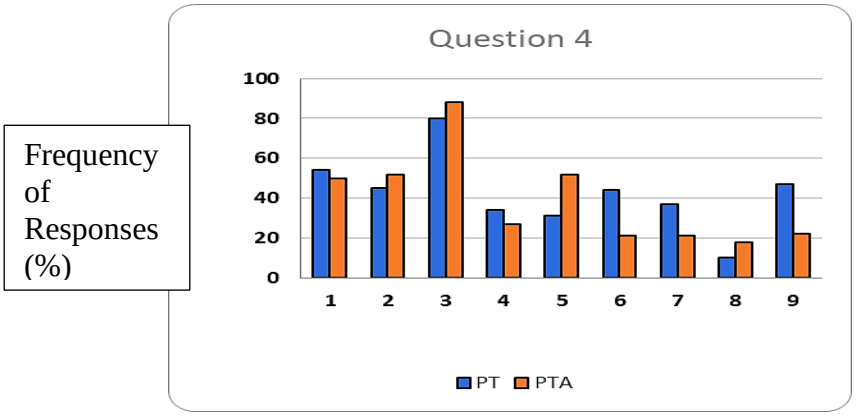
Which curricular areas are older adult content included in accredited entry-level physical therapy programs in the United States? (Questionnaire Question 4)

The participants responded to the "select all that apply" instructions indicating that older adult content is being taught most (97.11%) in the clinical sciences areas of PT and PTA programs' curriculum. The least selected response was intraprofessional educational experience with PT programs reported at 11.90% (10/84 programs) and PTA programs

reported at 20.22% (18/89 programs). Figure 8 illustrates the frequency of curricular areas where older adult content is taught by program type.

Figure 8

Frequency of Curriculum Areas of Older Adult Content by Program Type



Note: n = 173 (84 PT and 89 PTA programs)

Response Options for Curricular Area
1 = Basic sciences
2 = Behavioral-social sciences
3 = Clinical sciences
4 = Professional physical therapy practice
5 = Clinical Experience requirement
6 = Clinical experience opportunity
7 = Interprofessional education experience
8 = Intraprofessional education experience
9 = Community learning education experience

Research Question 5

Which curricular instructional categories are used to teach older adult content in accredited entry-level physical therapy programs in the United States?

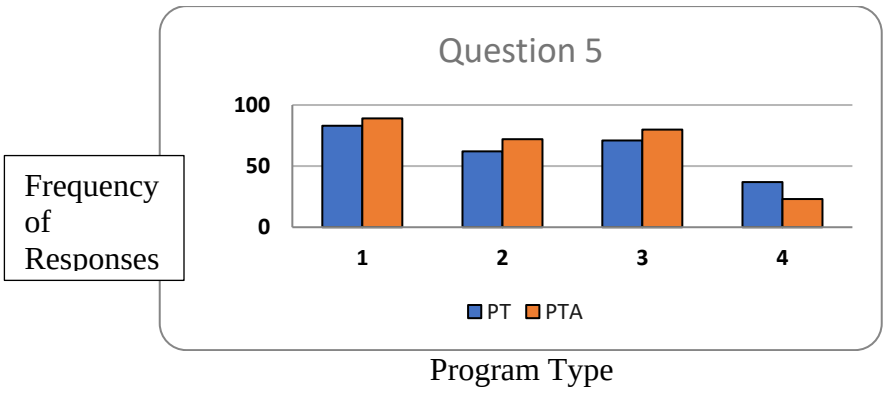
(Questionnaire Question 5)

The participants responded to the "select all that apply" instructions indicating that the most frequent instructional category used for teaching older adult content in PT and PTA programs is the didactic portion of the curriculum at 99.42% based on 173 program

responses. Research was selected as the least frequent instructional category with PT programs reported at 44.05% (37/84 programs) and PTA programs reported 25.84% (23/89 programs). Figure 9 illustrates the frequency of the instructional category chosen and Table 3 provides the frequency of responses in combined programs.

Figure 9

Frequency of Instructional Category of Older Adult Content by Program Type



Note: n = 173 (84 PT programs and 89 PTA programs)

Response Options for Instructional Category
1 = Didactic
2 = Laboratory
3 = Clinical
4 = Research

Table 3

Frequency of Instructional Categories by Programs Combined

Instructional Categories with the Most Responses	Analysis N = 173 89 PTA programs & 84 PT programs	Results N = 173 Combined PT and PTA Programs
Didactic	Frequency	99.42%
Clinical	Frequency	87.28%
Laboratory	Frequency	77.46%
Instructional Category with the Least Responses		
Research	Frequency	34.68%

Methods of Delivery

Research Question 6

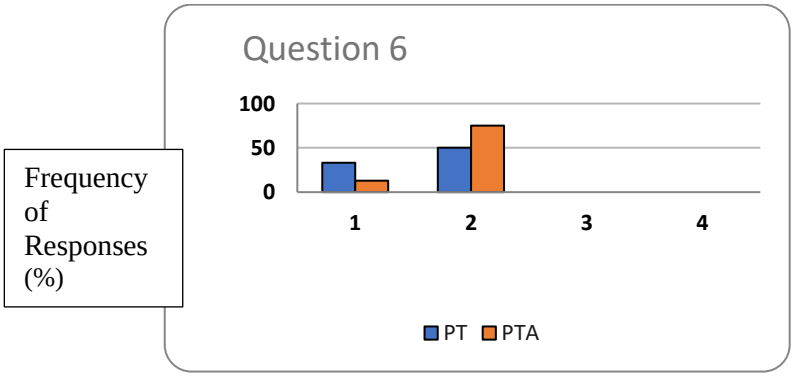
Which methods of course delivery of content regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?

(Questionnaire Question 6)

The participants responded with a "select one response" instructions indicating older adult content is delivered most frequently in an integrated method in multiple course offerings for both PT and PTA programs. Combined PT and PTA programs (total 171) indicated 73.01% of older adult content is delivered over multiple courses in the curriculum. Interprofessional education experiences and community engagement/service learning experiences were not selected as responses by PT or PTA programs as a means to deliver course content related to older adults. Figure 10 illustrates the frequencies reported, and Table 4 provides the frequencies of course delivery responses per program type. Having the response choice of "select one answer" may underrepresent the utilization of various course delivery methods present in PT and PTA curriculums.

Figure 10

Frequency of Older Adult Course Delivery by Program Type



Note: n = 171 (PT programs = 83 and PTA programs = 88)

Response Options for Content Delivery
1 = One course
2 = Integrated in multiple courses
3 = Interprofessional education
4 = Community engagement/service learning

Table 4

Table of Frequencies of Course Delivery by Program Type

Course Delivery	Analysis N = 171 88 PTA programs & 83 PT programs	Results N = 171 88 PTA programs & 83 PT programs
Integrated in multiple courses	Frequency	PTA programs 85.23% PT programs 60.24%
One Course to delivery older adult content	Frequency	PTA programs 14.77% PT programs 39.76%
Interprofessional education experiences	Frequency	PTA and PT programs 0%
Community engagement/service learning	Frequency	PTA and PT programs 0%

Research Question 7

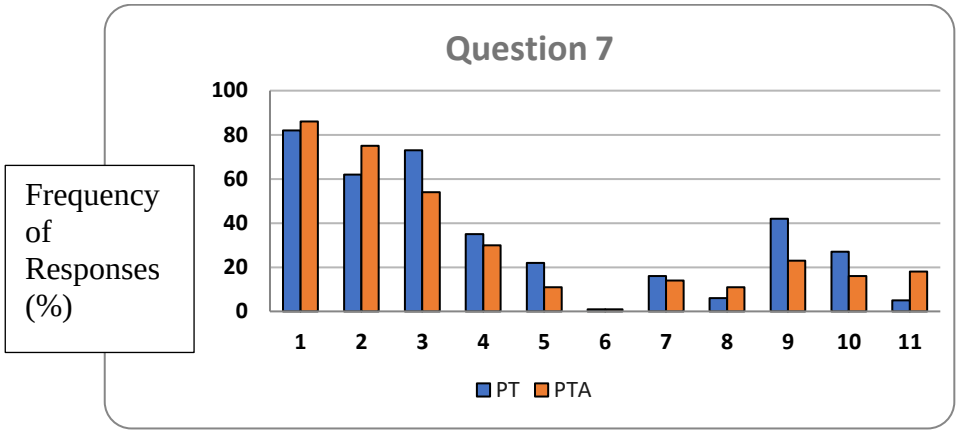
Which methods of content delivery regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?

(Questionnaire Question 7)

Participants responded to the "select all that apply" instructions indicating the most common delivery method for older adult content is by lecture with the total frequency of PT and PTA programs at 97.11% (168/173 programs). The least used method of older adult content delivery was online at 1.16% for combined PT and PTA program types. Figure 11 illustrates the frequencies reported and Table 5 provides the highest response frequencies by program type.

Figure 11

Frequency of Older Adult Content Delivery by Program Type



Note: n = 173 (84 PT programs and 89 PTA programs)

Response Options for Content Delivery
1 = Lecture
2 = Laboratory/skills
3 = Case-based delivery
4 = Project-based delivery
5 = Online delivery partly
6 = Online delivery entirely
7 = Podcast and video delivery
8 = Outside organization with expertise provides delivery
9 = Community-based learning activities
10 = Interprofessional education experience/activity
11 = Intraprofessional education experience/activity

Table 5

Table of Frequencies of Content Delivery by Program Type

Content Delivery	Analysis	Results N = 173 89 PTA & 84 PT program
Lecture	Frequency	PTA programs 96.63% PT programs 97.62%
Laboratory	Frequency	PTA programs 84.27% PT programs 73.81%
Case-based	Frequency	PTA programs 60.67% PT programs 86.90%

Instructional Strategies and Assessments

Research Question 8

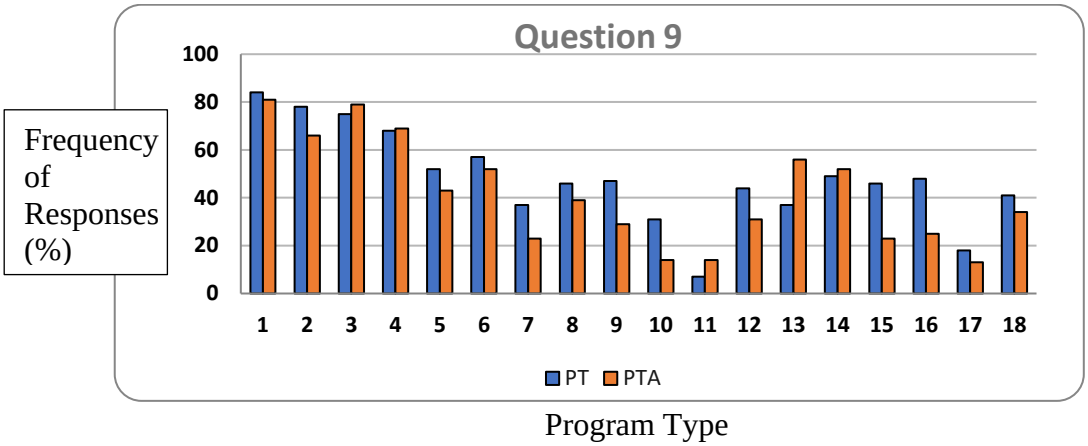
Which instructional strategies are employed to engage learners in older adult content in accredited entry-level physical therapy programs in the United States?

(Questionnaire Question 9)

Participants responded to the "select all that apply" instructions indicating the most common instructional strategy for older adult content is lecture-based with the combined PT and PTA programs reported at 95.38% (165/173 programs). Intraprofessional activities were reported as the least utilized instructional strategies at 12.14% (21/173 programs) for PT and PTA programs combined. The engagement instructional strategy options were all selected and cited by both PT and PTA programs. Figure 12 illustrates the frequencies reported and Table 6 provides the highest frequencies by program type responses.

Figure 12

Frequency of Instructional Strategies of Older Adult Content by Program Type



Note: n = 173 (84 PT programs and 89 PTA programs)

Response Options for Engagement Strategies
1 = Lecture format
2 = Problem or Case-based format
3 = Discussion-based format
4 = Psychomotor skills activities and experiences
5 = Instructor modeling clinical skills
6 = Instructor directed feedback on clinical performance
7 = Older adult interaction with feedback
8 = Real-time learning performance assessment and feedback
9 = Student-led activities
10 = Interprofessional activity
11 = Intraprofessional activity
12 = Video analysis
13 = Role playing
14 = Simulated patient experiences
15 = Older adult contact experiences
16 = Community-based project or activity
17 = Interactive electronic tools
18 = Videos

Table 6

Frequencies of the Top Three Engagement Strategies Employed by Program Type

Engagement Strategies	Analysis N = 173 89 PTA programs & 84 PT programs	Results N = 173 89 PTA programs & 84 PT programs
Lecture	Frequency	PTA programs 91.01% PT programs 100%
Problem/case-based	Frequency	PTA programs 74.16% PT programs 92.86%
Discussion based	Frequency	PTA programs 88.76 % PT programs 89.29%

Research Question 9

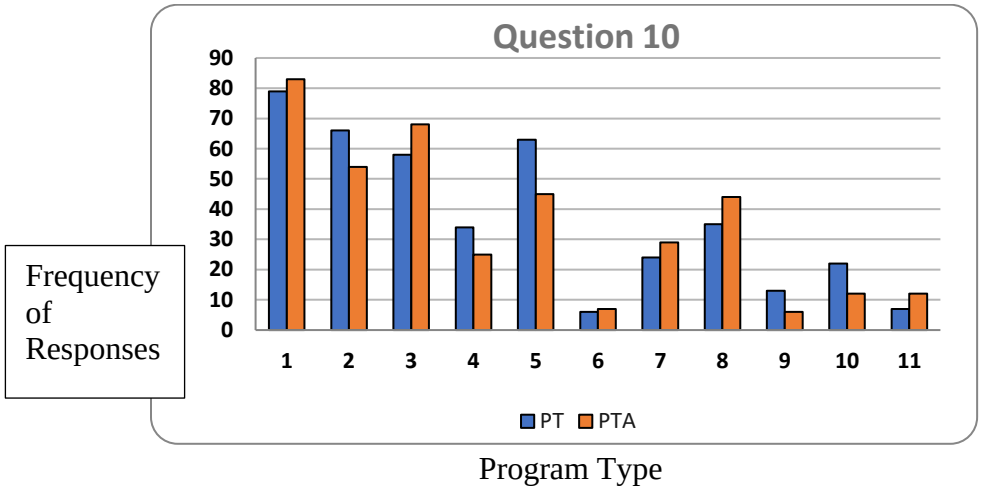
Which learner assessments of older adult knowledge and skills are used in accredited entry-level physical therapy programs in the United States?

(Questionnaire Question 10)

Participants responded to the "select all that apply" instructions indicating the most common learner assessment of older adult content is multiple choice testing. Portfolio or e-Portfolio was reported as the least frequently selected method of learner assessment at 7.51% (13/173 programs) for PT and PTA programs. Figure 13 illustrates the frequency of responses and Table 7 provides the most commonly chosen responses per program type.

Figure 13

Frequency of Learner Assessments of Older Adult Content by Program Type



Note: n = 173 (84 PT programs and 89 PTA programs)

Response Options for Learner Assessment
1 = Multiple choice testing
2 = Problem/Case-based assessments
3 = Skills competencies and practical skills performance
4 = Individual project(s)
5 = Group project(s)
6 = Portfolio or e-Portfolio
7 = Research or literature review paper
8 = Presentation
9 = Poster presentation
10 = Interprofessional collaborative activity
11 = Intraprofessional collaborative activity

Table 7

Frequency of Select Learner Assessments by Program Types

Learning Assessments	Analysis N = 173 89 PTA programs & 84 PT programs	Results N = 173 89 PTA programs & 84 PT programs
Multiple choice testing	Frequency	PTA programs 93.26 % PT programs 94.05%
Problem/Case-based	Frequency	PTA programs 60.67 % PT programs 78.57%
Skills competencies and practical	Frequency	PTA programs 76.40 % PT programs 65.17%
Group Projects	Frequency	PTA programs 50.56% PT programs 75%

Resources

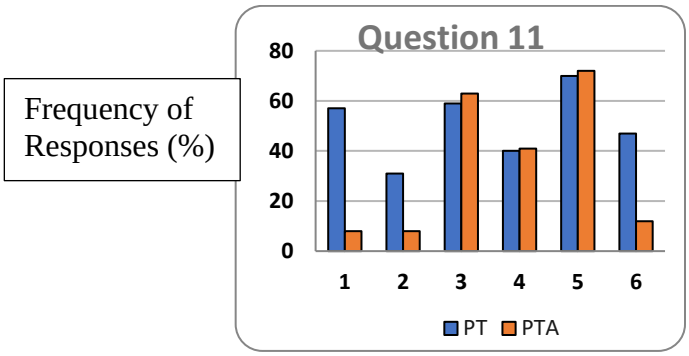
Research Question 10

Which resources are employed to teach content regarding older adults in accredited entry-level physical therapy programs in the United States? (Questionnaire Question 11)

Participants responded to the "select all that apply" instructions indicating the most common resource utilized to teach for older adult content is the use of instructors with contemporary clinical experiences in the care of older adults at a combined program frequency of 82.08% based on 142 out of 173 program responses. The least selected resource was having instructors who were Certified Exercise Expert for Aging Adults (CEEAA) reported at 22.54% (39/173 combined programs). Figure 14 illustrates the responses regarding resources by program type, and Table 8 provides the frequency of responses by program type.

Figure 14

Frequency of Resources by Program Type



Program Type

Note: *n* = 173 (84 PT programs and 89 PTA programs)

Response Options for Resources
1 = Clinical Specialist on Faculty
2 = Certified Exercise Expert for Aging Adults (CEEAA)
3 = Contemporary continuing education in the care of older adults
4 = Contemporary continuing education in teaching older adults
5 = Contemporary clinical experiences in the care of older adults

6 = Using Academy of Geriatric Physical Therapy's Essential Competencies

Table 8

Frequency of Resources Utilized by Program Type

Resources	Analysis	Results *N* = 173 89 PTA programs & 84 PT programs
Clinical Specialist on Faculty	Frequency	PTA programs 8.99% PT programs 65.51 %
Certified Exercise Expert for Aging Adults (CEEAA)	Frequency	PTA programs 8.99% PT programs 36.90 %
Contemporary continuing education in the care of older adults	Frequency	PTA programs 70.79% PT programs 70.24 %
Contemporary continuing education in teaching older adults	Frequency	PTA programs 46.07% PT programs 47.62%
Contemporary clinical experiences in the care of older adults	Frequency	PTA programs 80.09% PT programs 83.33%
Using Academy of Geriatric Physical Therapy's Essential Competencies	Frequency	PTA programs 13.48% PT programs 55.95%

Inferential Statistical Analysis

The following research questions and analysis results indicate if there is a difference or association between program type (PT or PTA) and the dependent variables of instructor type, time dedicated, curricular areas, curricular instructional categories, course delivery, content delivery methods, engagement strategies, learner assessments, and resources utilized. Significance determination was based on $p \leq .05$. Table 9 provides a summary of the results.

Research Question 11

Are there differences in older adult content instructor type based on accredited entry-level physical therapy program type in the United States?

(Questionnaire Questions 1 & 2)

A chi-square test was performed with program type (PT and PTA) and instructor type (Full-Time Faculty, Part-Time Faculty, Adjunct Instructor, Guest Clinical Lecturer,

and Contracted Content Expert). There was a statistically significant association $X^2(4) = 22.42$, $p = .02$ of program type and instructor type of older adult content. Based on the frequency and chi-square test analysis, more full-time faculty/instructors are utilized in PTA programs (92.13%) than in PT programs (72.62%) to teach older adult content. PT programs (26.19%) utilized adjunct instructors more than PTA programs (12.36%) to teach older adult content.

Research Question 12

Are there differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy type in the United States?

(Questionnaire Questions 1 & 3)

A Student's Independent *t* -test was calculated with an $N = 171$ (2 programs did not provide answers to questionnaire question 3). The *t*-test was utilized to determine if there was a difference in means between program type (PT or PTA) and time estimate as a percentage (0-100%) of curriculum spends on older adult content instruction. The time responses were the continuous variables used to compare with program type (PT or PTA). Findings indicated that $t(171) = 4.061$, $p = .00$. There is a significant difference in the mean estimate of time for PT programs ($M = 14$, $SD = 9.75$) and PTA programs ($M = 20.88$, $SD = 12.92$). PTA programs (20%) spend significantly more time on instruction related to older adult content.

Research Question 13

Are there differences in curricular areas where content regarding the older adult population is included based on accredited entry-level physical therapy program type in the United States? (Questionnaire Questions 1 & 4)

A chi-square test was performed with program type (PT and PTA) and curriculum area responses (Basic sciences, Behavioral-social sciences, Clinical sciences, Professional physical therapy practice, Clinical Experience requirement, Clinical experience opportunity, Interprofessional education experience, Intraprofessional education experience, and Community learning education experience). There was a statistically significant association, $X^2(8) = 119.45$, p = .00, of program type and curricular area of older adult content. Physical therapist programs reported older adult content significantly more in the curricular areas of clinical experience opportunities (97.11%), and community learning education experiences (55.95%) than physical therapist assistant programs (24.72%).

Research Question 14

Are there differences in curricular instructional categories of older adult content based on accredited entry-level physical therapy program type in the United States?

(Questionnaire Questions 1 & 5)

A chi-square test was performed with program type (PT and PTA) and curriculum instructional categories (Didactic, Laboratory, Clinical, and Research). There was a statistically significant association, $X^2(3) = 18.142$, p = .03, of program type and curricular category. PT programs (44.05%) include older adult content in the research curriculum instructional category more than was reported by PTA programs (25.84%). PTA programs (80.90%) reported older adult content more frequently in the laboratory category compared to PT programs (73.81%).

Research Question 15

Are there differences in course delivery of older adult content based on accredited entry-level physical therapy program type in the United States?

(Questionnaire Questions 1 & 6)

A chi-square test was performed with program type (PT and PTA) and course delivery responses related to older adult content. Course delivery options included one course, integrated content in multiple courses, interprofessional education experiences, and community engagement/service learning. There was a statistically significant association, $X^2(3) = 14.504$, p = .001, of program type and course delivery. An integrated multi-course delivery of older adult content was reported significantly more frequently in PTA programs (85.23%) than in PT programs (60.24%). PT programs (39.29%) reported significantly more the one course delivery format for older adult content delivery than was reported by PTA programs (14.61%).

Research Question 16

Are there differences in methods of content delivery regarding the older adult population based on accredited entry-level physical therapy program type in the United States? (Questionnaire Questions 1 & 7)

A chi-square test was performed with program type (PT and PTA) and content delivery responses related to older adult content. Content delivery options included lecture, laboratory/skills, case-based delivery, project-based delivery, online delivery partly, online delivery entirely, podcast and video delivery, outside organization with expertise provides delivery, community-based learning activities, interprofessional education experience/activity, intraprofessional education experience/activity lecture, laboratory/skills, case-based delivery, project-based delivery, online delivery partly, online delivery entirely, podcast and video delivery, outside organization with expertise provides delivery, community-based learning activities, interprofessional education experience/activity, and intraprofessional education experience/activity.

There was a statistically significant association, $X^2(10) = 92.448$, p = .031, of program type and content delivery. PTA programs (84.27%) include older adult content significantly more in laboratory/skills than PT programs (71.26%). Case-based delivery of older adult content was reported more in PT programs (86.90%) than in PTA programs (60.67%). PT programs (50%) included older adult content in more community-based learning activities than PTA programs (25.84%).

Research Question 17

Is there a difference in older adult content topics taught based on accredited entry-level physical therapy program type (PT and PTA programs) in the United States? (Questionnaire Questions 1 & 8)

A chi-square test was performed with program type (PT and PTA) and content topics responses related to older adult content. There were 27 content topic options offered ranging from medical conditions to economic issues related to older adults. There was not a statistically significant association, $X^2(26) = 152.650$, p = .129, of program type and content topics. PT and PTA programs include similar older adult content topics in their curriculums.

Research Question 18

Are there differences in learner engagement strategy methods of older adult content based on accredited entry-level physical therapy program type in the United States?

(Questionnaire Questions 1 & 9)

A chi-square test was performed with program type (PT and PTA) and engagement strategy responses related to older adult content. There were 18 engagement strategy options offered ranging from lecture format, problem/case-based format, discussion-based format, and psychomotor skills to older adult interaction with feedback. There was not a

statistically significant association, $X^2(17) = 154.184$, p = .091, of program type and engagement strategies. PT and PTA programs include similar learner engagement strategies for older adult content in their curriculums.

Research Question 19

Are there differences in learner assessment of older adult content based on accredited entry-level physical therapy program type in the United States? (Questionnaire Questions 1 & 10)

A chi-square test was performed with program type (PT and PTA) and learner assessment responses related to older adult content. Eleven learning assessment response options ranged from multiple choice testing, program/case-based assessments to projects. There was a statistically significant association, $X^2(10) = 105.530$, p = .048. of program type and learner assessments. PT programs (75%) reported utilizing group projects significantly more for learner assessments than PTA programs (50.56%).

Research Question 20

Are there differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type in the United States? (Questionnaire Questions 1 & 11)

A chi-square test was performed with program type (PT and PTA) and resources employed to teach older adult content. Resource response options included utilization of clinical specialist, Certified Exercise Expert for Aging Adults, contemporary continuing education in the care of older adults, contemporary continuing education in teaching older adults, contemporary clinical experiences in the care of older adults, and using the Academy of Geriatrics Physical Therapy's Essential Competencies. There was a statistically significant

association, $X^2(5) = 121.564$, p = .000, of program type and resources. PT programs utilized clinical specialists, Certified Exercise Expert for Aging Adults, and the Academy of Geriatric Physical Therapy's Essential Competencies significantly more than PTA programs.

Question 12 of the Questionnaire

Question 12 of the questionnaire was an open text box for comments and the responses were not analyzed. The instructions were as follows*: Please use this space to share any additional thoughts or comments about older adult curriculum and learning experiences in physical therapy education.*

The responses received are provided below and are directly taken from the questionnaire response data. No thematic analysis was performed on the open text responses.

> "In addition to the courses and integration of geriatrics throughout the curriculum, we offer a 2 credit geriatric elective taught by certified specialists in Geriatrics."
>
> "The faculty here have served on the APTA Geriatrics in many capacities and including being faculty for CEEAA so we believe we are ahead of most institutions."
>
> "Our geriatric content is spread over multiple courses, so it is hard for me to answer with absolute certainty about what my colleagues are doing. I collaborate in many of these courses since this is my area of expertise, but I am not always present and teaching the content. While I like the approach because 'geriatrics' is not captured in one course, the multi-system nature of caring

for older adults makes it hard to make sure all content (in multiple courses) is presented in a way that I (as a content expert) would prefer."

"We have a dedicated Geriatric PT course, but we also integrate older adult cases in many other courses (neuro, ortho, cardiopulmonary, complex patient, and more). I could only make one choice on that question...Q6."

"I'm very concerned about the content of geriatric physical therapy as programs push to finish in 2 to 2.5 years. Our program has a 4 credit geriatric course but I'm told many programs are now putting the Geri content in the systems classes and doing away with a dedicated class!"

"We also cover elder abuse, signs, symptoms, reporting"

"Medicare insurance is reviewed."

"Adjunct faculty teaching in this area are GCS"

"We also cover elder abuse, signs, symptoms, reporting"

"Such an important topic and is integrated throughout the curriculum. My estimate of total % is likely low but I considered only time identified only for this population.

"Simulation experiences were limited during the past year of COVID. Move to virtual and telehealth simulation experience. Answers include experiences over several years rather than just the past year"

"Thank you for conducting this research. I look forward to reading the results as I had been thinking about this topic a lot lately! "

"Thanks for the opportunity to share!"

"More geriatrics practice"

"We match curriculum to actual practice so have increased time spent on geriatrics"

"most classes incorporate information concerning older adults"

Summary of Results

The total number of completed questionnaires was 173, a 29.47% (173/587) response rate utilized in analysis. Table 9 provides a concise summary of the study's results based on the research questions, variables, and analysis.

Table 9

Summary Table of the Results

Research Questions and Variables	Analysis ($p < .05$)	Results
Research Questions: 2 and 11 **Who teaches content regarding the older adult population in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA)** **Instructor Type**	Frequency chi-square test for Significant Association $X^2(4) = 22.42$, $p = .02$ N = 173 (PT programs = 84 & PTA programs = 89)	N = 173 (PT programs = 84 & PTA programs = 89) **Full-Time Instructors: PTA > PT programs** PTA (92.13%) PT (72.62%) **Adjunct Instructors: PT > PTA programs** PTA (12.36%) PT (26.19%) **Instructor Type Not Used in PTA and PT programs:** Guest clinical lecturers 0%
Research Questions: 3 and 12 **How much estimated instructional time is dedicated to older adult content in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA)** **Estimated Percentage of Time**	Frequency Independent t-test for Difference $t(171) = 4.061$, $p = .00$ N = 171 (PT programs = 83 & PTA programs = 88)	N = 171 (PT programs = 83 & PTA programs = 88) **PTA mean time = 20.88**, SD = 12.92 (20.88%) **PT mean time = 14.00**, SD = 9.75 (14%) (0-100% of curriculum)
Research Questions: 4 and 13 **Which curricular areas are older adult content included in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA)** **Curricular Area**	Frequency chi-square test for Significant Association $X^2(8) = 119.45$, $p = .00$ N = 173 (PT programs = 84 & PTA programs = 89)	N = 173 (PT programs = 84 & PTA programs = 89) **Clinical Experience Opportunities: PT > PTA programs** PTA (24.72%) PT (97.11%) **Community Learning Experiences: PT > PTA programs** PTA (24.52%) PT (55.95%) **Least utilized: Intraprofessional education experiences** PTA (20.22%) PT (11.90%)
Research Questions: 5 and 14 **Which curricular instructional categories are used to teach**	Frequency	N = 173 (PT programs = 84 & PTA programs = 89) **Older adult content in the research category:**

older adult content in accredited entry-level physical therapy programs in the United States? **Program Type (PT and PTA) Instructional Categories**	chi-square test for Significant Association $X^2(3) = 18.142$, p = .03 N = 173 (PT programs = 84 & PTA programs = 89)	**PT > PTA programs** PTA (25.84%) PT (44.055) **Similar Use in PT and PTA programs** Didactic category 99.42% combined programs

Research Questions Variables	Analysis (p < .05)	Results
Research Questions: 6 and 15 **Which methods of course delivery of content regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA) Course Delivery**	Frequency chi-square test for Significant Association $X^2(3) = 14,504$, p = .001 N = 173 (PT programs = 84 & PTA programs = 89)	N = 173 (PT programs = 84 & PTA programs = 89) **Integrated multi-course delivery: PTA > PT programs** PTA (85.23%) PT (60.24%) **One course delivery: PT > PTA programs** PTA (14.61%) PT (39.29%)
Research Questions: 7 and 16 **Which methods of content delivery regarding the older adult population are used in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA) Content Delivery**	Frequency chi-square test for Significant Association $X^2(10) = 92.448$, p = .031 N = 171 (PT programs = 83 & PTA programs = 88)	N = 171 (PT programs = 83 & PTA programs = 88) **Laboratory delivery: PTA > PT programs** PTA (84.27%) PT (71.26%) **Case-based delivery: PT > PTA programs** PTA (60.67%) PT (86.90%) **Community-based activities: PT > PTA programs** PTA (25.84%) PT (50%) **Least Utilized (combined PT and PTA)** **Intraprofessional activities: .70%** **Interprofessional activities: 4.12%**
Research Questions: 9 and 19 **Which learner assessments of older adult knowledge and skills are used in accredited entry-level physical therapy programs in the United States?** **Program Type (PT and PTA) Learner Assessments**	Frequency chi-square test for Significant Association $X^2(10) = 105.530$, p = .048 N = 173 (PT programs = 84 & PTA programs = 89)	N = 173 (PT programs = 84 & PTA programs = 89) **Problem/Case-based assessments: PT > PTA** PTA programs (60.67 %) PT programs (78.57%) **Skills competencies and practical: PTA > PT** PTA programs (76.40 %) PT programs (65.17%) **Group projects: PT > PTA programs** PTA (50.56%) PT (75%) **Similar Use in PT and PTA Programs** Multiple choice testing PTA programs (93.26 %) PT programs (94.05%)

Research Questions: 10 and 20		
Which resources are employed to teach content regarding older adults in accredited entry-level physical therapy programs in the United States?	Frequency chi-square test for Significant Association $X^2(5) = 121.564$, $p = .000$ N = 173 (PT programs = 84 & PTA programs = 89)	N = 173 (PT programs = 84 & PTA programs = 89) **Clinical Specialist: PT > PTA programs** PTA (8.99%) PT (67.86%) **Certified Exercises of Expert of Aging Adults: PT > PTA programs** PTA (8.98%) PT (36.91%) **Academy of Geriatric Physical Therapy's Essential Competences PT > PTA programs** PTA (13.48%) PT (55.95%) **Similar Use in PT and PTA programs** Contemporary clinical experiences in the care of older adults: PTA programs 80.09% PT programs 83.33% Contemporary continuing education in the care of older adults: PTA programs 70.79% PT programs 70.24 % Contemporary continuing education in teaching older adults: PTA programs 46.07% PT programs 47.62%
Program Type (PT and PTA) Resources		

In summary, there was an association or difference between program type (PT or PTA) and the dependent variables of instructor type, time, curricular areas, curricular instructional categories, course delivery, content delivery methods, learner assessments, and resources utilized. The content topics taught and the engagement strategies utilized to teach older adult content were not statistically significantly different ($p > .05$) between program types (PT and PTA). PT and PTA programs teach similar older adult content topics, which include medical conditions, disease prevention and health promotion, mental health, and functional screenings. Learner engagement with lecture as the primary strategy was reported for PT and PTA programs. The least chosen learner engagement strategy for both program types was intraprofessional experiences and activities. The next chapter relates the study's purpose and findings to the current state of older adult curricula in entry-level physical therapy education in the United States.

Chapter Five

The purpose of this research study was to examine older adult content and instructional methods of accredited entry-level physical therapy programs (physical therapist and physical therapist assistant) in the United States. This information was used to analyze where and how older adult content is included in physical therapy curriculums and training. The survey highlighted the similarities and differences in older adult curricula and instructional methods based on program type (physical therapist or physical therapist assistant) and provided insights into the educational preparedness of physical therapy students for older adult clinical practice. Determining content and instructional areas of strength and areas of opportunity in physical therapy education programs may spearhead educational changes and positively impact future older adult care.

Discussion

The survey findings indicate there was an association or difference between program type (PT or PTA) and the dependent variables of instructor type, time spent, curricular areas, curricular instructional categories, course delivery, content delivery methods, learner assessments, and resources utilized. The content topics taught and the engagement strategies utilized to teach older adult content were not statistically significantly different between program types (PT and PTA).

Results and Educational Programs

To relate the study's results to physical therapy educational programs, a closer look at the program types follows. According to the CAPTE Aggregated Program Data for 2020-2021 (2021), physical therapy (DPT) educational programs on average have a planned class size of 46 students per cohort, and utilize a semester-based system with a total program mean length of 123.67 weeks with an average full-time core faculty of 10.8

and a ratio of core faculty to students of 1:12.2. For physical therapist assistant (PTA) programs, the average planned class size is 34 students per cohort with the semester-based system, the total mean length of 77 weeks with an average full time core faculty of 2.6 and a ratio of core faculty to students of 1:13.5. Currently, there are 36,799 PT students and 12,399 PTA students enrolled in entry-level programs in the United States (CAPTE, 2021).

The focus of physical therapy entry-level programs is to produce clinicians. The Doctor of Physical Therapy programs emphasize assessments and evaluation techniques in order to differentially diagnose, develop a physical therapy diagnosis, and create a plan of care to address a patient's impairments, goals, and discharge needs (APTA, 2021b). Physical therapist assistant programs emphasize treating impairments, patient education, and working under the supervision of a physical therapist's plan of care to maximize function and the independent of a patient, and assist with progressing towards goals and discharge (APTA, 2021b). The breadth and depth of assessments and interventions differ between degree and program type (PT and PTA). The expectation of program differences is based on the type of physical therapy education, associate degree versus clinical doctorate and the emphasis of education and training.

Older adult content topics and instructional learner engagement strategies were not statistically associated with a program type (PT or PTA). With the "select all that apply" response option, both program types chose similar topics and the most frequent choices were medical conditions, disease prevention and health promotion, mental health, and functional screening related to older adults. The range of 27 topic options allowed for a variety of responses and provided the opportunity to choose each choice. This study focused on the range of topics and did not include questions pertaining to the depth of knowledge related to the content topics.

Learner engagement strategies responses were offered as “select all that apply” options. There were 18 learner engagement strategies that included lecture, problem/case-based, discussion format, psychomotor skills and activities, modeling, older adult interactions, and video analysis, among others. Lecture, problem/case-based, and discussion strategies were the most frequently reported by both PT and PTA programs. With the “select all” option, each response may be chosen. The most common strategy practice utilized within a program was not assessed.

There were statistically significant differences between PT and PTA programs related to instructor type, percentage of dedicated time, course and content areas, delivery methods, learner assessment strategies, and resources utilized to teach older adult content in the curriculum. More full-time faculty/instructors were reported being utilized in PTA programs (92.13%) than in PT programs (72.62%) to teach older adult content. PT programs (26.19%) utilized adjunct instructors significantly more than PTA programs (12.36%) to teach older adult content even though PTA programs have significantly less full-time faculty and similar faculty to student ratios.

The percentage of time estimated for curricula related to older adult content compared to anticipated patient population for PT programs does not align to population projections. PT programs reported a mean of 14% of time dedicated in their curriculum to older adult content. The older adult population segment of the United States has been increasing with the projection that one in five (20%) individuals will be age 65 and older by 2030 (U.S. Census, 2019). With this higher concentration of potential older patient population, entry-level education and training of physical therapy professionals will need to consider incorporating additional older adult content in their curriculums. New as well as existing physical therapy education programs will need to align to current and projected

clinical training and practice needs. The PTA programs with a reported mean time estimated as 20.88% do align with the anticipated older adult patient population.

Older adult content delivery and learner assessment methods differed between PT and PTA programs. Overall, PT and PTA programs report integrating older adult content through multiple courses in the curriculum; however, PT programs relied significantly more on one course offering at 39.76% than reported by PTA programs at 14.77%. Older adult content was primarily reported as delivered by lecture format for PT and PTA programs combined at 97.11%. PT and PTA programs reported utilizing multiple choice testing as the primarily means of learner assessment of older adult content in their programs at > 93%. The provision of content primarily utilizing lecture delivery and multiple choice assessment of learning limit the opportunity to interact, integrate, and reinforce concepts and skills. Older adult content can be incorporated in a variety of courses including pharmacology, pathophysiology, neuromuscular and musculoskeletal classes, and laboratories. Active learning should be incorporated throughout the curriculum and assessment of older adult content should encompass a variety of instructional methods with an emphasis on interaction and feedback (McLeod, 2019).

Instructional strategies and content delivery may not be meeting the demands of active learning and current clinical practice. Physical therapists and physical therapist assistants work as a team to provide therapy care to patients. Intraprofessional practice is the cornerstone of patient care in the field of physical therapy. Intraprofessional experiences and activities for PT and PTA programs were reported as the least utilized curricular areas and instructional strategies for older adult content with PT programs at 11.90% and PTA programs at 20.22%. Intraprofessional education experience/activity was reported as the least utilized method of content delivery at .70% for combined PT and PTA

programs responses. Daily clinical practice includes intraprofessional and interprofessional interactions to coordinate and to provide care for older adults.

Physical therapy clinical practice encompasses a holistic approach with interprofessional communication and decision making (Flood et al, 2019). According to the survey responses, interprofessional experiences and activities were reported as minimally utilized learner engagement strategies with PT and PTA programs combined at 4.12%. The constructivism framework for professional clinical education emphasizes experiences and active learner engagement strategies to prepare learners for professional interactions and the critical problem-solving skill development needed for various clinical situations (Badyal & Singh, 2017; McLeod, 2019). Physical therapy education must consider increasing the inclusion of intraprofessional and interprofessional experiences and activities within their curriculums to reflect current and future clinical practice.

Results, Education, and Clinical Practice

The minimal use of interprofessional and intraprofessional content delivery and learner engagement strategies and opportunities does not reflect the clinical practice demands under the current team approach model with patient care (Flood et al., 2019). Active engagement with planned professional experiences in a variety of settings would enhance the educational process in preparation for clinical practice (Black & Sweet, 2017; Holmes et al., 2018). Experiential activities incorporated throughout the PT and PTA curriculums would facilitate professional communication and should include older adult interactions. The combined PT and PTA use of older adult clinical experience opportunities in the curriculum was 8.87%. During entry-level education, learning is contextual and builds upon experiences that influence future clinical practice (J. Stevens, 2018). Clinicians are expected to address the therapy care needs of older adults. Increasing the number of

interactions and opportunities to work with older adults is a critical need in physical therapy entry-level education.

Educational resources are utilized as available to promote learning and evidence-based clinical practice. This survey asked PT and PTA programs specifically about resource use related to clinical specialists, Certified Exercise Expert for Aging Adults (CEEAA) instructors, and instructors with contemporary continuing education and/or clinical experiences in the care of older adults, continuing education in teaching older adults, and the use of the Academy of Geriatric Physical Therapy's Essential Competencies. The most commonly reported resources for PT and PTA programs were the use of faculty and instructors with contemporary clinical experiences and continuing education in the care of older adults. Awareness and access to resources influence utilization. Having easily accessible educational tools and content would facilitate reliability of content being taught and encourage the use of the resources. Academic support by CAPTE and the APTA with free accessible content to assist with older adult curricular instruction and guidelines for specifics related to the care of older adults is needed.

Currently, there is limited older adult instructional content support unless a program faculty and clinicians have a paid membership in the APTA's Academy of Geriatric Physical Therapy and/or Academy of Education. CAPTE standards provide physical therapy educational guidance in the form of a general outline of content to include in the general physical therapy curriculum. A CAPTE guidance example is for programs to teach students to perform a general body systems review in patient care. The specifics related to the type of population are not delineated and are open to interpretation. To assist with creating care standardizations in physical therapy education, the accreditation agency,

CAPTE, should consider having specific content and outcome expectations for programs. This would promote consistency in curricula and clinical practice.

Recommendations and Future Research

This study focused on older adult content in physical therapy (PT and PTA) entry-level curriculums in the United States as of the fall of 2021. Future investigation into the depth of knowledge delivered as well as retained by students during their educational process would enhance our understanding of the training needs to develop clinicians. Educational clinical outcomes (clinical rotations and new graduate workplace performance) correlated with educational methods and resources would contribute to advancing and promoting programmatic growth and development as health needs and population changes occur. Faculty ratios studied along with national board exam passage and clinical practice outcomes may impact program staffing and content offerings. Perceptions of clinicians, faculty, and students of the barriers to older adult content in entry-level physical therapy education would provide insights into programmatic enhancement needs.

Conclusion

The survey findings highlight the need for physical therapy programs to scrutinize their curriculums in terms of the current and future education and training needs of physical therapists and physical therapist assistants for clinical practice. The United States' population is aging, and by 2030, 20% of individuals will be age 65 and older (U.S. Census, 2019). This study found disparities in time dedicated, delivery methods, instructional strategies, and resources in older adult content in entry-level physical therapy and physical therapist assistants' curricula in the United States. A key finding requiring immediate attention is that PT programs are lagging in response to the patient population trends as the time dedicated to older adult content is significantly below practice demands.

The study's findings underscore the need for physical therapy (PT and PTA) programs to expand instructional strategies related to older adult experiences, and intra and interprofessional interactions related to the care of older adults. By increasing the use of active learning activities inclusive of professional engagement and older adult interactions, students will develop the skills required for clinical practice. Entry-level physical therapy education programs must acknowledge and plan for the patient population's health care needs and update their curriculums continuously. Accreditation standards outlining specific older adult content and outcome expectations for physical therapy education programs are needed. Older adult educational standards would promote consistency in curricula and clinical practice. Findings from this study indicate areas of opportunity to enhance older adult curricula in entry-level physical therapy education to meet the demands of clinical practice.

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Appendix A

CAPTE Standards for PT Education Programs (11/2020)

Summary of Required Elements under Standard 7

7A The physical therapist professional curriculum includes content and learning experiences in the biological, physical, behavioral and movement sciences necessary for entry level practice. Topics covered include anatomy, physiology, genetics, exercise science, biomechanics, kinesiology, neuroscience, pathology, pharmacology, diagnostic imaging, histology, nutrition, and psychosocial aspects of health and disability

7B The physical therapist professional curriculum includes content and learning experiences in communication, ethics and values, management, finance, teaching and learning, law, clinical reasoning, evidenced-based practice and applied statistics.

7C The physical therapist professional curriculum includes content and learning experiences about the cardiovascular, endocrine and metabolic, gastrointestinal, genital and reproductive, hematologic, hepatic and biliary, immune, integumentary, lymphatic, musculoskeletal, nervous, respiratory, and renal and urologic systems; system interactions; differential diagnosis; and the medical and surgical conditions across the lifespan commonly seen in physical therapy practice.

7D The physical therapist professional curriculum includes content and learning experiences designed to prepare students to achieve educational outcomes required for initial practice of physical therapy. Courses within the curriculum include content designed to prepare program students to:

Professional Ethics, Values and Responsibilities

7D1 Adhere to legal practice standards, including all federal, state, and institutional regulations related to patient/client care and fiscal management.

7D2 Report to appropriate authorities suspected cases of abuse of vulnerable populations. 7D3 Report to appropriate authorities suspected cases of fraud and abuse related to the utilization of and payment for physical therapy and other health care services.

7D4 Practice in a manner consistent with the APTA Code of Ethics.

7D5 Practice in a manner consistent with the APTA Core Values.

7D6 Implement, in response to an ethical situation, a plan of action that demonstrates sound moral reasoning congruent with core professional ethics and values.

7D7 Communicate effectively with all stakeholders, including patients/clients, family members, caregivers, practitioners, interprofessional team members, consumers, payers, and policymakers.

7D8 Identify, respect, and act with consideration for patients'/clients' differences, values, preferences, and expressed needs in all professional activities.

7D9 Access and critically analyze scientific literature.

7D10 Apply current knowledge, theory, and professional judgment while considering the patient/client perspective, the environment, and available resources.

7D11 Identify, evaluate and integrate the best evidence for practice with clinical judgment and patient/client values, needs, and preferences to determine the best care for a patient/client.

7D12 Effectively educate others using teaching methods that are commensurate with the needs of the learner, including participation in the clinical education of students.

7D13 Participate in professional and community organizations that provide opportunities for volunteerism, advocacy and leadership.

7D14 Advocate for the profession and the healthcare needs of society through legislative and political processes.

7D15 Identify career development and lifelong learning opportunities, including the role of the physical therapist in the clinical education of physical therapist students.

Patient/Client Management Screening

7D16 Determine when patients/clients need further examination or consultation by a physical therapist or referral to another health care professional.

Examination, Evaluation and Diagnosis

7D17 Obtain a history and relevant information from the patient/client and from other sources as needed.

7D18 Perform systems review.

7D19 Select, and competently administer tests and measures appropriate to the patient's age, diagnosis and health status including, but not limited to, those that assess: a. Aerobic Capacity/Endurance b. Anthropometric Characteristics c. Assistive Technology d. Balance e. Circulation (Arterial, Venous, Lymphatic) f. Self-Care and Civic, Community, Domestic, Education, Social and Work Life g. Cranial and Peripheral Nerve Integrity h. Environmental Factors i. Gait j. Integumentary Integrity k. Joint Integrity and Mobility l. Mental Functions m. Mobility (including Locomotion) n. Motor Function o. Muscle Performance (including Strength, Power, Endurance, and Length) p. Neuromotor Development and Sensory Processing q. Pain r. Posture s. Range of Motion t. Reflex Integrity u. Sensory Integrity v. Skeletal Integrity w. Ventilation and Respiration or Gas Exchange 7D20 Evaluate data from the examination (history, health record, systems review, and tests and measures) to make clinical judgments.

7D21 Use the International Classification of Function (ICF) to describe a patient's/client's impairments, activity and participation limitations.

7D22 Determine a diagnosis that guides future patient/client management.

Systems Review: Including the cardiovascular/pulmonary system through the assessment of blood pressure, heart rate, respiration rate, and edema; the integumentary system through the gross assessment of skin color, turgor, integrity, and the presence of scar; the musculoskeletal system through the gross assessment of range of motion, strength, symmetry, height, and weight; the neuromuscular system through the general assessment of gross coordinated movement and motor function; and the gross assessment of communication ability, affect, cognition, language, and learning style, consciousness, orientation, and expected behavioral/emotional responses.

Prognosis and Plan of Care

7D23 Determine patient/client goals and expected outcomes within available resources (including applicable payment sources) and specify expected length of time to achieve the goals and outcomes.

7D24 Establish a safe and effective plan of care in collaboration with appropriate stakeholders, including patients/clients, family members, payers, other professionals and other appropriate individuals.

7D25 Determine those components of the plan of care that may, or may not, be directed to the physical therapist assistant (PTA) based on (a) the needs of the patient/client, (b) the role, education, and training of the PTA, (c) competence of the individual PTA, (d) jurisdictional law, (e) practice guidelines policies, and (f) facility policies.

7D26 Create a discontinuation of episode of care plan that optimizes success for the patient in moving along the continuum of care.

Intervention

7D27 Competently perform physical therapy interventions to achieve patient/client goals and outcomes. Interventions include: a. Airway Clearance Techniques b. Assistive Technology: Prescription, Application, and, as appropriate, Fabrication or Modification c. Biophysical Agents d. Functional Training in Self-Care and in Domestic, Education, Work, Community, Social, and Civic Life e. Integumentary Repair and Protection f. Manual Therapy Techniques (including mobilization/manipulation thrust and non-thrust techniques) g. Motor Function Training (balance, gait, etc.) h. Patient/Client education.

Therapeutic Exercise Management of Care Delivery

7D28 Manage the delivery of the plan of care that is consistent with professional obligations, interprofessional collaborations, and administrative policies and procedures of the practice environment.

7D29 Delineate, communicate and supervise those areas of the plan of care that will be directed to the PTA.

7D30 Monitor and adjust the plan of care in response to patient/client status.

7D31 Assess patient outcomes, including the use of appropriate standardized tests and measures that address impairments, functional status and participation.

7D32 Complete accurate documentation related to 7D15 - 7D30 that follows guidelines and specific documentation formats required by state practice acts, the practice setting, and other regulatory agencies. 53 Interventions: This list is adapted from the Guide to Physical Therapist Practice (2014

Respond effectively to patient/client and environmental emergencies in one’s practice setting.

7D34 Provide physical therapy services that address primary, secondary and tertiary prevention, health promotion, and wellness to individuals, groups, and communities.

7D35 Provide care through direct access.

7D36 Participate in the case management process. Participation in Health Care Environment

7D37 Assess and document safety risks of patients and the healthcare provider and design and implement strategies to improve safety in the healthcare setting as an individual and as a member of the interprofessional healthcare team

7D38 Participate in activities for ongoing assessment and improvement of quality services.

7D39 Participate in patient-centered interprofessional collaborative practice.

7D40 Use health informatics in the health care environment.

7D41 Assess health care policies and their potential impact on the healthcare environment and practice. Practice Management

7D42 Participate in the financial management of the practice setting, including accurate billing and payment for services rendered.

7D43 Participate in practice management, including marketing, public relations, regulatory and legal requirements, risk management, staffing and continuous quality improvement.

Commission on Accredited Physical Therapy Education. (2020a). *CAPTE standards for PT education programs: Summary of required elements under standard 7.* https://www.capteonline.org/globalassets/capte-docs/capte-pt-standards-required-elements.pdf

Appendix B

CAPTE Standards for PTA Education Programs (11/2020)

Summary of Required Elements under Standard 7

7A The physical therapist assistant program curriculum requires a complement of academic general education coursework appropriate to the degree offered that includes written communication and biological, physical, behavioral and social sciences which prepare students for coursework in the technical program sequence. General education courses are courses not designated as applied general education48 coursework by the institution or program.

7B The physical therapist assistant program curriculum includes content and learning experiences about the cardiovascular, endocrine and metabolic, gastrointestinal, genital and reproductive, hematologic, hepatic and biliary, immune, integumentary, lymphatic, musculoskeletal, nervous, respiratory, and renal and urologic systems; and the medical and surgical conditions across the lifespan commonly seen by physical therapist assistants.

7C The technical education component of the curriculum includes content and learning experiences that prepares the student to work as an entry-level physical therapist assistant under the supervision of a physical therapist who directs and supervises the physical therapist assistant in the provision of physical therapy.

7D Courses within the curriculum include content designed to prepare program students to: Ethics, Values and Responsibilities

7D1 Adhere to legal practice standards, including all federal, state, and institutional regulations related to patient/client care and fiscal management.

7D2 Report to appropriate authorities suspected cases of abuse of vulnerable populations.

7D3 Report to appropriate authorities suspected cases of fraud and abuse related to the utilization of and payment for physical therapy and other health care services.

7D4 Perform duties in a manner consistent with the Guide for Conduct of the Physical Therapist Assistant (APTA) and Standards of Ethical Conduct (APTA) to meet the expectations of patients, members of the physical therapy profession, and other providers as necessary.

7D5 Perform duties in a manner consistent with APTA's Values Based Behaviors for the Physical Therapist Assistant.

7D6 Implement, in response to an ethical situation, a plan of action that demonstrates sound moral reasoning congruent with core professional ethics and values.

7D7 Communicate effectively with all stakeholders, including patients/clients, family members, caregivers, practitioners, interprofessional team members, consumers, payers, and policymakers.

7D8 Identify, respect, and act with consideration for patients'/clients' differences, values, preferences, and expressed needs in all work-related activities.

7D9 Apply current knowledge, theory, and clinical judgment while considering the patient/client perspective and the environment, based on the plan of care established by the physical therapist.

7D10 Identify basic concepts in professional literature including, but not limited to, validity, reliability and level of statistical significance.

7D11 Identify and integrate appropriate evidence based resources to support clinical decision making for progression of the patient within the plan of care established by the physical therapist.

7D12 Effectively educate others using teaching methods that are commensurate with the needs of the patient, caregiver or healthcare personnel.

7D13 Participate in professional and community organizations that provide opportunities for volunteerism, advocacy and leadership.

7D14 Identify career development and lifelong learning opportunities, including the role of the physical therapist assistant in the clinical education of physical therapist assistant students.

Patient/Client Management
7D15 Interview patients/clients, caregivers, and family to obtain current information related to prior and current level of function and general health status (e.g., fatigue, fever, malaise, unexplained weight change).

7D16 Use the International Classification of Functioning, Disability and Health (ICF) to describe a patient's/client's impairments, activity and participation limitations.

Plan of Care
7D17 Communicate an understanding of the plan of care developed by the physical therapist to achieve short and long term goals and intended outcomes.

7D18 Review health records (e.g., lab values, diagnostic tests, specialty reports, narrative, consults, and physical therapy documentation) prior to carrying out the PT plan of care.

7D19 Monitor and adjust interventions in the plan of care in response to patient/client status and clinical indications.

7D20 Report any changes in patient/client status or progress to the supervising physical therapist.

7D21 Determine when an intervention should not be performed due to clinical indications or when the direction to perform the intervention is beyond that which is appropriate for the physical therapist assistant.

7D22 Contribute to the discontinuation of episode of care planning and follow-up processes as directed by the supervising physical therapist.

Intervention
7D23 Demonstrate competence in implementing selected components of interventions identified

in the plan of care established by the physical therapist. Interventions include:
a. Airway Clearance Techniques: breathing exercises, coughing techniques and secretion mobilization
b. Application of Devices and Equipment: assistive / adaptive devices and prosthetic and orthotic devices
c. Biophysical Agents: biofeedback, electrotherapeutic agents, compression therapies, cryotherapy, hydrotherapy, superficial and deep thermal agents, traction and light therapies
d. Functional Training in Self-Care and in Domestic, Education, Work, Community, Social, and Civic Life
e. Manual Therapy Techniques: passive range of motion and therapeutic massage
f. Motor Function Training (balance, gait, etc.)
g. Patient/Client Education
h. Therapeutic Exercise
i. Wound Management: isolation techniques, sterile technique, application and removal of dressing or agents, and identification of precautions for dressing removal

Test and Measures
7D24 Demonstrate competence in performing components of data collection skills essential for carrying out the plan of care by administering appropriate tests and measures (before, during and after interventions) for the following areas:
a. Aerobic Capacity and Endurance: measurement of standard vital signs; recognize and monitor responses to positional changes and activities (e.g., orthostatic hypotension, response to exercise)
b. Anthropometrical Characteristics: measurements of height, weight, length and girth
c. Mental Functions: detect changes in a patient's state of arousal, mentation and cognition)
d. Assistive Technology: identify the individual's and caregiver's ability to care for the device; recognize changes in skin condition and safety factors while using devices and equipment

Interventions
e. Gait, Locomotion, and Balance: determine the safety, status, and progression of patients while engaged in gait, locomotion, balance, wheelchair management and mobility
f. Integumentary Integrity: detect absent or altered sensation; normal and abnormal integumentary changes; activities, positioning, and postures that aggravate or relieve pain or altered sensations, or that can produce associated skin trauma; and recognize viable versus nonviable tissue
g. Joint Integrity and Mobility: detect normal and abnormal joint movement
h. Muscle Performance: measure muscle strength by manual muscle testing; observe the presence or absence of muscle mass; recognize normal and abnormal muscle length, and changes in muscle tone
i. Neuromotor Development: detect gross motor milestones, fine motor milestones, and righting and equilibrium reactions
j. Pain: administer standardized questionnaires, graphs, behavioral scales, or visual analog scales for pain; recognize activities, positioning, and postures that aggravate or relieve pain or altered sensations
k. Posture: determine normal and abnormal alignment of trunk and extremities at rest and during activities
l. Range of Motion: measure functional range of motion and measure range of motion

using an appropriate measurement device
m. Self-Care and Civic, Community, Domestic, Education, Social and Work Life: inspect the physical environment and measure physical spaces; recognize safety and barriers in the home, community and work environments; recognize level of functional status; administer standardized questionnaires to patients and others
n. Ventilation, Respiration and Circulation: detect signs and symptoms of respiratory distress, and activities that aggravate or relieve edema, pain, dyspnea, or other symptoms; describe thoracoabdominal movements and breathing patterns with activity, and cough and sputum characteristics

7D25 Complete accurate documentation that follows guidelines and specific documentation formats required by state practice acts, the practice setting, and other regulatory agencies.

7D26 Respond effectively to patient/client and environmental emergencies that commonly occur in the clinical setting.

Participation in Health Care Environment
7D27 Contribute to efforts to increase patient and healthcare provider safety.

7D28 Participate in the provision of patient-centered interprofessional collaborative care.

7D29 Participate in performance improvement activities (quality assurance).

Practice Management
7D30 Describe aspects of organizational planning and operation of the physical therapy service.

7D31 Describe accurate and timely information for billing and payment purposes

Commission on Accredited Physical Therapy Education. (2020b). *CAPTE standards for PTA education programs: Summary of required elements under standard 7.* https://www.capteonline.org/globalassets/capte-docs/capte-pta-standards-required-elements.pdf

Appendix C

Older Adult Curriculum in Physical Therapy Education Questionnaire

Question 1: Program Type: Select one response

- Physical Therapy (DPT) Program
- Physical Therapist Assistant (PTA) Program

For the following questions, an older adult is defined as ≥ 65 years old (Centers for Disease Control and Prevention, 2015).

Question 2: Who teaches content regarding the older adult population in your curriculum?

Instructor Type: Select all that apply.

- A full-time faculty member
- A part-time faculty member
- An adjunct instructor
- A guest clinical lecturer
- A contracted content expert

Question 3: Estimate how much instructional time is dedicated to older adult content in your curriculum: ____ percent (out of 100 percent of the entire curriculum).
Instructional time includes course work, laboratory sessions, simulation activities, and any older adult content teaching and learning experiences that students are required to attend.

Question 4: Where is content regarding the older adult population included in your physical therapy curriculum?

Curriculum areas: Select all that apply.

- Basic Sciences
- Behavioral-social sciences
- Clinical sciences
- Professional physical therapy practice
- Clinical experience requirement
- Clinical experience opportunity (Pro Bono clinic, observations, and extra clinical hours)
- Interprofessional education experience (two or more disciplines)
- Intraprofessional education experience (PT and PTA activity)
- Community learning education experience

Question 5: Which of the following curricular instructional categories are used to teach older adult content?

Curriculum instructional categories: Select all that apply.

- Didactic
- Laboratory
- Clinical
- Research

Question 6: Which course delivery method is most commonly used for content regarding the older adult population?

Course Delivery: **Select One Response** that is the most utilized.

- One course offering in the curriculum
- Integrated in multiple course offerings in the curriculum
- Interprofessional education experiences in the curriculum
- Community engagement/service learning experience in the curriculum

Question 7: Content regarding the older adult population is delivered using

Content Delivery Method: Select all that apply

- lecture.
- laboratory/skills.
- case-based delivery.
- project-based delivery.
- online delivery for part of the delivery.
- online deliver entirely.
- podcast and video recording delivery method.
- an outside organization with expertise provides instruction and materials (International Clinical Educators (ICE) Learning Center, MedBridge, American Physical Therapy Association Learning Center module, etc.).
- community-based learning activities.
- interprofessional education experience/activity.
- intraprofessional education experience/activity

Question 8: Which of the following topics relating to the older adult population are taught in your program's curriculum?

Content Topics: Select all that apply.

- Theories of aging
- Strategies for teaching older adults
- Medical conditions associated with older adults
- Mental health screening, assessments, and interventions
- Disease prevention and health promotion
- Psychosocial factors of care
- Pharmacology considerations in the older adult care
- Imaging
- Nutrition
- Communication
- Cognitive screening, assessments, and interventions
- Functional screening, assessments, and interventions
- Frailty screening, assessments, and interventions
- Fall risk screening, assessments, and prevention interventions
- Treatment modalities
- Environmental screening, assessments, and modifications
- Care planning and coordination across the care spectrum
- Discharge planning based on various settings
- Community resources available to assist older adults
- Caregiver support
- Interdisciplinary and team care
- Legislation
- Economic issues
- Healthcare systems and benefits
- Third-party reimbursement
- Advocacy for older adults
- Diversity in the aging population

Question 9: Which of the following learner engagement strategies(s) is used to teach content regarding older adults?

Engagement strategies: Select all that apply.

- Lecture format (in-person & virtually)
- Problem or Case-based format
- Discussion- based format (in class or virtual, discussion boards)
- Psychomotor skills activities and experiences
- Instructor modeling clinical skills and performance in an older adult session
- Instructor directed feedback on clinical skills and performance (written, oral, virtually)
- Older adult interaction with older adult providing feedback on skills and performance
- Real-time learner performance assessment and feedback
- Student-led activities (presentations and summary reports)
- Interprofessional activity
- Intraprofessional activity
- Video analysis
- Role playing
- Simulated patient experiences
- Older adult contact experiences
- Community-based project or activity
- Interactive electronic tools (games such as Yahoots, Gimkit, collaborative Google Document and online white board/mapping, and platform chat features in Google, Zoom, and others)
- Videos (YouTube, TED Talks, Educational Instruction)

Question 10: Which of the following learner assessments of knowledge and skills of older adult content is used in your program?

Learner Assessment: Select all that apply.

- Multiple choice testing (quiz and/or exam in select response format)
- Problem/Case-based assessments (written, video, virtual)
- Skill competencies and practicals (performance-based)
- Individual project(s)
- Group project(s)
- Portfolio or e-Portfolio
- Research or literature review paper
- Presentation by student(s)
- Poster presentation
- Interprofessional collaborative activity (peer and/or instructor assessment)
- Intraprofessional collaborative activity (peer and/or instructor assessment)

Question 11: Which of the following resources are currently employed in your program to teach content regarding older adults? The term, contemporary, indicates within the last three years.

Resources Employed: Select all that apply.

- Faculty and instructors with Clinical Specialist Certification in Geriatrics from the American Board of Physical Therapy Specialists
- Faculty and instructors with Certified Exercises Expert of Aging Adults (CEAA) credentials
- Faculty and instructors with contemporary continuing education in older adults
- Faculty and instructor with contemporary continuing education in teaching older adult topics
- Faculty and instructors with contemporary older adult clinical experiences
- Use of the APTA's Academy of Geriatric Physical Therapy's Essential Competencies in the Care of Older Adults in Entry-Level Physical Therapy Programs in your curriculum

Question 12: Please use this space to share any additional thoughts or comments about older adult curriculum and learning experiences in physical therapy education.

Appendix D

Table of Data Codes for Analysis of Variables and Linkage to the Research and Questionnaire Questions

Research Question (RQ) 1 Which older adult topics are taught in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ8 Content topics	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Older Adult Content Topics (CONTOPIC)	0= no selection 1= Theories of aging 2=Strategies for teaching 3=Medical conditions 4=Mental health screening, assessments, and interventions 5=Disease prevention and health promotion 6=Psychosocial factors of care 7=Pharmacology considerations 8=Imaging 9=Nutrition 10=Communication 11=Cognitive screening, assessments, and interventions 12=Functional screening, assessments, and interventions 13=Frailty screening, assessments, and interventions 14=Fall risk screening, assessments, and prevention interventions 15=Treatment modalities 16=Environmental screening, assessments, and modifications 17=Care planning and coordination across the care spectrum 18=Discharge planning based on various settings 19=Community resources available to assist older adults 20=Caregiver support	Categorical/ nominal	Frequency Distribution

			21=Interdisciplinary and team care 22=Legislation 23=Economic issues 24=Healthcare systems and benefits 25=Third-party reimbursement 26=Advocacy for older adults 27=Diversity in the aging population		
Research Question 2 Who teaches content regarding the older adult population in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ2 Instructor type	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Instructor Type (INSTRTYP)	0= no selection 1= full-time faculty member 2= part-time faculty member 3= adjunct instructor 4= guest clinical lecturer 5= contracted content expert	Categorical/ nominal	Frequency Distribution
Research Question 3 How much estimated instructional time is dedicated to older adult content in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ3 Estimated instructional time based on 100 percent of curriculum	Estimate of Time (ESTTIME)	N/A	Fill in the blank with percent value. Numeric response 0-100 or blank if no selection. Blank or code 999 for no response	Interval/ Numerical continuous value	Descriptive /Histogram
Research Question 4 Which curricular areas are older adult content included in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 4 Curriculum area location of content	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Curriculum Area (CURRAREA)	0= no selection 1=Basic Sciences 2=Behavioral-social sciences 3=Clinical sciences 4=Professional physical therapy practice 5=Clinical experience requirement 6=Clinical experience opportunity (Pro Bono clinic, observations, and extra clinical hours)	Categorical/ nominal	Frequency Distribution

			7=Interprofessional education experience (two or more disciplines) 8=Intraprofessional education experience (PT and PTA activity) 9=Community learning education experience		
Research Question 5 Which curricular instructional categories are used to teach older adult content in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 5 Curriculum instructional categories	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Curriculum Instructional Category (CURRCAT)	0= no selection 1=Didactic 2=Laboratory 3=Clinical 4=Research	Categorical/ nominal	Frequency Distribution
Research Question 6 Which methods of course delivery of content regarding older adult population are used in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 6 Course delivery method most used	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Course Delivery Method (COURSDEL)	0= no selection 1=One course offering in the curriculum 2=Integrated in multiple course offerings in the curriculum 3=Interprofessional education experiences in the curriculum 4=Community engagement/service-learning experience in the curriculum	Categorical/ nominal	Frequency Distribution
Research Question 7 Which methods of content delivery regarding older adult population are used in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 7 Content delivery methods	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Content Delivery Method (CONTDEL)	0=no selection 1=lecture 2=laboratory/skills 3=case-based delivery 4=project-based delivery 5=online delivery for part of the delivery 6=online deliver entirely	Categorical/ nominal	Frequency Distribution

			7=podcast and video recording delivery method 8=an outside organization with expertise provides instruction and materials (International Clinical Educators (ICE) Learning Center, MedBridge, American Physical Therapy Association Learning Center module, etc.). 9=community-based learning activities 10=interprofessional education experience/activity 11=intraprofessional education experience/activity		
Research Question 8 Which instructional strategies are employed to engage learners in older adult content in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 9 Engagement Strategies	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Engagement Strategies (ENGAGEST)	0= no selection 1=Lecture format (in-person & virtually) 2=Problem or Case-based format 3=Discussion- based format (in class or virtual, discussion boards) 4=Psychomotor skills activities and experiences 5=Instructor modeling clinical skills and performance in an older adult session 6=Instructor directed feedback on clinical skills and performance (written, oral, virtually) 7=Older adult interaction with older adult providing feedback on skills and performance 8=Real-time learner performance assessment and feedback 9=Student-led activities (presentations and summary reports) 10=Interprofessional activity 11=Intraprofessional activity	Categorical/ nominal	Frequency Distribution

			12=Video analysis 13=Role playing 14=Simulated patient experiences 15=Older adult contact experiences 16=Community-based project or activity 17=Interactive electronic tools (games such as Yahoots, Gimkit, collaborative Google Document and online white board/mapping, and platform chat features in Google, Zoom, and others) 18=Videos (YouTube, TED Talks, Educational Instruction)		
Research Question 9 Which learner assessments of older adult knowledge and skills are used in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 10 Types of learner assessment	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Types of learner engagement assessment (LRNASSMT)	0= no selection 1=Multiple choice testing (quiz and/or exam in select response format) 2=Problem/Case-based assessments (written, video, virtual) 3=Skill competencies and practicals (performance-based) 4=Individual project(s) 5=Group project(s) 6=Portfolio or e-Portfolio 7=Research or literature review paper 8=Presentation by student(s) 9=Poster presentation 10=Interprofessional collaborative activity (peer and/or instructor assessment) 11=Intraprofessional collaborative activity (peer and/or instructor assessment)	Categorical/ nominal	Frequency Distribution
Research Question 10 Which resources are employed to teach content regarding older adults in accredited entry-level physical therapy programs in the United States?					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 11	Physical Therapy Program Type (PROGTYPE) Physical Therapist (PT)	Types of Resources (RESOURCE)	0= no selection 1=Faculty and instructors with Clinical Specialist Certification in	Categorical/ nominal	Frequency Distribution

Resources employed in program	Physical Therapist Assistant (PTA) 1=PT 2=PTA		Geriatrics from the American Board of Physical Therapy Specialists 2=Faculty and instructors with Certified Exercises Expert of Aging Adults (CEAA) credentials 3=Faculty and instructors with contemporary continuing education in older adults 4=Faculty and instructor with contemporary continuing education in teaching older adult topics 5=Contemporary older adult clinical experiences of faculty and instructors 6=Use of the APTA's Academy of Geriatric Physical Therapy's Essential Competencies in the Care of Older Adults in Entry-Level Physical Therapy Programs in your curriculum		
Research Question 11 Are there differences in older adult content instructor type based on accredited entry-level physical therapy program type in the United States?					
RQ 11 Hypothesis: There are significant differences in older adult content instructor type based on accredited entry-level physical therapy program type in the United States. RQ **11** Null Hypothesis: There are no significant differences in older adult content instructor type based on accredited entry-level physical therapy program type in the United States.					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 1 & 2	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Instructor Type (INSTRTYP) 0= no selection 1= full-time faculty member 2= part-time faculty member 3= adjunct instructor 4= guest clinical lecturer 5= contracted content expert	Use of each response code described with numeric coding indicated	Categorical/ nominal	Chi-square Test
Research Question 12 Are there differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy type in the United States?					

RQ 12 Hypothesis: There are significant differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy program type in the United States.

RQ 12 Null Hypothesis: There are no significant differences in instructional time percentage dedicated to older adult content based on accredited entry-level physical therapy program type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 3	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Estimate of Time (ESTTIME)	Numeric percentage out of potential 100 percent	interval continuous variable	Student's t-test

Research Question 13

Are there differences in curriculum areas where content regarding older adult population is included based on accredited entry-level physical therapy program type in the United States?

RQ 13 Hypothesis: There are significant differences in curriculum areas where older adult content is taught based on accredited entry-level physical therapy program type in the United States.

RQ 13 Null Hypothesis: There are no significant differences in curriculum areas where older adult content is taught based on accredited entry-level physical therapy program type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 4	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Curriculum Area (CURRAREA) 1=Basic Sciences 2=Behavioral-social sciences 3=Clinical sciences 4=Professional physical therapy practice 5=Clinical experience requirement 6=Clinical experience opportunity (Pro Bono clinic, observations, and extra clinical hours) 7=Interprofessional education experience (two or more disciplines) 8=Intraprofessional education experience (PT and PTA activity) 9=Community learning education experience	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

Research Question 14

Are there differences in curriculum instructional categories of older adult content based on accredited entry-level physical therapy program type in the United States?

RQ 14 Hypothesis: There are significant differences in curriculum instructional categories of older adult content based on accredited entry-level physical therapy program type in the United States.

RQ 14 Null Hypothesis: There are no significant differences in curriculum instructional categories of older adult content based on accredited entry-level physical therapy program type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 5	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Curriculum Instructional Category (CURRCAT) 1=Didactic 2=Laboratory 3=Clinical 4=Research	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

Research Question 15

Are there differences in course delivery of older adult content based on accredited entry-level physical therapy program type in the United States?

RQ 15 Hypothesis: There are significant differences in course delivery of older adult content based on accredited entry-level physical therapy program type in the United States.

RQ 15 Null Hypothesis: There are no significant differences in course delivery of older adult content based on accredited entry-level physical therapy type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 6	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Course Delivery Method (COURSDEL) 1=One course offering in the curriculum 2=Integrated in multiple course offerings in the curriculum 3=Interprofessional education experiences in the curriculum 4=Community engagement/service -learning experience in the curriculum	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

Research Question 16

Are there differences in methods of content delivery regarding older adult population based on accredited entry-level physical therapy program type in the United States?

RQ 16 Hypothesis: There are significant differences in methods of content delivery of older adult content based on accredited entry-level physical therapy program type in the United States.

RQ 16 Null Hypothesis: There are no significant differences in content delivery of older adult content based on accredited entry-level physical therapy type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 7	Program Type (PROGTYPE)	Content Delivery	Use of each response code described with the	Categorical/ nominal	Chi-square Test

	Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Method (CONTDEL) 1=lecture 2=laboratory/skills 3=case-based delivery 4=project-based delivery 5=online delivery for part of the delivery 6=online deliver entirely 7=podcast and video recording delivery method 8=an outside organization with expertise provides instruction and materials (International Clinical Educators (ICE) Learning Center, MedBridge, American Physical Therapy Association Learning Center module, etc.). 9=community-based learning activities 10=interprofessional education experience/activity 11=intraprofessional education experience/activity	numeric coding indicated		
Research Question 17 Is there a difference in older adult content topics taught based on accredited entry-level physical therapy program type (PT and PTA programs) in the United States?					
RQ 17 Hypothesis: There are significant differences in older adult topics taught based on accredited entry-level physical therapy program type in the United States. RQ 17 Null Hypothesis: There are no significant differences in older adult topics taught in entry-level physical therapy programs (PT and PTA programs).					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 1 & 8	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Older Adult Content Topics (CONTOPIC) 1= Theories of aging 2=Strategies for teaching 3=Medical conditions 4=Mental health screening, assessments, and interventions	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

		5=Disease prevention and health promotion 6=Psychosocial factors of care 7=Pharmacology considerations 8=Imaging 9=Nutrition 10=Communication 11=Cognitive screening, assessments, and interventions 12=Functional screening, assessments, and interventions 13=Frailty screening, assessments, and interventions 14=Fall risk screening, assessments, and prevention interventions 15=Treatment modalities 16=Environmental screening, assessments, and modifications 17=Care planning and coordination across the care spectrum 18=Discharge planning based on various settings 19=Community resources available to assist older adults 20=Caregiver support 21=Interdisciplinary and team care 22=Legislation 23=Economic issues 24=Healthcare systems and benefits 25=Third-party reimbursement 26=Advocacy for older adults 27=Diversity in the aging population			

Research Question 18

Are there differences in learner engagement strategy methods of older adult content based on accredited entry-level physical therapy program type in the United States?

RQ18 Hypothesis: There are significant differences in learner engagement methods of older adult content based on accredited entry-level physical therapy program type in the United States.

RQ 18 Null Hypothesis: There are no significant differences in learner engagement methods of older adult content based on accredited entry-level physical therapy program type in the United States.

Associated Questionnaire Question (QQ)	Independent Variables (Code)	Dependent Variables (Code)	Response Code	Variable Type	Analysis
QQ 1 & 9	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Engagement Strategies (ENGAGEST) 1=Lecture format (in-person & virtually) 2=Problem or Case-based format 3=Discussion-based format (in class or virtual, discussion boards) 4=Psychomotor skills activities and experiences 5=Instructor modeling clinical skills and performance in an older adult session 6=Instructor directed feedback on clinical skills and performance (written, oral, virtually) 7=Older adult interaction with older adult providing feedback on skills and performance 8=Real-time learner performance assessment and feedback 9=Student-led activities (presentations and summary reports) 10=Interprofessional activity 11=Intraprofessional activity 12=Video analysis 13=Role playing 14=Simulated patient experiences 15=Older adult contact experiences 16=Community-based project or activity 17=Interactive electronic tools (games such as Yahoots, Gimkit, collaborative Google Document and online white board/mapping, and platform chat features in Google, Zoom, and others)	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

		18=Videos (YouTube, TED Talks, Educational Instruction)			
Research Question 19 Are there differences in learner assessment of older adult content based on accredited entry-level physical therapy program type in the United States?					
RQ 19 Hypothesis: There are significant differences in learner assessment of older adult content based on accredited entry-level physical therapy program type in the United States. RQ 19 Null Hypothesis: There are no significant differences in learner assessment of older adult content based on accredited entry-level physical therapy program type in the United States.					
Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 1 & 10	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Types of learner engagement assessment (LRNASSMT) 1=Multiple choice testing (quiz and/or exam in select response format) 2=Problem/Case-based assessments (written, video, virtual) 3=Skill competencies and practicals (performance-based) 4=Individual project(s) 5=Group project(s) 6=Portfolio or e-Portfolio 7=Research or literature review paper 8=Presentation by student(s) 9=Poster presentation 10=Interprofessional collaborative activity (peer and/or instructor assessment) 11=Intraprofessional collaborative activity (peer and/or instructor assessment)	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test
Research Question 20 Are there differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type in the United States?					
RQ 20 Hypothesis: There are significant differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type in the United States. RQ 20 Null Hypothesis: There are no significant differences in resources employed to teach older adult content based on accredited entry-level physical therapy program type in the United States.					

Associated Questionnaire Question (QQ)	**Independent Variables (Code)**	**Dependent Variables (Code)**	**Response Code**	**Variable Type**	**Analysis**
QQ 1 & 11	Program Type (PROGTYPE) Physical Therapist (PT) Physical Therapist Assistant (PTA) 1=PT 2=PTA	Types of Resources (RESOURCE) 1=Faculty and instructors with Clinical Specialist Certification in Geriatrics from the American Board of Physical Therapy Specialists 2=Faculty and instructors with Certified Exercises Expert of Aging Adults (CEAA) credentials 3=Faculty and instructors with contemporary continuing education in older adults 4=Faculty and instructor with contemporary continuing education in teaching older adult topics 5=Contemporary older adult clinical experiences of faculty and instructors 6=Use of the APTA's Academy of Geriatric Physical Therapy's Essential Competencies in the Care of Older Adults in Entry-Level Physical Therapy Programs in your curriculum	Use of each response code described with the numeric coding indicated	Categorical/ nominal	Chi-square Test

Appendix E

Radford University's Institutional Review Board Study Approval Letter

RADFORD UNIVERSITY

Research Compliance Office

Institutional Animal Care and Use Committee / Institutional Review Board

08/25/2021

TO: F. Jeannine Everhart

RE: Exempt Determination
STUDY TITLE: A Survey of Older Adult Curricular Content and Instructional Methods Used in Accredited Entry-Level Physical Therapy Educational Programs in the United States
IRB REFERENCE #: 2021-245
SUBMISSION TYPE: IRB Initial Submission
ACTION: Determination of Exempt IRB Review
DECISION DATE: 08/25/2021

The above-referenced study has been determined by Radford University's Institutional Review Board (IRB) to be exempt from review. A copy of your IRB protocol is available for your records in IRBManager under your dashboard of active protocols.

Your study has been determined to be exempt under Exempt Category 2: Educational tests, surveys, interviews, or observation of public behavior. Detailed explanations of the exempt review categories are available on the Research Compliance Office webpage.

You are approved for the enrollment or review of: 632 participants.

Note: The number approved is the number of study participants is defined as the number who enroll in the project and NOT the number of subjects with usable data for analysis. If this should change, you must submit an amendment to increase subject numbers.

Should you need to make changes in your protocol, you must submit a request for amendment for review to determine if the application still remains in an Exempt review category before implementing the changes. Amendments must be submitted via the IRBManager system. Please contact our office for assistance, if needed.

As the principal investigator for this project, you are ultimately responsible for ensuring that your study is conducted in an ethical manner. You are also responsible for filing all reports related to this project.

If you have any questions, please contact the Research Compliance Office at 540.831.5290 or irb-iacuc@radford.edu. Please include your study title and reference number in all correspondence with this office.

Good luck with this project!

Anna Marie Lee

Radford University Institutional Review Board (IRB)
Research Compliance Office
540.831.5290
irb-iacuc@radford.edu
https://www.radford.edu/content/research-compliance/home.html

Radford University IRB
Approval Date: 08/25/2021

Appendix F

Informed Consent as First Page of Survey

Qualtrics Format

Informed Consent to Participate in the Study

You are invited to participate in a research survey, entitled “A Survey of Older Adult Curricular Content and Instructional Methods Used in Accredited Entry-Level Physical Therapy Educational Programs in the United States.”

The study is being conducted by: Dr. J. Everhart, Program Director, and Julia Castleberry, a graduate student in the Doctor of Health Science program of Radford University- Carilion in Roanoke, Virginia.
Contact information is Dr. J. Everhart, Ph.D., MPH, MBA, CHES®
Program Director, DHSc and MS in Health Sciences Department of Public Health and Healthcare Leadership
Radford University Carilion 101 Elm Str. SE RUC Room 904 Roanoke, VA 24013
Office: 540.985.4046, Department: 540.985.9946
Email: jeverhart1@radford.edu

Purpose: The purpose of this study is to examine older adult content and instructional methods in accredited entry-level Physical Therapist (PT) and Physical Therapist Assistant (PTA) education programs, in the United States. Your participation in the survey will contribute to a better understanding of topics related to older adults and instructional strategies used to teach students in your program.

We estimate that it will take about 7 to 10 minutes of your time to complete the questionnaire. You are free to contact the investigator at the above address and phone number to discuss the survey.

Risks: This study has no more risks than you may find in daily life with the use of the Internet. The research team will work to protect your data to the extent permitted by technology. It is possible, although unlikely, that an unauthorized individual could gain access to your responses because you are responding online. Email addresses will be kept during the data collection phase for tracking purposes only. The survey tool, Qualtrics collects internet addresses as means to track and send reminders. Response data is aggregated and reported as a summary of findings. We will store all electronic data and response reports on a password-protected, encrypted computer and password-protected servers of the survey tool, Qualtrics. A limited number of research team members will have access to the data during data collection. Identifying information will be stripped from the final dataset.

Your participation in this survey is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time without

penalty. If you wish to withdraw from the study or have any questions, contact the investigator listed above. If you choose not to participate or decide to withdraw, your program will have no impact.

If you have any questions or wish to update your email address, please call Dr. J. Everhart at 540.985.4046 or send an email to jeverhart1@radford.edu. You may also request a hard copy of the survey from the contact information above. This study was approved by the Radford University Committee for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Ben Caldwell, Institutional Official and Dean of the College of Graduate Studies and Research, bcaldwell13@radford.edu, 1.540.831.5724.

We are providing a one-hundred-dollar donation to the Arthritis Foundation (qualified 501(c) (3) EIN 58-1341679 organization) if a 60 percent response rate is achieved.

Please continue to the survey questions by clicking the NEXT Arrow button at the bottom of the page.
If the survey does not appear, click on this link **Survey of Older Adult Curriculum in Entry-Level Physical Therapy Education**
Or copy and paste the link below
https://ehc.qualtrics.com/jfe/form/SV_0PoWoCftjBTFsEu

Thank you,
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