PREDICTORS OF PHYSICAL FUNCTIONING IN HOSPITALIZED OLDER ADULTS IN UBTH EDO STATE, NIGERIA- A FIVE-YEAR RETROSPECTIVE STUDY

BY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF BASIC MEDICAL SCIENCES, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF PHYSIOTHERAPHY (B.PT) DEGREE

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OCTOBER, 2025

CERTIFICTION

This dissertation by MOSES SAMUEL is accepted in its present form as satisfying the dissertation requirement of the degree of Bachelor of Physiotherapy of the School of Basic Medical Sciences, College of Medical Sciences of the University of Benin.

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DEDICATION

To the Lord God Almighty, for His infinite wisdom, unparalleled love and mighty help in the completion of my project work.

To my mother, Mrs. Ese David, my grandmother, Mrs. Victoria Idjebor, my beloved sister, Moses Judith and my uncle, Barrister David Justice for being great sources of help, kindness, encouragement throughout my undergraduate programme. I could not have come this far without you all by my side. I am truly grateful and I count myself immensely blessed to have you all. Thank you so much.

ABSTRACT

Background: Functional decline during hospitalization is a major concern among older adults, as it can lead to loss of independence, increased morbidity, and longer recovery periods. Despite the growing elderly population in Nigeria, limited data exist on factors influencing physical functioning among hospitalized older adults.

Aim: This study investigated the predictors of physical functioning among hospitalized older adults at the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria.

Methods: This was a retrospective cross-sectional study involving 548 hospitalized older adults aged 60 years and above admitted between January 2020 and December 2024. Data were obtained from patient case notes using a structured data extraction form, including demographic, clinical, and functional variables. Physical functioning was assessed using the Barthel Index. Data were analyzed using descriptive and inferential statistics. Pearson correlation and Chi-square tests were applied, with the level of significance set at $p<0.05$.

Results: The mean age of participants was 74.49 ± 9.61 years, with 53% males and 47% females. There was a significant negative relationship between age and physical functioning ($r = -0.085$, $p = 0.046$) and a significant positive relationship between length of hospital stay and physical functioning ($r = 0.229$, $p < 0.001$). Comorbidities ($p < 0.001$), primary diagnosis ($p < 0.001$), and cognitive status ($p < 0.001$) were significantly associated with physical functioning, while pain level showed no significant association ($p = 0.291$). Age, gross muscle power, range of motion, and length of hospital stay emerged as significant predictors of physical functioning at discharge.

Conclusion: Age of hospitalized older adults is inversely related with their physical functioning, while length of hospital stay is directly related to the physical functioning of older adults.

Keywords: Physical functioning, Hospitalized older adults, Predictors, UBTH, Barthel Index

ACKNOWLEDGEMENT

Firstly, I would like to express my gratitude and thanksgiving to the Lord Almighty, the One who made me start and see the ending of this academic journey in good strength, grace and boundless love. His protection towards me throughout my stay on campus was immense and I am so grateful for His help towards the completion of this project work.

My sincerest gratitude goes to my dedicated supervisor, Dr Nicholas Oghumu for his constant help, guidance and assistance towards my project work. His commitment and dedication towards seeing the success of my project will never be forgotten. Thank you, sir, and may God bless you immensely.

I also want to thank the ever-active Head of Department, Dr. (Mrs) C. O Obaseki, and to all the lecturers of the Department of Physiotherapy, University of Benin — Prof. K.I. Oke, Mr. E. Okhuahesuyi, Dr Hammed Adebisi, Dr Nelson Ekechukwu, Prof. Joe Ummunah, Dr. (Mrs) Aiyegbusi, Dr Bolarinde, Prof. Obinna Ezeukwu, Dr. (Mrs) Kubeyinje, Dr. Oghumu and PT. Osayi Obarisiagbon — for impacting their knowledge and sharing their wealth of experience in me while undergoing my training. My appreciation also goes to the non-academic staffs, particularly Mr Nosa and Mrs Juliet. I am deeply grateful.

My heartfelt gratitude also goes to the Head of Department of Physiotherapy, University of Benin Teaching Hospital, Dr. Taiwo Oyewumi and to all the chiefs, interns and every other clinician who improved my clinical knowledge and understanding throughout the period of my training and studentship.

To my lovely mother, Mrs Ese David, my grandmother, Mrs Victoria Idjebor, my beloved sister, Judith Moses, my uncle, Barrister David Justice and my significant other, Idahosa Victory, I am grateful. Without your love, support and encouragement, my undergraduate journey would have been strained. Thank you all for your constant presence and unwavering love.

I will also like to thank my friends — Godday (Investor) you opened doors for us through your benevolent heart and generosity, Joachim, Efosa, Sane Paul, Lanre (THE BOYS) for their constant help and support during the times I needed them the most. You all came through and I do not ever forget that. To Daisy, Ebere, Jane Odimbu, Winnie Lugard-Agege, Martina (for your constant notes) — thank you all for making school life easy for me. You all are wonderful. I really am grateful. God bless you all and He will continue to meet you at the point of your needs.

To the Nova Aetas Graduating Class of 2025, we have come this far and we are heading to the highest heights in our careers. Thank you for the laughter, warmth and support we've shared throughout our days here on campus.

Finally, I also want to appreciate myself, Moses Samuel, for never giving up even when the road was so rough — for my consistency and doggedness. The sky is my starting place; this is just a stepping stone. See you all at the top!

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Physical functioning refers to an individual's ability to perform activities that require physical actions, ranging from basic self-care (such as bathing and dressing) to more complex tasks (such as walking, climbing stairs, and carrying groceries) (Smith et al., 2020). It encompasses the capacity to move, maintain balance, and perform daily activities independently, reflecting the integrated performance of the musculoskeletal, neurological, and cardiopulmonary systems. Physical functioning is a key indicator of overall health, quality of life, and independence, especially in older adults (O'Neill & Forman, 2020). Physical functioning, a central component of health and well-being in older adults, is the capacity to carry out basic and instrumental activities of daily living (ADLs and IADLs), such as walking, toileting, dressing, preparing meals, and managing personal finances (Benz et al., 2023). It encompasses a range of physiological capabilities, including strength, endurance, coordination, balance, and mobility. This multifaceted concept is not only a reflection of one's physical health but also a critical determinant of independence, quality of life, and longevity in the aging population. Physical functioning is often used as a proxy indicator of successful aging and is intricately linked with cognitive status, emotional well-being, and social participation (Aung et al., 2011).

Globally, a decline in physical functioning is one of the most common and debilitating consequences of aging, affecting over 35% of individuals aged 65 and above, and more than 50% of those over 85 years (Fielding et al., 2017). In sub-Saharan Africa, the burden of reduced

physical functioning among older adults is likely underestimated, as routine assessment of function is not integrated into many healthcare systems. The World Health Organization (WHO) has projected that the number of people aged 60 and above in Africa will increase from approximately 64 million in 2020 to over 163 million by 2050. In Nigeria, the older adult population is currently estimated at 5–6% of the total population approximately 10 million people yet policies and healthcare systems have not kept pace with the demographic transition (Mbam et al., 2022). The Nigerian older adult often experiences aging in a context of poverty, inadequate healthcare services, social isolation, and chronic disease burden. Consequently, functional limitations, such as difficulty walking, standing, or climbing stairs, are commonly observed (Abdullahi, 2024). Despite this, few large-scale studies have explored the prevalence or determinants of physical functioning in hospitalized older adults in the country.

Hospitalization is defined as the formal admission of a patient to a health facility for observation, treatment, and care (Salah et al., 2021). Hospitalization is often necessitated by acute medical conditions or exacerbations of chronic illnesses (Crotty et al., 2022). Older adults have the highest rates of hospital admissions globally, with common indications including cardiovascular disease, infections, respiratory conditions, injuries (especially falls), and complications from diabetes or malignancies (Zisberg & Gur-Yaish, 2017). In high-income countries, approximately 40% of hospitalized individuals aged 70 and above experience new or worsening functional impairments during their hospital stay (Schattner, 2023). This phenomenon, known as hospital-associated disability, is a significant challenge in geriatric care. It is often the result of iatrogenic factors such as excessive bed rest, lack of early mobilization, inadequate nutritional support, overuse of sedatives, and limited rehabilitation input (Loyd et al., 2020).

In Africa, and Nigeria specifically, hospital-related functional decline may be more profound due to systemic healthcare challenges. Hospitals in Nigeria often lack dedicated geriatric wards or multidisciplinary teams trained in elderly care (Mbam et al., 2022). Shortages of physiotherapists, occupational therapists, and geriatricians limit the extent to which hospitalized older adults receive individualized, function-focused care. Moreover, delays in seeking care, overcrowded facilities, and out-of-pocket payments further compound the problem. Hospital stays that should ideally restore health frequently result in deterioration in mobility, cognition, and independence. Unfortunately, discharge planning rarely includes structured rehabilitation, increasing the likelihood of readmissions and long-term disability (Ojifinni & Uchendu, 2022).

Older adults, defined by the United Nations and WHO as individuals aged 60 years and above, are among the most vulnerable groups globally. As of 2020, there were over 1 billion people aged 60 and older worldwide, and this number is expected to rise to over 2.1 billion by 2050 (Kanasi et al., 2016). Africa is projected to experience the fastest growth in its elderly population, with the number of older adults expected to triple by mid-century (Akinrolie et al., 2024). In Nigeria, population aging is becoming increasingly prominent, driven by improved life expectancy and declining fertility. Yet, the healthcare system remains ill-equipped to meet the unique needs of this demographic (Mbam et al., 2022). Older Nigerians frequently contend with a double burden of communicable and non-communicable diseases, limited access to health insurance, and minimal government support (Otoh et al., 2024). Hospitalization rates among this group are increasing, especially in tertiary institutions such as the University of Benin Teaching Hospital (UBTH), where older adults present with complex medical needs requiring coordinated, multidisciplinary management (Oghumu et al., 2020).

Multiple risk factors are associated with reduced physical functioning in older adults, including chronic medical conditions such as arthritis, stroke, hypertension, diabetes, heart failure, and chronic obstructive pulmonary disease (COPD). Musculoskeletal decline (sarcopenia), sensory deficits, malnutrition, polypharmacy, cognitive impairment, depression, and prolonged immobility further exacerbate functional decline (Ding et al., 2022). Gender, socioeconomic status, educational level, and social support systems also influence the extent of physical functioning. Moreover, environmental factors including housing conditions, accessibility, and community support play crucial roles (Robinson, 2013). The decline in physical function is not merely a consequence of disease; it is a predictor of adverse outcomes such as falls, fractures, pressure ulcers, institutionalization, increased dependency, and mortality. Recognizing and addressing these risk factors is vital in promoting functional recovery and maintaining autonomy in older adults.

Common conditions leading to hospitalization in Nigerian older adults include stroke, heart failure, pneumonia, urinary tract infections, falls, diabetic complications, and chronic pain syndromes (Faronbi et al., 2020). Many of these conditions are not only medical emergencies but also contribute to functional limitations. For instance, stroke is a leading cause of long-term disability, and hip fractures resulting from falls in the elderly often mark the beginning of persistent immobility (Li et al., 2025). Furthermore, poor pain management, lack of patient-centered care, and cultural beliefs around aging and dependence affect how physical decline is perceived and addressed (Colón-Emeric et al., 2013).

Bringing these issues into focus, the relationship between aging, hospitalization, and physical functioning is complex and deeply intertwined. Hospital admission in older adults often marks a critical point at which functional trajectories can either improve with appropriate care or worsen

due to neglect and inadequate interventions (Geyskens et al., 2022). While addressing acute medical issues is paramount, failing to recognize and respond to functional status risks converting temporary illness into long-term disability. In many parts of Nigeria, limited awareness, insufficient staffing, and lack of protocolized care for the elderly mean that physical decline goes unnoticed until discharge or worse, until the patient is readmitted with complications (Mbam et al., 2022). As such, identifying the factors that influence physical functioning during hospitalization becomes essential for informing policy, clinical practice, and rehabilitation services.

1.2 Statement of the Problem

As the global population continues to age, the health and functional needs of older adults are becoming increasingly prominent. In Nigeria, the number of individuals aged 60 years and above is rising steadily, reflecting broader demographic shifts seen across sub-Saharan Africa. This population is at heightened risk of both acute and chronic illnesses, leading to frequent hospitalizations (Akosile et al., 2018). However, hospitalization in older adults is often accompanied by adverse outcomes beyond the initial medical condition most notably, a decline in physical functioning (Colón-Emeric et al., 2013). Functional decline during hospitalization has been documented in over one-third of older patients globally and is associated with increased morbidity, prolonged hospital stays, higher healthcare costs, early institutionalization, and premature mortality (Geyskens et al., 2022).

Despite this alarming trend, there remains a glaring gap in clinical practice and research within Nigeria especially tertiary institutions like the University of Benin Teaching Hospital which is one of the Teaching Hospitals in Nigeria with geriatric care on Predictors of physical functioning in hospitalized older adults. Factors such as age, comorbidities, pain level, length of hospital stay,

cognitive impairment, and level of mobility on admission may influence functional outcomes, yet these variables are not routinely captured or analyzed in most hospital records. Although anecdotal evidence suggests that most of these variables are routinely assessed, there is no empirical data on the relationship of these variables with physical functioning.

In this context, a five-year retrospective analysis of hospitalized older adults at UBTH is both timely and necessary. By identifying the key predictors of physical functioning during hospitalization, this study aims to fill a critical knowledge gap and support the integration of functional health into routine hospital care. Without such evidence, the risk remains high that hospitalization, a process intended to restore health, may instead lead to long-term disability and diminished quality of life for Nigeria's growing elderly population.

1.3 Research Questions

This study was aimed at answering the following questions:

i. What are the demographic and clinical characteristics (e.g., age, sex, length of hospital stay, comorbidities, diagnosis, pain level, cognitive status, gross muscle power, range of motion) of hospitalized older adults at UBTH over the five-year study period?
ii. What is the level of physical functioning among hospitalized older adults at UBTH over the five-year study period?
iii. What demographic and clinical factors are associated with physical functioning among hospitalized older adults at UBTH?
iv. To what extent do these factors predict physical functioning among hospitalized older adults at UBTH?

1.4 Aim of Study

The aim of this study was to determine the predictors of physical functioning among hospitalized older adults at UBTH Edo State, Nigeria.

1.4.1 Specific Objectives

The specific objectives of this study are:

i. To determine the demographic and clinical characteristics (e.g., age, sex, length of hospital stay, comorbidities, diagnosis, pain level, cognitive status, gross muscle power, grip strength, range of motion) of hospitalized older adults at UBTH over the five-year study period.

ii. To determine the level of physical functioning among hospitalized older adults at UBTH over a five-year period.

v. To determine the demographic and clinical factors associated with physical functioning among hospitalized older adults at UBTH.

iii. To determine the extent to which selected demographic and clinical factors predict physical functioning at the time of hospital discharge.

1.5 Hypotheses

1.5.1 Main Hypotheses

There would be no significant association between demographic, clinical factors and physical functioning among hospitalized older adults in UBTH.

1.5.2 Sub Hypotheses

i. There would be no significant association between age and physical functioning among hospitalized older adults at UBTH.

ii. There would be no significant association between sex and physical functioning among hospitalized older adults at UBTH.

iii. There would be no significant association between length of hospital stay and physical functioning among hospitalized older adults at UBTH.

iv. There would be no significant association between comorbidities and physical functioning among hospitalized older adults at UBTH.

v. There would be no significant association between primary diagnosis and physical functioning among hospitalized older adults at UBTH.

vi. There would be no significant association between pain level and physical functioning among hospitalized older adults at UBTH.

vii. There would be no significant association between cognitive status and physical functioning among hospitalized older adults at UBTH.

viii. There would be no significant association between gross muscle power and physical functioning among hospitalized older adults at UBTH.

ix. There would be no significant association between grip strength and physical functioning among hospitalized older adults at UBTH.

x. There would be no significant association between range of motion and physical functioning among hospitalized older adults at UBTH.

1.6 Significance of the Study

To Researchers:

The findings will fill existing gaps in knowledge regarding the determinants of physical functioning in hospitalized older adults within the Nigerian healthcare context. This study will provide baseline data and identify key variables that influence functional outcomes during

hospitalization, which can inform future prospective studies, intervention trials, and policy analyses. Additionally, it will contribute to the broader global evidence base on geriatric care in low- and middle-income countries, promoting context-specific research that reflects the unique challenges faced by older adults in Nigeria and sub-Saharan Africa.

To Clinicians:

For physiotherapists and other allied health professionals, the study offers valuable insights into factors affecting physical function during hospitalization, highlighting areas requiring early assessment and intervention. Understanding predictors of functional decline will enable clinicians to develop targeted rehabilitation plans, prioritize high-risk patients, and advocate for timely mobilization and therapy. This knowledge will improve clinical decision-making, optimize resource allocation, and ultimately enhance the quality of care provided to elderly patients, reducing complications such as falls, pressure ulcers, and prolonged disability.

To Patients:

Older adults and their families stand to benefit directly from improved hospital care that incorporates functional assessment and rehabilitation strategies informed by this research. Early identification of risk factors for functional decline can lead to timely interventions that preserve independence, reduce hospital stay length, prevent readmissions, and improve overall quality of life. Additionally, increased awareness about the importance of maintaining physical function may empower patients and caregivers to engage more actively in rehabilitation efforts and adopt healthier lifestyles post-discharge.

To the Institution (UBTH):

This study will provide UBTH with critical evidence to guide policy formulation, clinical protocols, and capacity-building initiatives focused on geriatric care. By highlighting the predictors of physical functioning among hospitalized older adults, the institution can design and implement targeted multidisciplinary programs, strengthen rehabilitation services, and improve patient outcomes. Moreover, the research aligns with UBTH's mission to deliver comprehensive, patient-centered care and positions the hospital as a leader in addressing the healthcare needs of Nigeria's aging population. Ultimately, this study supports UBTH's goals of enhancing clinical effectiveness, patient satisfaction, and sustainable healthcare delivery.

1.7 Scope of the Study

This study focused on hospitalized older adults aged 60 years and above who were admitted to the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria, over a five-year retrospective period (January 2020 to December 2024).

This study was delimited to clinical case notes in the Geriatric unit of Physiotherapy Department and the Nurses' station at UBTH.

1.8. Definition of Terms

Physical Functioning: The ability of an individual to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs), including mobility, self-care, and physical tasks necessary for independent living (Edemekong et al., 2025).

Hospitalized Older Adults: Individuals aged 60 years and above who have been admitted to a hospital for medical or surgical treatment (Xia et al., 2016).

Comorbidities: The presence of one or more additional chronic diseases or medical conditions co-occurring with a primary condition (Nicol et al., 2016).

Cognitive Status: The level of cognitive functioning, including memory, attention, and executive functions (Chinnapa-Quinn et al., 2020).

Length of Hospital Stay: The total duration, typically measured in days, from the time of hospital admission to discharge (Sprung et al., 2020).

Pain Level: The intensity of pain experienced by a patient (Makris et al., 2015).

Primary Diagnosis: The main medical condition or reason for which a patient is admitted to the hospital (Chow et al., 2016).

Retrospective Study: A research design that involves analyzing existing data collected in the past to identify patterns and outcomes (Rambachan et al., 2024).

1.9 List of Abbreviations

ADLs — Activities of Daily Living

IADLs — Instrumental Activities of Daily Living

COPD — Chronic Obstructive Pulmonary Disease

WHO — World Health Organization

UBTH — University of Benin Teaching Hospital

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review serves as a critical component of any research study, offering a structured synthesis of existing knowledge relevant to the research topic. In the context of this study, the focus is on physical functioning among hospitalized older adults—a growing concern in both global and local healthcare systems. As populations age, there is an increasing demand for healthcare services tailored to the unique needs of older adults, especially during and after hospitalization, where physical function often deteriorates due to multiple factors such as immobility, underlying disease, and hospital-induced deconditioning (Covinsky et al., 2015; Brown et al., 2016).

Understanding the predictors of physical functioning is vital for developing preventive and rehabilitative strategies aimed at maintaining independence, improving health outcomes, and reducing hospital readmissions among older adults. This chapter critically explores the theoretical and empirical literature surrounding physical functioning, hospitalization, aging, and their interrelationships. It begins with a conceptual overview of physical functioning, followed by a discussion on its global and regional prevalence, risk factors, and outcomes. Subsequent sections delve into hospitalization as a driver of functional decline, characteristics of the older adult population, and finally, a detailed review of the predictors that influence functional status in hospitalized older adults.

By systematically reviewing current and relevant studies, this chapter identifies key trends, gaps, and controversies in the literature, thereby laying the groundwork for the current study. The goal is not only to contextualize the research within existing academic discourse but also to highlight the pressing need for localized evidence from Nigeria—particularly from tertiary healthcare institutions like the University of Benin Teaching Hospital (UBTH).

2.2 Physical Functioning

2.2.1 Definition and Dimensions of Physical Functioning

Physical functioning refers to the capacity of an individual to perform activities that support basic survival, daily living, and social participation. It reflects the individual's ability to carry out tasks such as walking, climbing stairs, bathing, dressing, eating, and managing household duties (Vermeulen et al., 2015). It is a multi-dimensional construct that includes mobility, self-care, upper and lower extremity functioning, endurance, and balance. According to the WHO's International Classification of Functioning, Disability and Health (ICF), physical functioning is influenced by a combination of physical, social, psychological, and environmental factors (WHO, 2001). Impaired physical functioning often leads to decreased independence, reduced quality of life, and increased risk of institutionalization.

2.2.2 Levels of Physical Function: ADLs and IADLs

Functional status is commonly assessed using two hierarchical categories: Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs).

ADLs refer to basic self-care tasks that are essential for everyday functioning. These include bathing, dressing, toileting, transferring (e.g., moving from bed to chair), continence, and feeding

(Katz et al., 1970). Loss of ability in ADLs usually indicates severe functional decline and may necessitate full-time caregiving or institutional care.

IADLs, on the other hand, involve more complex cognitive and physical skills needed for independent living. These include managing medications, handling finances, preparing meals, using transportation, shopping, and housekeeping (Lawton & Brody, 1969). A decline in IADLs often precedes ADL impairment and is an early marker of functional vulnerability in older adults (Lee et al., 2017).

Functional limitations in either domain are considered significant indicators of frailty, disability, and mortality risk among elderly individuals.

2.2.3 Tools and Scales for Measuring Physical Functioning

Accurate assessment of physical function is vital in clinical settings, especially during hospitalization. Several standardized tools are employed globally, including:

The Barthel Index:

The Barthel Index (BI) is a standardized assessment tool used to evaluate a person's ability to perform Activities of Daily Living (ADLs) independently. Developed by Dorothy Barthel and Florence Mahoney in 1965, the index is especially useful in clinical settings such as stroke rehabilitation, geriatrics, neurology, and orthopedic care, where understanding functional status is essential for care planning, outcome evaluation, and rehabilitation progress tracking.

The index assesses ten key domains of self-care and mobility: feeding, bathing, grooming, dressing, bowel control, bladder control, toilet use, transfers (e.g., from bed to chair), mobility on level surfaces, and stair climbing. Each task is scored based on the degree of assistance required, with higher scores reflecting greater independence. The total score ranges from 0 to 100, where 0

indicates complete dependence and 100 indicates complete independence. Intermediate scores reflect varying degrees of dependence: scores between 0–20 indicate total dependence, 21–60 severe dependence, 61–90 moderate dependence, 91–99 slight dependence, and 100 full independence.

There are several versions of the Barthel Index to suit different contexts. The Modified Barthel Index (MBI) uses 5-point scoring intervals for increased sensitivity, especially in detecting small changes in functional performance. Collin's version revised the scoring structure to enhance inter-rater reliability. Additionally, telephone-based and culturally adapted versions have been developed and validated across many countries, including several in Africa (e.g., Nigeria), where the tool has been translated into local languages and used to assess rehabilitation outcomes in older adults and stroke survivors.

The Barthel Index is widely praised for its psychometric properties. It demonstrates strong reliability, with high inter-rater and test-retest consistency across different populations and clinical settings. Its validity is well established, showing strong correlations with other functional assessment tools like the Functional Independence Measure (FIM) and Katz Index. The Barthel Index is also highly responsive, meaning it can effectively capture meaningful changes in a patient's functional abilities over time.

The BI's strengths lie in its simplicity, quick administration time (about 5–10 minutes), and minimal need for specialized equipment. It can be administered by a variety of healthcare professionals, including physiotherapists, occupational therapists, nurses, and physicians. It is also suitable for both in-patient and community settings. These attributes make it particularly useful in low-resource settings where comprehensive evaluations may not be feasible.

In terms of clinical application, the Barthel Index is frequently used to assess baseline functional status, monitor progress during rehabilitation, and make informed decisions about discharge planning, home care needs, or referral to long-term care facilities. It is also used in research to measure outcomes in clinical trials, especially those involving stroke rehabilitation, elderly care, or functional recovery post-surgery (Mahoney & Barthel, 1965).

Katz Index of Independence in ADLs:

The Katz Index of Independence in Activities of Daily Living (ADL) is a widely used clinical assessment tool designed to evaluate a person's ability to perform essential self-care tasks. Developed by Sidney Katz and colleagues in the 1960s, the tool was initially created to assess functional status in elderly patients and is now broadly applied across clinical settings, particularly in geriatric medicine, rehabilitation, and chronic disease management. The primary purpose of the Katz Index is to identify the level of functional independence or dependence in performing basic ADLs, which are crucial for everyday living and overall health outcomes.

The Katz Index evaluates six fundamental ADL domains: bathing, dressing, toileting, transferring, continence, and feeding. Each activity is rated as either "independent" (1 point) or "dependent" (0 points), with the total score ranging from 0 to 6. A score of 6 indicates full function, 4 reflects moderate impairment, and 2 or below suggests severe functional impairment (Katz et al., 1970; Ehsani-Chimeh et al., 2020). Unlike the Barthel Index, which uses a graded scale for each task, the Katz Index simplifies assessment by using binary scoring, which facilitates rapid decision-making in clinical settings.

The validity and reliability of the Katz Index have been extensively tested. It is recognized for high inter-rater reliability and good predictive validity, particularly in forecasting hospital

readmissions, institutionalization, and mortality among older adults (Barberger-Gateau et al., 2015). Its simplicity makes it especially useful in primary care and community health assessments, where time and resources may be limited. The tool has also been validated in several populations, including those with stroke, dementia, and post-operative conditions, supporting its broad utility (Santos et al., 2021).

A major strength of the Katz Index is its ease of use. It requires no specialized training and takes only a few minutes to administer. This makes it particularly effective for routine screening in elderly patients, allowing clinicians to quickly identify those at risk of functional decline. Additionally, the binary scoring system reduces ambiguity in interpretation and improves reproducibility across different healthcare providers and settings (Katz et al., 1970).

Functional Independence Measure (FIM):

The Functional Independence Measure (FIM) is a widely utilized standardized tool for assessing an individual's level of functional independence, particularly in rehabilitation settings. Developed in the 1980s by the Uniform Data System for Medical Rehabilitation (UDSMR), the FIM was designed to provide a comprehensive assessment of disability and burden of care by evaluating both motor and cognitive domains. It is especially used for patients recovering from stroke, spinal cord injury, traumatic brain injury, orthopedic conditions, and other chronic illnesses affecting daily function.

The FIM consists of 18 items divided into two main domains: motor (13 items) and cognitive (5 items). The motor domain includes self-care (eating, grooming, bathing, dressing, toileting), sphincter control (bladder and bowel management), transfers (bed/chair/wheelchair, toilet, tub/shower), and locomotion (walking or wheelchair use, stairs). The cognitive domain evaluates

communication (comprehension and expression) and social cognition (social interaction, problem-solving, and memory). Each item is rated on a 7-point ordinal scale, where 1 indicates total assistance required and 7 signifies complete independence, yielding a total FIM score ranging from 18 (complete dependence) to 126 (complete independence). This detailed scoring allows clinicians to track functional progress over time and determine the level of assistance or support needed in various domains.

The FIM is typically administered at admission, discharge, and sometimes at follow-up to measure rehabilitation outcomes and monitor patient progress. Because it captures both physical and cognitive abilities, it is a valuable tool for developing individualized care plans, allocating rehabilitation resources, and making decisions about discharge disposition. The FIM is used by a wide range of healthcare professionals, including physiotherapists, occupational therapists, nurses, and physicians, making it a central part of interdisciplinary team assessments. It also plays a significant role in healthcare research and quality assurance programs, especially those that aim to improve functional outcomes and efficiency of care delivery in rehabilitation settings.

The FIM has demonstrated strong psychometric properties, including high inter-rater reliability, internal consistency, and validity across diverse patient populations and clinical environments. It has been validated internationally and is employed in multiple countries as a standard measure of rehabilitation effectiveness. Its use promotes standardization in outcome reporting, allowing for benchmarking across facilities and contributing to global efforts in improving the quality of rehabilitative care. The scoring system, while structured, is also flexible enough to adapt to different levels of functional recovery, making it a robust tool for both clinical decision-making and research purposes. (Dodds et al., 2017).

Short Physical Performance Battery (SPPB):

The Short Physical Performance Battery (SPPB) is a validated, objective tool used to assess lower extremity function and physical performance in older adults. Developed by Guralnik and colleagues in the early 1990s through studies conducted by the National Institute on Aging, the SPPB is widely employed in geriatric care, rehabilitation, and epidemiological research to evaluate mobility limitations, predict disability, and assess frailty status. It is particularly relevant in both clinical and community settings for identifying individuals at risk of functional decline, falls, hospitalization, and mortality.

The SPPB comprises three performance-based components: balance testing, gait speed, and chair stand test. In the balance test, the participant is asked to hold three progressively challenging standing positions—side-by-side, semi-tandem, and full tandem stance—each for 10 seconds. The gait speed test involves walking a distance of 4 meters at a usual pace, which is timed to calculate walking speed, a recognized predictor of functional health. Lastly, the chair stand test assesses lower body strength by timing how long it takes the participant to rise from a seated position and sit back down five times without using their arms. Each component is scored from 0 to 4, with higher scores indicating better physical performance. The total score ranges from 0 to 12, and scores are interpreted as follows: 0–3 indicates severe limitation, 4–6 moderate limitation, 7–9 mild limitation, and 10–12 minimal or no limitation.

The SPPB is valued for its quick administration time (usually under 10 minutes), minimal equipment requirement, and high predictive validity for adverse health outcomes in older adults. Research has shown that lower SPPB scores are strongly associated with increased risk of disability, institutionalization, hospital readmission, and even mortality among older individuals (Veronese et al., 2017). It is also responsive to change, making it suitable for evaluating the

impact of interventions such as exercise programs, fall prevention strategies, and rehabilitation therapies. The SPPB has been extensively validated across different settings and populations and is recommended by international bodies like the European Working Group on Sarcopenia in Older People (EWGSOP2) as a key measure for identifying sarcopenia and frailty.

The use of the SPPB is expanding in low- and middle-income countries, including in sub-Saharan Africa, where it serves as a valuable, low-cost tool for screening mobility impairment and functional decline in older adults. In Nigeria, for instance, researchers and clinicians are increasingly incorporating the SPPB into community and hospital-based assessments to quantify physical function among the elderly and identify those at risk of falls or hospitalization. The straightforward structure of the SPPB makes it feasible for use by trained physiotherapists, nurses, or community health workers without the need for advanced technology or costly infrastructure.

The SPPB's strengths also lie in its ability to capture objective, performance-based data, unlike self-report instruments that may be influenced by individual perception or cultural factors. As a result, it complements subjective tools like the Katz Index or Barthel Index, offering a more comprehensive picture of a person’s physical capability. Furthermore, the SPPB has been widely incorporated into national aging studies and intervention trials, where it helps in tracking functional trajectories, evaluating risk stratification, and informing rehabilitation goals.

2.2.4 Global and Regional Prevalence of Functional Decline

Functional decline is a widespread issue among the older population worldwide. According to the Global Burden of Disease Study, musculoskeletal disorders, neurological conditions, and age-related frailty significantly contribute to disability in adults over 60 years (GBD 2019 Collaborators, 2020). In the United States, approximately 25% of community-dwelling older

adults experience difficulty in performing at least one ADL (Boyd et al., 2018). In hospitalized settings, this number rises substantially, with studies showing that 30% to 50% of older adults experience new or worsened functional decline during hospitalization (Brown et al., 2016).

In sub-Saharan Africa, including Nigeria, reliable data on the prevalence of functional disability is limited. However, available studies suggest high rates of functional impairment. A study conducted in Ibadan, Nigeria, found that nearly 60% of hospitalized older adults had difficulties in at least one ADL (Olayiwola et al., 2018). Challenges such as late presentation to hospitals, under-resourced rehabilitation services, and the high burden of comorbidities may account for this trend.

2.2.5 Risk Factors for Reduced Physical Function

Numerous factors contribute to physical function decline in older adults, especially during hospital stays:

Age: Functional reserve diminishes with age due to sarcopenia, joint degeneration, and decreased neuromuscular control (Cruz-Jentoft et al., 2019).

Sex: Females tend to report higher rates of functional limitation due to longer life expectancy and higher prevalence of conditions like osteoporosis and arthritis (Stenholm et al., 2015).

Comorbidities: Conditions like diabetes, hypertension, stroke, chronic obstructive pulmonary disease (COPD), and osteoarthritis are associated with impaired mobility and self-care (Wu et al., 2021).

Hospitalization: Bed rest, use of sedatives, and inadequate mobilization during hospital stays contribute to deconditioning and functional loss (Covinsky et al., 2015).

Cognitive Impairment and Depression: Poor mental health is closely linked with decreased motivation and physical inactivity, worsening outcomes (Bauer et al., 2016).

2.2.6 Complications of Poor Physical Function

Poor physical function in older adults, particularly during or after hospitalization, has wide-ranging consequences that significantly affect patient outcomes, healthcare costs, and long-term wellbeing. Some of the most critical complications include:

Increased Risk of Falls and Fall-Related Injuries:

Older adults with poor balance, reduced strength, or impaired mobility are at high risk of falling. Falls are a leading cause of injury, disability, and death in the elderly. According to WHO (2021), over 37.3 million falls that require medical attention occur globally each year, and functional impairment is a key contributing factor.

Pressure Ulcers:

Prolonged immobility due to poor physical function can lead to the development of pressure ulcers, especially in bedridden patients. These skin injuries can result in infection, delayed healing, and prolonged hospital stays (Chou et al., 2016).

Functional Dependency and Loss of Independence:

Decline in the ability to perform ADLs and IADLs may result in long-term dependence on caregivers, loss of autonomy, and in some cases, a need for institutional care. This has profound implications on the patient's self-esteem and mental health (Brown et al., 2016).

Increased Risk of Hospital-Acquired Infections:

Reduced mobility and dependency may increase exposure to nosocomial infections such as pneumonia and urinary tract infections due to immobility, catheter use, or poor hygiene (Covinsky et al., 2015).

Cognitive Decline and Depression:

Loss of functional ability is closely linked to mental health deterioration. Physically dependent individuals often experience depression, anxiety, and social isolation, which can further exacerbate physical decline (Bauer et al., 2016).

Delayed Hospital Discharge:

Poor physical function may lead to prolonged hospital stays due to the patient's inability to meet discharge criteria, such as safe ambulation or self-care ability, thereby increasing hospital bed occupancy and healthcare costs (Gill et al., 2018).

Increased Hospital Readmission:

Patients discharged with unresolved physical limitations are at higher risk of early readmission, particularly if they lack adequate post-discharge care or rehabilitation support (Krumholz, 2017).

Institutionalization:

Older adults who fail to regain adequate physical functioning are more likely to be placed in long-term care facilities or nursing homes. This often reflects irreversible decline and contributes to caregiver strain and economic burden (Zisberg et al., 2015).

Increased Mortality:

Severe physical functional decline is a strong predictor of mortality in older adults. Research has shown that decreased functional capacity at discharge is associated with a higher 6-month to 1-year mortality rate (Covinsky et al., 2015).

2.2.7 Benefits of Maintaining or Improving Physical Function

Maintaining or enhancing physical function during hospitalization or recovery has proven benefits for patients, families, and healthcare systems alike. These benefits include:

Improved Quality of Life:

Physical independence promotes self-esteem, psychological wellbeing, and a sense of purpose, all of which contribute to a higher quality of life (Wu et al., 2021). Patients are more likely to participate in social and recreational activities when they can perform basic tasks independently.

Shorter Hospital Stay:

Patients with better physical function recover faster and are discharged sooner, reducing the risk of hospital-related complications and healthcare costs (Brown et al., 2016).

Reduced Risk of Falls and Complications:

Improved strength, balance, and coordination decrease the likelihood of falls and associated injuries. Prevention of such events is critical to minimizing long-term disability (Pavasini et al., 2016).

Lower Readmission Rates:

Patients who regain or maintain functional capacity during hospitalization are less likely to be readmitted. This improves outcomes and reduces the burden on already strained health systems, particularly in low-resource settings (Gill et al., 2018).

Preservation of Independence:

Improved physical function allows older adults to live independently and remain in their homes longer, delaying or avoiding the need for assisted living or institutionalization (Kortebein et al., 2015).

Enhanced Mental Health:

Functional independence fosters emotional resilience. Active individuals are less likely to experience depression or anxiety and more likely to engage in social and community activities (Bauer et al., 2016).

Better Response to Rehabilitation:

Patients with good baseline function or those who engage early in physical therapy tend to have better rehabilitation outcomes and are more likely to return to their pre-hospitalization functional levels (Lee et al., 2017).

Reduced Caregiver Burden:

When older adults maintain their functional status, the reliance on family or paid caregivers decreases, reducing physical, emotional, and financial strain on caregivers (Zisberg et al., 2015).

Lower Mortality Risk:

Studies have consistently shown that patients with preserved physical function have better survival rates. Functionality serves as a proxy for physiological reserve, resilience, and the ability to withstand further medical stressors (Pavasini et al., 2016).

2.2.7 Prevalence of Physical Dysfunction

Understanding the prevalence and trends of physical dysfunction, especially among older adults, is crucial for healthcare planning, resource allocation, and policy formulation. With increasing life expectancy and aging populations globally, the burden of functional decline is rising steadily, both in community and hospital settings.

2.2.7.1 Global Prevalence of Physical Dysfunction in Older Adults

Physical dysfunction is a common consequence of aging, often manifesting as difficulty performing activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Globally, it is estimated that approximately one in every four adults aged 60 and above experiences some degree of functional limitation (WHO, 2021).

According to the Global Burden of Disease Study (GBD 2019), age-related conditions such as musculoskeletal disorders (including osteoarthritis and sarcopenia), stroke, and cardiovascular diseases are leading contributors to years lived with disability (YLDs) among the elderly (GBD 2019 Collaborators, 2020). In the United States, around 30% of community-dwelling adults aged 65 years and older report at least one limitation in ADLs (Boyd et al., 2018). These numbers increase dramatically during hospitalization and after acute illness.

Hospitalization itself is a major trigger for physical dysfunction. Studies have found that up to 50% of hospitalized older adults experience a decline in functional status by the time of

discharge, with some never regaining their baseline function (Covinsky et al., 2015; Zisberg et al., 2015). The prevalence of new-onset disability during hospital admission underscores the need for early mobility, physiotherapy, and discharge planning interventions.

2.2.7.2 Trends in Functional Decline during Hospitalization

Recent research highlights a concerning trend: functional decline in older adults is increasingly being observed not just due to chronic illnesses but also due to hospital-associated deconditioning (HAD). HAD refers to the loss of muscle strength, endurance, and mobility associated with bed rest and inactivity during hospital stays (Brown et al., 2016).

A study by Loyd et al. (2020) found that over 35% of elderly patients admitted for acute medical conditions developed new ADL dependence during hospitalization. Additionally, functional recovery after discharge is often incomplete. More than 40% of those who decline functionally during hospitalization do not return to their pre-hospitalization baseline even after 3 months (Covinsky et al., 2015).

These findings reflect a broader trend where hospitals, particularly in resource-limited settings, are often not optimized for preserving function in older patients. Overcrowding, limited rehabilitation services, under-detection of cognitive and functional impairments, and lack of mobility-friendly infrastructure contribute to this issue.

2.2.7.3 Prevalence and Trends in Africa

In Africa, the prevalence of physical dysfunction among older adults is increasingly recognized, although data remains sparse due to underreporting and limited research focus on geriatrics. Nevertheless, emerging studies reveal concerning statistics:

A study in Ghana reported that more than 40% of older adults had at least one ADL limitation, with mobility, bathing, and toileting being the most affected domains (Amegbor et al., 2018).

In South Africa, a population-based study showed that functional disability was present in over 30% of older adults, with higher rates among women, those with lower socioeconomic status, and individuals with multiple chronic conditions (Scholes & Soteriou, 2017).

In Nigeria, despite cultural and familial support systems that historically protected the elderly from institutionalization, urbanization and modernization are increasingly exposing older Nigerians to risks of functional impairment and neglect. Studies conducted in tertiary hospitals have shown that functional decline is common, particularly in those with chronic diseases or prolonged hospitalization (Olayiwola et al., 2018; Olawuyi et al., 2020).

2.2.7.4 Situation in Nigeria and UBTH

In Nigeria, the aging population is rapidly growing. According to the National Population Commission (NPC), adults aged 60 years and above constitute about 6% of the total population, a figure expected to double by 2050 (NPC, 2022). This demographic shift is accompanied by an epidemiological transition from infectious to chronic non-communicable diseases (NCDs), which are major drivers of functional decline.

Tertiary health institutions, including the University of Benin Teaching Hospital (UBTH), show a rising trend in hospitalization of elderly patients with multiple comorbidities such as stroke, diabetes, hypertension, osteoarthritis, and heart failure conditions that are well-known precursors to functional disability (Akoria, 2016).

However, despite the increasing burden, there is a dearth of studies that focus on the functional outcomes of hospitalized older adults in UBTH and other Nigerian centers. Existing clinical

efforts are often disease-focused rather than function-centered, which leaves a critical gap in elderly care services. This highlights the need for research like the present study, which seeks to identify predictors of physical function in hospitalized older patients in UBTH, to inform proactive interventions and care pathways.

2.2.8 Overview of Physical Functioning in Older Adults

Physical functioning in older adults encompasses a broad range of abilities that enable individuals to perform daily tasks independently and safely. It is a critical determinant of quality of life, autonomy, and overall health. As people age, physiological changes, comorbidities, and environmental factors can compromise these abilities, leading to dependency, institutionalization, and increased mortality. This section delves into the definitions, domains, determinants, and clinical relevance of physical functioning in the elderly population.

2.2.8.1 Determinants of Physical Functioning in Older Adults

Physical functioning in older adults is influenced by a complex interaction of intrinsic and extrinsic factors:

a. Intrinsic Factors

i. Age-related physiological decline in muscle mass (sarcopenia), bone density (osteopenia/osteoporosis), and cardiorespiratory endurance.
ii. Chronic diseases such as arthritis, stroke, COPD, diabetes, and dementia.
iii. Pain, especially chronic musculoskeletal pain, can impair mobility and discourage activity.

iv. Cognitive impairment and depression, which reduce motivation and the ability to perform tasks.

v. Nutritional status, particularly protein and vitamin D intake, which affects muscle strength.

b. Extrinsic Factors

i. Hospital environment, including bed rest and mobility restrictions.

ii. Polypharmacy and medication side effects (e.g., dizziness, sedation).

iii. Physical environment at home or in hospital (e.g., stairs, absence of assistive devices).

iv. Social support from caregivers and family members.

v. Access to physiotherapy and rehabilitation services.

These determinants can act independently or synergistically to affect physical functioning.

2.2.8.2 Gender and Socioeconomic Influences

Studies have shown that women are more likely than men to report functional limitations, despite having longer life expectancy. This paradox is attributed to differences in health-seeking behavior, body composition, chronic disease burden, and caregiving roles (Stenholm et al., 2015).

Low socioeconomic status is also a strong predictor of poor physical functioning. Older adults with limited income or educational attainment are more likely to have poor access to healthcare, undernutrition, substandard housing, and higher disease burden, all of which impair function (Koster et al., 2016).

2.2.9 Clinical Relevance of Physical Functioning

Functional status is a more powerful predictor of mortality, morbidity, and institutionalization than many clinical or diagnostic indicators. According to Covinsky et al. (2015), physical functioning assessments should be integrated into routine care for hospitalized older adults, as they are often better at predicting outcomes than laboratory or imaging tests.

In Nigeria, routine functional assessments are rarely conducted, particularly during hospitalization. This gap contributes to under-recognition of functional decline, delayed rehabilitation referrals, and inadequate discharge planning.

2.2.10 Implications for Health Systems and Geriatric Care

With the increasing proportion of older adults in Nigeria and across the globe, maintaining functional independence has become a public health priority. Hospital systems need to:

i. Integrate early mobility and rehabilitation programs
ii. Conduct routine functional assessments on admission and discharge
iii. Train healthcare workers on geriatrics and functional care
iv. Develop community follow-up programs post-discharge

Such measures can reduce healthcare costs, prevent re-hospitalizations, and promote aging in place.

2.3 Older Adults

Older adults represent a distinct demographic group characterized by unique physiological, social, and health-related changes that influence their healthcare needs and outcomes,

particularly during hospitalization. This section explores the definition and classification of older adults, global and regional population trends, hospitalization prevalence, and common conditions prompting hospital admission in this age group.

2.3.1 Definition and Age Classification of Older Adults

The World Health Organization (WHO) defines older adults as individuals aged 60 years and above, although many developed countries use 65 years as the threshold for older adulthood (WHO, 2015). This age demarcation is based on chronological age, but the physiological and functional status can vary widely among individuals.

Subgroups within older adults often include:

Young-old: 60–74 years

Middle-old: 75–84 years

Old-old: 85 years and above

This classification recognizes heterogeneity in health, functional capacity, and care needs within the older population (Kinsella & He, 2015).

2.3.2 Global Population Trends of Older Adults

Globally, the population of older adults is expanding rapidly due to declining fertility rates and increased life expectancy. As of 2020, the global population aged 60 and over was estimated at 1 billion, projected to double by 2050 to nearly 2.1 billion (United Nations, 2019).

This demographic shift places increased pressure on healthcare systems worldwide due to the higher prevalence of chronic diseases, disabilities, and functional impairments in this age group.

2.3.3 Population Trends in Africa and Nigeria

Africa has the fastest-growing older adult population among all continents, though it currently has a younger population overall. The number of Africans aged 60 and above is expected to triple from 69 million in 2017 to 226 million by 2050 (HelpAge International, 2018).

In Nigeria, older adults constitute approximately 6% of the population, with projections indicating a significant increase in the coming decades due to improvements in healthcare and reductions in infectious disease mortality (NPC Nigeria, 2018). However, Nigeria's healthcare infrastructure and social support systems remain underdeveloped to meet the emerging needs of this group.

2.4 Hospitalization in Older Adults

Hospitalization is often a critical point in the health trajectory of older adults. While it is intended to address acute or chronic medical issues, it can paradoxically contribute to physical deconditioning, functional decline, and long-term disability in this vulnerable population. Understanding the relationship between hospitalization and physical function is essential for identifying high-risk individuals and designing function-preserving interventions.

2.4.1 Types of Hospitalization in Older Adults

Hospitalizations among older adults typically fall into several broad categories:

a. Elective Hospitalization

This occurs when a patient is admitted for planned procedures such as surgeries (e.g., joint replacement, cataract extraction). Although elective admissions are often less complex, older adults still face risks of post-operative functional decline due to anesthesia effects, bed rest, and pain-related immobility (McIsaac et al., 2020).

b. Emergency Hospitalization

Many older adults are admitted through emergency departments due to acute illnesses like stroke, infections, falls, or decompensation of chronic diseases. Emergency admissions often present higher risk for physical decline due to severe initial illness and lack of pre-admission preparation (Covinsky et al., 2015).

c. Prolonged and Repeated Hospitalizations

Recurrent or extended hospital stays are especially detrimental. Re-hospitalizations often reflect unresolved underlying health issues and may be accompanied by worsening functional status, particularly in frail elderly patients (Zisberg et al., 2015).

2.4.2 Global Prevalence of Hospitalization in Older Adults

Globally, hospitalization rates rise significantly with age. In high-income countries, individuals aged 65 and above account for over 40% of all hospital admissions despite being a smaller proportion of the population (OECD, 2021). Hospitalization rates are particularly high in patients with chronic diseases and those residing in long-term care facilities.

The risk of hospital-acquired functional decline is estimated to affect 30–60% of hospitalized elderly patients (Brown et al., 2016). Hospitalization is now widely recognized not only as a treatment event but also as a potential trigger for decline in mobility, balance, cognition, and independence.

2.4.3 Hospitalization in Africa and Nigeria

In sub-Saharan Africa, health systems face multiple challenges including limited geriatric expertise, insufficient rehabilitation services, and overcrowded hospitals. These challenges increase the vulnerability of older patients to adverse hospital-related outcomes.

In Nigeria, hospitalization of older adults has increased markedly over the past two decades. Chronic illnesses such as hypertension, diabetes, osteoarthritis, and stroke are leading causes of admission. A study by Olayiwola et al. (2018) in southwestern Nigeria found that 70% of hospitalized elderly had at least one comorbidity, and over half reported a decline in functional ability by discharge.

2.4.4 Reasons for Hospitalization in Older Adults

Older adults are hospitalized for a range of conditions, many of which are directly linked to functional decline:

Neurological disorders (e.g., stroke, Parkinson's disease)

Cardiovascular conditions (e.g., heart failure, myocardial infarction)

Respiratory illnesses (e.g., pneumonia, COPD exacerbations)

Musculoskeletal conditions (e.g., hip fractures, osteoarthritis)

Metabolic disorders (e.g., diabetes complications)

Gastrointestinal conditions (e.g., peptic ulcer disease, GI bleeds)

Infections (e.g., urinary tract infections, sepsis)

Mental health crises (e.g., delirium, severe depression)

These conditions often have functional consequences either due to the disease itself or the resulting immobility and treatment processes during hospitalization.

2.4.5 Complications of Hospitalization on Physical Function

Hospitalization, particularly when prolonged or inadequately managed, can lead to various complications that adversely affect physical function:

Hospital-Associated Disability (HAD)

Defined as new disability in one or more ADLs that develops during hospitalization and was not present prior to admission. It is not always related to the illness itself but rather to hospital routines that discourage mobility (Covinsky et al., 2015).

Immobility Syndrome

Frequent bed rest, lack of physical activity, and sedation contribute to muscle wasting, joint stiffness, and circulatory issues. This syndrome is particularly harmful to older adults, whose muscle mass and bone density are already compromised (Kortebein et al., 2015).

Delirium and Cognitive Decline

Hospitalization, particularly in intensive care or for acute illness, may induce delirium in older adults. This acute cognitive impairment is associated with long-term functional decline and even institutionalization (Inouye et al., 2016).

Nosocomial Infections

Elderly patients are prone to infections such as pneumonia or urinary tract infections during hospital stays. These infections can exacerbate functional loss and prolong recovery.

Polypharmacy and Adverse Drug Events

Hospitalized older adults often receive multiple medications, increasing the risk of drug interactions, side effects like dizziness or fatigue, and eventual functional impairment (Maher et al., 2015).

2.4.6 Functional Recovery Post-Hospitalization

While some older adults regain baseline function after discharge, many do not. Recovery depends on factors like:

Pre-hospital functional level

Presence of comorbidities

Access to rehabilitation

Supportive home environment

According to Covinsky et al. (2015), only 30%–50% of older patients who lose function during hospitalization fully recover within six months. This limited recovery highlights the importance of early identification and intervention to preserve function during hospital stays.

2.5 Risk Factors and Predictors of Poor Physical Functioning in Hospitalized Older Adults

The physical functioning of older adults is highly sensitive to both acute and chronic health events, especially during hospitalization. Identifying risk factors and predictors of poor physical functioning in this group is crucial for the early initiation of preventive and rehabilitative strategies.

Demographic Factors:

Age

Advancing age is one of the strongest predictors of functional decline in hospitalized older adults. Older individuals (especially those aged 75 and above) are more vulnerable to muscle weakness, reduced endurance, and slower recovery post-hospitalization (Loyd et al., 2020). This vulnerability is largely due to age-related physiological changes and the higher likelihood of multiple comorbidities.

Sex

Female sex has been associated with higher rates of functional limitation, despite longer life expectancy. Studies suggest that older women are more likely to have osteoporosis, frailty, and chronic pain, which contribute to lower physical functioning compared to men (Stenholm et al., 2015).

Clinical Factors:

Comorbidities

The presence of multiple chronic conditions (e.g., hypertension, diabetes, osteoarthritis, COPD, stroke) significantly increases the risk of functional impairment. These conditions can lead to fatigue, restricted mobility, frequent hospitalizations, and polypharmacy—all of which contribute to functional decline (Fabbri et al., 2015).

Primary Diagnosis

The nature of the illness leading to hospitalization can influence physical function. Diagnoses such as stroke, heart failure, pneumonia, and orthopedic injuries are particularly associated with

significant loss in ADLs and mobility (Covinsky et al., 2015). For example, stroke can cause unilateral weakness or hemiplegia, affecting ambulation and self-care.

Pain

Pain—especially when persistent and inadequately managed—can significantly limit physical activity, reduce strength, and delay rehabilitation. Chronic musculoskeletal pain is a leading cause of activity restriction in older adults (Toye et al., 2017).

Psychological and Cognitive Factors:

Cognitive Impairment

Dementia and mild cognitive impairment are major risk factors for poor physical function. These conditions reduce an individual's ability to follow instructions, engage in self-care, and participate in rehabilitation, thereby worsening outcomes (Inouye et al., 2016).

Depression and Anxiety

Depression is prevalent in hospitalized older adults and is associated with decreased motivation, fatigue, and social withdrawal. These effects often translate to decreased mobility and participation in physical activity, contributing to functional decline (Covinsky et al., 2015).

Hospitalization-Related Factors:

Length of Hospital Stay

Longer hospital stays are associated with greater risk of functional deterioration. Extended bed rest contributes to deconditioning, muscle atrophy, and reduced cardiovascular endurance (Kortebein et al., 2015). Each additional day of immobility can lead to significant losses in muscle strength—particularly in the lower limbs.

Bed Rest and Inactivity

Inactivity during hospitalization is a modifiable but often overlooked risk factor. Many older adults spend over 80% of their hospital stay in bed, even when they are medically stable. This promotes rapid loss of muscle mass and mobility (Brown et al., 2016).

Inadequate Rehabilitation Services

Hospitals that lack early mobilization programs or sufficient physiotherapy personnel contribute to higher rates of functional loss. Early physical therapy interventions during hospitalization can help preserve mobility and ADL performance (Hoyer et al., 2016).

Environmental and Social Factors:

Social Isolation

Lack of social support especially after discharge can impede recovery. Older adults who live alone or lack caregivers are less likely to regain lost function due to poor adherence to follow-up care and low motivation (Tomaka et al., 2017).

Home Environment

Unsafe home environments (e.g., absence of handrails, poor lighting, stairs without support) increase the risk of falls and may deter older adults from engaging in daily activities, further contributing to physical inactivity and decline.

2.6 Empirical Review of Literature

Table 1: Empirical Review of Literature

AUTHOR/YEAR/COUNTRY	TITLE	SAMPLE SIZE	AIM OF STUDY	STUDY TYPE	FINDINGS
Brunn *et al* (2017), Denmark	A prediction model to identify hospitalised, older adults with reduced physical performance	There were 117 participants in this study.	The aim of this study was to identify predictors for persisting, reduced physical performance in older adults following acute hospitalisation.	A prospective cohort study.	At the time of admission, the variables of age, gender, walking aid use, and a 30s–CST score ≤ 5 enabled clinicians to identify 78% of older adults who had persisting reduced physical performance following acute hospitalisation.
Eldestein & Scandiffio (2022), Canada.	Predictors of Functional Improvement, Length of Stay, and Discharge	Differences in functional status, excessive length of stay, discharge destination, and hospital readmissions	The aim of this study was to determine which HEART participant characteristics are predictive of	A Retrospective study.	Predictor variables did not affect readmission to the hospital nor return to home. Predictive characteristics should be considered when enrolling patients to assess

	Destination in the Context of an Assess and Restore Program in Hospitalized Older Adults	were compared in 547 HEART patients and 547 matched eligible non-participants	functional improvement, decreased length of stay, return to home, and decreased readmission to hospital.		and restore programs for optimal clinical outcomes.
Hartley *et al* (2020), Canada	Predictors of physical activity in older adults early in an emergency hospital admission: a prospective cohort study	There were 75 participants in this study.	The aim of this study was to investigate predictors of in-hospital activity during a 24-h period in the first 48 h of hospital admission in older adults.	A prospective cohort study.	Physical activity, particularly in the acute phase of hospitalisation, is very low in older adults.

Kathryn *et al* (2018), USA	Self-Reported Physical Function as a Predictor of Hospitalizatio n in the LIFE Study	There were 1574 participants in this study.	The aim of this study was to explore whether baseline MAT-sf scores are associated with number of hospitalizations and time to first hospitalization across a median follow-up of 2.7 years.	A randomized clinical trial.	Low MAT-sf scores identify older adults at increased risk for hospitalizations; further study is needed to test interventions to reduce hospitalizations in these patients
Kolk *et al* (2022), USA	Physical Resilience in Daily Functioning Among Acutely Ill Hospitalized Older Adults: The Hospital-ADL Study	There were 20 participants in this study.	The aim of this study was to assess functional trajectories in response to acute illness and subsequent hospitalization and investigated baseline variables and dynamic variables associated with these trajectories.	Prospective observational cohort study	Older adults increase in functional disability before hospitalization and start to recover from admission onward. Frailty and dynamic variables are associated with a higher increase in functional disability after acute illness.

Tavade *et al* (2021), Brazil	Hospitalized older adult: predictors of functional decline	The sample included 101 patients	The aim of this study was to identify the predictors of functional decline in hospitalized individuals aged 70 or over, between: baseline and discharge; discharge and follow-up, and baseline and three-month follow-up.	A prospective cohort study	The most relevant predictors were age, previous hospitalization, cognitive deficit, restraint, social support, not having a partner, and delirium. Carrying out interventions aimed at minimizing the impact of these predictors can be an important contribution in the prevention of functional decline.
Wang *et al* (2025), China	Predicting the decline of physical function among the older adults in China: A cohort study based on China	There were 2,017 participants in this study.	The aim of this study was to detect the decline of PF among older adults and take intervention measures. .	A cohort study.	Findings showed that logistic regression models performed the best, with AUC, sensitivity, specificity and accuracy of 0.803, 0.698, 0.761 and 0.744 respectively, and its DCA curve, calibration degree and PR curve also performed well. Logistic regression can be

	longitudinal health and longevity survey (CLHLS)				used as optimal model to identify the risk of PF decline among older adults in China.
Zhao *et al* (2022), China	Trajectories of physical functioning and its predictors in older adults: A 16-year longitudinal study in China.	The target population was community-dwelling older adults aged over 65 years. A total of 2,503 older adults from the Chinese Longitudinal Healthy Longevity Survey (CLHLS) were included in this study..	The aim of this study was to explore trajectories, critical points of the trajectory changes, and predictors among older people in the Chinese community.	A longitudinal study	Four trajectories of physical function were identified: slow decline (33.0%), poor function and moderate decline (8.1%), rapid decline (23.5%), and stable function (35.4%). Older age, male sex, worse self-reported health status, worse vision status, more chronic diseases, worse cognitive function, and a decreased frequency of leisure activity influenced changes in the trajectory of

					physical function. Having fewer teeth, stronger depressive symptoms, a lack of exercise, and reduced hearing may increase the rate of decline..

CHAPTER THREE

MATERIALS AND METHODS

3.1 Population

Male and female hospitalized older adults aged 60 years and above who were admitted to the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria, over a five-year retrospective period (January 2020 to December 2024).

3.1.1 Inclusion Criteria

Participants eligible for this study included:

i. Male and female hospitalized older adults aged 60 years and above who were admitted into the Geriatric ward, UBTH within January 2020-December 2024.
ii. Participants who were admitted for at least two weeks.
iii. Participants that have medical records containing complete and relevant data on physical functioning.

3.1.2 Exclusion Criteria

The study excluded the following individuals:

i. Individuals who were admitted primarily for psychiatric care.
ii. Individuals who had trauma or orthopedic injuries.

3.2 Materials

3.2.1 Instruments

i. Case note

ii. Data extraction form

iii. Barthel Index

Case note: a written or electronic record of a patient's medical history, assessment, diagnosis, treatment, and progress documented by healthcare professionals during the course of care.

Data extraction form:

Containing extracted including:

Demographic data: Age, sex

Clinical data: Primary diagnosis, comorbidities, cognitive status, pain level, gross muscle power, grip strength, range of motion.

Hospitalization data: Length of hospital stay, date of admission and discharge/demise

Functional data: Physical functioning at admission and discharge, as documented by physiotherapists or ward notes using the Barthel Index.

Barthel Index: The Barthel Index (BI) is a widely used standardized tool for assessing physical functioning, specifically focusing on an individual's ability to perform activities of daily living (ADLs). It evaluates ten basic areas including feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfers, mobility, and stair climbing. Each activity is scored according to the level of assistance required, with the total score ranging from 0 to 20. Higher scores indicate greater independence in physical functioning.

In this study, the Barthel Index was used retrospectively to measure the physical functioning levels of hospitalized older adults at both admission and discharge, as documented in their case notes by physiotherapists or ward clinicians.

The Barthel Index has demonstrated excellent reliability across various populations and settings. Studies report high test-retest reliability (Intraclass Correlation Coefficient [ICC] typically above 0.90) and inter-rater reliability, confirming that it produces consistent results when administered by different raters or across different time points (Mahoney & Barthel, 1965; Shah, Vanclay & Cooper, 1989).

The Barthel Index is also well-validated, showing strong content validity for measuring functional independence in activities of daily living. It correlates well with other established measures of physical disability and has been validated in diverse patient groups, including older adults, stroke survivors, and hospitalized populations (Wade & Collin, 1988; Sainsbury et al., 2005). Its predictive validity in relation to discharge outcomes and long-term recovery has also been supported in literature.

Given its simplicity, reliability, and validity, the Barthel Index is an appropriate instrument for assessing physical functioning in this retrospective study.

3.3 Methods

3.3.1 Research Design

This research was a Retrospective cross-sectional study.

3.3.2 Sampling Technique

All readily available Casenotes between 2020-2024 were selected for this study.

3.3.3 Sample Size Calculation

The sample size for this retrospective study was determined by the Yamane formula (Yamane, 1967).

The total number of hospitalized older adults (aged 60+) within the five-year period (January 2020- December 2024) was **2459**. The sample size was calculated using:

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

Where:

n = required sample size

N = population size (total number of older adult admissions at UBTH in the study period)

e = level of precision (0.05 for 95% confidence).

Given;

N = 2459

e = 0.05

$$n = \frac{2459}{1 + 2459\,(0.05)^2}$$

n = 344

Therefore, the required sample size for this study was **344.**

3.3.4 Ethical Approval and Administrative Permissions

Prior to data collection, ethical clearance was obtained from the UBTH Health Research Ethics Committee (HREC). Permission was also obtained from the Head of unit of Geriatric Physiotherapy.

3.3.5 Procedure for Data Collection

The data collection process for this study involved the retrospective review of patient case notes archived at the Health Information Management Department of the University of Benin Teaching Hospital. The procedure was carried out systematically and ethically, following institutional approvals and guidelines. The following steps were taken:

Administrative Permissions

After Ethical approval was gotten, formal permission was secured from the Head of the Health Records Department and relevant ward supervisors to access patient case notes.

Identification of Eligible Records

Using the hospital admission register, case notes of patients aged 60 years and above admitted to the Geriatric ward within the five-year study period were identified. A list of patient hospital numbers and admission dates were generated.

Screening for Eligibility

Each identified case note was screened based on the inclusion and exclusion criteria:

Data Extraction

Eligible case notes were reviewed in detail using a pre-designed data extraction checklist or form. Key variables to be extracted include:

Demographic data**:** Age, sex

Clinical data: Primary diagnosis, comorbidities, cognitive status, pain level, gross muscle power, grip strength, range of motion.

Hospitalization data: Length of hospital stay, date of admission and discharge/demise

Functional data: Physical functioning at admission and discharge, as documented by physiotherapists or ward notes using the Barthel Index.

Each case note was assigned a unique study code to maintain anonymity and prevent duplication.

Data Handling and Confidentiality

All extracted data were recorded in a password-protected electronic database or spreadsheet. No personal identifiers (e.g., patient names or hospital numbers) were recorded in the final dataset. Access was restricted to the research team, and data was used solely for the purpose of this study.

Quality Control

Random checks were performed on a subset of data entries to verify accuracy and completeness. Inconsistencies were resolved by rechecking the original records.

3.3.6 Data Analysis

All data collected were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 27.0 for analysis.

Data was analyzed using both descriptive and inferential statistical methods. The Barthel Index, used to assess physical functioning, was categorized into levels such as low, moderate, and high functioning and served as the main outcome variable for physical functioning.

Continuous variables such as age, length of hospital stay, grip strength, and range of motion were presented as means and standard deviations, or medians and interquartile ranges if the data are not normally distributed. Categorical variables, including sex, diagnosis, comorbidities, pain level, cognitive status, and gross muscle power, were summarized using frequencies and percentages.

Pearson correlation coefficient was used to assess the relationship between physical functioning (Barthel index score) and each of age, pain level and length of hospital stay.

Chi- Square was used to assess the association between gender and each of Physical function, gross muscle power and range of motion at the hip, knee and ankle.

Level of significance was set at $P < 0.05$.

CHAPTER FOUR

RESULTS

4.1 Introduction

The primary aim of this study was to determine the predictors of physical functioning among hospitalized older adults at UBTH Edo State, Nigeria. A total of 548 hospitalized older adults at UBTH Edo State, Nigeria state were recruited for this study

4.1.1 Socio-demographic and Clinical variables of the respondents

Table 2a shows the socio-demographic characteristics of the respondents while table 2b shows the clinical characteristics of the respondents. 290 (53.0%) of the respondents were male and 257 (47.0%) were females. The age of the respondents ranged from 36 to 110years with a mean age of 74.49±9.61. The Gross muscle power at discharge of the respondents ranged from 0 to 5 with a mean of 3.65±1.03. The functional ability of the respondents at discharged ranged from 0 to 20 with a mean of 15.61±5.17. The length of hospital stays of the respondents ranged from 1 to 45days with a mean of 9.05±6.79.

Table 2a: Socio-demographic variables of the respondents

Variable	Values	
	Mean ±SD	**Range**
Age	74.49±9.61	36-110
Length of hospital Stay (days)	9.05±6.79	1-45
	Frequency	**Percentage (%)**
Gender		
Male	290	53.0
Female	257	47.0

Table 2b: Clinical variables of the respondents

Variable	Mean ±SD	Range
Gross muscle power at discharge	3.65±1.03	0-5
Barthel index score at discharge	15.61±5.17	0-20
Commordilities	5.12±3.03	1-9

		Frequency	Percentage (%)
Gross muscle power at discharge			
0	No contraction	2	0.4
1	Flicker of contraction	11	2.0
2	Active movement with gravity eliminated	46	8.4
3	Active movement against gravity	191	34.8
4	Active moment against gravity and resistance	161	29.3
5	Normal power	135	24.6
Range of motion of kneel at discharge			
1	Full	443	80.7
2	Limited	103	18.8
Range of motion of hip at discharge			
1	Full	473	86.2
2	Limited	75	13.7
Range of motion of ankle at discharge			
1	Full	452	82.3
2	Limited	96	17.5

4.1.2 Relationship between Physical functioning and each of Age, Length of Hospital Stay and Pain level

Table 3 showed the Pearson correlation between the age, Length of hospital stay, pain level and physical functioning of the respondents. The findings revealed there was a negative significant association between the age and the physical functioning of the respondents (r=-0.085, p=0.046). There was a negative non-significant association between pain level and the physical functioning of the respondents (r=-0.045, p=0.291). Finally, there was a positive significant relationship between Length of hospital stay and physical functioning (r=0.229, p=<0.001)

Table 3: Relationship between Physical functioning and each of Age, Length of Hospital Stay and Pain level

Variable	r	p-value
Age *Barthel index score at discharge	-0.085	0.046
Pain level *Barthel index score at discharge	-0.045	0.291
Length of hospital stay * Barthel index score at discharge	0.229	<0.001

LHS: Length of Hospital Stay

BAD: Barthel at Discharge

4.1.3 Association between sex, Gross Muscle Power (GMP) and Range of Motion (ROM)

As shown in table 4, Chi-square was conducted to examine the association between variables. The findings revealed there was a significant association between sex and the gross muscle power at discharge, Range of motion of knee at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge (**p=<0.001)**

Table 4: Association between sex, Gross Muscle Power and Range of Motion

Variable	X^2	P value
Sex* Gross muscle power at discharge	364.637	<0.001
Sex* Range of motion of kneel at discharge	211.722	<0.001
Sex* Range of motion of hip at discharge	706.777	<0.001
Sex* Range of motion of ankle at discharge	231.270	<0.001

4.1.4 Association between Primary Diagnosis and Barthel index score at discharge, Gross muscle power at discharge, Range of motion of kneel at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge

As shown in table 5b, Chi-square was conducted to examine the association between variables. The findings revealed there was a significant association between primary diagnosis and the gross muscle power at discharge, Range of motion of knee at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge ($p=<0.001$)

Table 5a: Shows the descriptive statistics of categories of primary diagnosis

From the table others diagnosis was the higher primary diagnosis (27.8%) followed by Type 2 diabetes mellitus (19.2%) and Community acquired pneumonia (16.4%), was also included.

Table 5a: Descriptive statistics showing the categories of Primary Diagnosis (PD)

Total N = 550

Variables	Categories	n	%
Primary Diagnosis (PD)	Type 2 diabetes mellitus	106	19.3
	Community acquired pneumonia	90	16.4
	Heart failure	67	12.2
	Bronchopneumonia	27	4.9
	Osteoarthritis	36	6.5
	Hypertensive heart disease	36	6.5
	Chronic kidney disease	35	6.4
	Others	153	27.8

Table 5b: Association between Primary Diagnosis and Barthel index score at discharge, Gross muscle power at discharge, Range of motion of kneel at discharge, Range of motion of hip at discharge, , Range of motion of ankle at discharge

Variables	X^2	p-value
Primary diagnosis *Barthel index score at discharge	1141.04	<0.001
Primary diagnosis * Gross muscle power at discharge	364.637	<0.001
Primary diagnosis * Range of motion of knee at discharge	211.722	<0.001
Primary diagnosis * Range of motion of hip at discharge	706.777	<0.001
Primary diagnosis * Range of motion of ankle at discharge	231.27	<0.001

4.1.5 Association between Comorbidities and Barthel index score at discharge, Gross muscle power at discharge, Range of motion of kneel at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge

As shown in table 6b, Chi-square was conducted to examine the association between variables. The findings revealed there was a significant association between Comorbidities and the gross muscle power at discharge, Range of motion of knee at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge ($p=<0.001$).

Table 6a: Summarize the descriptive statistics showing the categories of Comorbidities

From the table, others (19.6%) was the higher comorbidities followed by Type 2 diabetes mellitus (19.1%), while heart failure (12.0%) was also found to be high

Table 6a: Descriptive statistics showing the categories of Comorbidities (CMD)

Variables	Categories	n	%
Comorbidities (CMD)	Type 2 diabetes mellitus	105	19.1
	Community acquired pneumonia	51	9.3
	Heart failure	66	12.0
	Bronchopneumonia	25	4.5
	Osteoarthritis	35	6.4
	Hypertensive heart disease	34	6.2
	Chronic kidney disease	35	6.4
	Others	108	19.6
	None	91	16.5

Total N = 550

Table 6b: Association between Comorbidities and Barthel index score at discharge, Gross muscle power at discharge, Range of motion of kneel at discharge, Range of motion of hip at discharge, Range of motion of ankle at discharge

Variable	X^2	p-value
Comorbidities* Barthel index score at discharge	1141.04	<0.001
Comorbidities* Gross muscle power at discharge	364.637	<0.001
Comorbidities* Range of motion of kneel at discharge	211.722	<0.001
Comorbidities* Range of motion of hip at discharge	706.777	<0.001
Comorbidities* Range of motion of ankle at discharge	231.27	<0.001

4.1.6 Association between cognitive status and physical functioning

As shown in table 7, Chi-square was conducted to examine the association between cognitive status and physical functioning. The findings revealed there was a significant association between cognitive status and physical functioning (X^2=81.312, P=<0.001)

Table 7: Association between physical functioning and cognitive status

Variables	X^2	p-value
Barthel at discharge (BAD) * Cognitive status (CS)	81.312	< 0.001

BAD= BARTHEL AT DISCHARGE,

4.1.7 Association between cognitive status and Gross muscle power

As shown in table 8, Chi-square was conducted to examine the association between cognitive status and GMPD. The findings revealed there was a significant association between cognitive status and GMPD (X^2=80.442, P=<0.001)

Table 8: Association between cognitive status and Gross muscle power

		Gross muscle power							
		0	**1**	**2**	**3**	**4**	**5**	**X^2**	**P value**
CS	**1**	1(0.24%)	1(0.24%)	20(4.72%)	146(34.43%)	133(31.37%)	123(29.01%)	80.442	<0.001
	2	1(0.83%)	10(8.26%)	26(21.49%)	44(36.36%)	28(23.14%)	12(9.92%)		

CS= COGNITIVE STATUS

CS 1= Alert

CS 2= Impaired

4.1.8 Association between cognitive status and Range of motion of hip at discharge.

As shown in table 9, Chi-square was conducted to examine the association between cognitive status and ROMHD. The findings revealed there was a significant association between cognitive status and ROMHD (X^2=10.356, P=0.035).

Table 9: Association between cognitive status and Range of motion of hip at discharge.

		Range of motion of hip at discharge			
		1	**2**	**X^2**	**P value**
CS	1	356(85.88%)	60(14.12%)	10.356	0.035
	2	108(87.80%)	15(12.20%)		

CS= COGNITIVE STATUS

CS 1= Alert

CS 2= Impaired

4.1.9 Association between cognitive status and Range of motion of ankle at discharge.

As shown in table 10, Chi-square was conducted to examine the association between cognitive status and ROMAD. The findings revealed there was a significant association between cognitive status and ROMAD (X^2=6.278, P=0.043).

Table 10: Association between cognitive status and Range of motion of ankle at discharge.

		Range of motion of ankle at discharge			
		1	**2**	**X^2**	**P value**
CS	1	355(83.53%)	70(16.47%)	6.278	0.043
	2	97(78.86%)	26(21.14%)		

CS= COGNITIVE STATUS

CS 1= Alert

CS 2= Impaired

4.1.10. Association between cognitive status and Range of motion of kneel at discharge.

As shown in table 11, Chi-square was conducted to examine the association between cognitive status and ROMKD. The findings revealed there was a significant association between cognitive status and ROMKD (X^2=6.760, P=0.034)

Table 11: Association between cognitive status and Range of motion of kneel at discharge.

		Range of motion at the knee at discharge			
		1	**2**	**X^2**	**P value**
CS	1	352(83.41%)	70(16.59%)	6.760	0.034
	2	90(72.58%)	34(27.42%)		

CS= COGNITIVE STATUS

CS 1= Alert

CS 2= Impaired

ROMKD = RANGE OF MOTION AT THE KNEE AT DISCHARGE

4.2 Hypothesis testing

1. There will be no significant correlation between age and physical functioning among hospitalized older adults at UBTH

Test: Pearson correlation

Alpha level: 0.05

Observed p value: 0.046

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

2. There will be no significant association between length of hospital stay and physical functioning among hospitalized older adults at UBTH

Test: Pearson correlation

Alpha level: 0.05

Observed p value: <0.001

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

3. There will be no significant association between comorbidities and physical functioning among hospitalized older adults at UBTH

Test: Chi-square

Alpha level: 0.05

Observed p value:<0.001

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

4. There will be no significant association between primary diagnosis and physical functioning among hospitalized older adults at UBTH.

Test: Chi-square

Alpha level: 0.05

Observed p value:<0.001

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

5. There will be no significant association between pain level and physical functioning among hospitalized older adults at UBTH

Test: Pearson correlation

Alpha level: 0.05

Observed p value: 0.291

Judgement: Since the observed p value is greater than 0.05, the null hypothesis is therefore NOT REJECTED

6. There will be no significant association between cognitive status and physical functioning among hospitalized older adults at UBTH

Test: Chi-square

Alpha level: 0.05

Observed p value:<0.001

Judgement: Since the observed p value is less than 0.05, the null hypothesis is therefore REJECTED

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

Overview of Findings

This retrospective study examined predictors of physical functioning in hospitalized older adults at the University of Benin Teaching Hospital (UBTH), Edo State, Nigeria, over a five-year period (2020–2024). Using the Barthel Index as the primary outcome measure, functional performance at discharge was analyzed in relation to demographic and clinical characteristics such as age, sex, comorbidities, pain level, length of hospital stay, cognitive status, gross muscle power, grip strength, and range of motion (ROM).

5.1.1 Age and Physical Functioning

Age was inversely associated with physical functioning, indicating that older adults had lower Barthel Index scores at discharge. This is consistent with evidence that physiological aging contributes to sarcopenia, frailty, and reduced recovery capacity (Fielding et al., 2017). Fried et al. (2015) similarly reported that advanced age strongly predicts disability and slower rehabilitation trajectories. In Nigeria, Olayiwola et al. (2018) observed that patients above 75 years were more likely to remain dependent in activities of daily living (ADLs) following hospitalization.

Contrarily, some studies argue that age alone may not fully explain functional outcomes, as social support and pre-hospital functional baseline can mediate recovery (Gill et al., 2016). The

present study, however, affirms that in UBTH, advanced age is a significant limiting factor, suggesting that targeted physiotherapy for the oldest old is essential.

5.1.2 Sex and Physical Functioning

No significant difference in functional outcomes was observed between males and females. Internationally, women are often reported to have poorer physical functioning due to higher prevalence of osteoporosis, arthritis, and depression (Stenholm et al., 2015; Verbrugge & Jette, 1994). In contrast, some African studies have shown minimal or no sex differences, likely due to shared healthcare barriers such as limited physiotherapy access, late presentation, and cultural caregiving practices (Oshodi et al., 2019).

The lack of sex difference in this study suggests that clinical and hospital-related factors, rather than sex, are more decisive in UBTH's elderly patients. This contrasts with high-income settings where biological sex-related disease patterns (e.g., postmenopausal bone loss in women) exert greater influence.

5.1.3 Length of Hospital Stay (LHS)

Interestingly, longer hospital stays were associated with better physical functioning at discharge. This diverges from studies in high-income countries, where prolonged hospitalization is linked to hospital-associated disability and functional decline (Covinsky et al., 2015; Loyd et al., 2020).

A possible explanation is contextual: in Nigeria, longer hospital stays may reflect better access to physiotherapy and rehabilitative care, while earlier discharges may occur in patients with severe or worsening conditions. Ojifinni and Uchendu (2022) reported similar patterns in Nigeria, where extended hospitalization sometimes facilitated gradual recovery when therapy was

consistent. Thus, unlike Western contexts where prolonged immobility is the risk, in UBTH longer stays may paradoxically enhance rehabilitation opportunities.

5.1.4 Pain and Physical Functioning

Pain did not show a significant association with functional outcomes. This contrasts with Molton and Terrill (2014), who emphasized pain as a predictor of poor ADL performance in older adults with chronic conditions. A likely explanation lies in data limitations: retrospective hospital notes may under-record pain severity, and analgesic management during admission could mask its functional impact.

In Nigerian contexts, pain is often under-assessed but aggressively managed in acute care, potentially minimizing its association with discharge function (Akosile et al., 2018). Hence, while global literature stresses the negative effect of pain on function, this study highlights the importance of consistent and standardized pain assessments in Nigerian hospitals to clarify its true role.

5.1.5 Comorbidities and Primary Diagnosis

Comorbidities were highly prevalent, consistent with global geriatric patterns (Marengoni et al., 2015). However, their influence on physical function was mixed. Stroke, diabetes, and cardiovascular diseases were more strongly linked to poor outcomes, aligning with Akoria (2016), who found these conditions to be the leading causes of functional dependency in Nigerian elderly patients.

Nevertheless, comorbidity count alone was not a strong predictor in this study. This echoes research by Cesari et al. (2017), which emphasized that the type and severity of comorbidities

matter more than their number. Thus, individualized care targeting high-risk conditions (e.g., post-stroke rehabilitation, diabetes control) may be more effective than generalized management of multimorbidity.

5.1.6 Muscle Strength and Range of Motion (ROM)

Gross muscle power and ROM were strong predictors of functional outcomes. Patients with better muscle strength and preserved joint mobility achieved higher Barthel Index scores. This agrees with Guralnik et al. (2016), who found lower extremity strength to be a key determinant of ADL independence. Similarly, Gill et al. (2016) demonstrated that strength trajectories predict long-term autonomy in older adults.

In Nigeria, Oghumu et al. (2020) confirmed that physiotherapy interventions targeting strength and mobility significantly improve discharge outcomes in hospitalized elderly. These findings reinforce the clinical value of structured physiotherapy in UBTH, where resource limitations may otherwise compromise functional recovery.

5.1.7 Grip Strength

Grip strength showed a positive association with physical functioning, although less strong than gross muscle power. This aligns with Bohannon (2019), who described grip strength as a global biomarker of frailty, morbidity, and mortality. Studies in Asia and Europe (Cheung et al., 2018) confirmed that weak grip strength predicts disability, institutionalization, and early mortality.

In Nigeria, studies are scarce, but similar findings have been reported by Faronbi et al. (2020), who observed that low grip strength correlated with dependency in ADLs among Yoruba elderly.

Thus, incorporating grip strength testing into hospital assessments may serve as a low-cost predictor of recovery potential in UBTH.

5.1.8 Cognitive Status

Although cognitive status did not emerge as a dominant predictor in this study, literature strongly supports its role in determining rehabilitation success. Inouye et al. (2014) highlighted delirium and cognitive impairment as leading barriers to functional recovery. Robinson et al. (2013) similarly showed that impaired cognition reduces adherence to physiotherapy tasks and slows ADL independence.

The lack of significance here may be due to inconsistent documentation of cognition in retrospective records. Prospective studies using validated tools (e.g., MMSE, MoCA) are necessary to clarify cognition's role in UBTH's elderly population.

5.1.9 Integration with Literature

Overall, the findings are consistent with global and Nigerian evidence regarding age, strength, and ROM as major determinants of physical function. However, the protective association of longer hospital stay contrasts with high-income settings, underscoring healthcare system differences. Pain and cognition, well-documented predictors elsewhere, showed weaker influence here, likely due to methodological and contextual factors.

These findings suggest that functional recovery in Nigerian hospitalized older adults is shaped more by clinical rehabilitation resources and mobility-focused interventions than by psychosocial or subjective factors commonly emphasized in Western literature.

5.2 Conclusion

This study established that age, gross muscle power, ROM, and length of hospital stay are significant predictors of physical functioning among hospitalized older adults in UBTH. Sex and pain levels were not significant predictors, while comorbidities and diagnosis showed mixed influence. These findings answer the research questions and confirm that muscle strength and mobility are the strongest drivers of functional independence at discharge.

5.3 Recommendations

For Clinicians:

- Implement standardized functional assessments (e.g., Barthel Index, grip strength tests) at admission and discharge.
- Prioritize physiotherapy-led strength and mobility interventions during hospitalization.
- Develop individualized care plans for high-risk patients with stroke, diabetes, or cardiovascular conditions.

For Policymakers:

- Establish multidisciplinary geriatric wards in tertiary hospitals.
- Integrate functional status monitoring into discharge planning.
- Increase staffing of physiotherapists and occupational therapists in Nigerian hospitals.

For Researchers:

- Conduct prospective multicenter studies with standardized pain and cognition measures.

- Explore longitudinal recovery trajectories post-discharge in Nigerian elderly.
- Test interventions such as early mobilization, resistance training, and caregiver-supported rehabilitation.

5.4 Implications for Further Study

Future research should:

1. Employ prospective longitudinal designs to establish causality.
2. Use standardized cognitive and psychosocial measures to assess their influence on function.
3. Investigate community reintegration and long-term outcomes post-hospitalization.
4. Examine gendered caregiving dynamics in Nigerian elderly rehabilitation.

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APPENDIX 1

DATA EXTRACTION FORM

Study Title: Predictors of Physical Functioning in Hospitalized Older Adults in UBTH, Edo State, Nigeria – A Five-Year Retrospective Study

Unique Study Code: _____

Date of Data Extraction: _____

Data Extractor Name/ID: _____

Variable Category	**Variable Name**	**Details / Options / Units**	**Data Entry**	**Comments/Notes**
Patient Identification	Unique Study Code	Generated code for anonymity	_____	
	Hospital Number (for tracking only)	From admission register	_____	Not included in final dataset
Demographic Data	Age	Years	_____	
	Sex	Male / Female	_____	
Clinical Data	Primary Diagnosis	Diagnosis as documented (e.g., stroke, CAP)	_____	
	Comorbidities	List or number of comorbid conditions	_____	
	Cognitive Status	Normal / Impaired / Unknown	_____	
	Pain Level	None / Mild /	_____	

		Moderate / Severe		
	Gross Muscle Power (0–5)	0 to 5	_____	
	Grip Strength	Value	_____	
	Range of Motion	Degrees	_____	
Hospitalization Data	Date of Admission	DD/MM/YYYY	_____	
	Date of Discharge/Demise	DD/MM/YYYY	_____	
	Length of Hospital Stay	Days (calculated from admission and discharge)	_____	
Functional Data	Barthel Index Score at Admission	0–20 or category (low/moderate/high)	_____	
	Barthel Index Score at Discharge	0–20 or category (low/moderate/high)	_____	
Additional Notes				

APPENDIX 2

Barthel Index of Activities of Daily Living

Instructions: Choose the scoring point for the statement that most closely corresponds to the patient's current level of ability for each of the following 10 items. Record actual, not potential, functioning. Information can be obtained from the patient's self-report, from a separate party who is familiar with the patient's abilities (such as a relative), or from observation. Refer to the Guidelines section on the following page for detailed information on scoring and interpretation.

The Barthel Index

Bowels
0 = incontinent (or needs to be given enemata)
1 = occasional accident (once/week)
2 = continent
Patient's Score: _____

Bladder
0 = incontinent, or catheterized and unable to manage
1 = occasional accident (max. once per 24 hours)
2 = continent (for over 7 days)
Patient's Score: _____

Grooming
0 = needs help with personal care
1 = independent face/hair/teeth/shaving (implements provided)
Patient's Score: _____

Toilet use
0 = dependent
1 = needs some help, but can do something alone
2 = independent (on and off, dressing, wiping)
Patient's Score: _____

Feeding
0 = unable
1 = needs help cutting, spreading butter, etc.
2 = independent (food provided within reach)
Patient's Score: _____

Transfer
0 = unable – no sitting balance
1 = major help (one or two people, physical), can sit
2 = minor help (verbal or physical)
3 = independent
Patient's Score: _____

Mobility
0 = immobile
1 = wheelchair independent, including corners, etc.
2 = walks with help of one person (verbal or physical)
3 = independent (but may use any aid, e.g., stick)
Patient's Score: _____

Dressing
0 = dependent
1 = needs help, but can do about half unaided
2 = independent (including buttons, zips, laces, etc.)
Patient's Score: _____

Stairs
0 = unable
1 = needs help (verbal, physical, carrying aid)
2 = independent up and down
Patient's Score: _____

Bathing
0 = dependent
1 = independent (or in shower)
Patient's Score: _____

Total Score: _____

(Collin et al., 1988)

Scoring:

Sum the patient's scores for each item. Total possible scores range from 0 – 20, with lower scores indicating increased disability. If used to measure improvement after rehabilitation, changes of more than two points in the total score reflect a probable genuine change, and change on one item from fully dependent to independent is also likely to be reliable.

Sources:

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APPENDIX 3

HEALTH RESEARCH ETHICS COMMITTEE (HREC)
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Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/107

PROPOSAL TITLE: "PREDICTOR OF PHYSICAL FUNCTIONING IN HOSPITALIZED OLDER ADULTS IN UBTH EDO STATE, NIGERIA – A FIVE-YEAR RETROSPECTIVE STUDY"

PRINCIPAL INVESTIGATOR(S): MOSES SAMUEL

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

DATE CONSIDERED: JULY 14TH, 2025

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 14/7/2025 TO 13/7/2026. 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** Sign 14/7/2025 Date

SUPERVISOR (S): DR. NICHOLAS OGHUMU

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 16/07/2025