# COMPLIANCE AND BARRIES TO TREATMENT ADHERENCE AMONG GERIATRICS PATIENTS RECEIVING PHYSIOTHERAPY IN UNIVERSITY OF BENIN TEACHING HOSPITAL.

**BY**

**NNAMENE RUTH EBERECHUKWU**

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# CERTIFICATION

This dissertation is by Eberechukwu Ruth Nnamene is accepted in its present form as satisfying the dissertation requirements of the degree of Bachelor of Physiotherapy of the school of Basic Medical Sciences of the University of Benin.

**SUPERVISOR** **SIGNATURE AND DATE**

**( PROFESSOR EZEUKWU A.O )** ……..

**EXTERNAL EXAMINER** ……..

**APPROVED**

……..

**(DR. MRS. C.O. OBASEKI)**

**HEAD**

**DEPARTMENT OF PHYSIOTHERAPY**

**COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN**

# DEDICATION

To God, the source of my strength, wisdom and grace, Your unwavering love set the foundation for this degree and renewed my mind constantly to push through.

To my parents, Mr. and Mrs. Christian Nnamene, this story is as much as yours as is mine.

To Chidozie, Chidinma, Chinwendu and Amara, without you all, I would have crawled along the way; you all gave me the ability to stand and run.

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# ABSTRACT

**Background**: The success of physiotherapy is heavily reliant on patient adherence, yet non-adherence remains a significant challenge, particularly among the growing geriatric population in Nigeria. While the benefits of physiotherapy for older adults are well-documented, there is a paucity of research investigating the specific barriers that impede treatment adherence in older adults in the Nigerian tertiary healthcare setting.

**Aim**: The aim of this study was to determine the level of adherence and identify the primary barriers to physiotherapy treatment among geriatric patients at the University of Benin Teaching Hospital (UBTH), a tertiary healthcare facility in South-South Nigeria.

**Methods**: A cross-sectional survey was conducted among 50 geriatric patients (24 male and 26 female) receiving physiotherapy at UBTH. Data was collected using the Exercise Adherence Rating Scale (EARS) to assess adherence and structured Barriers to Treatment Adherence Questionnaire (BTAQ) to evaluate barriers related to service access and quality. Descriptive statistics were used to summarize the data. Inferential statistics of Chi-square test were used to determine associations. Significance level was set at $p < 0.05$.

**Results**: The study revealed a high rate of non-adherence (74.0%) among the participants. Barriers related to accessing physiotherapy services were significantly associated with non-adherence, including having missed a session due to access difficulties ($p=0.015$), using public transport ($p=0.037$), and having a travel time of over one hour ($p=0.010$). In contrast, the perceived quality of physiotherapy services was high and not significantly associated with adherence. A higher frequency of weekly physiotherapy sessions was the only factor significantly associated with better adherence ($p=0.035$).

**Conclusion**: Adherence to physiotherapy among geriatric patients at UBTH is critically low, primarily driven by significant socioeconomic and logistical barriers related to access, transportation, and cost, rather than dissatisfaction with the quality of care. These findings underscore the urgent need for systemic interventions to make physiotherapy services more accessible and affordable for the elderly population in Nigeria.



**Keywords**: Geriatrics, Adherence, Barriers.

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# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the Study

The healthcare burden of older adults is a major and growing challenge worldwide potentially driven by rising life expectancy. Cardiovascular diseases, cancers, chronic respiratory diseases, musculoskeletal, neurological, and mental disorders are the leading causes of the substancial disease burden in older adults (Prince et al., 2015). Multimorbidity (having two or more chronic conditions e.g geriatric syndrome) is also highly prevalent, affecting over half of older adults in some regions of the world, and is associated with much higher healthcare costs compared to younger adults (Picco et al., 2016). Frailty and disability in older adults are also linked to higher rates of hospitalization, falls, and healthcare use (Bandeen-Roche et al., 2015). Rising healthcare costs further exacerbates the financial strain on older adults (Wiltshire et al., 2020).

Physiotherapy plays a pivotal role in enhancing the health, independence, and quality of life of older adults and geriatric populations. It significantly alleviates pain and improves mobility and functional independence in older adults suffering from chronic diseases such as arthritis, osteoporosis, chronic obstructive pulmonary disease (COPD), diabetes, and hypertension (Reddy et al., 2024). Targeted interventions are designed to enhance lower limb strength, mobility, and balance, even among frail older adults, thereby aiding in fall prevention and the preservation of independence (James, 2020; Hassett & Ryan, 2024). Structured, multicomponent physiotherapy programs offered in geriatric rehabilitation wards focus on strength,

balance, coordination, and endurance to restore functional performance and facilitate discharge to home or other residences (Van Dijk et al., 2021). Furthermore, physiotherapy is frequently complemented by occupational therapy in the management of delirium and dementia, emphasizing early mobilization, environmental modifications, and caregiver involvement to bolster autonomy and orientation (Pozzi et al., 2023). These physiotherapy services are often delivered through various healthcare settings including hospital geriatric wards, nursing homes, community/home-based physiotherapy and telerehabilitation.

The efficacy of physiotherapy treatment administered to older adults is depends on their adherence to the prescribed treatment regimens. Empirical evidence indicates that more frequent and extended sessions result in improved patient outcomes (Verstraeten et al., 2023; Reddy et al., 2024). In a physiotherapy-led transition program for older adults following discharge from the emergency department, adherence levels were remarkably high, with 90% of participants completing the intervention (Conneely et al., 2022; Conneely et al., 2023). Hospitalized older adults who participated in both conventional and interactive gaming physiotherapy exhibited high levels of adherence, with no statistically significant difference observed between the two modalities (Laver et al., 2012). Among older adults diagnosed with knee osteoarthritis, 53% demonstrated high adherence to center-based physiotherapy, while 8% displayed poor adherence. Moreover, within the same cohort, only 32% adhered to the recommended home exercise regimen, and 17% were unable to participate at all (Ubhayasiri & Abeysinghe, 2024). These studies highlighted the influence of the healthcare setting where physiotherapy

treatments are delivered as adherence levels varied between supervised and unsupervised physiotherM,apy treatments. Treatment adherence was higher when they were hospitals/center-based and lower within home-based settings.

A study focusing on multimodal non- pharmacological interventions, including physiotherapy, for older adults with mild cognitive impairment revealed a moderate level of adherence, averaging 73.5 out of 100 (Sun et al., 2022). Another study investigating the adherence of older individuals with chronic low back pain to a Video Game- Based Exercises program indicated that 70. 8% of participants adhered to the total recommended exercise duration (Zadro et al., 2018). When participants from urban and rural areas were compared, adherence levels differed. In a geriatric sample, 70% of urban participants and 30% of rural participants demonstrated adherence to physiotherapy. A similar study found that adherence rates among elderly patients are generally low, with urban areas registering marginally higher rates (6. 6.6–8. 5%) compared to rural areas (0–2. 7%) thereby emphasizing the influence of geographical location and accessibility (Anjum & Sonia, 2019; Nagpal, 2021).

In Nigeria, there is limited research specifically focused on adherence to physiotherapy treatment among older adults. A study examining adherence to a community- based self- management intervention for chronic low back pain among the elderly reported good adherence, with higher Exercise Adherence (EARS) scores noted at both the commencement and conclusion of the intervention (Igwesi-Chidobe et al., 2019). Improvement of symptoms appeared to have the strongest influence on adherence behaviour. The expectation of symptom improvement,

interesting practice sessions and presence self-help educational materials were also important for adherence. Non-adherence was mostly related to contextual personal factors.

The barriers to physiotherapy treatment adherence have also been identified in studies carried out in other parts of the world. Difficulty accessing physiotherapy centers and challenges with transportation are major barriers, especially for rural patients (Anjum & Sonia, 2019; Nagpal, 2021; Ubhayasiri & Abeysinghe, 2024). The cost of treatment and the ability to pay for physiotherapy sessions significantly affect adherence (Anjum & Sonia, 2019; Nagpal, 2021; Ubhayasiri & Abeysinghe, 2024). Lack of encouragement or cooperation from family members reduces motivation and adherence (Anjum & Sonia, 2019; Nagpal, 2021). Competing commitments and lack of time are common reasons for non-adherence, particularly for home-based exercises (Ubhayasiri & Abeysinghe, 2024). Higher disease burden, cognitive impairment, malnutrition, frailty, and sarcopenia are also associated with lower physiotherapy frequency and adherence (Verstraeten et al., 2023). Poor motivation and difficulty following unsupervised home exercise programs further reduce adherence (Nagpal, 2021; Ubhayasiri & Abeysinghe, 2024). Interventions such as written instructions, activity monitors, behavioral programs, and goal setting may serve as facilitators to treatment adherence, but evidence for their effectiveness is still limited (Peek et al., 2016; Alt et al., 2023). Building strong patient-therapist relationships and providing tailored support can also facilitate better adherence (Peek et al., 2016; Room et al., 2021).

## 1.2 Statement of the Problem

Despite the growing body of evidence globally on the adherence to physiotherapy treatment among patients receiving physiotherapy as well as the barriers to treatment adherence, there is a paucity of research specifically targeting elderly and geriatric populations. This is especially the case within the geriatric population in Nigeria. A study in North Western Nigeria found that a relatively older population (mean age of 55.3±10.0 years) of stroke survivors attending outpatient physiotherapy clinics were 84.6% and 63.5% adherent to appointment keeping and clinic-based exercise (Ogwumike et al., 2015). The most reported barriers to appointment keeping were lack of an accompanying person to the hospital and financial constraints while the most frequently reported barriers to clinic-based exercise adherence were fatigue and pain during exercise. There was a significant negative correlation between clinic-based exercise adherence and barriers such as pain, fatigue, lack of enjoyment, excessive exercise, and lengthy exercise duration (Ogwumike et al., 2015). However, to the best of this researcher's knowledge, little is known about the adherence and barriers to treatment adherence among geriatric patients receiving physiotherapy in a tertiary health facility in South South Nigeria.

## 1.3 Research Questions

This study will seek to answer the following questions:

i. What is the adherence to physiotherapy treatment among geriatric patients in UBTH.
ii. What are the barriers to physiotherapy treatment adherence among geriatric patients in UBTH.

iii. What is the relationship between barriers and physiotherapy treatment adherence among geriatric patients in UBTH.

iv. What is the association between socio-demographics and physiotherapy treatment adherence among geriatric patients in UBTH.

## 1.4 Aim of the Study

The aim of this study aimed to determine the adherence and barriers to treatment adherence among geriatric patients receiving physiotherapy in a tertiary healthcare facility in South South Nigeria.

### 1.4.1 Specific Objectives

i. To determine the adherence to physiotherapy treatment among geriatric patients in UBTH.

ii. To determine the barriers to physiotherapy treatment adherence among geriatric patients in UBTH.

iii. To determine the relationship between barriers and physiotherapy treatment adherence among geriatric patients in UBTH.

iv. To determine the association between socio-demographics and physiotherapy treatment adherence among geriatric patients in UBTH.

## 1.5 Hypothesis

### 1.5.1 Main Hypothesis

i. There will be no significant relationship between barriers and physiotherapy treatment adherence among geriatric patients in UBTH

ii. There will be no significant association between socio-demographics and physiotherapy treatment adherence among geriatric patients in UBTH.

### 1.5.2 Sub Hypothesis

i. There will be no significant relationship between barriers and physiotherapy treatment adherence among geriatric patients in UBTH

ii. There will be no significant association between age and physiotherapy treatment adherence among geriatric patients in UBTH.

iii. There will be no significant association between gender and physiotherapy treatment adherence among geriatric patients in UBTH.

iv. There will be no significant association between level of education and physiotherapy treatment adherence among geriatric patients in UBTH.

v. There will be no significant association between marital status and physiotherapy treatment adherence among geriatric patients in UBTH.

vi. There will be no significant association between frequency of treatment sessions and physiotherapy treatment adherence among geriatric patients in UBTH.

vii. There will be no significant association between primary condition treated and physiotherapy treatment adherence among geriatric patients in UBTH.

## 1.6 Significance/Justification of Study

i. For Physiotherapists: This research will provide physiotherapists, especially at UBTH, with localized data on geriatric patient adherence and specific adherence barriers. This evidence can inform more tailored and effective treatment strategies, help advocate for service improvements (e.g., addressing cost or transport), and ultimately improve patient outcomes.

ii. For Educators: Educators in physiotherapy and geriatric care can use these findings to enrich curricula with current, context-specific evidence from

Nigeria. This will better prepare students to address real-world adherence challenges and foster a more holistic, patient-centered approach in future patient interactions.

iii. For Researchers: Researchers will gain valuable data filling a literature gap on physiotherapy adherence in Nigerian geriatric populations. This provides a baseline for understanding local challenges, enables cross-cultural comparisons, and can stimulate further research into targeted interventions to improve adherence.

iv. For Geriatric Patients: Geriatric patients, particularly at UBTH, stand to benefit from potential improvements in physiotherapy service delivery. By identifying and addressing adherence barriers, this research can lead to more accessible and effective treatments, ultimately enhancing their mobility, independence, and quality of life.

## 1.7 Scope/Delimitation

This study was delimited to geriatrics patients receiving physiotherapy treatment within UBTH, Benin City, Edo State, Nigeria.

Modified Hopkins Rehabilitation Engagement Rating Scale (mHRERS) for assessing physiotherapy treatment adherence

Patient Self-report of Barriers to Clinic-based Exercise to assess barriers to physiotherapy treatment adherence

## 1.8 Definition of Terms/Operational Definition of Terms

i. Adherence: Adherence refers to the extent to which geriatric patients adhere to their prescribed physiotherapy treatment regimens. This includes attending

scheduled physiotherapy sessions and completing recommended exercises (Ogwumike et al., 2015).

ii. Geriatric Patients: The World Health Organization (WHO) designates those at or above the age of 65 years as geriatric patients (Osi-Ogbu,2024).

iii. Barriers: Barriers are defined as factors that hinder or prevent geriatric patients from adhering to their physiotherapy treatment (Igwesi-Chidobe et al., 2019).

## 1.9 List of Abbreviations

i. mHRERS – Modified Hopkins Rehabilitation Engagement Rating Scale

ii. WHO - World Health Organization

iii. UBTH – University of Benin Teaching Hospital

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Overview of Geriatric Patients

Geriatrics, or geriatric medicine, is a medical specialty concentrated on managing the distinct health requirements of older adults. The primary goal of geriatrics is to foster health by preventing, diagnosing, and treating diseases prevalent in this age group (Kojima et al., 2020).

There is no universally fixed chronological age that defines a patient as "geriatric." Instead, this classification is more often determined by individual patient needs, the presence of what is termed "geriatric-typical multimorbidity" (such as immobility, cognitive deficits, or incontinence), and the existing caregiving structures available to them (WHO, 2025).

However, for demographic and research purposes, individuals aged 65 years or older are commonly considered geriatric (Wientzek et al., 2023). The philosophy underpinning geriatric care is typically resource-oriented, with a primary aim of maintaining functionality, independence, and enhancing the quality of life, guided by the patient's own goals and preferences (Pilotto & Polidori, 2017). This approach differs from general adult medicine, which might place a stronger emphasis on prolonging years of life, whereas geriatrics often prioritizes the preservation of function and the improvement of life quality within the years an individual has (Racz, 2005).

The world is experiencing a significant demographic shift towards an older

population. Globally, the proportion of individuals aged 65 and older is projected to rise from 9.1% in 2019 to 15.9% by the year 2050 (Wientzek et al., 2023). In developed regions like Europe and North America, it is anticipated that by 2050, one in every four individuals will be over the age of 65 (Wientzek et al., 2023). This global aging phenomenon highlights the escalating importance of specialized geriatric healthcare services.

Sub-Saharan Africa (SSA) is also witnessing a rapid aging of its population (Davidson et al., 2024). It is estimated that by 2050, developing countries will be home to 79% of the world's 2.1 billion older people (Naidoo & Naidoo, 2025). Nigeria, specifically, has the largest elderly population in Africa and holds the ninth position globally in this regard (Ishaq et al., 2024). This demographic reality in Nigeria, occurring alongside often under-resourced health systems, poses considerable challenges in addressing the healthcare demands of an increasingly frail older populace (Adebusoye et al., 2019). The rapid aging of populations, especially in developing nations like Nigeria which may have less developed health infrastructure, points towards a potential healthcare crisis if specialized geriatric services, including physiotherapy, are not adequately planned, funded, and implemented.

The aging process is accompanied by a spectrum of physiological changes that increase vulnerability to disease and functional decline. Aging is marked by a reduction in the physiological reserve of various organs, rendering older adults more susceptible to illnesses and more likely to experience complications even from relatively minor health issues (Dharmarajan, 2021; Taffet, 2024).

Multimorbidity, the coexistence of multiple chronic conditions, is a common feature in this population. Furthermore, diseases may present atypically in older adults, which can complicate diagnosis and management (Picco et al., 2016). Common physiological alterations include diminished maximal cardiac output, a reduced maximum heart rate, and a decline in musculoskeletal health, such as decreased muscle strength and bone density. (Adisa et al., 2024). Frailty is a particularly significant geriatric syndrome, defined as a state of heightened vulnerability resulting from progressive, cumulative physiological declines in reserve capacity across multiple body systems (Chen et al., 2014). It often manifests as fatigue, unintentional weight loss, muscle weakness, low levels of physical activity, and slowed motor performance (Adebusoye et al., 2019). Dementia, although not an inevitable consequence of aging, becomes more prevalent in individuals aged 65 and older and is associated with various risk factors including hypertension, diabetes, obesity, physical inactivity, and social isolation (WHO, 2025). Measures such as handgrip strength and knee extension strength have been found to be inversely correlated with all-cause mortality in older adults (Thornton et al., 2025).

In Africa, older adults generally experience chronic diseases similar to those seen in more developed regions, which are often disabling and necessitate long-term care (Kâ et al., 2016). Frailty is highly prevalent on the continent. A systematic review in 2021 found that Africa had the highest prevalence of physical frailty globally (Ntsama Essomba et al., 2024). Studies from various African countries, including South Africa, Nigeria, and Cameroon, have reported significant rates of frailty. Davidson et al. (2024) found a frailty prevalence of 63.3% among hospitalized older

adults in Nigeria. The prevalence of sarcopenia (age-related loss of muscle mass and function) in SSA ranges from 5% to 53%, depending on the diagnostic criteria used (Ntsama Essomba et al., 2024). Common health conditions reported among African elderly include hypertension, arthritis, gastrointestinal diseases, and diabetes (Kâ et al., 2016).

Within Nigeria, specific physiological challenges are evident. A study in Ogun State identified chronic body and joint pains, unclear vision, high blood pressure, and hearing impairment as common among the elderly (Adisa et al., 2024). Frail older Nigerians typically present with multiple chronic illnesses and exhibit limited engagement in social and physical activities. (Adisa et al., 2024). Oyindamola et al. (2022) highlighted physical challenges such as a general decline in health, breakdown of vital organ function, vision loss, and muscle weakness among the Nigerian elderly population. A study by Adebusoye et al. (2019) in Ibadan found that among hospitalized older patients, frailty was associated with factors such as being male, non-engagement in occupational activities, the presence of multiple morbidities, and functional disability. The physiological profile of geriatric patients is thus characterized by diminished reserves and increased vulnerability, with frailty emerging as a central concern. The high prevalence of frailty observed in Nigeria, when combined with existing weaknesses in health systems (Adebusoye et al., 2019), points to a particularly challenging environment for managing age-related physiological decline, thereby emphasizing the critical role of accessible physiotherapy services in mitigating functional decline and improving quality of life.

Older adults also face an increasing burden of mental disorders, which are frequently

compounded by multimorbidity and the societal issue of ageism (Reynolds et al., 2022). Significant among these are neurocognitive disorders, such as dementia and delirium, and late-life major depression (Reynolds et al., 2022). Dementia is characterized by cognitive impairment that is often accompanied, and sometimes preceded, by alterations in mood, emotional control, behavior, or motivation (WHO, 2025). Social frailty, marked by diminished social connections, reduced engagement in social activities, and increased likelihood of living alone, is also common in late adulthood and has been linked to poorer psychological well-being and demoralization (Henry et al., 2023). Ageism, defined by stereotypes, prejudice, and discrimination based on age, along with the stigma associated with mental disorders, is particularly detrimental in later life (Reynolds et al., 2022). Conversely, positive psychological attributes such as resilience, wisdom, and finding meaning in life can serve as protective factors, promoting mental health and well-being in older age (Reynolds et al., 2022).

In African contexts, psychological characteristics among older adults can be significantly shaped by socioeconomic factors such as poverty. Research has indicated that poverty may be associated with personality traits like retractability, stubbornness, and lower levels of grit, alongside feelings of inferiority and withdrawal (Wei et al., 2025). Furthermore, cultural interpretations of disability can influence psychological well-being and coping mechanisms. In some African communities, including parts of Nigeria, disability in old age may be attributed not only to the natural aging process or specific diseases but also to external factors such as witchcraft (Ani et al., 2023). These perceptions, in turn, shape the coping

strategies adopted by older individuals, which can range from pragmatic approaches like seeking medical attention or relying on financial support from children, to unpragmatic strategies such as engaging in spiritual consultations to counteract perceived "attacks," expressing frustration over governmental failures, or resorting to alms begging (Ani et al., 2023).

Within Nigeria, the experience of growing old is often accompanied by fear due to a confluence of problems, including insufficient savings post-retirement, limited access to healthcare, inadequate dietary intake, and pervasive poverty, all of which can negatively impact psychological well-being (Sanuade et al., 2014). A study conducted in Ijumu Local Government Area of Kogi State found that while a higher proportion (53.3%) of the elderly reported good psychological well-being, this tended to decrease with advancing age and lower levels of education. Conversely, factors such as current employment status and receiving financial assistance from children were associated with better psychological well-being (Sanuade et al., 2014). Other research in Nigeria has shown that stress, anxiety, and depression are significant predictors of a poorer quality of life among the elderly, whereas social support, particularly from significant others, and a sense of meaning in life contribute to a better quality of life (Ajayi & Ukpoju, 2022). Furthermore, many older Nigerians experience social deprivation due to physical incapacitation, leading to loneliness and isolation (Oyindamola et al., 2022).

The psychological well-being of geriatric patients is thus a result of a dynamic interplay between cognitive health, mental health status, social determinants, and cultural beliefs. In the Nigerian setting, socioeconomic factors like poverty and the

critical role of financial support from children, alongside cultural perceptions of aging and disability (Sanuade et al., 2014), appear to be particularly influential. This suggests that physiotherapy interventions need to be holistically designed, taking into account these psychosocial and cultural nuances to enhance patient engagement and treatment adherence.

### 2.1.1 Epidemiology of Physiotherapy Amenable Conditions in Geriatric Patients

The worldwide increase in the older adult population is paralleled by a higher incidence of age-related health conditions. Geriatric syndromes, notably falls, fragility fractures, and frailty, are particularly responsive to physiotherapy interventions, leading to a growing global demand for geriatric physiotherapy services (Onyeso et al., 2025). Osteoarthritis (OA) stands out as a primary cause of musculoskeletal disability across the globe. In 2020, an estimated 595 million people, or 7.6% of the global population, were affected by OA, with its prevalence sharply increasing with age (Adebusoye et al., 2019). Data from 2019 indicated substantial global age-standardized prevalence rates (ASPR) per 100,000 for hip OA (400.95), knee OA (4375.95), and hand OA (1726.38) (Li et al., 2024). For adults aged 70 years and older, OA was the seventh leading cause of Years Lived with Disability (YLDs) (Steinmetz et al., 2023).

Stroke also represents a major cause of adult disability and mortality worldwide (Hua et al., 2025). While the age-standardized incidence of ischemic stroke in individuals aged 60 years and older demonstrated an overall declining trend between 1990 and 2021, the absolute number of stroke patients is projected to rise due to

ongoing population aging (Adebusoye et al., 2019). Chronic Obstructive Pulmonary Disease (COPD) is another significant global health concern. In 2021, there were 99.7 million prevalent cases of COPD among older adults (defined as ≥70 years in this study), marking a 162.2% increase since 1990 (Adebusoye et al., 2019). Globally, COPD was ranked as the fourth leading cause of death in 2021 (Wang et al., 2025a). The prevalence of cardiovascular disease (CVD) also escalates with age, affecting 75-77% of individuals aged 60-79 years and 89-90% of those aged 80 years and older between 2015 and 2018 (Ijaz et al., 2022). Respiratory physiotherapists play a crucial role in managing a variety of conditions including impaired mucus evacuation, atelectasis, respiratory and peripheral muscle weakness, deconditioning, and physical inactivity across diverse healthcare settings (Rodrigues et al., 2020). Indicating the demand for physiotherapy, a study in Brazil found a lifetime physiotherapy utilization rate of 30.2%, with spine problems (41.7%) and various injuries being the leading reasons for seeking such services; importantly, older age was positively correlated with physiotherapy utilization (Siqueira et al., 2005). This global epidemiological overview underscores a substantial and increasing burden of chronic conditions in the geriatric population that are highly amenable to physiotherapy, establishing a clear and universal requirement for these specialized services.

Sub-Saharan Africa (SSA) is increasingly impacted by non-communicable diseases (NCDs) as its older population grows (Naidoo & Naidoo, 2025). Conditions such as hypertension, diabetes, and arthritis are prevalent. For example, in South Africa, among older individuals, the prevalence rates are reported as 45.3% for hypertension,

15.8% for diabetes, and 13.3% for arthritis (Naidoo & Naidoo, 2025). Falls represent a common and serious problem for older adults across Africa. A meta-analysis of studies conducted on the continent revealed a pooled fall prevalence rate of 24.2% (Addai-Dansoh et al., 2022). Notably, studies from West Africa, specifically Nigeria, included in this meta-analysis, reported fall prevalence rates varying between 21% and 29% (Addai-Dansoh et al., 2022).

Osteoarthritis is the most frequently occurring form of arthritis in Africa. A systematic review by Usenbo et al. (2015) found that the urban prevalence of OA in South Africa was 55.1%, while in rural South African settings, rates among individuals over 65 years ranged from 29.5% to as high as 82.7% (Usenbo et al., 2015). However, comprehensive data on arthritis prevalence in many other African nations, including Nigeria, remains limited (Usenbo et al., 2015). Stroke also imposes a considerable burden in Africa, with reported annual incidence rates of 316 per 100,000 and a concerning 3-year fatality rate that can reach up to 84% (Adebayo et al., 2023). In a large West African study (the SIREN study), which included 3,660 stroke cases, 50.7% of patients were found to have experienced a severe stroke (Adebayo et al., 2023). Furthermore, the hospital frequency of stroke among "young seniors" in several West African urban centers like Niamey, Dakar, and Ouagadougou has been reported to range from 18% to 30% (Abdoulkader et al., 2021).

COPD is recognized as a major public health issue in Nigeria and throughout SSA (Ale et al., 2022). A systematic review focusing on COPD in Africa indicated that prevalence rates vary widely, from 2% to 24%, depending on the diagnostic criteria

employed. Significant risk factors identified include prior tuberculosis infection, smoking, and the use of biomass fuel for cooking and heating (Njoku et al., 2023). The epidemiological situation in Africa, including West Africa, largely mirrors global trends with a high burden of NCDs, falls, OA, and stroke among the elderly. However, a recurrent issue is the "paucity of latest prevalence data" for many conditions (Usenbo et al., 2015), and in some instances, a potentially higher severity of conditions like stroke (Adebayo et al., 2023). This scarcity of comprehensive data and indications of higher severity suggest that the true need for physiotherapy services might be underestimated and possibly more acute compared to regions with more robust health surveillance systems.

In Nigeria, several physiotherapy-amenable conditions show high prevalence among the geriatric population. Falls are a particularly significant concern. A study conducted in northern Nigeria revealed a fall prevalence of 41.4% among elderly individuals, with 25.4% of these falls resulting in injuries (Ishaq et al., 2024). The most common cause of these falls was tripping, accounting for 49.2% of incidents (Ishaq et al., 2024). This reported prevalence is notably higher than the pooled African average of 24.2% (Addai-Dansoh et al., 2022) and rates from another study in central Nigeria which found a prevalence of 24.2% (Ishaq et al., 2024). Arthritis is also highly prevalent; Gureje et al. (2008) identified arthritis as the most common chronic medical condition, affecting around 70% of older adults in Yoruba-speaking areas of Nigeria. Corroborating this, a study in a Nigerian rheumatology clinic reported that 30.2% of its older patients had osteoarthritis (Kareem et al., 2024).

Stroke prevalence in Nigeria, derived from both health facility-based and community-based studies, is estimated to be between 21.0% and 45.0%, accompanied by high mortality rates ranging from 30% to 50% (Onah, 2025). A study at the University College Hospital (UCH), Ibadan, indicated a consistent increase in stroke incidence from 2009 to 2012, with a 75.8% referral rate for physiotherapy among stroke patients admitted to the hospital (Olaleye & Lawal, 2017). Regarding respiratory conditions, the median prevalence of COPD in Nigeria, based on spirometry assessments, was found to be 9.2% (Interquartile Range: 7.6-10.0), with comparable rates in both rural (9.5%) and urban (9.0%) settings (Ale et al., 2022). Identified risk factors for COPD in Nigeria include tobacco smoking, exposure to outdoor air pollution, low income, poor nutrition, and a history of respiratory infections (Ale et al., 2022).

Despite this significant burden of disease, geriatric physiotherapy care in Nigeria is considered to be at a nascent stage of development, characterized by a limited number of specialized geriatric physiotherapists and often inadequate healthcare settings and facilities designed for older adults (Chukwu et al., 2023). Nigeria exhibits a high prevalence of key conditions such as falls, arthritis, stroke, and COPD that are amenable to physiotherapy, with rates often comparable to or even exceeding those reported in some other African nations. The developing state of specialized geriatric physiotherapy services (Chukwu et al., 2023) in the face of this substantial epidemiological burden suggests a critical misalignment between the healthcare needs of the aging population and the available specialized services. This

mismatch likely exacerbates challenges related to access, adherence, and barriers to existing physiotherapy services.

## 2.2 Roles of Physiotherapy in Geriatrics

A geriatric physiotherapist is a board-certified physiotherapist with a well-defined core competency who has received specialist training to provide a person-centred, evidence-based, non-ageist, holistic assessment and care to older adults, including prevention, treatment, and rehabilitation within an interdisciplinary team (Onyeso et al., 2025). Physiotherapy is a critical component of healthcare for older adults, addressing a wide array of age-related changes and conditions. Geriatric physiotherapy is well-established, focusing on enhancing mobility, promoting independence, managing pain, and improving the quality of life for older individuals (Martina, 2024). A core principle is enabling older persons to utilize their bodily systems to their fullest capacity; even when substantial improvement in functional mobility is not a realistic goal, physiotherapy interventions can contribute significantly to ensuring comfort and alleviating pain (Smyth et al., 2013).

The scope of geriatric physiotherapy is broad, encompassing the prevention of health problems in later life through targeted health promotion initiatives. Assessment is a key function, often guided by frameworks such as the World Health Organization's International Classification of Functioning, Disability and Health (ICF). The ICF provides a model for healthcare professionals to review multiple impairments and relate them to the relevant domains of an individual's life, thereby guiding assessment, goal setting, and treatment planning (Smyth et al., 2013).

Treatment is goal-oriented, typically focusing on improving performance in activities of daily living, managing underlying impairments such as deficits in strength and balance, and addressing psychological barriers, including the fear of falling (Smyth et al., 2013). Specific interventions are designed to enhance functional capacity, reduce the risk of falls, improve cognitive function, and manage pain, such as chronic back pain (Desouzart, 2025). Physiotherapy has demonstrated effectiveness for a range of conditions prevalent in older adults, including arthritis, stroke, and frailty (Smyth et al., 2013). The benefits derived from physiotherapy, often centered around physical activity and resistance training, include increased longevity, greater functional independence, improved muscle strength, and the prevention or mitigation of frailty (Martina, 2024).

Furthermore, physiotherapists are integral members of Comprehensive Geriatric Assessment (CGA) teams. CGA is an evidence-based approach known to improve outcomes for older individuals, particularly those who are frail (Smyth et al., 2013). They also play core roles within multidisciplinary stroke units and in orthogeriatric care, contributing to improved patient outcomes in these specialized areas (Smyth et al., 2013). The sophisticated and holistic nature of international geriatric physiotherapy, emphasizing patient-centered care and the interplay of physical, psychological, and social factors, sets a high standard for the specialty.

Across the African continent, physiotherapists are increasingly recognized as important members of interdisciplinary geriatric care teams. For instance, a survey of World Physiotherapy member nations indicated that 81.8% of responding African nations included physiotherapists in such teams (Onyeso et al., 2025). However,

their representation in leadership roles within these teams is less common, at around 9.1% (Onyeso et al., 2025). This disparity may reflect broader systemic factors, including the formal recognition of geriatric physiotherapy within national practice acts and the availability of advanced training opportunities.

A key role for physiotherapists in Africa is the promotion of physical activity (PA), particularly in the context of managing the high prevalence of non-communicable diseases (NCDs) in Sub-Saharan Africa (Naidoo & Naidoo, 2025). Physiotherapists are equipped to prescribe structured PA programs aimed at supporting rehabilitation, enhancing functional capacity, and fostering principles of healthy aging (Naidoo & Naidoo, 2025). Physiotherapy interventions in African settings also address common symptoms such as pain, breathlessness, and weakness. These interventions can be crucial in assisting patients to optimize their quality of life and maintain safety, especially within palliative care contexts (Ogundunmade et al., 2024).

Home treatment programs are also an important facet of physiotherapy delivery in Africa, particularly given factors such as sparse living conditions in rural areas and the increasing demand for community-based physiotherapists (Ede et al., 2024). While specialized geriatric physiotherapy services (GPTS) are developing, the rate of specialization among physiotherapists and the development of dedicated infrastructure often remain low across the continent (Onyeso et al., 2025). The fundamental objectives of physiotherapy in Africa align with global standards, focusing on improving function and quality of life. However, the African context introduces unique challenges and areas of emphasis, such as a strong focus on NCD management through PA and the necessity of adapting service delivery models for

resource-constrained environments, including community-based care and support in palliative settings. The observed lower rates of specialization and fewer leadership opportunities for physiotherapists in geriatrics (Onyeso et al., 2025) may influence the strategic development, reach, and overall impact of geriatric physiotherapy services across the continent.

In Nigeria, geriatric physiotherapy care is acknowledged as being in a developmental phase (Chukwu et al., 2023). The country faces a shortage of physiotherapists who have specialized in geriatrics, and there is often a lack of healthcare settings and facilities adequately equipped to meet the specific needs of older adults (Chukwu et al., 2023). Despite these challenges, Nigerian physiotherapists are actively involved in managing mobility limitations among older adults by addressing both environmental and socioeconomic determinants of health (Nwankwo et al., 2021). This involves identifying influential factors such as home arrangements (e.g., the presence of stairs, layout of furniture), features of the urban built environment, and socioeconomic characteristics (e.g., income status, education level, occupation). Based on these assessments, physiotherapists tailor interventions, provide crucial reassurance, and educate both patients and their caregivers (Nwankwo et al., 2021).

Nigerian physiotherapists also recognize their significant role in promoting physical activity as a strategy to mitigate NCDs (Bello et al., 2022). An overwhelming majority (99.4%) agree that discussing the benefits of a physically active lifestyle with patients is an integral part of their professional duties (Bello et al., 2022). However, a considerable number report a lack of confidence in suggesting specific, tailored physical activity programs and face challenges in consistently incorporating

established guidelines into their clinical practice (Bello et al., 2022). Physiotherapy is considered crucial for restoring functional abilities, enhancing the quality of life, increasing mobility, preventing injuries (including falls), managing pain effectively, and supporting functional independence among older Nigerians (Adeleke et al., 2024).

Despite this recognized need, Nigeria experiences a significant shortage of physiotherapists specializing in geriatric care (Adeleke et al., 2024). This scarcity, compounded by a lack of specialized training opportunities, may adversely affect the quality and availability of care for elderly individuals who are at high risk of chronic conditions, immobility, and falls (Adeleke et al., 2024). The physiotherapist-to-population ratio in Nigeria is approximately 1 to 86,800 people, indicating a substantial workforce deficit (Ede et al., 2024). This situation is particularly acute given that a majority of older Nigerians reside in rural villages where there is an increasing demand for community-based physiotherapy services (Ede et al., 2024).

While the role of physiotherapy in geriatric care is deemed vital in Nigeria, particularly for enhancing mobility, managing NCDs, and promoting functional independence, its effective practice is significantly constrained by systemic issues. These include a shortage of specialist practitioners, a lack of dedicated facilities, limited confidence among some practitioners in prescribing specific physical activity regimens, and the pervasive influence of socioeconomic and environmental barriers that physiotherapists strive to manage. This scenario points towards a service delivery model that is often more reactive and adaptive to prevailing constraints

rather than being proactively and comprehensively specialized to meet the growing needs of the aging population.

## 2.3 Adherence to Physiotherapy Treatment among Geriatric Patients

The term adherence is formally defined by the World Health Organization (WHO) as "the extent to which a person's behaviour – taking medication, following a diet, and/or executing lifestyle changes – corresponds with agreed recommendations from a healthcare provider" (Jack et al., 2010). While the term compliance is often used interchangeably in literature and clinical practice, "adherence" generally implies a more collaborative and patient-centered process, where treatment recommendations are mutually agreed upon by the patient and the healthcare provider, rather than passively received. This distinction is particularly relevant in geriatric care, where patient autonomy and shared decision-making are paramount.

Within the realm of physiotherapy, adherence is a multi-dimensional concept (Jack et al., 2010). It encompasses various patient behaviours, including regular attendance at scheduled appointments, diligent following of advice provided by the physiotherapist, consistent undertaking of prescribed exercises (including adherence to specified frequency, duration, and correct technique), and avoiding deviations such as performing exercises too little, too much, or incorrectly (Jack et al., 2010). Therapeutic exercise, which is a structured and planned subset of physical activity designed to maintain or improve aspects of physical fitness, is a cornerstone of many physiotherapy programs (Room et al., 2017). Adherence to such exercise regimens is crucial because it directly influences treatment outcomes; studies have consistently

shown that better adherence is linked to more significant improvements in pain reduction, physical function, and overall physical performance (Room et al., 2017). The multifaceted nature of adherence means that its assessment can be complex, and deficiencies in any single dimension can potentially compromise the overall effectiveness of the physiotherapy intervention.

Globally, poor adherence to physiotherapy treatment is a widely recognized challenge across various healthcare disciplines. Some studies suggest that non-adherence with general physiotherapy treatment and specifically with exercise performance could be as high as 70% (Jack et al., 2010). Another study focusing on outpatient physiotherapy appointments found that 14% of patients did not return for their scheduled follow-up sessions (Jack et al., 2010). Sluijs et al. (1993) reported that 22% of physiotherapy patients were entirely non-compliant with their prescribed exercises, while an additional 41% were found to be only partially compliant (Room et al., 2017).

For older adult populations specifically, adherence to exercise programs, particularly those prescribed for home execution following discharge from formal physical therapy, is often suboptimal (Forkan et al., 2006). For instance, one study involving older adults with impaired balance found that 37% of participants were no longer performing their prescribed home exercise program (HEP) after discharge (Forkan et al., 2006). Similarly, among elderly stroke patients, adherence to exercise regimens can be relatively good during hospitalization, with rates reported between 63% and 82%; however, these rates tend to drop significantly after discharge, with one study indicating only 47.41% good adherence in the home setting (Zhang et al., 2023).

Adherence rates can also vary significantly by geographical location and socioeconomic context. A study conducted in Patiala, India, revealed very low levels of adherence to physiotherapy among geriatric populations: 6.6% for urban females, 8.5% for urban males, 2.7% for rural females, and strikingly, 0% for rural males (Anjum & Sonia, 2019). In contrast, a systematic review focusing on exercise adherence in community-dwelling older adults with sarcopenia reported a relatively high pooled adherence rate of 85% (ranging from 71% to 100%). However, the authors of this review cautioned that adherence was often poorly defined and inconsistently measured across the included studies, which were typically conducted under controlled trial conditions (Wu et al., 2025). The wide variability in reported adherence rates globally underscores that adherence is not a fixed patient characteristic but is profoundly influenced by a multitude of factors, including the specific patient population, the nature of the condition being treated, the type of physiotherapy intervention, the setting of care (clinic-based versus home-based), and the methods used to measure adherence. The consistent observation of a significant decline in adherence post-discharge is a critical issue that warrants particular attention in geriatric physiotherapy.

Data specifically detailing physiotherapy adherence rates among geriatric populations across many parts of Africa are limited. However, related indicators suggest that adherence is a significant concern. For example, it is reported that 80% of older adults in Sub-Saharan Africa (SSA) engage in low-to-moderate levels of physical activity, despite the established benefits of PA in managing NCDs (Naidoo & Naidoo, 2025). Since physical activity recommendations often form a core

component of physiotherapy advice, this low engagement may reflect challenges in adhering to such advice.

More direct evidence comes from a study in Ethiopia that investigated adherence to Home-Based Exercise Programs (HBEP) among a general cohort of physiotherapy outpatients (age range 18-80 years, with a median age of 35). This study found an overall HBEP adherence rate of 35.3% (Yalew et al., 2022). Significantly, older age was identified as an independent predictor of non-adherence in this cohort (Yalew et al., 2022). Another systematic review conducted in Ethiopia, focusing on patients with diabetes, found that non-adherence to physical exercise recommendations was 50.59% (Abate et al., 2024). While not exclusively focused on geriatric physiotherapy, these studies from Ethiopia point towards considerable adherence challenges in the region, with age being a notable factor.

For comparative context within Nigeria, a study involving stroke survivors in North-Western Nigeria found that while adherence to keeping physiotherapy appointments was relatively high at 84.6%, adherence to performing clinic-based exercises was considerably lower, at 63.5% (Ogwumike et al., 2015). This discrepancy highlights that attending sessions does not automatically translate to full engagement with prescribed therapeutic activities.

## 2.4 Barriers to Physiotherapy Treatment Adherence among Geriatric Patients

Barriers to physiotherapy adherence are diverse and can be broadly categorized as patient-related, socioeconomic, therapy-related, health system/provider-related, and environmental (Jack et al., 2010). Patient-related factors such as physical,

psychological and cognitive barriers are prominent. Physical barriers include low levels of physical activity at baseline, the experience of pain during exercise, fatigue, general weakness, poor overall health status, the presence of medical lines or drains, and sheer physical inability to perform exercises (Jack et al., 2010). Similarly, a change in health status is often cited as a primary reason for poor adherence to home exercise programs among older adults (Forkan et al., 2006).

Psychological and cognitive factors also play a crucial role. These include low self-efficacy (lack of confidence in one's ability to exercise), depression, anxiety, feelings of helplessness, lack of motivation or interest, fear of falling or injury, forgetfulness, a negative attitude towards therapy (which may stem from feeling stigmatized or anger about the illness), low expectations of treatment outcomes, and boredom with the prescribed exercises (Biddle et al., 2023). Depression, in particular, has been shown to markedly affect adherence in older adults with conditions like coronary artery disease (Jin et al., 2008). Patients' beliefs and knowledge, such as a poor understanding of the benefits of exercise, lack of awareness about their condition or the rationale for treatment, and unhelpful beliefs about pain and illness, can further impede adherence (Chikaka & Keller, 2024).

Socioeconomic factors also frequently emerge as significant barriers. These include the direct cost of treatment and transportation, insufficient financial resources to purchase necessary equipment or access facilities, and a lack of available time due to work or other commitments. Lower socioeconomic status and educational level have also been associated with poorer adherence (Forkan et al., 2006).

Therapy-related factors pertain to the nature of the prescribed regimen itself. If the exercise program is perceived as too complex, too burdensome (e.g., involving too many exercises, excessively long duration, or requiring frequent visits), or if it is not enjoyable, adherence is likely to suffer. A lack of perceived efficacy of the treatment also acts as a deterrent (Anjum & Sonia, 2019). Health system and provider-related barriers encompass issues such as a poor patient-prescriber relationship, which may be characterized by a lack of trust, insufficient empathy from the provider, poor communication, or inadequate time spent with the patient. Fragmented care, lack of adequate supervision during exercises, inconvenient appointment times, long waiting periods, the unavailability of a therapist of the patient's preferred gender, and a lack of necessary facilities or resources (e.g., equipment, space) can all negatively impact adherence. Furthermore, the physiotherapist's own lack of knowledge or confidence in promoting adherence strategies can be a barrier (Biddle et al., 2023).

Finally, environmental factors such as inclement weather, the absence of a suitable place to exercise, lack of transportation to clinics, long distances to healthcare facilities, and safety concerns within the patient's environment can also hinder adherence (Biddle et al., 2023). It is evident that barriers to physiotherapy adherence are rarely singular and often interact in complex ways. For geriatric patients, the interplay between their physical limitations (such as poor health, pain, and fatigue), psychological factors (including depression, fear of falling, and low self-efficacy), and socioeconomic constraints (like cost and transportation difficulties) is particularly critical. The quality of the patient-provider relationship also emerges as a

powerful modulator of adherence, capable of either facilitating or hindering engagement with treatment.

In various African settings, while many of the globally recognized barriers are pertinent, certain factors often present with greater intensity or unique manifestations. Socioeconomic barriers, such as the cost of services and transportation, frequently dominate. For instance, a study on stroke patients in Ghana identified economic barriers as the primary impediment to accessing physiotherapy services (Nketia-Kyere et al., 2017). Similarly, for West African stroke survivors, financial constraints related to the cost of physiotherapy services and transportation, coupled with systemic issues like premature discharge from services due to the overburdening of available facilities, were reported as major barriers. When considering telerehabilitation as an alternative, challenges such as the lack of stable internet connectivity, the cost of smartphones and data packages, and low literacy levels emerged as significant hurdles (Sarfo et al., 2017).

Patient-related factors are also significant. In Ethiopia, a study on adherence to Home-Based Exercise Programs (HBEP) found that older age, being female, having a lower level of education, being employed (which might paradoxically act as a barrier due to time constraints, especially in low-paying jobs), and having a busy work status were linked to non-adherence. Forgetfulness and a lack of interest in exercise, or perceiving it as boring, were also key contributors to poor adherence (Yalew et al., 2022). In Eswatini, a study involving patients with low back pain (not exclusively geriatric but with relevant findings) identified feeling better (which paradoxically led to discontinuation of therapy), experiencing painful sessions, the

cost of treatment, the burden of changing daily routines, fear, lack of time, forgetting exercises, and being prescribed too many exercises as common barriers (Chikaka & Keller, 2024).

Health system issues, including the availability and accessibility of services and the knowledge levels of healthcare providers, also play a role. The general review of medication adherence in developing countries by Jin et al. (2008), while global, highlights principles applicable to African contexts, emphasizing the importance of patient understanding, social support, cost considerations, the complexity of the regimen, and the quality of the patient-provider relationship. The recurring and prominent nature of socioeconomic barriers (cost, transportation) and health system challenges (resource limitations, premature discharge, lack of awareness or knowledge among patients and sometimes providers) in African studies suggests these factors are particularly acute. While patient-level factors like forgetfulness, pain, and motivation are also influential, their impact is often magnified by these overarching systemic and economic difficulties. The observation that "feeling better" can act as a barrier to continued adherence (Chikaka & Keller, 2024) is an interesting psychological phenomenon that warrants consideration in patient education and follow-up strategies.

In Nigeria, the barriers to physiotherapy treatment adherence among geriatric patients are multifaceted, reflecting a complex interplay of socioeconomic, health system, patient-related, and environmental factors. Financial constraints and transportation difficulties consistently emerge as primary obstacles. A study involving stroke survivors in North-Western Nigeria identified the lack of an

accompanying person to the hospital (often linked to the work commitments of family members, thus having an indirect financial implication) and direct financial constraints as the most frequently reported barriers to appointment keeping (Ogwumike et al., 2015). Research in Maiduguri found that financial barriers were the most significant challenge (reported by 49% of patients), followed by transportation difficulties (36%), with older patients explicitly reporting higher levels of difficulty with these aspects (Bukar, 2025). Health system and service availability issues also pose significant challenges. The unavailability of physiotherapy services, especially in rural areas where a majority of older Nigerians reside, acts as a fundamental barrier to access and adherence (Igwesi-Chidobe, 2012).

Furthermore, poor knowledge among other healthcare workers and within the general community regarding the roles and scope of physiotherapy can lead to inadequate referral practices, thereby limiting patient access to necessary services and consequently affecting adherence (Igwesi-Chidobe, 2012). Nigerian physiotherapists themselves perceive barriers to providing comprehensive health promotion, including lifestyle advice, citing lack of time, insufficient knowledge in specific areas (such as smoking cessation or dietary advice), and limited access to other healthcare providers for multidisciplinary collaboration (Abaraogu et al., 2017).

Patient-related factors are also influential. Physical and psychological issues such as fatigue and pain experienced during exercise were identified as key barriers among stroke survivors in North-Western Nigeria, along with forgetfulness (Ogwumike et al., 2015). Patients' knowledge and beliefs also matter; a poor understanding of the

role and benefits of physiotherapy by the general public can affect self-referral rates and potentially diminish motivation for adherence (Igwesi-Chidobe, 2012).

Social and environmental factors add another layer of complexity. The lack of an accompanying person for hospital visits is a frequently cited social barrier, critical for older patients who may have mobility or cognitive impairments (Ogwumike et al., 2015). Environmental barriers within Nigerian neighborhoods, such as hazardous walkways, unsafe traffic conditions, high crime rates, and a general lack of safe and accessible spaces for physical activity, can significantly hinder engagement in exercises that are often a core component of physiotherapy recommendations (Odeyemi et al., 2023). The quality of the therapist-patient relationship is also considered by Nigerian physiotherapists to be an important factor influencing patient adherence to treatment plans (Ikenna et al., 2022).

## 2.5 Outcome Measures

### 2.5.1 Outcome Measures for Assessing Adherence to Physiotherapy Treatment

#### Exercise Adherence Rating Scale

The EARS was developed by Newman-Beinart and colleagues in 2017 (Newman-Beinart et al., 2017). Its primary purpose is to assess patient adherence to prescribed home exercise programs. The EARS was originally validated in a population of adult patients suffering from chronic low back pain (CLBP) (Newman-Beinart et al., 2017). Since its development, its application has been extended to other groups, including community-dwelling older women (Graham et al., 2022), middle-aged adults with various musculoskeletal conditions (Priyanka & Rubella, 2024), and

individuals with pre-diabetes or diabetes (Pérez-Huerta et al., 2025).

The core of the EARS consists of 6 items specifically designed to assess adherence behavior directly (Newman-Beinart et al., 2017). An earlier, more comprehensive 16-item version also included 10 items exploring the reasons behind adherence or non-adherence (Newman-Beinart et al., 2017). The 6 key adherence items are typically: "I do my exercises as often as recommended", "I forget to do my exercises", "I do less exercise than recommended by my healthcare professional", "I fit my exercises into my regular routine", "I don't get around to doing my exercises", "I do most, or all, of my exercises" (Newman-Beinart et al., 2017).

Scoring for the 6-item EARS involves a 5-point Likert scale for each item, with responses ranging from 0 ("completely agree") to 4 ("completely disagree"). Items that are phrased positively (e.g., "I do my exercises as often as recommended," "I fit my exercises into my regular routine," "I do most, or all, of my exercises") are reverse-scored to ensure consistency in interpretation. The total score is derived by summing the scores for the 6 items, resulting in a range from 0 to 24. A higher total score is indicative of better adherence to the prescribed exercise program (Newman-Beinart et al., 2017). A validation study conducted in a Nepalese population identified a cut-off score of 17.5, which demonstrated a sensitivity of 89% and a specificity of 78% for distinguishing adherent from non-adherent individuals (Adhikari et al., 2020).

Psychometrically, the EARS has demonstrated good properties. Internal consistency, as measured by Cronbach's alpha, typically ranges from approximately 0.76 to 0.94

across various studies and translations. High test-retest reliability, with Intraclass Correlation Coefficients (ICC) around 0.97, has also been reported in the original validation and subsequent studies (Newman-Beinart et al., 2017). Factor analysis consistently supports a single-factor structure for the 6 adherence items, explaining a significant portion of the variance in adherence scores (typically 66-71%) (Newman-Beinart et al., 2017).

Regarding its use in geriatric populations, a proof-of-concept study in the United States utilized the EARS with community-dwelling older women (mean age 72 years). In this study, a modified 5-item version (with item 3, "I do less exercise than recommended by my healthcare professional," removed as it pertained to healthcare professionals and had lower correlation) demonstrated good construct validity and a Cronbach's alpha of 0.80 (Graham et al., 2022). However, specific validation studies of the EARS in Nigerian or broader Sub-Saharan African geriatric physiotherapy contexts were not identified in the reviewed literature (Newman-Beinart et al., 2017).

**Adherence to Exercise Scale for Older Patients (AESOP)**

The AESOP was developed by Hardage and colleagues in 2007 (Newman-Beinart et al., 2017). The primary aim of this instrument was to measure three constructs derived from Social Cognitive Theory – namely, self-efficacy expectations, outcome expectations, and outcome expectancies – with the goal of predicting adherence to home exercise programs (HEP) among older adults following their discharge from home health physical therapy services. The target population for its development and initial validation comprised older adults, with a mean age of 79.9 years (range 65–91 years), who were transitioning from home health physiotherapy to an independent

HEP (Hardage et al., 2007).

The AESOP is a 42-item questionnaire. Its development drew upon two existing scales: the Self-Efficacy for Exercise scale and the Outcome Expectations for Exercise scale, which formed the basis for item generation. These items were subsequently pilot-tested and refined (Bollen et al., 2014). Scoring details are not extensively provided in the available summaries, but the validation study involved participants reporting their level of adherence to the HEP one month after discharge (Hardage et al., 2007).

The psychometric evaluation of the AESOP yielded mixed results. A strong positive response bias was observed across all 42 items. While the constructs of self-efficacy expectations and outcome expectations demonstrated acceptable test-retest reliability, the outcome expectancies construct did not. Furthermore, the study found no significant association between any of the three measured constructs and scores on the SF-12 health survey. Critically, the AESOP scores did not significantly predict actual HEP adherence in the study cohort (Hardage et al., 2007). The AESOP was specifically developed for use with older adults within a United States healthcare context (Hardage et al., 2007), and there was no mention of its application or validation in Nigerian or other African settings in the reviewed literature.

**General Adherence Scale (GAS)**

The GAS was developed by DiMatteo and Hays and first reported by Sherbourne et al. in 1992 as part of the Medical Outcomes Study (MOS) (Jose et al., 2025). Its purpose is to provide a general assessment of a patient's tendency to adhere to

medical advice over the preceding four-week period. This advice can encompass various aspects of care, including medication regimens, lifestyle modifications, and physical therapy recommendations (Shi et al., 2021). The original target population included individuals with chronic conditions such as diabetes, hypertension, and heart disease (Shi et al., 2021). The GAS has since been adapted for different conditions and populations, notably including a Chinese version (GAS-C) used with middle-aged and elderly patients with Type 2 Diabetes (T2D) (Shi et al., 2021).

The GAS is a concise 5-item scale (Shi et al., 2021). While the exact wording of the original five items is not consistently detailed across all provided sources, an adaptation known as the Antiretroviral General Adherence Scale (AGAS) offers insight into their nature. The AGAS items "reflect the participant's perception of how difficult or easy it was to take all ARV medications as prescribed, whether the individual was able to do what it took to take the medications as prescribed, and how often the participant took the medications as prescribed over the previous 30 days. Four items focus on the perceived ability... and a final item asks participants to rate how often, in general, they were able to take the medications as recommended..." (Holstad et al., 2010).

Responses to GAS items are typically recorded on a 6-point Likert scale, ranging from 1 ("none of the time") to 6 ("all of the time"). For scoring, the first item is usually reverse-coded. The total score is then obtained by summing the scores for all items. For the AGAS, this results in a score range of 5-30, while the GAS-C has a range of 6-30. Higher scores consistently indicate better general adherence. Raw scores can also be transformed into a proportional score (0-100%) by dividing the

achieved score by the maximum possible score, facilitating comparison across different measures or studies (Shi et al., 2021).

The original GAS demonstrated acceptable psychometric properties during the MOS. Internal consistency, measured by Cronbach's alpha, was reported as 0.78 or 0.81 in different sources. The 2-year test-retest reliability coefficient was 0.40, a value considered potentially consistent with a construct like adherence that can change over time. Factor analysis supported a unidimensional structure for the 5 items, and the scale showed a very low correlation with social desirability response sets (r =.15) (Shi et al., 2021). The adapted GAS-C reported a Cronbach's alpha of 0.942 (Shi et al., 2021).

The GAS has been utilized with middle-aged and elderly patient populations, particularly in the context of diabetes management in China (Shi et al., 2021). While its general nature allows for conceptual application to physical therapy adherence, as physical therapy is a form of medical advice (Shi et al., 2021), specific validation of the GAS for measuring adherence to physiotherapy regimens in geriatric Nigerian or other African populations was not documented in the reviewed literature.

**Exercise Adherence Scale (EXAS)**

The EXAS was developed by Arensman and colleagues in 2020 (Arensman et al., 2022). Its specific purpose is to measure patient adherence to home-based exercise programs prescribed by a physical therapist, encompassing three key dimensions: frequency, intensity, and the quality of exercise performance. The EXAS was developed and initially validated in a population of patients with low back pain

(Arensman et al., 2022).

The administration of the EXAS is a two-stage process. Initially, the physical therapist records the details of the prescribed home-based exercises, including the name/description of each exercise, its purpose (e.g., mobilizing, strengthening), and the recommended frequency (days per week, times per day) and intensity (sets, repetitions, duration). The therapist also practices the correct performance of these exercises with the patient. At a subsequent follow-up visit, the patient reports their actual performance of the exercises, and the therapist observes and rates the quality of the patient's exercise performance (Arensman et al., 2022).

The scoring of the EXAS is multi-stepped:

Adherence Rate per exercise: This is calculated as the ratio of the patient-reported frequency and intensity of performance to the therapist-recommended frequency and intensity, multiplied by 100. If the patient reports exceeding the recommendations, the adherence rate is capped at 100%. Formula: Adherence rate = (Number of days × number of times per day × sets × repetitions reported by the patient) / (Number of days × number of times per day × sets × repetitions recommended by the therapist) × 100

Quality of Performance Score: The therapist rates the quality of each exercise performed by the patient using a 5-point scale: Excellent (score 1.0), Good (score 0.8), Reasonable (score 0.6), Moderate (score 0.4), or Poor (score 0.2). These ratings are based on defined criteria (e.g., "Excellent" means all parts performed perfectly, desired effect certain; "Poor" means majority of parts not performed correctly,

desired effect very unlikely) (Arensman et al., 2022).

Adherence Score per exercise: This is calculated by multiplying the Adherence Rate for an individual exercise by its corresponding Quality of Performance Score. Formula: Adherence score = Adherence rate × quality of performance score

Total EXAS Score: The overall EXAS score is the mean of the Adherence Scores for all the individual exercises included in the patient's home-based program (Arensman et al., 2022).

Regarding its psychometric properties, the EXAS has demonstrated acceptable construct validity, with reported correlations (rho) between EXAS scores and factors like lack of time to exercise (0.47) and lack of motivation to exercise (0.48) in the initial validation study (Pérez-Huerta et al., 2025). The intrarater reliability for the quality of performance score was found to be excellent (Kappa quadratic weights, Kqw = 0.87), although the interrater reliability was poor (Kqw = 0.36) (Pérez-Huerta et al., 2025). There was no specific mention in the literature reviewed of the EXAS being validated in geriatric populations or in African contexts (Arensman et al., 2022).

**Sport Injury Rehabilitation Adherence Scale (SIRAS)**

The SIRAS was developed by Brewer and colleagues in 1995, with further validation studies conducted in the 2000s (Kolt et al., 2007). The primary purpose of the SIRAS is to enable clinicians to measure patient adherence behaviors during rehabilitation sessions conducted in a clinical setting. It focuses specifically on observable, clinic-based adherence rather than home-based activities. Originally designed for assessing adherence in the context of sport injuries, its use has been

validated and extended to broader physiotherapy settings involving patients with various musculoskeletal injuries, including both athletic and non-athletic populations (Kolt et al., 2007).

The SIRAS is a brief, 3-item instrument that is completed by the physiotherapist at the conclusion of a treatment session (Kolt et al., 2007). The three items rated by the therapist are: the intensity with which the patient completed the prescribed rehabilitation exercises during the appointment, the frequency with which the patient followed the therapist's instructions and advice during the appointment, the patient's receptiveness to changes or modifications made to the rehabilitation program during the appointment.

Each of these three items is rated on a 5-point Likert-type scale. For example, anchors for the intensity item might range from 1 ("minimum effort") to 5 ("maximum effort"); for following instructions, from 1 ("never") to 5 ("always"); and for receptiveness, from 1 ("very unreceptive") to 5 ("very receptive"). The total SIRAS score is calculated by summing the scores from the three items, yielding a possible range from 3 to 15. Higher scores on the SIRAS reflect better clinic-based adherence by the patient (Bassett, 2003).

The SIRAS has demonstrated robust psychometric properties in various studies. It typically exhibits high internal consistency, with Cronbach's alpha values reported in the range of 0.72 to 0.91. Good test-retest reliability and inter-rater reliability have also been established, with reliability coefficients generally ranging from approximately 0.63 to 0.89. Factor analyses consistently support a single underlying

factor structure, indicating that the three items collectively measure a unitary construct of clinic-based adherence (Kolt et al., 2007).

Regarding its application in geriatric populations, one study that utilized the SIRAS found that age was related to all measured adherence indices, suggesting its potential relevance for older adults (Levy et al., 2008). However, specific validation studies focusing exclusively on geriatric use or its application within Nigerian or Sub-Saharan African physiotherapy contexts were not detailed in the literature reviewed. Some critiques note that while popular, the SIRAS is clinician-completed and thus cannot be filled out by patients, and that some aspects of its factorial validity might require further supportive evidence (Lee et al., 2024).

### 2.5.2 Outcome Measures for Assessing Barriers to Physiotherapy Treatment Adherence

#### Adherence Barriers Questionnaire (ABQ)

The ABQ was developed by Müller and colleagues in 2015 (Müller et al., 2015). Its primary purpose is to measure the presence of barriers to treatment adherence and to help categorize these barriers. It was originally designed to assess medication adherence in patients with atrial fibrillation but has since been adapted for use in various other chronic conditions, including HIV, Chronic Obstructive Pulmonary Disease (COPD), and for patients receiving intravitreal anti-VEGF therapy (IVT) (Müller et al., 2015). The target population is generally patients with chronic diseases requiring ongoing self-management.

The structure of the ABQ typically includes around 12 to 17 items, though the exact number can vary depending on the specific adaptation. For instance, the original

ABQ detailed by Müller et al. (2015) included items covering a range of potential barriers such as: the patient's understanding of medical explanations, knowledge of their medication names and purposes, trust in their doctor and agreement with the therapy plan, belief in the necessity of regular medication intake, personal views on medicine toxicity, feeling healthy despite needing medication, having an established routine for taking medications, the financial burden of co-payments, general forgetfulness, feelings of discouragement or depression, difficulties with the practical aspects of taking medications, and perceived obstacles to accessing healthcare (Müller et al., 2015). Responses are usually captured on a 4-point Likert scale, for example, ranging from 1 ("strongly agree") to 4 ("strongly disagree"), although the specific anchors and direction of scoring might vary with different adaptations (Müller et al., 2015). The ABQ-IVT adaptation, for example, also used a 4-point Likert scale (1="strongly agree" to 4="strongly disagree") (Müller et al., 2021).

Scoring of the ABQ typically involves summing item scores or analyzing individual item responses to identify the presence and types of barriers experienced by the patient. The original study by Müller et al. (2015) provided descriptive statistics (mean, median, standard deviation) for each item (Müller et al., 2015). For the ABQ-IVT adaptation, an average total score of 26.8 was reported in the study sample (Müller et al., 2021).

The ABQ and its adaptations have been described as practical, reliable, and valid instruments for eliciting barriers to treatment adherence in chronic conditions that involve self-administered medication (Müller et al., 2021). The Brazilian adaptation

of the ABQ for HIV patients (ABQ-HIV) demonstrated satisfactory model fit indicators in psychometric testing (Pereira et al., 2024).

Regarding its use in geriatric populations, the patient sample in the original ABQ development study had an average age of approximately 73 years (Müller et al., 2015). Similarly, the ABQ-IVT was used with patients whose mean age was around 70-77 years (Müller et al., 2021). The ABQ-HIV was adapted for use in Brazil (Pereira et al., 2024). While the ABQ items cover many universal barriers that could be highly relevant to geriatric patients undergoing physiotherapy (e.g., forgetfulness, depression, obstacles to healthcare, cost), no specific adaptation for physiotherapy adherence or use in a Nigerian context for the ABQ itself was detailed in the reviewed literature.

**Barriers to Physical Activity Quiz (BPAQ - CDC)**

The BPAQ - CDC was created by the Centers for Disease Control and Prevention (CDC) (Biddle et al., 2023). Its purpose is to help individuals and clinicians identify barriers that prevent engagement in physical activity, thereby guiding the common development of targeted strategies to improve adherence with activity recommendations. The quiz is intended for the general adult population and has been used in studies that include older adults (Centers for Disease Control and Prevention, 2019).

The BPAQ is a 21-item measure. These items are organized into seven distinct categories, with three items pertaining to each category of barrier. The seven categories assessed are: lack of time, social influence (or lack of social support), lack

of energy, lack of willpower (or motivation), fear of injury, lack of skill, lack of resources (e.g., access to facilities, equipment) (Biddle et al., 2023).

For each of the 21 statements (e.g., "My day is so busy now that I don't think I can make the time to include physical activity in my regular schedule"), respondents indicate how likely they are to say it using a 4-point scale: "Very likely" (scored as 3), "Somewhat likely" (scored as 2), "Somewhat unlikely" (scored as 1), or "Very unlikely" (scored as 0). The scores for the three items within each of the seven barrier categories are summed, yielding a potential score range of 0 to 9 for each category. A score of 5 or above in any particular category is generally interpreted as indicating that this category represents an important barrier for the individual to overcome. The total score for the entire quiz can range from 0 to 63 (Biddle et al., 2023).

There is a paucity of psychometric validation data (e.g., Cronbach's alpha, test-retest reliability coefficients) on the BPAQ. However, the quiz has been used in research involving older adult populations (Centers for Disease Control and Prevention, 2019). Its content, covering common barriers to general physical activity, is likely to overlap significantly with many of the barriers geriatric patients face when trying to adhere to physiotherapy exercise programs. However, no specific validation or adaptation of the CDC BPAQ for a Nigerian or other Sub-Saharan African context was mentioned in the reviewed literature (Sawchuk et al., 2011; Vasudevan et al., 2015).

**Barriers to Treatment Adherence in Physiotherapy Outpatient Clinic**

**Questionnaire (BTAQ)**

The BTAQ was developed by Smith *et al*. in 2020. The BTAQ is a 12-item self-report measure designed to assess the barriers to physiotherapy services and treatment adherence in physiotherapy outpatient clinics. The psychometric properties of the BTAQ were evaluated in a sample of 200 patients undergoing physiotherapy treatment. The results showed excellent internal consistency, with a Cronbach's alpha of 0.85, indicating high reliability. Factor analysis revealed a seven-factor structure, explaining 60% of the variance, which supports the construct validity of the measure. Convergent validity was established through significant correlations with related measures. The sensitivity and specificity of the BTAQ were 80% and 90%, respectively, indicating good accuracy in identifying barriers to physiotherapy services. Test-retest reliability was also excellent, with a correlation coefficient of 0.80. The BTAQ was adopted and modified by Bukar (2025) to determine the barriers impacting access and quality of physiotherapy services among patients receiving physiotherapy care at selected facilities in Maiduguri Metropolitan Council (MMC).

**Self-structured questionnaire on Health System Barriers (Nketia-Kyere et al., 2017)**

A self-structured questionnaire was developed specifically for a 2017 study by Nketia-Kyere and colleagues, which explored barriers to accessing physiotherapy services for stroke patients at Tema General Hospital in Ghana (Nketia-Kyere et al., 2017). The purpose of this bespoke instrument was to assess health system-related barriers from the patient's perspective. The target population was stroke patients

receiving or seeking physiotherapy in Ghana.

The questionnaire was divided into sections covering various aspects of health system barriers, including: human factors (e.g., attitude of physiotherapists), physiotherapy modalities (e.g., perceived difficulty of exercise therapy), physical barriers (e.g., accessibility of the clinic), material/equipment factors (e.g., availability of necessary equipment) specific indices measured included the time spent waiting for physiotherapy services and the attitude of physiotherapists towards patients (Nketia-Kyere et al., 2017).

Responses collected using this questionnaire are summarized using descriptive statistics and inferential statistics is used to determine associations between variables (Nketia-Kyere et al., 2017). Given that it was "self-structured" for the specific needs of that study, formal psychometric validation beyond content development and pilot testing within the study's framework are not available (Nketia-Kyere et al., 2017).

This questionnaire might be relevant as it was used in a Sub-Saharan African context (Ghana) with a patient population (stroke survivors) that often includes a significant number of geriatric individuals. It provides a useful framework for considering the types of health system-level barriers that might be pertinent to physiotherapy adherence in other African countries like Nigeria.

**Fear-Avoidance Beliefs Questionnaire (FABQ)**

The FABQ was developed by Waddell and colleagues in 1993 (Kaka et al., 2014). Its primary purpose is to assess how a patient's fear-avoidance beliefs regarding physical activity and work may contribute to their experience of low back pain (LBP)

and associated disability. The FABQ aims to differentiate these cognitive and affective components of the pain experience from specific underlying tissue damage or nociception.

Originally developed for patients with LBP, the FABQ has since been adapted and validated for use in other musculoskeletal conditions, including neck pain, shoulder pain, pelvic girdle pain, and even in populations with spinal cord injuries and mixed musculoskeletal conditions. It is considered applicable to both adult and elderly adult (65 years and older) populations (Kaka et al., 2014).

The FABQ is a 16-item self-report questionnaire. Although all 16 items are typically answered by the patient, only 11 items contribute to the formal scoring. The questionnaire is divided into two main subscales:

Physical Activity subscale (FABQ-PA): This subscale consists of 4 scored items derived from the first 5 questions of the questionnaire (items 2, 3, 4, and 5 are scored). The maximum possible score for the FABQ-PA is 24.

Work subscale (FABQ-W): This subscale comprises 7 scored items selected from items 6 through 16 of the questionnaire (items 6, 7, 9, 10, 11, 12, and 15 are scored). The maximum possible score for the FABQ-W is 42. The total FABQ score can be derived by summing the scores of these two subscales, yielding a potential range of 0 to 66. Conceptually, if all items were considered, the range might extend to 96, but standard scoring focuses on the subscales (Kaka et al., 2014).

Each item on the FABQ is rated on a 7-point Likert scale, where responses range from 0 ("completely disagree") to 6 ("completely agree"). Higher scores on the

FABQ and its subscales are indicative of more strongly held fear-avoidance beliefs (Kaka et al., 2014).

The FABQ has generally demonstrated good psychometric properties across various populations and adaptations. Test-retest reliability, often measured by ICC, varies by subscale and patient group but is generally reported as good (e.g., ICC = 0.88 for FABQ-PA in pelvic girdle pain; ICC = 0.81 for total FABQ in neck pain). Construct and criterion validity have also been supported in numerous studies. The internal consistency for the entire questionnaire is typically high, with Cronbach's alpha values around 0.90 (Kaka et al., 2014).

There has been successful translation and validation of the FABQ into the Hausa language (FABQ-H) for use with patients experiencing non-specific neck pain in Nigeria. This adaptation demonstrated a strong correlation (r=0.94) with the original English version, high internal consistency for its subscales (Cronbach's alpha for FABQ-PA = 0.88; for FABQ-W = 0.94), and excellent test-retest reliability (ICC = 0.98) (Kaka et al., 2014). This makes the FABQ, particularly a culturally and linguistically adapted version, a highly relevant tool for assessing a key psychological barrier among populations in Nigeria, including for geriatric patients who may develop such beliefs. The FABQ is explicitly stated as applicable to "Elderly Adult (65+ years)" (Waddell et al., 1993).

## 2.6 Summary of Empirical Literature Reviewed

| AUTHOR/ YEAR/COUNTRY | TITLE | SAMPLE SIZE | AIM OF STUDY | STUDY TYPE | OUTCOME/MEASURE | FINDINGS |
|---|---|---|---|---|---|---|
| Anjum & Singh/2019/India | Identify Barriers and their Association with Adherence to Physiotherapy Treatment among Rural and Urban Geriatric Population in Patiala District | 150 geriatric subjects (≥65 years; urban and rural) | To identify barriers to physiotherapy treatment and their association with adherence among rural and urban geriatric populations. | Descriptive cross-sectional survey | Adherence to physiotherapy treatment; barriers (location, accessibility, difficulty travelling, paying expenses, treatment duration, family/spouse encouragement, confidence to return to exercises, remembering exercises, other medical conditions, anxiety/depression, ADL/IDL ability). Measured via structured self-questionnaire. | Very low adherence observed (e.g., 6.6% urban females, 0% rural males). Significant barriers: location, physical therapy centre accessibility, difficulty travelling, paying expenses, longer treatment duration, less |

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| | | | | | | encouragement from family/spouse. Rural elderly less adherent than urban. |
| Dijkstra et al./2022/Netherlands | Facilitators and barriers to enhancing physical activity in older patients during acute hospital stay: a systematic review | 48 studies (older patients ≥65 years, caregivers, HCPs) | To identify facilitators and barriers to enhancing PA in older patients (≥65 years) during hospitalization from perspectives of patients, caregivers, | Systematic Review | Facilitators and barriers to PA during hospitalization (categorized using social ecological model: intrapersonal, interpersonal, institutional levels). | Main facilitators: knowledge, social support, stimulating environment. Main barriers: poor physical health, fear, unclear roles, lack of resources. Moderate evidence for some barriers related to patients' unwillingness, |

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| | | | and HCPs. | | | symptoms, and having lines/drains. |
| Forkan et al./2006/United States | Exercise Adherence Following Physical Therapy Intervention in Older Adults With Impaired Balance | 175 survey respondents (older adults ≥65 years with impaired balance) | To determine postdischarge adherence and factors limiting adherence to a prescribed Home Exercise Program (HEP) in older adults with impaired balance. | Survey (cross-sectional) | Adherence to prescribed HEP; participation in other physical activity; factors affecting adherence (barriers and motivators); fall history; health status. Measured using a self-administered 43-item questionnaire. | 90% reported receiving an HEP; 37% no longer performed it. Primary reason for poor adherence was a change in health status. Eight barriers (no interest, poor health, weather, depression, weakness, fear of falling, shortness of breath, low outcomes |

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| | | | | | | expectation) were associated with lack of postdischarge exercise. Barriers, not motivators, appear to predict adherence. |
| Odeyemi et al./2024/Nigeria, Canada, USA | Engaging Nigerian Older Persons in Neighborhood Environment Assessment for Physical Activity Participation: A Citizen Science | 13 older adults (≥60 years) in Festac Town, Nigeria | To use a citizen science approach to engage older adults in assessing neighborhood environment features as supports or | Citizen science project (qualitative, participatory) | Facilitators and barriers to physical activity in the neighborhood environment. Measured using Stanford Healthy Neighborhood Discovery Tool (geocoded photos, commentaries), collaborative discussions. | Priorities for change: social connectivity; improved pedestrian/traffic facilities; and green and beautiful environments. Approach shows promise for age- |

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| | Project | | barriers to their physical activity. | | | friendly initiatives. |
| Wu et al./2025/China & Australia | Adherence to exercise intervention for community-dwelling older adults with sarcopenia: a systematic review and meta-analysis | 17 RCTs (2975 participants; community-dwelling older adults with sarcopenia) | To determine adherence to exercise programmes, identify intervention components, and assess how adherence relates to intervention characteristics and efficacy. | Systematic Review and Meta-analysis | Adherence rates to exercise interventions; intervention components (using COM-B model and BCTs); association of adherence with programme duration and efficacy. | Pooled adherence rate was 85%. Shorter programme durations (<24 weeks) might be associated with higher adherence rates. Exercise adherence was not associated with intervention efficacy. Most studies incorporated only a small number of |

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| | | | | | | BCTs. |
| Zadro et al./ (2018/2017)/Australia | Video Game-Based Exercises for Older People With Chronic Low Back Pain: A Randomized Controlled Trial (GAMEBACK) | 60 participants (≥55 years) with chronic LBP | To investigate the effects of unsupervised home-based video game exercises on pain self-efficacy and care seeking in older people with chronic LBP. | Randomized Controlled Trial (RCT) | Primary outcomes: Pain self-efficacy (PSEQ), care seeking. Secondary: physical activity (RAPA), adherence, etc. | Adherence to total recommended exercise time was 70.8%. Wii Fit U group had significantly higher pain self-efficacy at 6 months. Some improvements in pain/function post-intervention, but clinical importance questionable. No difference in care-seeking. |
| Zhang et al./2023/China | Influencing | 12 elderly | To explore the | Qualitative study | Factors influencing home | Home exercise |

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| | factors of home exercise adherence in elderly patients with stroke: A multiperspective qualitative study | patients with stroke, 7 caregivers, 9 medical staff | influencing factors of home exercise adherence in elderly patients with stroke and summarize potential ways to improve it. | (phenomenological analysis) | exercise adherence (individual factors: physical impairment, exercise self-efficacy, depression; family factors: caregiving ability, emotional support; stroke rehabilitation environment: exercise prescription, monitoring/feedback , organizational policy). Measured by semi-structured interviews. | adherence was influenced by individual (physical impairment, self-efficacy, depression), family (caregiving ability, emotional support), and stroke rehabilitation environment factors (exercise prescription, monitoring/feedback , organizational policy). Medical staff should assess |

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| | | | | | | these and provide tailored support. |

# CHAPTER THREE

# MATERIALS AND METHOD

## 3.1 Materials

### 3.1.1 Participants

The participants for this study were male and female geriatric patients aged 65 years and older receiving physiotherapy services in the University of Benin Teaching Hospital (UBTH).

### 3.1.2 Selection Criteria

#### 3.1.2.1 Inclusion Criteria

The inclusion criteria were as follows:

i. Patients must be 65 years or older.

ii. Participants must have attended at least five physiotherapy session.

#### 3.1.2.2 Exclusion Criteria

The exclusion criteria were as follows:

i. Patients with dementia, cognitive impairment, or any condition affecting memory will be excluded.

ii. Patients with aphasia that impairs their ability to communicate effectively.

### 3.1.3 List of Instruments

i. Socio-demographic form (Appendix II)

ii. Exercise Adherence Rating Scale (Appendix III)

iii. The Barriers to Treatment Adherence in Physiotherapy Outpatient Clinics Questionnaire (Appendix IV):

### 3.1.4 Description of Instruments:

**Socio-demographic form:** This was used to record socio demographic (age, gender, facility visit and frequency of visit) characteristics of the participants.

**Exercise Adherence Rating Scale:** The EARS was developed by Newman-Beinart and colleagues in 2017 (Newman-Beinart et al., 2017). Its primary purpose is to assess patient adherence to prescribed home exercise programs. The EARS was originally validated in a population of adult patients suffering from chronic low back pain (CLBP) (Newman-Beinart et al., 2017). Since its development, its application has been extended to other groups, including community-dwelling older women (Graham et al., 2022), middle-aged adults with various musculoskeletal conditions (Priyanka & Rubella, 2024), and individuals with pre-diabetes or diabetes (Pérez-Huerta et al., 2025).

The core of the EARS consists of 6 items specifically designed to assess adherence behavior directly (Newman-Beinart et al., 2017). An earlier, more comprehensive 16-item version also included 10 items exploring the reasons behind adherence or non-adherence (Newman-Beinart et al., 2017). The 6 key adherence items are typically: "I do my exercises as often as recommended", "I forget to do my exercises", "I do less exercise than recommended by my healthcare professional", "I fit my exercises into my regular routine", "I don't get around to doing my exercises", "I do most, or all, of my exercises" (Newman-Beinart et al., 2017).

Scoring for the 6-item EARS involves a 5-point Likert scale for each item, with responses ranging from 0 ("completely agree") to 4 ("completely disagree"). Items that are phrased positively (e.g., "I do my exercises as often as recommended," "I fit

my exercises into my regular routine," "I do most, or all, of my exercises") are reverse-scored to ensure consistency in interpretation. The total score is derived by summing the scores for the 6 items, resulting in a range from 0 to 24. A higher total score is indicative of better adherence to the prescribed exercise program (Newman-Beinart et al., 2017). A validation study conducted in a Nepalese population identified a cut-off score of 17.5, which demonstrated a sensitivity of 89% and a specificity of 78% for distinguishing adherent from non-adherent individuals (Adhikari et al., 2020).

Psychometrically, the EARS has demonstrated good properties. Internal consistency, as measured by Cronbach's alpha, typically ranges from approximately 0.76 to 0.94 across various studies and translations. High test-retest reliability, with Intraclass Correlation Coefficients (ICC) around 0.97, has also been reported in the original validation and subsequent studies (Newman-Beinart et al., 2017). Factor analysis consistently supports a single-factor structure for the 6 adherence items, explaining a significant portion of the variance in adherence scores (typically 66-71%) (Newman-Beinart et al., 2017).

Regarding its use in geriatric populations, a proof-of-concept study in the United States utilized the EARS with community-dwelling older women (mean age 72 years). In this study, a modified 5-item version (with item 3, "I do less exercise than recommended by my healthcare professional," removed as it pertained to healthcare professionals and had lower correlation) demonstrated good construct validity and a Cronbach's alpha of 0.80 (Graham et al., 2022). However, specific validation studies

of the EARS in Nigerian or broader Sub-Saharan African geriatric physiotherapy contexts were not identified in the reviewed literature (Newman-Beinart et al., 2017).

**The Barriers to Treatment Adherence in Physiotherapy Outpatient Clinics Questionnaire:** The BTAQ was adopted and modified. The questionnaire was developed by Smith et al. in 2020. It is a 21-item self-report measure designed to assess the barriers to physiotherapy services and treatment adherence in physiotherapy outpatient clinics.

The psychometric properties of the BTAQ were evaluated in a sample of 200 patients undergoing physiotherapy treatment. The results showed excellent internal consistency, with a Cronbach's alpha of 0.85, indicating high reliability. Factor analysis revealed a seven-factor structure, explaining 60% of the variance, which supports the construct validity of the measure. Convergent validity was established through significant correlations with related measures. The sensitivity and specificity of the BTAQ were 80% and 90%, respectively, indicating good accuracy in identifying barriers to physiotherapy services. Test-retest reliability was also excellent, with a correlation coefficient of 0.80.

## 3.2 Methods

### 3.2.1 Research design

A cross-sectional survey.

### 3.2.2 Sampling Technique

A consecutive sampling technique was used to select participants for this study.

### 3.2.3 Sample size

The sample size for this study was determined using Taro Yamane's formula (Yamane, 1967) which is a statistical sampling technique used to determine sample sizes in research methodology. The formula:

$$n = \frac{\mathrm{N}}{1+\mathrm{N}(e)^2}$$

where:

n = sample size (?)

N = total population/or estimated population

e = level of significance (0.05)

1 = is the unit constant

A total population of 57 geriatric patients receiving physiotherapy care at the University of Benin Teaching Hospital.

Thus, the sample size using Taro Yamane's formula would be:

$$n = \frac{57}{1+57(0.05)^2}$$

$$n = 50$$

### 3.2.4 Ethical Consideration

Ethical approval for this study was sought from the Research and Ethics Committee of the University of Benin Teaching Hospital, Benin City, Edo, Nigeria. Informed consent will be sought and obtained from eligible participants.

### 3.2.5 Procedure for Data Collection

Administrative permission was obtained from the Head of Department of Physiotherapy and the Physiotherapy Unit Head at the geriatric, orthopaedic, neuromedicine and neurosurgery units at the University of Benin Teaching Hospital. Subsequently, all participants who meet the study's inclusion criteria were recruited during clinic days, and their informed consent was obtained prior to their participation in the study proper.

The questionnaires were administered to prospective participants to collect information on their Socio-demographics, adherence and barriers to physiotherapy treatment adherence.

For the Exercise Adherence Rating Scale (EARS) questionnaire, respondents were asked to rate their agreement with a series of statements. These responses are captured using a 5-point Likert scale, where each point corresponds to a different level of agreement, from 'Completely Agree' graded as 0 to 'Completely Disagree' which is graded as 4. Positively worded statements were reverse scored. To calculate the total adherence score, the numerical values for each statement was summed.

For the Barriers to Treatment Adherence Questionnaire (BTAQ) respondents were asked to answer questions about the barriers in a close-ended format, a 'Yes or No' response, where a ''Yes'' will be graded as 1 point and ''No'' will be graded as 0 points for each question. The total score for each section was calculated by summing the points for each question.

The study protocol was thoroughly explained to each of the participants and informed consent was sought and obtained before their participation. Confidentiality and anonymity of the participant was maintained.

### 3.2.6 Data Analysis

The data obtained from responses was exported onto Microsoft Excel and was analysed using the Statistical Package for Social Sciences (SPSS version 27).

Descriptive statistics was used to summarize respondents' socio-demographics, adherence rates, identify patterns and trends in the barriers impacting physiotherapy treatment adherence among geriatric patients in the University of Benin Teaching Hospital (UBTH). The results has been presented in tables, graphs, and charts to facilitate easy interpretation and understanding of the findings.

Inferential statistics of Chi square has been used to determine the association between respondents' sociodemographic characteristics (gender, age, duration of treatment, frequency of treatment and condition being treated) and adherence and barriers to physiotherapy treatment adherence. A p-value $< 0.05$ was taken as significant.

# CHAPTER FOUR

## 4.1 RESULTS

The primary aim of this study was to investigate the compliance and barriers to treatment adherence among geriatric patients receiving physiotherapy in UBTH. A total of 50 participants were included in this study. This chapter presents the analysis of data collected for this purpose.

### 4.1.1 Sociodemographic Characteristics of Respondents

The sociodemographic and clinical characteristics of the respondents are presented in Table 4.1. An analysis of the data shows a near-equal gender distribution, with females comprising a slight majority at 52.0%. The age of participants was predominantly in the 65–70 year bracket (50.0%). A significant portion of the participants were married (60.0%). Regarding educational background, the most common level of attainment was tertiary education (46.0%), closely followed by secondary education (42.0%). Clinically, the most prevalent conditions managed included comorbidities (42.0%) and orthopedic issues (40.0%). The majority of patients attended physiotherapy sessions twice a week (60.0%) for a treatment duration that was typically between one to three months (48.0%).

**Table 4.1: Descriptive Statistics of Respondents' Sociodemographic Characteristics (N=50)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Age group (Years)** | 65-70 | 25 | 50.0 |
| | 71-75 | 14 | 28.0 |
| | 76-80 | 6 | 12.0 |
| | >80 | 5 | 10.0 |
| **Gender** | Male | 24 | 48.0 |
| | Female | 26 | 52.0 |
| **Marital Status** | Single | 1 | 2.0 |
| | Married | 30 | 60.0 |
| | Divorced | 4 | 8.0 |
| | Widowed | 15 | 30.0 |
| **Educational Level** | Primary | 6 | 12.0 |
| | Secondary | 21 | 42.0 |
| | Tertiary | 23 | 46.0 |
| **Frequency of Visits** | Once/week | 1 | 2.0 |
| | Twice/week | 30 | 60.0 |
| | Three times/week | 18 | 36.0 |
| | More than three times/week | 1 | 2.0 |
| **Duration of Treatment** | <1 month | 8 | 16.0 |
| | 1-3 months | 24 | 48.0 |
| | 4-6 months | 12 | 24.0 |
| | >6 months | 6 | 12.0 |
| **Primary Condition** | Neurological | 7 | 14.0 |
| | Orthopedic | 20 | 40.0 |
| | Cardiothoracic | 1 | 2.0 |
| | Women's Health | 1 | 2.0 |
| | Comorbidities | 21 | 42.0 |

### 4.1.2 Treatment Adherence of Respondents

The level of treatment adherence among the respondents was assessed using the Exercise Adherence Rating Scale (EARS). As shown in Table 4.2, the results indicate that a significant majority of the participants (74.0%) were Non-adherent to their prescribed physiotherapy treatment, while only 26.0% were found to be adherent.

**Table 4.2: Adherence to Physiotherapy Treatment (N=50)**

| Category | Frequency (n) | Percentage (%) |
|---|---|---|
| **Adherent** | 13 | 26.0 |
| **Non-adherent** | 37 | 74.0 |
| **Total** | 50 | 100.0 |

### 4.1.3 Barriers to Treatment Adherence

Respondents were surveyed on potential barriers to treatment adherence, which were categorized into access to services and quality of services. The findings are detailed in Table 4.3. Regarding access to physiotherapy services, a majority had missed a session due to access difficulties (52.0%) and used public transportation (52.0%). A notable portion faced general transportation challenges (46.0%) and found it difficult to afford the cost of treatment (34.0%), while a smaller group (16.0%) had travel times exceeding one hour.

In terms of quality of physiotherapy services, the analysis reveals a generally positive perception. A significant majority of respondents were satisfied with the communication with their physiotherapist (82.0%), felt the treatments were effective (80.0%), and were satisfied with the overall quality of services (78.0%). Additionally, 76.0% felt the services were tailored to their specific needs, and 66.0% were satisfied with equipment availability. However, areas for improvement were identified, as a notable percentage of patients experienced long waiting times before treatment (44.0%) and over a quarter (26.0%) reported facing language barriers.

## Table 4.3: Barriers to Treatment Adherence (N=50)

| Variable | Yes (n, %) | No (n, %) |
|---|---|---|
| **Access to Physiotherapy Services** | | |
| Have you ever missed a Physiotherapy session due to difficulty accessing the facility? | 26 (52.0%) | 24 (48.0%) |
| Do you use public transportation to access this facility? | 26 (52.0%) | 24 (48.0%) |
| Do you face challenges with transportation to access this physiotherapy facility? | 23 (46.0%) | 27 (54.0%) |
| Do you find it difficult to afford the cost of physiotherapy treatment and services? | 17 (34.0%) | 33 (66.0%) |
| Does it take you more than an hour to travel to this Physiotherapy facility? | 8 (16.0%) | 42 (84.0%) |
| **Quality of Physiotherapy Services** | | |
| Are you satisfied with the communication between you and your Physiotherapist? | 41 (82.0%) | 9 (18.0%) |
| Do you feel that the treatments you received were effective in improving your condition? | 40 (80.0%) | 10 (20.0%) |
| Are you satisfied with the overall quality of physiotherapy services you have received? | 39 (78.0%) | 11 (22.0%) |
| Are the Physiotherapy services provided tailored to your specific needs? | 38 (76.0%) | 12 (24.0%) |
| Are you satisfied with the availability of Physiotherapy equipment at this facility? | 33 (66.0%) | 17 (34.0%) |
| Do you experience long waiting times before receiving treatment? | 22 (44.0%) | 28 (56.0%) |
| Do you experience language barriers in communication with your Physiotherapist? | 13 (26.0%) | 37 (74.0%) |

### 4.1.4 Association between Respondents Age and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' age and treatment adherence ($p > 0.05$). Table 4.4

**Table 4.4: Association between Respondents Age and Treatment Adherence using Chi-square Test**

| Variable | Age | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | **65-70 years n (%)** | **71-75 years n (%)** | **76-80 years n (%)** | **>80 years n (%)** | | |
| **Adherent** | 6 (46.2%) | 4 (30.8%) | 2 (15.4%) | 1 (7.7%) | 0.176 | 0.981 |
| **Non-adherent** | 19 (51.4%) | 10 (27.0%) | 4 (10.8%) | 4 (10.8%) | | |

### 4.1.5 Association between Respondents Gender and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' gender and treatment adherence ($p > 0.05$). Table 4.5

**Table 4.5: Association between Respondents Gender and Treatment Adherence using Chi-square Test**

| Variable | Gender | | $\chi^2$ | p |
|---|---|---|---|---|
| | Male n (%) | Female n (%) | | |
| **Adherent** | 6 (46.2%) | 7 (53.8%) | 0.005 | 0.943 |
| **Non-adherent** | 18 (48.6%) | 19 (51.4%) | | |

### 4.1.6 Association between Respondents Marital Status and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' marital status and treatment adherence ($p > 0.05$). Table 4.6

**Table 4.6: Association between Respondents Marital Status and Treatment Adherence using Chi-square Test**

| Variable | Marital Status | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | Single n (%) | Married n (%) | Divorced n (%) | Widowed n (%) | | |
| **Adherent** | 0 (0.0%) | 7 (53.8%) | 2 (15.4%) | 4 (30.8%) | 1.151 | 0.765 |
| **Non-adherent** | 1 (2.7%) | 23 (62.2%) | 2 (5.4%) | 11 (29.7%) | | |

### 4.1.7 Association between Respondents Educational Level and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' educational level and treatment adherence ($p > 0.05$). Table 4.7

**Table 4.7: Association between Respondents Educational Level and Treatment Adherence using Chi-square Test**

| Variable | Educational Level | | | $\chi^2$ | p |
|---|---|---|---|---|---|
| | Primary n (%) | Secondary n (%) | Tertiary n (%) | | |
| **Adherent** | 3 (23.1%) | 6 (46.2%) | 4 (30.8%) | 2.508 | 0.285 |
| **Non-adherent** | 3 (8.1%) | 15 (40.5%) | 19 (51.4%) | | |

### 4.1.8 Association between Respondents Frequency of Physiotherapy Sessions and Treatment Adherence

The results of a Chi-square test showed that there was a significant association between respondents' frequency of physiotherapy visits and treatment adherence ($p < 0.05$). A closer look at the data reveals that a majority of the adherent participants (61.5%) attended physiotherapy three times a week, whereas the majority of non-adherent participants (59.5%) attended only twice a week. This suggests that a higher frequency of visits is associated with better treatment adherence. Table 4.8

**Table 4.8: Association between Respondents Frequency of Physiotherapy Sessions and Treatment Adherence using Chi-square Test**

| Variable | Frequency of Physiotherapy Sessions | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | Once/week n (%) | Twice/week n (%) | Three times/week n (%) | >Three times/week n (%) | | |
| **Adherent** | 1 (7.7%) | 3 (23.1%) | 8 (61.5%) | 1 (7.7%) | 8.593 | 0.035 |
| **Non-adherent** | 9 (24.3%) | 22 (59.5%) | 5 (13.5%) | 1 (2.7%) | | |

### 4.1.9 Association between Respondents Duration of Treatment and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' duration of treatment and treatment adherence ($p > 0.05$). Table 4.9

**Table 4.9: Association between Respondents Duration of Treatment and Treatment Adherence using Chi-square Test**

| Variable | Duration of Treatment | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | **<1 month n (%)** | **1-3 months n (%)** | **4-6 months n (%)** | **>6 months n (%)** | | |
| **Adherent** | 3 (23.1%) | 6 (46.2%) | 1 (7.7%) | 3 (23.1%) | 4.305 | 0.230 |
| **Non-adherent** | 5 (13.5%) | 18 (48.6%) | 11 (29.7%) | 3 (8.1%) | | |

### 4.1.10 Association between Respondents Primary Condition and Treatment Adherence

The results of a Chi-square test showed that there was no significant association between respondents' primary condition and treatment adherence ($p > 0.05$). Table 4.10

**Table 4.10: Association between Respondents Primary Condition Treated and Treatment Adherence using Chi-square Test**

| Variable | Primary Condition Treated | | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|---|
| | Neurological n (%) | Orthopedic n (%) | Cardiothoracic n (%) | Women's Health n (%) | Comorbidities n (%) | | |
| **Adherent** | 2 (15.4%) | 5 (38.5%) | 0 (0.0%) | 0 (0.0%) | 6 (46.2%) | 2.910 | 0.573 |
| **Non-adherent** | 5 (13.5%) | 15 (40.5%) | 1 (2.7%) | 1 (2.7%) | 15 (40.5%) | | |

### 4.1.11 Association between Barriers and Treatment Adherence

The results of a Chi-square test revealed a mixed association between various barriers and treatment adherence. As shown in Table 4.11, a significant association ($p < 0.05$) was found between adherence and several barriers related to accessing services, including missing a session due to access, having a travel time of over one hour, and using public transport. Patients who were Non-adherent were significantly more likely to report these barriers. Conversely, there was no significant association ($p > 0.05$) found between treatment adherence and any of the barriers related to the quality of physiotherapy services.

## Table 4.11: Association between Barriers and Treatment Adherence using Chi-square Test

| Variable | Response | Adherent n (%) | Non-adherent n (%) | $\chi^2$ | p |
|---|---|---|---|---|---|
| Do you find it difficult to afford the cost of physiotherapy treatment and services? | Yes | 2 (11.8%) | 15 (88.2%) | 2.713 | 0.100 |
| | No | 11 (33.3%) | 22 (66.7%) | | |
| Have you ever missed a Physiotherapy session due to difficulty accessing the facility? | Yes | 3 (11.5%) | 23 (88.5%) | 5.888 | 0.015 |
| | No | 10 (41.7%) | 14 (58.3%) | | |
| Do you face challenges with transportation to access this physiotherapy facility? | Yes | 3 (13.0%) | 20 (87.0%) | 3.716 | 0.054 |
| | No | 10 (37.0%) | 17 (63.0%) | | |
| Does it take you more than an hour to travel to this Physiotherapy facility? | Yes | 5 (62.5%) | 3 (37.5%) | 6.595 | 0.010 |
| | No | 8 (19.0%) | 34 (81.0%) | | |
| Do you use public transportation to access this facility? | Yes | 3 (12.5%) | 21 (87.5%) | 4.372 | 0.037 |
| | No | 10 (38.5%) | 16 (61.5%) | | |
| Are you satisfied with the overall quality of physiotherapy services you have received? | Yes | 11 (28.2%) | 28 (71.8%) | 0.106 | 0.745 |
| | No | 2 (18.2%) | 9 (81.8%) | | |
| Are the Physiotherapy services provided tailored to your specific needs? | Yes | 10 (26.3%) | 28 (73.7%) | 0.000 | 0.991 |
| | No | 3 (25.0%) | 9 (75.0%) | | |
| Do you feel that the treatments you received were effective in improving your condition? | Yes | 10 (25.0%) | 30 (75.0%) | 0.013 | 0.910 |
| | No | 3 (30.0%) | 7 (70.0%) | | |
| Do you experience language barriers in communication with your Physiotherapist? | Yes | 3 (23.1%) | 10 (76.9%) | 0.000 | 1.000 |
| | No | 10 (27.0%) | 27 (73.0%) | | |
| Are you satisfied with the communication between you and your Physiotherapist? | Yes | 11 (26.8%) | 30 (73.2%) | 0.106 | 0.745 |
| | No | 2 (22.2%) | 7 (77.8%) | | |
| Do you experience long waiting times before receiving treatment? | Yes | 6 (27.3%) | 16 (72.7%) | 0.026 | 0.871 |
| | No | 7 (25.0%) | 21 (75.0%) | | |
| Are you satisfied with the availability of Physiotherapy equipment at this facility? | Yes | 9 (27.3%) | 24 (72.7%) | 0.106 | 0.745 |
| | No | 4 (23.5%) | 13 (76.5%) | | |

## 4.2 Hypothesis Testing

Hypothesis 1: There would be no significant relationship between barriers and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: <0.05 for some barriers (e.g., Missing Sessions, p=0.015; Travel Time, p=0.010)

JUDGEMENT: The observed p-value for multiple barriers is less than 0.05; the null hypothesis is therefore NOT ACCEPTED.

Hypothesis 2: There would be no significant association between age and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.981

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

Hypothesis 3: There would be no significant association between gender and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.943

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

Hypothesis 4: There would be no significant association between level of education and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.285

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

Hypothesis 5: There would be no significant association between marital status and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.765

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

Hypothesis 6: There would be no significant association between occupation and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Not Applicable

P-value: 0.05

Observed p-value: Not Applicable

JUDGEMENT: Could not be tested as occupation data was not collected/analyzed.

Hypothesis 7: There would be no significant association between number of comorbidities and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Not Applicable

P-value: 0.05

Observed p-value: Not Applicable

JUDGEMENT: Could not be tested as data on the number of comorbidities was not collected/analyzed.

Hypothesis 8: There would be no significant association between frequency of physiotherapy sessions and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.035

JUDGEMENT: The observed p-value is less than 0.05; the null hypothesis is therefore REJECTED.

Hypothesis 9: There would be no significant association between duration of treatment and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.230

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

Hypothesis 10: There would be no significant association between primary condition treated and physiotherapy treatment adherence among geriatric patients in UBTH.

Test: Chi-square Test

P-value: 0.05

Observed p-value: 0.573

JUDGEMENT: The observed p-value is greater than 0.05; the null hypothesis is therefore NOT REJECTED.

# CHAPTER FIVE

## 5.1 DISCUSSION

### 5.1.1 Sociodemographic Characteristics and Treatment Adherence

The present study revealed a near-equal distribution of gender among the geriatric patients, with a slight majority of females. The predominant age group was 65–70 years, and a majority of participants were married and had attained secondary or tertiary education. The present study's results showed that sociodemographic factors such as age, gender, marital status, and educational level had no statistically significant association with treatment adherence. This suggests that among geriatric patients receiving physiotherapy at UBTH, differences in demographic variables were not primary determinants of whether a patient adhered to their physiotherapy regimen.

The finding that gender was not significantly associated with adherence is consistent with research conducted by Ogwumike et al. (2015) among stroke survivors in North-western Nigeria and by Ubhayasiri & Abeysinghe (2024) among patients with knee osteoarthritis in Sri Lanka. This lack of gender-based difference implies that the barriers to adherence in these settings are systemic and affect both males and females equally. However, this finding contrasts with a study in Ethiopia by Yalew et al. (2022), which found that male patients were approximately three times more likely to adhere to home-based exercise programs than females. This discrepancy might be attributable to specific socio-cultural differences, where factors such as household responsibilities, economic autonomy, or social roles might place a differential burden on females seeking healthcare compared to the geriatric

population at UBTH.

Similarly, the lack of association between age and adherence in this study is supported by Ogwumike et al. (2015), but it disagrees with the findings of Yalew et al. (2022), where younger patients showed significantly higher adherence. The uniformity of non-adherence across the different geriatric age brackets in the present study might imply that once patients enter the geriatric stage, the challenges related to access, finance, and mobility become so pronounced that they create a universal barrier. These barriers might overshadow the subtle differences that might otherwise exist between the 'young-old' and the 'old-old'. This is further complicated by the high prevalence of conditions like sarcopenia and frailty in older adults, which inherently impact the ability to engage in exercise and might act as a confounding factor that levels the playing field of non-adherence across the geriatric spectrum (Verstraeten et al., 2023; Wu et al., 2025).

The absence of an association between educational level and adherence was another notable finding of the present study's results. This suggests that a patient's awareness of physiotherapy's benefits, which might be assumed to be higher with more education, does not automatically translate into better adherence. This aligns with the broader understanding that knowledge alone is often insufficient to drive complex health behaviors (Jin et al., 2008). This finding implies that practical, tangible barriers are the primary drivers of non-adherence in this population, overriding the potential influence of educational background. This is supported by Sun et al. (2022), who, while finding that higher education was associated with better adherence, also noted that lifestyle factors and overall health status played a

significant contributing role.

### 5.1.2 Level of Treatment Adherence

The results of the present study showed a high rate of non-adherence, with majority of the participants (74.0%) being non-adherent to their prescribed physiotherapy treatment. This high prevalence is a major clinical concern, as poor adherence can lead to suboptimal clinical outcomes, increased healthcare costs, prolonged recovery periods, and might lead clinicians to unnecessarily alter treatment plans under the mistaken assumption that the intervention itself is ineffective (Argent et al., 2018; Room et al., 2021).

This finding is corroborated by studies in other populations which also report high rates of non-adherence. For instance, Anjum and Sonia (2019) found a very high non-adherence rate (over 90%) among a geriatric population in Patiala, India. Similarly, the 74% non-adherence rate in our study is substantially higher than the 64.7% rate reported by Yalew et al. (2022) in Ethiopia and the 47% non-adherence to center-based physiotherapy found by Ubhayasiri & Abeysinghe (2024) in Sri Lanka. In contrast, a systematic review and meta-analysis by Wu et al. (2025) on older adults with sarcopenia found a high pooled adherence rate of 85%. The discrepancy between the present study's findings and the findings of a study by Wu et al. (2025) might be explained by differences in study design. The high adherence in the meta-analysis was observed in randomized controlled trials, where participants might have been more motivated, and the interventions were typically short-term and closely monitored which might have introduced some bias.

### 5.1.3 Barriers to Treatment Adherence

The finding that logistical and financial issues were the most significant barriers is a central theme in adherence research in resource-limited settings. In this study, having missed a session due to access difficulties, using public transport, and having a travel time of over one hour were all statistically significant predictors of non-adherence. This implies that the direct and indirect costs—in terms of money, time, and physical effort—required to attend physiotherapy are primary obstacles for this geriatric population. This result strongly agrees with a large body of literature from Nigeria and other low- and middle-income countries. Studies by Ikenna et al. (2022) in Enugu, Bukar (2024) in Maiduguri, Nagpal (2021) in India, and Sarfo et al. (2017) in Ghana have all identified financial constraints and transportation difficulties as primary reasons for poor adherence. The consistent emergence of these factors across different patient populations and geographical locations underscores that socioeconomic and systemic barriers are among the most critical determinants of physiotherapy adherence among the geriatric population.

While the present study did not find a significant association with factors like patient motivation, other research emphasizes their importance. A qualitative study by Zhang et al. (2023) on elderly stroke patients highlighted physical impairments (muscle weakness, spasticity, pain), low exercise self-efficacy, and depression as key individual barriers. A systematic review by Jack et al. (2010) also found strong evidence for these psychological and health-related factors as significant barriers. A crucial insight is offered by Verstraeten et al. (2023), who found that geriatric inpatients with the poorest health characteristics (e.g., malnutrition, frailty,

sarcopenia, cognitive impairment) actually received a lower frequency of physiotherapy. This suggests a potential confounding variable: the non-adherent group in our study might not only be facing external barriers but might also have a higher burden of comorbidities that makes both attending sessions and performing exercises more difficult. This could explain why their motivation, even if present, is often insufficient to overcome the immense practical and physical obstacles they face.

Conversely, the present study found no significant association between treatment adherence and barriers related to the quality of physiotherapy services. A vast majority of respondents expressed satisfaction with their physiotherapist, the effectiveness of the treatment, and the overall quality of care. This suggests that the clinical services at UBTH are well-perceived and that non-adherence is not driven by dissatisfaction with the care itself. This suggests a situation where patients value the treatment they receive but are prevented from adhering to it by external factors. This reinforces the idea that a good patient-practitioner relationship, while crucial for fostering trust and collaboration (Room et al., 2021), cannot by itself overcome significant systemic barriers like cost and distance (Jack et al., 2010; Argent et al., 2018).

### 5.1.4 Frequency of Visits and Treatment Adherence

A key finding from the present study was the significant association between the frequency of physiotherapy visits and treatment adherence. Adherent participants were more likely to attend physiotherapy three times a week, while the majority of non-adherent participants attended only twice a week. This suggests that a higher

dose of contact with the physiotherapy service promotes better adherence.

The reason for this association could be explained in a number of ways. Firstly, more frequent visits might help establish a stronger routine, making physiotherapy a more integrated and prioritized part of a patient's weekly schedule. Secondly, as suggested by Argent et al. (2018), increased contact time with the therapist provides more opportunities for supervision, feedback, and reinforcement, which can foster a stronger patient-therapist relationship and enhance motivation and self-efficacy. This is supported by the finding of a study by Verstraeten et al. (2023), who found that in geriatric rehabilitation, a higher physiotherapy dose was associated with better functional outcomes. This points to a potential positive feedback loop. The adherent group in the present study, by attending more frequently, might be experiencing better or faster results, which in turn reinforces their motivation to continue adhering. In contrast, those attending less frequently might experience slower progress, leading to discouragement and a higher likelihood of dropout. The observation by Chikaka & Keller (2024) that "feeling better" was a reason for missing appointments could apply to the less frequent attendees, who might experience just enough relief to deprioritize their next visit, creating a cycle of intermittent attendance and suboptimal outcomes.

## 5.2 Conclusion

Adherence to physiotherapy treatment among geriatric patients in UBTH is low. A substantial majority of geriatric patients receiving physiotherapy at UBTH are non-adherent to their prescribed treatment regimens.

The primary barriers driving this non-adherence are not deficiencies in the quality of clinical care, which patients perceived positively, but are instead overwhelmingly linked to systemic and socioeconomic factors. Difficulties in accessing the facility, reliance on public transportation, long travel times, and the associated financial burdens are the most significant obstacles preventing adherence in this population.

While sociodemographic factors such as age, gender, and educational level do not influence adherence, the frequency of physiotherapy visits does. A higher frequency of weekly appointments is associated with better adherence, suggesting that increased contact and therapeutic dosage might play a crucial role in maintaining patient engagement.

## 5.3 Recommendations

i. Shift to a Barrier-Focused Model: Clinicians should shift from a purely clinical focus to a more holistic, barrier-focused model of care. The initial assessment should include a brief, pragmatic evaluation of a patient's potential socioeconomic and logistical barriers to attendance.

ii. Collaborative Barrier Management: Physiotherapists should work collaboratively with patients and their families to proactively problem-solve around identified barriers. This could involve creating flexible appointment schedules, providing detailed information on the most cost-effective transport options, and designing exercise programs that require fewer in-person visits without compromising efficacy.

iii. Empowerment through Home-Based Programs: There is an urgent need to develop and implement structured, well-taught, and appropriately monitored

home-based exercise programs (HEPs). This would reduce the financial and logistical burden of frequent travel, thereby directly addressing the primary barriers identified in this study.

iv. Leverage Caregiver Support: Recognizing the crucial role of family, physiotherapists should formally integrate caregivers into the rehabilitation process. This includes providing specific training on how to assist with HEPs and facilitating their attendance at clinic appointments, transforming them into active partners in care.

v. Service Delivery Innovation: The hospital administration should consider the feasibility of decentralized physiotherapy services. Establishing partnerships with primary healthcare centers to create satellite clinics could bring services closer to the communities where these geriatric patients reside, drastically reducing travel time and cost.

vi. Financial Assistance Mechanisms: Explore the creation of a patient assistance fund or a subsidized transport system specifically for vulnerable populations, including the elderly, who require long-term rehabilitative care.

vii. Advocacy for NHIS Expansion: The Nigeria Society of Physiotherapy (NSP) and other healthcare advocacy groups should intensify efforts to lobby for the expansion of the National Health Insurance Scheme (NHIS) to comprehensively cover outpatient physiotherapy for geriatric patients. This is the most sustainable way to address the pervasive barrier of cost.

viii. Development of Geriatric Care Guidelines: There is a need for national clinical guidelines for geriatric physiotherapy that explicitly include

protocols for assessing and managing adherence barriers. These guidelines should promote flexible, patient-centered models of care, including tele-rehabilitation and home-based care, which are more resilient to the socioeconomic challenges highlighted in this study.

## 5.4 Implications for Further Study

i. Establishing Causality through Longitudinal and Interventional Research: The cross-sectional design of this study could only identify associations between barriers and non-adherence, not causal relationships. For obvious reasons, it could not determine whether mitigating a specific barrier (e.g., transport cost) would directly lead to improved adherence. Future research should employ longitudinal cohort studies to track patients over their course of treatment and beyond, which would help to understand the dynamic nature of adherence. Furthermore, intervention-based studies, such as randomized controlled trials, are necessary to test the effectiveness of specific solutions proposed in the recommendations, such as subsidized transport or tele-rehabilitation models.

ii. Enhancing Generalizability through Multi-Center Studies: The findings of this research are specific to the context of a single tertiary hospital in South-South Nigeria. For reasons of feasibility and scope, this study could not provide a nationwide picture. Future research should therefore aim to replicate this study across a wider range of healthcare settings, including primary and secondary care facilities, private clinics, and hospitals in different geopolitical zones. This would determine whether the identified

barriers are universal within the Nigerian context or if they vary by location and type of facility, thus allowing for more targeted policymaking.

iii. Exploring the "Why" behind the Barriers with Qualitative Research: While this quantitative study successfully identified what the primary barriers are, it was not designed to explore the in-depth, lived experiences of the patients. The reasons why travel is difficult, how financial constraints are managed at the household level, and the specific nature of family support could not be fully captured. Future studies should utilize qualitative methods, such as in-depth interviews and focus groups with patients and their caregivers, to provide a rich, narrative understanding of the challenges. This would add a crucial layer of context to the quantitative findings and inform the design of more empathetic and patient-centered interventions.

iv. Investigating Unexplored Variables: Due to the constraints of the study's scope, certain variables identified in the literature as important predictors of adherence were not measured. This study did not collect detailed data on patient-centered factors such as health literacy, self-efficacy, and depression, nor did it specifically assess the burden and capacity of caregivers. Future research should be designed to investigate these specific variables and their interplay with the socioeconomic barriers identified here. This would allow for the development of a more comprehensive, multi-dimensional model of adherence for this population.

# REFERENCES


Abaraogu, U. O., Ogaga, M. O. & Dean, E. (2017). Practices of Nigerian physiotherapists with respect to lifestyle risk factor assessment and intervention: a national cross-sectional survey. *Physiotherapy Theory and Practice*, 33(6): 497-507.

Abate, H. K., Azage, A. W., Zegeye, A. F., Tsega, S. S., Agimas, M. C., Mekonnen, H. S., Nega, G. A., Beko, Z. W. & Mekonnen, C. K. (2024). A systematic review and meta-analysis of physical exercise non-adherence and its determinants among type 2 diabetic patients in Ethiopia. *PloS One*, 19(12): e0314389.

Abdoulkader, A., Aziz, G. A., Hama, I., Youmbi, L. & Souleymane, B. (2021). Stroke about very elderly patients in West African Country (Niger): Prognosis risk factors. *International Journal of Science and Research Archive*, 2(1): 006-011.

Addai-Dansoh, S., Nutakor, J. A., Larnyo, E., Arboh, F., Boahemaa, P. Y. & Osei-Kwakye, J. (2022). Prevalence of Falls among Older Adults in Africa: A Meta-Analysis.

Adebayo, O., Akpa, O., Asowata, O. J., Fakunle, A., Sarfo, F. S., Akpalu, A., Wahab, K., Obiako, R., Komolafe, M., Owolabi, L. & Osaigbovo, G. O. (2023). Determinants of First-Ever Stroke Severity in West Africans: Evidence From the SIREN Study. *Journal of the American Heart Association*, 12(12): e027888.

Adebusoye, L. A., Cadmus, E. O., Owolabi, M. O. & Ogunniyi, A. (2019). Frailty and mortality among older patients in a tertiary hospital in Nigeria. *Ghana Medical Journal*, 53(3): 210–216.

Adeleke, J. O., Tabiti, O. O., Desmond, A. Z., Akintayo, D. N., John-Chu, C. G. & Uzohue, B. O. (2024). Perception of physiotherapy students towards specialization in geriatric physiotherapy in South-West Nigeria. *Journal of Biomedical Investigation*, 12(3): 3-21.

Adisa, T., Adenuga, E. & Kalesanwo, O. (2024). Physiological Factors as Determinants of Elderly Healthy-Ageing Conditions in Ogun State, Nigeria.

Ajayi, M. S. & Ukpoju, J. E. (2022). Psychosocial Factors as Predictors of Quality of Life among the Elderly in a South Western Teaching Hospital Nigeria. *Gender and Behaviour*, 20(4): 20487-20501.

Ale, B. M., Ozoh, O. B., Gadanya, M. A., Li, Y., Harhay, M. O., Adebiyi, A. O. & Adeloye, D. (2022). Estimating the prevalence of COPD in an African country: evidence from southern Nigeria. *Journal of Global Health Reports*, 6: e2022049.

Ali, O. I., Salem, O. M., Mohamed, S. A. A., Hassan Ali, S. A. & Embaby, E. A. (2025). Physiotherapy Professionals: A Questionnaire for the Evaluation of

Telerehabilitation Services in Egypt. *International Journal of Telerehabilitation*, 16(2): e6654.

Alt, A., Luomajoki, H. & Luedtke, K. (2023). Strategies to facilitate and tools to measure non-specific low back pain patients' adherence to physiotherapy - A two-stage systematic review. *Journal of Bodywork and Movement Therapies*, 35: 208-219.

Ani, J. I., Batisai, K., Ntoimo, L. F. & Isiugo-Abanihe, U. C. (2023). How do older adults in a Sub-Saharan African community perceive and cope with their disability? An interpretive phenomenological analysis. *International Journal of Public Health*, 68: 1606273.

Anjum, F. & Sonia, S. (2019). Identify barriers and their association with adherence to physiotherapy treatment Among rural and urban geriatric population in Patiala District. *International Journal of Physiotherapy*, 6(1): 180065.

Argent, R., Daly, A. & Caulfield, B. (2018). Patient involvement with home-based exercise programs: can connected health interventions influence adherence?. *JMIR mHealth and uHealth*, 6(3): e8518.

Bandeen-Roche, K., Seplaki, C., Huang, J., Buta, B., Kalyani, R., Varadhan, R., Xue, Q., Walston, J. & Kasper, J. (2015). Frailty in Older Adults: A Nationally Representative Profile in the United States. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 70(11): 1427-34.

Barati, M., Taheri-Kharameh, Z., Bandehelahi, K., Yeh, V. M. & Kripalani, S. (2018). Validation of the Short Form of the Adherence to Refills and Medications Scale (ARMS-SF) in Iranian Elders with Chronic Disease. *Journal of Clinical & Diagnostic Research*, 12(11).

Bello, B., Hartley, S. E. & Yeowell, G. (2022). Nigerian physiotherapists' knowledge, current practice and perceptions of their role for promoting physical activity: A cross-sectional survey. *PloS One*, 17(5): e0266765.

Biddle, S. J., Gorely, T., Faulkner, G. & Mutrie, N. (2023). Psychology of physical activity: a 30-year reflection on correlates, barriers, and theory. *International Journal of Sport and Exercise Psychology*, 21(1): 1-14.

Bukar A. A. (2025). Examining the barriers impacting access and quality of physiotherapy service among patients receiving physiotherapy care in some selected facilities in Maiduguri.

Butt, M. N., Akhter, F., Kashif, M., Perveen, W., Akhtar, M., Riaz, H. & Fatima, I. Determination of Factors Influencing Physical Therapy Treatment Compliance.

Chen, X., Mao, G. & Leng, S. X. (2014). Frailty syndrome: an overview. *Clinical Interventions in Aging*, 9: 433-441.

Chikaka, T. & Keller, M. M. (2024). Low back pain treatment adherence barriers in Eswatini private physiotherapy practices: A pilot study. *The South African Journal of Physiotherapy*, 80(1): 2077.

Chukwu, C. S., Ede, S. S., Egbumike, J. C., Nwabueze, I. U., Okoh, C. F. & Ojukwu, C. P. (2023). Geriatric physiotherapy care: exploring the state of affairs in southeast Nigeria. *Physiotherapy Review*, 27(2): 5-18.

Collado-Mateo, D., Lavín-Pérez, A. M., Peñacoba, C., Del Coso, J., Leyton-Román, M., Luque-Casado, A., Gasque, P., Fernández-Del-Olmo, M. Á. & Amado-Alonso, D. (2021). Key Factors Associated with Adherence to Physical Exercise in Patients with Chronic Diseases and Older Adults: An Umbrella Review. *International Journal of Environmental Research and Public Health*, 18(4): 2023.

Conneely, M., Holmes, A., O'Connor, M., Leahy, A., Gabr, A., Saleh, A., Okpaje, B., Corey, G., Barry, L., Griffin, A., O'Shaughnessy, Í., Ryan, L., Synott, A., McCarthy, A., Carroll, I., Leahy, S., Trépel, D., Ryan, D., Robinson, K. & Galvin, R. (2022). 265 A PHYSIOTHERAPY-LED TRANSITION TO HOME INTERVENTION FOR OLDER ADULTS FOLLOWING EMERGENCY DEPARTMENT DISCHARGE: A PILOT FEASIBILITY RANDOMISED-CONTROLLED TRIAL. *Age and Ageing*, 51.

Conneely, M., Leahy, A., O'Connor, M., Gabr, A., Okpaje, B., Saleh, A., Corey, G., Barry, L., Griffin, A., O'Shaughnessy, Í., Ryan, L., O'Carroll, I., Leahy, S., Trépel, D., Ryan, D., Robinson, K. & Galvin, R. (2023). A physiotherapy-led transition to home intervention for older adults following Emergency Department discharge: a pilot feasibility randomised controlled trial. *Rural and Remote Health*, 23(1): 8154.

Conneely, M., Leahy, S., O'Connor, M., Corey, G., Gabr, A., Saleh, A., Okpaje, B., O' Shaughnessy, Í., Synnott, A., Mccarthy, A., Holmes, A., Robinson, K., Ryan, L., Griffin, A., Barry, L., Trépel, D., Ryan, D. & Galvin, R. (2023). A Physiotherapy-Led Transition to Home Intervention for Older Adults Following Emergency Department Discharge: A Pilot Feasibility Randomised Controlled Trial (ED PLUS). *Clinical Interventions in Aging*, 18: 1769 - 1788.

Davidson, S. L., Emmence, L., Motraghi-Nobes, S. M., Bickerstaff, E., Rayers, G., Lyimo, G., Kilasara, J., Chuwa, M., Kisheo, F., Kisaruni, E., Urasa, S., Mitchell, E., Dotchin, C. L. & Walker, R. W. (2024). Assessing frailty amongst older people admitted to hospital in a low-income setting: a multicentre study in northern Tanzania. *BMC Geriatrics*, 24(1): 190.

Desouzart, G. (2025). Physiotherapy Intervention on Functional Health in Aging on Functional Capacity, Risk of Falls, Cognitive Function, and Back Pain. *Osteology*, 5(1): 10.

Dharmarajan, T. S. (2021). Physiology of aging. In: *Geriatric Gastroenterology*. pp. 101-153.

Dickson, C., De Zoete, R. M. J., Berryman, C., Weinstein, P., Chen, K. K. & Rothmore, P. (2023). Patient-related barriers and enablers to the implementation of high-value physiotherapy for chronic pain: a systematic review. *Pain Medicine*, 25(2): 104–115.

Dijkstra, F., van der Sluis, G., Jager-Wittenaar, H., Hempenius, L., Hobbelen, J. S. M. & Finnema, E. (2022). Facilitators and barriers to enhancing physical activity in older patients during acute hospital stay: a systematic review. *The International Journal of Behavioral Nutrition and Physical Activity*, 19(1): 99.

Ede, C. F., Fothergill-Misbah, N. & Ede, S. S. (2024). "Life has always been physical physical, now visual": an explorative study on the use of digital health technologies to promote physiotherapy home treatment programs among older people. *Physiotherapy Theory and Practice*, 1–14.

Forkan, R., Pumper, B., Smyth, N., Wirkkala, H., Ciol, M. A. & Shumway-Cook, A. (2006). Exercise adherence following physical therapy intervention in older adults with impaired balance. *Physical Therapy*, 86(3): 401-410.

Furlong, B. & Hall, A. (2024). Clinimetrics: The Sport Injury Rehabilitation Adherence Scale. *Journal of Physiotherapy*, 70(1): 70.

Ghassi, H. T., Buh, F. C., Muntessu, D. L. N., Siewe, J. R., Noumoé, D. L., Epee, P. L. S. & Douryang, M. Effect of Physiotherapy on Pain Intensity and Disability in Patients with Chronic Low Back Pain: A Call for Patients' Awareness to Focus on Physiotherapy Treatment in Cameroon.

Graham, H., Scott, J. & Benton, M. (2022). CONSTRUCT VALIDITY OF EXERCISE ADHERENCE RATING SCALE IN COMMUNITY DWELLING OLDER WOMEN: PROOF OF CONCEPT. *Innovation in Aging*, 6(Supplement_1): 802.

Gureje, O., Ademola, A. & Olley, B. O. (2008). Depression and disability: comparisons with common physical conditions in the Ibadan study of aging. *Journal of the American Geriatrics Society*, 56(11): 2033-2038.

Hassett, P. & Ryan, E. (2024). The Effect of Physiotherapy on Strength, Mobility and Balance in Older Adults Attending an Integrated Care Programme for Older Persons. *Age and Ageing*.

Henry, J. D., Coundouris, S. P., Mead, J., Thompson, B., Hubbard, R. E. & Grainger, S. A. (2023). Social frailty in late adulthood: social cognitive and psychological well-being correlates. *The Journals of Gerontology: Series B*, 78(1): 87-96.

Hua, S., Dong, Z., Wang, H. & Liu, T. (2025). Global, regional, and national burden of ischemic stroke in older adults (≥ 60 years) from 1990 to 2021 and projections to 2030. *Frontiers in Neurology*, 16: 1567609.

Igwesi-Chidobe C. (2012). Obstacles to obtaining optimal physiotherapy services in a rural community in southeastern Nigeria. *Rehabilitation Research and Practice*, 2012: 909675.

Ijaz, N., Buta, B., Xue, Q. L., Mohess, D. T., Bushan, A., Tran, H., Batchelor, W., DeFilippi, C. R., Walston, J. D., Bandeen-Roche, K. & Forman, D. E. (2022). Interventions for frailty among older adults with cardiovascular disease: JACC state-of-the-art review. *Journal of the American College of Cardiology*, 79(5): 482-503.

Ikenna, C. U., Mirian, C. O., Paul, C. N., Onyekachi, C. O., Kingsley, K. O. & Chidera, L. A. (2022). Towards developing a comprehensive treatment schedule for patients with cerebral palsy: factors influencing patient's adherence to physiotherapy treatment. *African Health Sciences*, 22(2): 573-580.

Ishaq, M. S., Umar, Z. A., Grema, B. A., Michael, G. C., Olawumi, A. L. & Abiso, M. A. (2024). Pattern of fall and its determinants among elderly patients attending the general outpatient clinic of a tertiary hospital in northern Nigeria: a cross-sectional study. *The Pan African Medical Journal*, 48: 82.

Jack, K., McLean, S. M., Moffett, J. K. & Gardiner, E. (2010). Barriers to treatment adherence in physiotherapy outpatient clinics: a systematic review. *Manual Therapy*, 15(3): 220–228.

James, R. (2020). Forms of Geriatric Physical Therapy Exercises. *Journal of Yoga & Physical Therapy*, 10: 1-2.

Jin, J., Sklar, G. E., Min Sen Oh, V. & Chuen Li, S. (2008). Factors affecting therapeutic compliance: A review from the patient's perspective. *Therapeutics and Clinical Risk Management*, 4(1): 269–286.

Kâ, O., Gaye, A., Leye, M. M. M., Ngom, N. F., Dia, A. T., Diop, S. N. & Sow, A. M. (2016). Elderly and preventive care of the geriatric pathologies in African environment. *Gériatrie et Psychologie Neuropsychiatrie du Vieillissement*, 14(4): 363-370.

Kareem, Y. A., Ogualili, P. N., Alatishe, K. A., Adesina, I. O., Ali, F. A., Alatishe, T. A. & Uwakwe, R. (2024). Demographic and clinical correlates of depression among older adults with arthritis in Nigeria. *South African Journal of Psychiatry*, 30: 2264.

Kåringen, I., Dysvik, E. & Furnes, B. (2011). The elderly stroke patient's long-term adherence to physiotherapy home exercises. *Advances in Physiotherapy*, 13(4): 145-152.

Kojima, T., Mizokami, F. & Akishita, M. (2020). Geriatric management of older patients with multimorbidity. *Geriatrics & Gerontology International*, 20(12): 1105-1111.

Kolt, G. S., Brewer, B. W., Pizzari, T., Schoo, A. M. & Garrett, N. (2007). The Sport Injury Rehabilitation Adherence Scale: a reliable scale for use in clinical physiotherapy. *Physiotherapy*, 93(1): 17-22.

Li, X. X., Cao, F., Zhao, C. N., Ge, M., Wei, H. F., Tang, J., Xu, W. L., Wang, S., Gao, M., Wang, P. & Pan, H. F. (2024). Global burden of osteoarthritis: Prevalence and temporal trends from 1990 to 2019. *International Journal of Rheumatic Diseases*, 27(8): e15285.

Martina R. (2024). The Impact of Physical Therapy on Senior Health: Promoting Mobility and Independence. *Journal of Novel Physiotherapies*, 14: 770.

Meng, K., Chen, X., Chen, Z. & Xu, J. (2025). Burden of chronic obstructive pulmonary disease in adults aged 70 years and older, 1990-2021: Findings from the Global Burden of Disease Study 2021. *PloS One*, 20(1): e0316135.

Mikolaizak, A. S., Taraldsen, K., Boulton, E., Gordt, K., Maier, A. B., Mellone, S., Hawley-Hague, H., Aminian, K., Chiari, L., Paraschiv-Ionescu, A., Pijnappels, M., Todd, C., Vereijken, B., Helbostad, J. L. & Becker, C. (2022). Impact of adherence to a lifestyle-integrated programme on physical function and behavioural complexity in young older adults at risk of functional decline: a multicentre RCT secondary analysis. *BMJ Open*, 12(10): e054229.

Müller, S. & Wilke, T. (2014). Validation of the Adherence Barriers Questionnaire (Abq)–An Instrument for Identifying Potential Risk Factors Associated With Medication-Related Non-Adherence. *Value in Health*, 17(7): A512.

Nagpal, M. (2021). EVALUATING IMPEDIMENTS LEADING TO NON-ADHERENCE OF PHYSICAL THERAPY TREATMENT AMONGST INHABITANTS OF ROHTAK DISTRICT. *International Journal of Scientific Research*.

Naidoo, S. & Naidoo, N. (2025). Physical activity and ageing: The role of physiotherapy in promoting healthy ageing. *South African Journal of Physiotherapy*, 81(1): 2114.

Newman-Beinart, N. A., Norton, S., Dowling, D., Gavriloff, D., Vari, C., Weinman, J. A. & Godfrey, E. L. (2017). The development and initial psychometric evaluation of a measure assessing adherence to prescribed exercise: the Exercise Adherence Rating Scale (EARS). *Physiotherapy*, 103(2): 180-185.

Ngai, S. P., Cheung, R. T., Lam, P. L., Chiu, J. K. & Fung, E. Y. (2012). Validation and reliability of the Physical Activity Scale for the Elderly in Chinese population. *Journal of Rehabilitation Medicine*, 44(5): 462-465.

Nicolson, P. J., Hinman, R. S., Wrigley, T. V., Stratford, P. W. & Bennell, K. L. (2018). Self-reported home Exercise Adherence: A validity and reliability study using concealed accelerometers. *Journal of Orthopaedic and Sports Physical Therapy*, 48(12): 943–950.

Niyonsenga, P. M., Habimana, A. & Nsanzabera, C. (2025). Prevalence and factors associated with non-adherence to antiretroviral therapy in HIV patients at Kibungo referral hospital, in Rwanda. *medRxiv*, 2025-01.

Njoku, C. M., Hurst, J. R., Kinsman, L., Balogun, S. & Obamiro, K. (2023). COPD in Africa: risk factors, hospitalisation, readmission and associated outcomes—a systematic review and meta-analysis. *Thorax*, 78(6): 596-605.

Nketia-Kyere, M., Aryeetey, G. C., Nonvignon, J. & Aikins, M. (2017). Exploring barriers to accessing physiotherapy services for stroke patients at Tema general hospital, Ghana. *Archives of Physiotherapy*, 7(1).

Ntsama Essomba, M. J., Esson Mapoko, B. S., Metogo Mbengono, J. A., Simo-Tabue, N., Kengne, A. P., Choukem, S. P., Sobngwi, E., Ze Minkande, J. & Tabue Teguo, M. (2024). Pre-Therapeutic Assessment of Older People in Sub-Saharan Africa: Introduction to the Comprehensive Geriatric Assessment. *Journal of Clinical Medicine*, 13(6): 1801.

Nwankwo, H. C., Akinrolie, O., Adandom, I., Obi, P. C., Ojembe, B. U. & Kalu, M. E. (2021). The clinical experiences of Nigerian physiotherapists in managing environmental and socioeconomic determinants of mobility for older adults. *Physiotherapy Theory and Practice*, 37(12): 1391-1403.

Odeyemi, E., Chesser, S., King, A. C. & Porter, M. M. (2023). Engaging Nigerian older persons in neighborhood Environment Assessment for Physical activity Participation: a citizen science project. *Innovation in Aging*, 8(4).

Odole, A. C., Okafor, A., Oyewole, O. O. & Ekediegwu, E. (2024). Knowledge, attitude and utilisation of evidence-based therapeutic exercises in knee osteoarthritis management in Nigeria. *Ghana Medical Journal*, 58(1): 91–100.

Odole, A. C., Oyewole, O. O. & Akinpelu, A. O. (2018). A comparative survey of Nigerian physiotherapists' familiarity with, knowledge of and utilisation of standard outcome measures: 10 years after initial survey. *The South African Journal of Physiotherapy*, 74(1): 435.

Ogundunmade, B. G., John, D. O. & Chigbo, N. N. (2024). Ensuring quality of life in palliative care physiotherapy in developing countries. *Frontiers in Rehabilitation Sciences*, 5: 1331885.

Ogwumike, O. O., Badaru, U. M. & Adeniyi, A. F. (2015). Barriers to treatment adherence among stroke survivors attending outpatient physiotherapy clinics in North-western Nigeria. *Clinical Health Promotion*, 5(1): 4-10.

Olaleye, O. A. & Lawal, Z. I. (2017). Utilization of physiotherapy in the continuum of stroke care at a tertiary hospital in Ibadan, Nigeria. *African Health Sciences*, 17(1): 79-87.

Omonijo, A., Olowoyo, P. & Ibrahim, A. O. (2023). RELATIONSHIP BETWEEN THE LEVEL OF SPIRITUALITY AND BLOOD PRESSURE CONTROL AMONG ADULT HYPERTENSIVE PATIENTS IN RURAL SOUTHWESTERN NIGERIA. *medRxiv*, 2023-03.

Onah, P. O. (2025). Knowledge and attitudes towards stroke in semi-urban communities in North Central Nigeria. *Mediterranean Journal of Pharmacy and Pharmaceutical Sciences*, (AheadOfPrint): 8-19.

Onyeloili, M. C. (2023). PREDICTING LEVEL OF COMPLIANCE WITH INFECTION PREVENTION AND CONTROL PRACTICES AMONG HEALTHCARE WORKERS IN SOUTHERN NIGERIA USING ORDINAL LOGISTIC REGRESSION MODEL. *medRxiv*, 2023-11.

Onyeso, O. K., Alumona, C. J., Okoh, A. C., Ibekaku, M., Shirazi, S. & Kalu, M. E. (2025). Geriatric and gerontological physiotherapy in focus: a cross-sectional survey of education, clinical practice, and service availability across world physiotherapy member nations. *BMC Medical Education*, 25(1): 471.

Osi-Ogbu, O. (2024). Current status and the future trajectory of geriatric services in Nigeria. *Journal of Global Medicine*, 4(1): e229.

Oyindamola, F., Bidemi, A. & Opeyemi, A. (2022). CHALLENGES FACING THE ELDERLY IN NIGERIA: A GERONTOLOGICAL PERSPECTIVE. *KOGJOURN (KoG)*, 7(2).

Peek, K., Sanson-Fisher, R., Mackenzie, L. & Carey, M. (2016). Interventions to aid patient adherence to physiotherapist prescribed self-management strategies: a systematic review. *Physiotherapy*, 102(2): 127-35.

Picco, L., Achilla, E., Abdin, E., Chong, S., Vaingankar, J., McCrone, P., Chua, H., Heng, D., Magadi, H., Ng, L., Prince, M. & Subramaniam, M. (2016). Economic burden of multimorbidity among older adults: impact on healthcare and societal costs. *BMC Health Services Research*, 16.

Pilotto, A. & Polidori, M. C. (2017). The comprehensive geriatric assessment: goal-oriented, patient-centered care. In *Learning Geriatric Medicine: A Study Guide for Medical Students*, Cham: Springer International Publishing, pp. 273-286.

Pozzi, C., Tatzer, V., Strasser-Gugerell, C., Cavalli, S., Morandi, A. & Bellelli, G. (2023). Innovative Non-Pharmacological Management of Delirium in Persons with Dementia: New Frontiers for Physiotherapy and Occupational Therapy? *Geriatrics*, 8.

Prince, M., Wu, F., Guo, Y., Robledo, L., O'Donnell, M., Sullivan, R. & Yusuf, S. (2015). The burden of disease in older people and implications for health policy and practice. *The Lancet*, 385: 549-562.

Racz, M. (2005). Caring for older Americans: the future of geriatric medicine. *Journal of the American Geriatrics Society*, 53.

Reddy, R. S., Alahmari, K. A., Alshahrani, M. S., Alkhamis, B. A., Tedla, J. S., ALMohiza, M. A., Elrefaey, B. H., Koura, G. M., Gular, K., Alnakhli, H. H., Mukherjee, D., Rao, V. S. & Al-Qahtani, K. A. (2024). Exploring the impact of physiotherapy on health outcomes in older adults with chronic diseases: a cross-sectional analysis. *Frontiers in Public Health*, 12: 1415882.

Reynolds, C. F., 3rd, Jeste, D. V., Sachdev, P. S. & Blazer, D. G. (2022). Mental health care for older adults: recent advances and new directions in clinical practice and research. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 21(3): 336–363.

Rodrigues, A., Castro, G. M., Jácome, C., Langer, D., Parry, S. M. & Burtin, C. (2020). Current developments and future directions in respiratory physiotherapy. *European Respiratory Review*, 29(158).

Room, J., Boulton, M., Dawes, H., Archer, K. & Barker, K. (2021). Physiotherapists' perceptions of how patient adherence and non-adherence to recommended exercise for musculoskeletal conditions affects their practice: a qualitative study. *Physiotherapy*, 113: 107-115.

Room, J., Hannink, E., Dawes, H. & Barker, K. (2017). What interventions are used to improve exercise adherence in older people and what behavioural techniques are they based on? A systematic review. *BMJ Open*, 7(12): e019221.

Sanuade, O. A., Ibitoye, O. G. & Adebowale, A. S. (2014). Psychological well-being of the Elderly in Nigeria. *The Nigerian Journal of Sociology and Anthropology*, 12(1): 74-85.

Sarfo, F. S., Adamu, S., Awuah, D., Sarfo-Kantanka, O. & Ovbiagele, B. (2017). Potential role of tele-rehabilitation to address barriers to implementation of physical therapy among West African stroke survivors: A cross-sectional survey. *Journal of the Neurological Sciences*, 381: 203-208.

Sawadogo, A., Sogbossi, E. S., Everard, G. J., Kpadonou, T. & Batcho, C. S. (2024). Use of standardised outcome measures among physiotherapists in French-speaking sub-Saharan Africa. *South African Journal of Physiotherapy*, 80(1): 1981.

Siqueira, F. V., Facchini, L. A. & Hallal, P. C. (2005). Epidemiology of physiotherapy utilization among adults and elderly. *Revista de Saude Publica*, 39(4): 662-668.

Smyth, L., Kinsman, R., Ransome, H. & Smith, P. (2013). *Practical Physiotherapy with Older People*. Springer.

Steinmetz, J. D., Culbreth, G. T., Haile, L. M., Rafferty, Q., Lo, J., Fukutaki, K. G., Cruz, J. A., Smith, A. E., Vollset, S. E., Brooks, P. M. & Cross, M. (2023). Global, regional, and national burden of osteoarthritis, 1990–2020 and projections to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet Rheumatology*, 5(9): e508-e522.

Sun, X., Wang, L., Shen, X., Huang, C., Wei, Z., Su, L., Wang, S., Liu, X. & Zhen, X. (2022). Correlates of Adherence of Multimodal Non-pharmacological Interventions in Older Adults With Mild Cognitive Impairment: A Cross-Sectional Study. *Frontiers in Psychiatry*, 13.

Świątoniowska-Lonc, N., Kołtuniuk, A. & Jankowska-Polańska, B. (2022). Psychometric Properties of the Treatment Satisfaction with Medicines Questionnaire (SATMED-Q) in Patients with Diabetes, Arterial Hypertension and Heart Failure. *International Journal of Environmental Research and Public Health*, 19(3): 1088.

Taffet, G. E. (2024). Physiology of aging. In *Geriatric Medicine: A Person Centered Evidence Based Approach*. Cham: Springer International Publishing, pp. 1555-1565.

Thornton, J. S., Morley, W. N. & Sinha, S. K. (2025). Move more, age well: prescribing physical activity for older adults. *CMAJ*, 197(3): E59-E67.

Ubhayasiri, S. & Abeysinghe, D. (2024). E045 Adherence to physiotherapy among patients with knee osteoarthritis in a rheumatology specialized care unit in Sri Lanka. *Rheumatology*.

Usenbo, A., Kramer, V., Young, T. & Musekiwa, A. (2015). Prevalence of Arthritis in Africa: A Systematic Review and Meta-Analysis. *PloS one*, 10(8): e0133858.

Van Der Endt, A. R., Hoevenaar-Blom, M. P., Galenkamp, H., Kas, M. J. H., Van Den Berg, E., Handels, R., Van Charante, E. P. M. & Richard, E. (2025). mHealth Intervention for Dementia Prevention through lifestyle Optimisation (MIND-PRO) in a primary care setting: protocol for a randomised controlled trial in people with low SES and/or migration background. *BMJ Open*, 15(2): e088324.

Van Dijk, M., Allegaert, P., Locus, M., Deschodt, M., Verheyden, G., Tournoy, J. & Flamaing, J. (2021). Geriatric Activation Program Pellenberg, a novel physiotherapy program for hospitalized patients on a geriatric rehabilitation ward. *Physiotherapy Research International: The Journal for Researchers and Clinicians in Physical Therapy*.

Verstraeten, L., Sacchi, F., Van Wijngaarden, J., Meskers, C. & Maier, A. (2023). Sarcopenia, malnutrition and cognition affect physiotherapy frequency during geriatric rehabilitation: RESORT cohort. *Annals of Physical and Rehabilitation Medicine*, 66(6): 101735.

Vincenzo, J. L., Patton, S. K., Lefler, L. L., Falvey, J. R., McElfish, P. A., Curran, G. & Wei, J. (2022). Older Adults' Perceptions Regarding the Role of Physical Therapists in Fall Prevention: A Qualitative Investigation. *Journal of Geriatric Physical Therapy*, 45(3): E127–E136.

Wang, X., Chen, Z., Liang, Y., Su, H., Wang, T., Lv, Y. & Yu, L. (2025). Effects of Exercise on Balance Function in People with Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *MDPI*.

Wang, Y., Jin, L., Dong, Y., Yang, E., Niu, X., Mao, J., Yuan, C., You, B., Wang, Y. & Chai, Y. (2025). Global burden of disease study on COPD in the older adult: comprehensive analysis of environmental factors and interaction effects. *Frontiers in Public Health*, 13.

Wei, W., Li, Y. & Zhu, J. (2025). Psychological characteristics of the rural poor from self-assessment and external assessment perspectives and their association with socio-demographic factors. *Frontiers in Psychology*, 16: 1566612.

Wientzek, R., Brückner, R. M., Schönenberg, A. & Prell, T. (2023). Instruments for measuring self-management and self-care in geriatric patients–a scoping review. *Frontiers in Public Health*, 11: 1284350.

Wilson, C. M., Arena, S. K. & Boright, L. E. (2022). State of the Art Physiotherapist-Led Approaches to Safe Aging in Place. *Archives of Physiotherapy*, 12(1): 17.

Wiltshire, J., Orban, B., Conner, K., Colato, E., Anderson, E. & Carrion, I. (2020). Healthcare Affordability and Associated Concerns Among Older Adults in Florida. *Innovation in Aging*, 4: 97 - 97.

World Health Organization (2025). *Dementia*. Available at: https://www.who.int/news-room/fact-sheets/detail/dementia (Accessed: 21 June 2025).

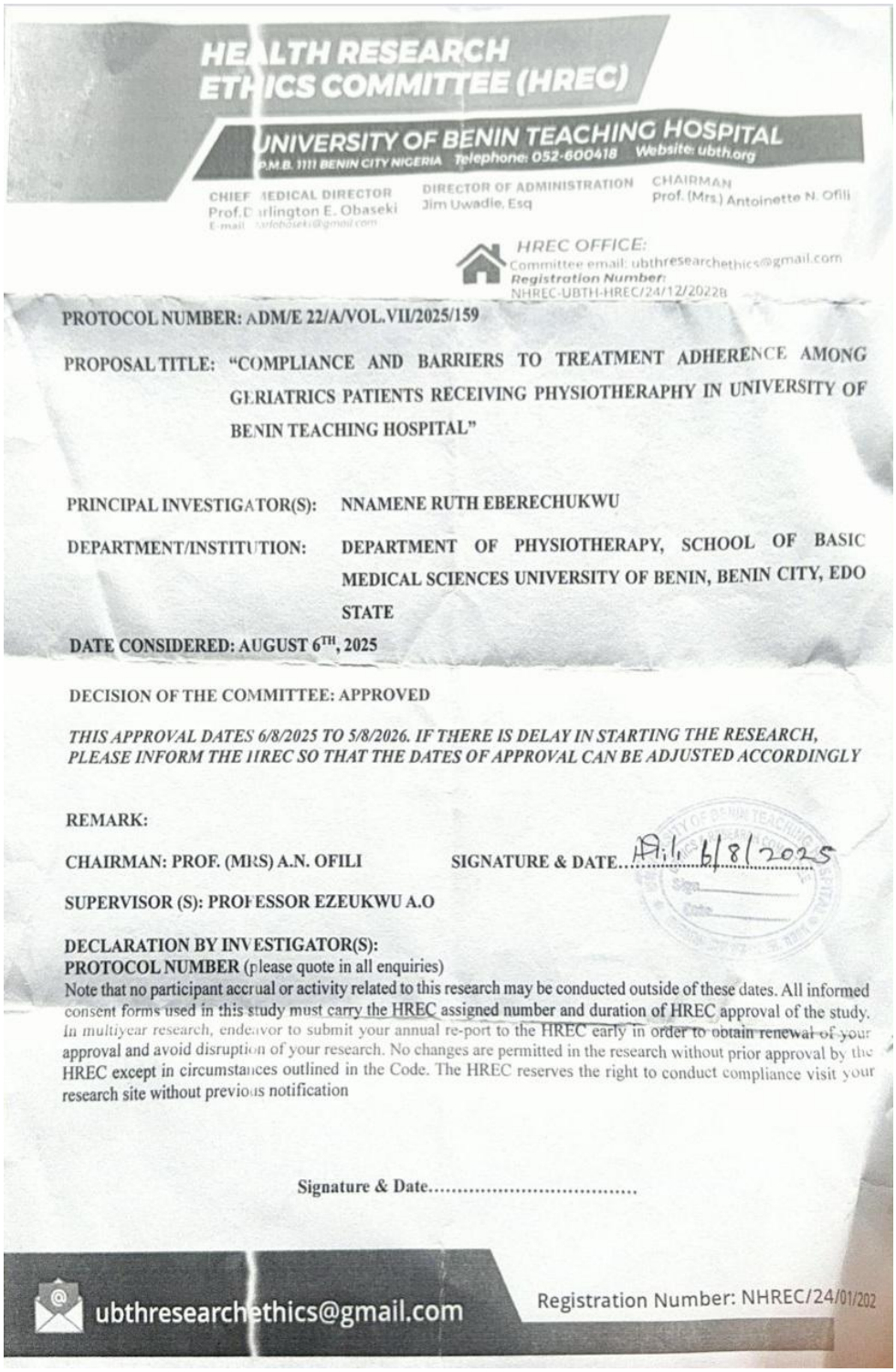
Wu, S., Nan, J., Chang, J., Jiang, D., Cao, Z., Zhou, S., Feng, H. & Xiao, L. D. (2025). Adherence to exercise intervention for community-dwelling older adults with sarcopenia: a systematic review and meta-analysis. *Age and Ageing*, 54(4): afaf094.

Yalew, E. S., Melese, A. Z., Guadie, Y. G. & Gashaw, M. (2022). Adherence to home-based exercise program and its predictors among patients treated in physiotherapy outpatient department in Amhara Region Hospitals in Ethiopia: A prospective cross-sectional study. *Patient Preference and Adherence*, 16: 561-572.

Zhang, Y., Qiu, X., Jin, Q., Ji, C., Yuan, P., Cui, M., Zhang, J. & Chen, L. (2023). Influencing factors of home exercise adherence in elderly patients with stroke: A multiperspective qualitative study. *Frontiers in Psychiatry*, 14: 1157106.

# APPENDICES

# ETHICAL APPROVAL



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

P.M.B. 1111 BENIN CITY NIGERIA Telephone: 052-600418 Website: ubth.org

CHIEF MEDICAL DIRECTOR Prof.D arlington E. Obaseki E-mail :edobaseki@gmail.com

DIRECTOR OF ADMINISTRATION Jim Uwadie, Esq

CHAIRMAN Prof. (Mrs.) Antoinette N. Ofili

HREC OFFICE: Committee email: ubthresearchethics@gmail.com

Registration Number: NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/159

PROPOSAL TITLE: "COMPLIANCE AND BARRIERS TO TREATMENT ADHERENCE AMONG GERIATRICS PATIENTS RECEIVING PHYSIOTHERAPHY IN UNIVERSITY OF BENIN TEACHING HOSPITAL"

PRINCIPAL INVESTIGATOR(S): NNAMENE RUTH EBERECHUKWU

DEPARTMENT/INSTITUTION: DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF BASIC MEDICAL SCIENCES UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

DATE CONSIDERED: AUGUST 6TH, 2025

DECISION OF THE COMMITTEE: APPROVED

*THIS APPROVAL DATES 6/8/2025 TO 5/8/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY*

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE... 6/8/2025

SUPERVISOR (S): PROFESSOR EZEUKWU A.O

DECLARATION BY INVESTIGATOR(S):

PROTOCOL NUMBER (please quote in all enquiries)

Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual re-port to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date.....

ubthresearchethics@gmail.com Registration Number: NHREC/24/01/202

# APPENDIX I

# INFORMED CONSENT

**Title of study:** Compliance and Barriers to Treatment Adherence Among Geriatrics Patients Receiving Physiotherapy in University of Benin Teaching Hospital (UBTH).

**Investigator:** Nnamene Ruth Eberechukwu

**Supervisors:** Professor Ezeukwu A. O

**Financial Sponsorship:** This research project is self-sponsored

**Purpose of the research:** The purpose of the research is to assess the compliance and barriers to treatment adherence among geriatrics patients receiving physiotherapy in University of Benin Teaching Hospital (UBTH).

**Procedures and protocol involved in the study**: You are politely approached to respond to an interviewer-administered questionnaire interview.

This questionnaire would be only used for research purpose and will determine the compliance and barriers to treatment adherence among geriatrics patients receiving physiotherapy in University of Benin Teaching Hospital (UBTH).

**Compensation**

There will be no financial compensation for participating in this study.

**Voluntary Participation**

Please note that your participation in this research is entirely voluntary. No form of discrimination will be meted to you, should you decide not to participate in this study; You are entirely free to change your mind and stop participating even if you agreed earlier.

**Side Effects**

There is no anticipated adverse effect associated with participating in this study.

**Benefits**

The purpose of the research is to assess the compliance and barriers to treatment adherence among geriatrics patients receiving physiotherapy in University of Benin Teaching Hospital (UBTH).

**Confidentiality**

All information and data obtained during this study will be treated confidentially. The names of the participants will not be written on the questionnaire, and all information collected will be encoded in a file in my personal computer and passworded. Thereafter the questionnaires will be shelved and locked in my personal document cabinet.

CONTACT INFORMATION

NNAMENE RUTH EBERECHUKWU

PROJECT STUDENT

Email: ruthebere54@gmail.com

Ethics and Research Committee

University of Benin Teaching Hospital

Benin City.

Phone Number: 08133228059

# APPENDIX II

## SOCIODEMOGRAPHIC FORM

Demographic Information:

1. Age: 65 – 70 years [ ] 71 – 75 years [ ] 76 – 80 years [ ] > 80 years [ ]
2. Gender: Male [ ] Female [ ]
3. Marital Status: Single [ ] Married [ ] Widowed [ ] Divorced [ ]
4. Educational level Primary: Primary [ ] Secondary [ ] Tertiary [ ]
5. Frequency of Physiotherapy Visits:
   - Once a week ( )
   - Twice a week ( )
   - Three times a week ( )
   - More than three times a week ( )
6. Duration of Physiotherapy Treatment:
   - Less than 1 month ( )
   - 1-3 months ( )
   - 4-6 months ( )
   - More than 6 months ( )
7. Condition being managed by physiotherapy:

   _____

# APPENDIX III

## EXERCISE ADHERENCE RATING SCALE (EARS)

1. I do my exercises as often as recommended
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

2. I forget to do my exercises
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

3. I do less exercise than recommended by my healthcare professional (physiotherapist)
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

4. I fit my exercises into my regular routine
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

5. I don't get around to doing my exercises
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

6. I do most, or all, of my exercises
   ( ) Completely Disagree ( ) Disagree ( ) Neither agree or disagree ( ) Agree ( ) Completely agree

# APPENDIX IV

## BARRIERS TO TREATMENT ADHERENCE QUESTIONNAIRE (BTAQ)

### SECTION A: ACCESS TO PHYSIOTHERAPY SERVICES

1. Do you find it difficult to afford the cost of physiotherapy treatment and services

- Yes [ ]
- No [ ]

2. Have you ever missed a Physiotherapy session due to difficulty accessing the facility?

- Yes [ ]
- No [ ]

3. Do you face challenges with transportation to access this physiotherapy facility?

- Yes [ ]
- No [ ]

4. Does it take you more than an hour to travel to this Physiotherapy facility?

- Yes [ ]
- No [ ]

5. Do you use public transportation to access this facility?

- Yes [ ]
- No [ ]

### SECTION B: QUALITY OF PHYSIOTHERAPY SERVICES

6. Are you satisfied with the overall quality of physiotherapy services you have received

- Yes [ ]

- No [ ]

7. Are the Physiotherapy services provided tailored to your specific needs?

- Yes [ ]
- No [ ]

8. Do you feel that the treatments you received were effective in improving your condition?

- Yes [ ]
- No [ ]

9. Do you experience language barriers in communication with your Physiotherapist?

- Yes [ ]
- No [ ]

10. Are you satisfied with the communication between you and your Physiotherapist?

- Yes [ ]
- No [ ]

11. Do you experience long waiting times before receiving treatment?

- Yes [ ]
- No [ ]

12. Are you satisfied with the availability of Physiotherapy equipment at this facility?

- Yes [ ]
- No [ ]