

**DIGITAL LONGEVITY: TELE-PHYSIOTHERAPY IN
ENHANCING QUALITY OF LIFE AMONG THE
ELDERLY IN SELECTED AREAS OF IKPOBA-OKHA,
EDO STATE.**

BY

**ASIKAGBON, ANNA IBHADE
(BMS1802662)**

**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 PHYSIOTHERAPY (B.PT)
DEGREE**

OCTOBER, 2025.

CERTIFICATION

This dissertation by Asikagbon Anna Ibhide is accepted in its presented 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.

SUPERVISOR

SIGNATURE AND DATE

DR (MRS) OLUWASEUN S. KUBEYINJE

.....

EXTERNAL EXAMINER

.....

APPROVED

.....

DR. (MRS.) CHIGOZIE. O. OBASEKI

HEAD

DEPARTMENT OF PHYSIOTHERAPY

COLLEGE OF MEDICAL SCIENCES

UNIVERSITY OF BENIN

DEDICATION

This dissertation is dedicated to God Almighty.

ABSTRACT

Background: Many older adults struggle with poor movement, loneliness, depression, and daily activities. Many older people cannot access physiotherapists due to illness, long distance, and lack of transportation. Tele-physiotherapy gives them care online, helps them move well, feel less lonely and stay independent.

Aim: This research investigated the impact of tele-physiotherapy in improving the quality of life for aged persons in Nigeria. Its objective is to propose solutions regarding the use of available technologies to improve mobility, happiness, and social participation at the local level.

Methodology: The research used a single-group pretest - posttest quasi-experimental design. Fifty-eight participants were recruited, took part in tele-physiotherapy (guided virtual exercises) and assessed before and after the intervention. Pre and posttest differences were analysed using paired test. The data collection tools were; Time Up and Go, University of California Los Angeles Loneliness Scale, Geriatric Depression Scale 15 and Barthel Index of Activities of Daily Living. Pretest and posttest scores were compared using the Wilcoxon signed-rank test.

Result: For mobility, the time reduced from 20.41 seconds pretest to 17.14 seconds in the posttest. The social solitude scores reduced from 55.09 pretest to 44.90 posttest. There was significant drop in depression scores from 9.03 pretest to 5.47 posttest. While the participants' independence increased from 64.43 to 73.93.

Conclusion: These results imply that tele-physiotherapy is an effective approach for supporting better health and daily living for the elderly.

Keywords: Tele-physiotherapy, elderly, mobility, social solitude, activities of daily living, depression, quality of life.

ACKNOWLEDGEMENTS

I am grateful to God Almighty for the completion of this work. Special thanks to my supervisor DR. MRS. OLUWASEUN KUBEYINJE, for her assistance and guidance during the course of the research study. Despite the busy schedule, she devoted her time to listen to me, answered questions, read through my work and also made corrections. May God Almighty bless you. My sincere gratitude goes to the Head of Department, DR. MRS. C.O. OBASEKI, all academic and non-academic staffs of the Department of Physiotherapy, University of Benin.

I also want to thank the past Heads, Physiotherapy Department, University of Benin PROFESSOR KAYODE OKE and REV. SIS (Dr) HENRIETTA FAWOLE. I am grateful for the knowledge and discipline you have imparted. To the entire adjunct Lecturers, thank you for all the sacrifices made, for going the extra mile and for the knowledge imparted.

My sincere appreciation also goes to the Department of Physiotherapy, University of Benin Teaching Hospital, the HOD DR. TAIWO OYEWUMI, and all clinicians. Thank you for all the clinical skills imparted. My utmost gratitude goes to all the participants for their cooperation as they made this study successful.

I also want to appreciate my wonderful mother Mrs. Kate Asikagbon for her advice, encouragement and consistent prayers and my siblings for their financial support.

TABLE OF CONTENTS

Title Page	-	-	-	-	-	-	-	-	i
Certification	-	-	-	-	-	-	-	-	ii
Dedication	-	-	-	-	-	-	-	-	iii
Abstract	-	-	-	-	-	-	-	-	iv
Acknowledgements	-	-	-	-	-	-	-	-	v
Table of Contents	-	-	-	-	-	-	-	-	vi
List of Tables	-	-	-	-	-	-	-	-	ix
CHAPTER ONE: INTRODUCTION	-	-	-	-	-	-	-	-	1
1.1 Background of the Study	-	-	-	-	-	-	-	-	1
1.2 Statement of the Problem	-	-	-	-	-	-	-	-	3
1.3 Research Questions	-	-	-	-	-	-	-	-	4
1.4 Aim of Study	-	-	-	-	-	-	-	-	4
1.5 Specific Objectives	-	-	-	-	-	-	-	-	4
1.6 Hypotheses	-	-	-	-	-	-	-	-	4
1.7 Significance of Study	-	-	-	-	-	-	-	-	5
1.8 Limitation	-	-	-	-	-	-	-	-	6
1.9 Scope and Delimitation	-	-	-	-	-	-	-	-	6
1.10 Definition of Terms	-	-	-	-	-	-	-	-	7
1.11 List of Abbreviations	-	-	-	-	-	-	-	-	7
CHAPTER TWO: LITERATURE REVIEW	-	-	-	-	-	-	-	-	8
2.1 Introduction	-	-	-	-	-	-	-	-	8

2.2	Conceptual Clarifications	-	-	-	-	-	8
2.3	Theoretical Framework	-	-	-	-	-	9
2.4	Overview of Ageing and Health Challenges	-	-	-	-	-	11
2.5	Tele-physiotherapy: A Global Perspective	-	-	-	-	-	12
2.6	Empirical Review	-	-	-	-	-	16
2.7	Gaps in Literature	-	-	-	-	-	18
2.8	Summary of Literature Review	-	-	-	-	-	19
2.9	Empirical Review	-	-	-	-	-	21
	CHAPTER THREE: MATERIALS AND METHODS	-	-	-	-	-	31
3.1	Participant	-	-	-	-	-	31
3.1.1	Inclusion Criteria	-	-	-	-	-	31
3.1.2	Exclusion Criteria	-	-	-	-	-	31
3.2	Materials	-	-	-	-	-	32
3.2.1	Apparatus/Instrument	-	-	-	-	-	32
3.3	Methods	-	-	-	-	-	40
3.3.1	Research Design	-	-	-	-	-	40
3.3.2	Sampling Technique/ Sample Size Calculation	-	-	-	-	-	40
3.3.3	Research Procedure/Procedure for Data Collection	-	-	-	-	-	42
3.2.5	Data Analysis	-	-	-	-	-	44
	CHAPTER FOUR: RESULTS	-	-	-	-	-	45
4.1	Demographic Characteristics of Participants	-	-	-	-	-	45
4.1.2	Normality Check for the Variables	-	-	-	-	-	47
4.1.3	Mobility of Respondents	-	-	-	-	-	49
4.1.4	Social Solitude amongst Respondents	-	-	-	-	-	52

4.1.5	Depression amongst Respondents	-	-	-	-	-	-	55
4.1.6	Independence of Activities of Daily Living amongst Respondents-							
		-	-	-	-	-	-	58
4.2	Test of Hypotheses	-	-	-	-	-	-	61

CHAPTER FIVE: DISCUSSION, CONCLUSION, RECOMMENDATIONS

	AND IMPLICATIONS	-	-	-	-	-	--	63
5.1	Discussion	-	-	-	-	-	-	63
5.2	Conclusion	-	-	-	-	-	-	65
5.3	Recommendations	-	-	-	-	-	-	65
5.4	Implications for Further Studies							
		-	-	-	-	-	-	66
	REFERENCES	-	-	-	-	-	-	67
	APPENDICES		-	-	-	-	-	75
	APPENDIX A	-	-	-	-	-	-	75
	APPENDIX B	-	-	-	-	-	-	80
	APPENDIX C	-	-	-	-	-	-	82

LIST OF TABLES

TABLE	PAGE
Table 4.1: Sociodemographic Characteristics of Participants -	46
Table 4.2: Shapiro-Wilk for Normality for Study Variables -	47
Table 4.3: Descriptive Statistics for Mobility - - -	50
Table 4.4: Wilcoxon Signed Ranks Test for Mobility - -	51
Table 4.5: Descriptive Statistics for Social Solitude - - -	53
Table 4.6: Wilcoxon Signed Ranks Test for Social Solitude - -	54
Table 4.7: Descriptive Statistics for Depression amongst Respondents -	56
Table 4.8: Wilcoxon Signed Ranks Test for Depression amongst Respondents - - - - - - - -	57
Table 4.9: Descriptive Statistics for Independence in Daily Activities amongst Respondents - - - - - - - -	59
Table 4.10: Wilcoxon Signed Ranks Test for Independence in Activities of Daily Living Amongst Respondents - - - -	60

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Nigeria as a country is facing more hurdles in maintaining a high standard of living for the elderly as the population continues to age. Forecast for 2050 suggests close to 25 million Nigerians aged 60 and above, which marks an almost 100% increase due to better healthcare access and declining mortality rates (U.N, 2023). In Nigeria, specialized health care is often a luxury or non-existent in rural areas such as the outskirts of Benin City.

For example, in the outskirts of Benin City, physiotherapy clinics are non-existent. Because of this, elderly patients are compelled to undertake harrowing journeys on poorly maintained roads just to access rudimentary care. Even in places like Benin City, which are considered urban, one can find hospitals that are resource constrained and staffed with burnt-out personnel, which makes access to basic specialized care for the elderly, such as post-stroke management or arthritis, exceedingly difficult.

The elderly may need to cope with permanent mobility restrictions like arthritis, strokes, and other age-related conditions that require elaborate rehabilitation and long-term care. Physiotherapy is often inaccessible for the elderly due to lack of transportation, medical facilities, and appropriately trained physiotherapists. Registered physiotherapists in Nigeria are below four thousand, which is alarming given the population is over two hundred million (Nigeria Society of Physiotherapy, 2024). This gap in the region's healthcare services is further

compounded by the constant outmigration of physiotherapists and other highly trained physiotherapy personnel to the United Kingdom, Australia, United States of America, and Canada where they offer more remunerative employment opportunities. “Brain drain” is how this phenomenon has been labelled. This is a common problem in Benin City’s hospitals because there are clinics that have very few physiotherapists to provide clinical services for hundreds of patients. For the elderly in rural areas, this translates into diminished opportunities to receive specialized attention that would help them maintain mobility and independence.

The introduction of various digital health technology solutions seems to provide resolve for some of the issues. These services include tele-physiotherapy, which is offered through video conferencing, mobile applications, and other wearable devices. This technology gained acceptance worldwide during the COVID-19 pandemic, which fast-tracked the use of telehealth (World Health Organization, 2022).

Nigeria, however, seems to lack the integration of this eldercare innovation. Although urban centres such as Lagos and Abuja have started offering pilot telehealth services, rural and semi-urban areas like Edo State still lag, due to poor infrastructure and low digital literacy among older adults as well (Ojo & Adebayo, 2023).

With tele-physiotherapy services, patients could be guided through exercises via remote monitoring by physical professionals. Yet, how useful are these findings in Nigeria’s socio-cultural and technological context, especially for older learners, is

still ambiguous, particularly for older populations who might be resistant to employing digital technologies.

This research seeks to explore the impact of tele-physiotherapy on physical functioning, mental health, and social interaction for the elderly in Nigeria. The purpose is to fill the gap in eldercare, by integrating a technology like tele-physiotherapy into the healthcare system in Nigeria, while advancing the digital healthcare framework in Africa.

This study also aims to contribute to policy and program development in Edo State and beyond, given the emerging community-based research initiatives at the University of Benin.

1.2 Statement of the Problem

Like with any other country in Africa, growing old in Nigeria has its uniquely challenging set of problems to navigate. Many older people in Nigeria need help with movement, pain, weak joints, and daily activities. Yet, most cannot reach a physiotherapist. Clinics are few, far, and hard to get to. Long travel, bad roads, high transport costs, and crowded hospitals stop many from getting care. Because of this they stay at home in pain and lose the chance to improve their health at home.

Physiotherapy could help but many older adults lack the necessary gadgets and electronics, as many of them do not own smartphones or computers, and in some regions, speedy internet is a luxury. There is also little research on whether tele-physiotherapy can help solve these issues in Nigeria.

1.3 Research Questions

1. To what extent does tele-physiotherapy improve movement and strength in older adult over time.
2. Does tele-physiotherapy reduce signs of depression in older adult.
3. Does tele-physiotherapy reduce signs of loneliness in older adult.

1.4 Aim of Study

This study investigates the impact of tele-physiotherapy in improving the quality of life for aged persons in Nigeria. Its objective is to propose solutions regarding the use of available technologies to improve mobility, happiness, and social participation at the local level.

1.5 Specific Objectives

1. To measure how tele-physiotherapy improves movement and strength in older adults over time.
2. To find out if tele-physiotherapy reduces signs of depression in older adults.
3. To find out if tele-physiotherapy reduces signs of loneliness in older adults.
4. To find out if tele-physiotherapy improves daily living activities in older adults.

1.6 Hypotheses

1. There would be no significant difference in strength of participants before and after receiving tele-physiotherapy.
2. There would be no significant difference in signs of depression of participants before and after receiving tele-physiotherapy.
3. There would be no significant difference in signs of loneliness of participants before and after receiving tele-physiotherapy.

4. There would be no significant difference in daily living activities of participants before and after receiving tele-physiotherapy.

1.7 Significance of Study

This project answers a pressing question: how do we care for Nigeria's elderly as we grow older? By studying tele-physiotherapy, the researcher aims to evaluate how technology can bridge gaps which make it difficult to access care, such as remote hospitals, bad roads, or long-distance travel. Therefore, the findings of the study may potentially benefit many different groups in concrete terms.

For the elderly people in Benin City and even outside, this is getting physiotherapy in the comfort of their homes, helping them move more comfortably, with less pain, and greater happiness without exhausting clinic visits. Relatives will worry less about taking their grandparents around or shelling out so much money, knowing care is just a call away.

Medical centres like the University of Benin Teaching Hospital will be able to relieve overcrowded clinics by referring more older patients for care via tele-physiotherapy, and at a lower cost. More patients will benefit from physiotherapists who are not spread too thinly, using electronic means to guide and track improvements more efficiently.

For the government, this study makes the case for inexpensive, scalable solutions that can fit within national health plans so that eldercare can be made accessible even in rural centres in Edo State or elsewhere. As a student at the University of Benin, the researcher also hopes to create more conversation about eldercare in Nigeria, where it is so easily overlooked. In showing how tele-physiotherapy can

be done here, the study hopes to inspire the creation of policies and programs that allow the elderly to live healthier, better lives, and ease the burden on all concerned.

1.8 Limitation

1. Some elderly participants may be hard to reach due to poor network or health issues.
2. Low literacy may affect how some people understand or answer the questions.
3. The study tools, though tested, may not fully match local speech or culture.
4. Bias may come from self-reported answers, especially on health and feelings.
5. Not all regions may be covered, which limits how wide the findings apply.

1.9 Scope and Delimitations

This study focused on older adults aged 60 years and over. All study participants experienced mild and moderate movement or strength difficulties. They lived at home and were enrolled in a four-week tele-physiotherapy program. This study focused on two central variables: the independent and the dependent variables. The independent variable was tele-physiotherapy. The dependent variables were the participant's mobility and strength, the presence of depression, their daily living activities, and loneliness. The study specifically evaluated the impact of tele-physiotherapy on the participants' movement and emotional state using the TUG, UCLA Loneliness Scale, Geriatric Depression Scale (GDS-15), and the Barthel Index for daily activities.

1.10 Definition of Terms

1. **Digital Longevity:** refers to the ability to keep digital information, systems and content accessible, usable and valuable over an extended period of time.
2. **Tele-Physiotherapy:** The delivery of Physiotherapy services remotely using technology like video calls or online platforms
3. **Quality of Life:** The standard of health, comfort and happiness experience by an individual or group.

1.11 List of Abbreviations

QOL: Quality of Life

SMD: Standardized Mean Difference

UCLA: University of California, Los Angeles

WHO: World Health Organization

GDS-15: Geriatric Depression Scale 1

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter looks at what others have written about tele-physiotherapy. It also explores how these tools help improve the lives of older people. The review covers both global and Nigerian studies. A literature review shows what is already known. It helps avoid repeating past work. It also shows what gaps still exist. This gives a clear reason for doing new research (USC Upstate Library Guides, n.d.).

The review covers key ideas, past studies, and gaps. It includes research from other countries and work done in Nigeria. It focuses on digital tools for elderly care. This helps explain how this project fits into the bigger picture.

2.2 Conceptual Clarifications

Digital Longevity

Longevity in the digital sense pertains to employing equipment with the goal of helping the elderly to live longer, healthier lives. This consists of health app tools, health monitoring device at home, and even video consultations with doctors. All of these tools try to facilitate independence in the elderly for as long as possible. As previously stated, these digital tools are capable of automating independence and health in aging societies (Chen, 2023).

Tele-physiotherapy refers to undertaking physical therapy sessions on video calls or on dedicated physiotherapy apps. Patients have discussions with registered therapist online and perform exercises in their homes. This strategy is helpful for

numerous people who are unable to move about easily. Virtual physical therapy refers to any instance when physical therapists provide services via telehealth (USAHS, 2021).

Quality of Life (QoL)

Quality of Life (QoL) refers to how happy and satisfied people feel with their lives. For older adults, this includes their health, comfort, and ability to enjoy daily activities. Quality of life is often defined as the degree to which a person is healthy, comfortable, and able to participate in or enjoy special occasions and activities (Stefanacc, 2024).

Elderly (Definitions by WHO and in the Nigerian Context)

The World Health Organization (WHO) defines older adults as people aged 60 years and above. In Nigeria, people aged 60 or 65 and above are often considered elderly (Cadmus et al., 2021).

2.3 Theoretical Framework

To analyze the adoption of telehealth by older adults, this work integrates three models: The Health Belief Model (HBM), The Technology Acceptance Model (TAM), and The Biopsychosocial Model.

Health Belief Model (HBM)

The HBM defines health actions as a function of an individual's perception. It states that people are more willing to use health services if they suspect they are at risk for a certain health problem, believe the health problem will result in severe consequences, believe that action will mitigate the risk, and that the merits of taking action far exceed the costs. Within telehealth, older adults would make

greater use of these services if they perceived high risk regarding health problems, believed telehealth would assist them, and encountered very few barriers to technology. An interdisciplinary study incorporating self-efficacy into the HBM concluded that perceived susceptibility, associated benefits, and barriers had a considerable impact on the intention to use telehealth systems (Alharbi et al., 2022).

Technology Acceptance Model (TAM)

The TAM is interested in how individuals come to adopt and utilize technology. The TAM identifies two main determinants: perceived usefulness (thinking that the use of the technology will make things better) and perceived ease of use (thinking that the use of the technology will be trouble-free). Older adults, if they find telehealth services useful and easy to use, are likely to adopt them. Research has shown that TAM effectively captures older adults' adoption of various healthcare technologies, including telehealth services (Kim, 2024).

Biopsychosocial Model

The Biopsychosocial Model views health as a mixture of biological, psychological, and social influences. Adding a digital element to this model recognizes the contribution of technology to health care. For older people, this implies that their physical well-being, mental status, social context, and exposure to digital equipment all have an impact on their utilization of telehealth services. A suggested "bio psychedosomal-digital" model stresses the importance of taking digital influences into account when making health assessments (Taukeni, 2020).

2.4 Overview of Ageing and Health Challenges

Physical Health Challenges

Most older adults are bound to experience physical issues like joint osteoarthritis, high blood pressure and diabetes. These issues in a person might lead to restricted movements and loss of independence. In Nigeria, a good number of aged citizens claim to have these health issues which affect their daily routines and overall quality of life (Faronbi et al., 2020)

Psychological Health Challenges

Mental health becomes one of the major issues for concern for the aged. Old age brings with itself a range of health challenges. Depression and anxiety are extremely common amongst elders due to reasons such as isolation, decline in the health or death of peers. In one of the studies, about 35.8% of elderly respondents in Nigeria were reported to have mental disorders with generalized anxiety disorder being the most dominant one (Jawed & Hogan, 2024).

Social Health Challenges

There have been concerns regarding social isolation in the elderly, which remains a challenge. Many elderly people live alone or have little to no contact with other people, which results in loneliness. As stated in research conducted on the social impact of COVID-19, lockdowns and social distancing policies created further barriers to social contact for older people (Rahman et al., 2025).

Mobility and Rehabilitation Needs

The elderly as a group are prone to mobility-related issues, usually associated with arthritis or stroke. Such challenges not only make everyday chores difficult but

also increase the risk of falls. With the right physiotherapy rehab services, one's mobility and independence can be vastly improved. Unfortunately, as noted in other studies, there is limited access to these services in a lot of parts of Nigeria (Chukwu et al., 2023).

Healthcare Access Challenges in Nigeria

Healthcare access is a significant problem for the majority of the elderly in Nigeria. Excessive fees, long distances to health centres, and lack of specialized geriatric care render the elderly unable to access the type of care they need. In addition, the majority of the health centres are found in urban centers, and the rural population is under-served (Frances et al., 2024).

2.5 Tele-Physiotherapy: A Global Perspective

Development and Trends in Tele-Physiotherapy

Tele-physiotherapy has received global attention, particularly with the onset of the COVID-19 pandemic. This enables patients to remotely access physiotherapy services, helping to maintain treatment continuity when in person appointments are not feasible. The pandemic sped up the uptake of digital health technologies. Many healthcare providers started offering virtual physiotherapy services (WHO, 2021).

Research indicates that tele-physiotherapy can be as effective as in person physiotherapy sessions for a variety of conditions. For example, a randomized trial found that remotely delivered physiotherapy was noninferior to face to face sessions for managing musculoskeletal conditions (Withers et al., 2024).

Tools and Technologies Used

The following physiotherapy technologies have been used:

- Video Conferencing Platforms: Toxigon (2023) cites the use of Zoom, Skype, and Google Meet for real time interactions between the therapist and patient for assessment and guided exercises.
- Mobile Applications: A number of apps like PT Pal and Physitrack are noted to have exercise programs along with educational materials which the patients can use towards self-engagement (Pope, 2024).
- Wearable Devices: Fitbits and Apple Watches are known to track physical activities, heart rates, and a number of other metrics that aid in the formulation of a treatment plan (Kumar et al., 2021).
- Virtual Reality (VR): According to Brodsky (2022), VR is useful to immerse patients in environments within which they can perform exercises, especially useful in neurorehabilitation.

Usefulness from Prior Studies

There is overwhelming evidence which supports the use of tele-physiotherapy.

According to a HealthTech study in 2020, over 27,000 patients and doctors recognized that digital physiotherapy offered the same benefits as clinical treatment, improving pain and function to the same extent (Rees, 2020).

In 2022, PMC reported through meta-analysis the vast benefits telerehabilitation offered for patients suffering pain due to arthritis, spinal conditions, or post-surgery, claiming it significantly improved their physical function.

In 2021, ScienceDirect highlighted the improvement VR-based therapies rendered in pain, functional ability, and muscular strength across a multitude of conditions, claiming it had a consistently positive effect (ScienceDirect, 2021).

Success Stories and Assessments of Developed Nations

Canada's incorporation of tele-physiotherapy to stroke patients and its video therapies yielded favourable results for rehabilitation outcomes (Tousignant, 2021).

In Norway, Sunnaas Rehabilitation Hospital developed a model that offered remote follow up care, enhancing the accessibility and reducing the burden of travel for patients with spinal cord injuries (Hjelmas et al, 2021). Remote Physiotherapy intervention from Sword Health in the United States led to the patients achieving the same outcomes as offered with face to face interaction (Sword Health, 2024).

Growing In Popularity among Developing Nations

Tele-physiotherapy is gaining more popularity in African countries especially regions where access to health services is a problem (Akinwuntan et al., 2022). An analysis demonstrated that mobile devices can facilitate delivery of rehabilitation services, to areas that are remote and not close to clinics (Owolabi et al., 2022). In Nigeria, physiotherapists had a moderate acceptance level towards adoption of tele-physiotherapy. There are problems associated with the adoption of tele-physiotherapy which include poor internet connectivity and inadequate funding which hinder broader application of it (Akinola et al., 2024). More training and better digital infrastructure are essential for embracing change.

Digital Skills of Older Adult Nigerians

In Nigeria, the elderly population has low level of digital skills. Many elderly people continue to use non-digital methods over digital platforms as a result of a lack of their knowledge as well as perceived complexity (Omotayo, 2020). This problem is worse in rural areas, as it deepens levels of social isolation, especially during the period of the COVID-19 pandemic (Ekoha et al., 2021).

Obstacles: Infrastructure, Cost, Awareness, Trust

There are several barriers to the adoption of technology based health care services by older people:

- **Infrastructure:** Lack of stable power supply and unstable internet connection makes the use of digital health tools very difficult (Babatunde et al., 2021).
- **Cost:** The expenditure on smartphones and data bundles is exorbitant for a large population of older people (Omotayo, 2020).
- **Awareness:** There is absence of information concerning the digital health services that are offered and their importance (Ekoha et al., 2021).
- **Trust:** Adequate privacy and concealment alongside doubt about technological application has hindered its use (Omotayo, 2020).

Mobile Health Platforms and Opportunities

Inspite of all the challenges, there are some opportunities:

- **Mobile Penetration:** The number of mobile subscribers is high in Nigeria, which can be tapped into for implementation of digital health programs (Babatunde et al., 2021).

- **mHealth (mobile Health) Platforms:** Programs such as Safermom transmit health messages through SMS and voice calls in vernacular which is easier for older people to understand (Babatunde et al., 2021).
- **Government Initiatives:** The Nigerian government aims to achieve 95% digital literacy by 2030, which could enhance digital health adoption among seniors (Vanguard News, 2021).

2.6 Empirical Review

Outcomes of Tele-Physiotherapy among Elderly Patients

Recent studies have shown that the incorporation of tele-physiotherapy into practice leads to positive psychological and physical outcomes among older adults. A systematic review and meta-analysis conducted by Man et al. (2024) revealed that tele-physiotherapy improved physical function (SMD = 0.406) as well as psychological well-being (SMD = 0.223) when compared to in person rehabilitation processes. The review noted that the best outcomes were associated with interventions less than 12 weeks, and females had better rehabilitation outcomes than males.

Also, a meta-analysis conducted by Wang et al. (2023) on older adults with chronic illnesses noted that physiotherapist-assisted tele-physiotherapy had a better effect on functional mobility, quadriceps strength, and overall physical performance than usual care. However, no significant differences were found regarding mental health, quality of life, and some other measured outcomes.

Enhancements in Quality of Life through Tele-physiotherapy Programs

As with any kind of telemedicine, tele-physiotherapy has also been associated with improvements in quality of life (QoL) among elderly patients. Shafiee et al. (2022) conducted a systematic review that showed the effectiveness of telecare and telemonitoring among other telecare services, on older adults' quality of life." The study highlighted the importance of developing specific telecare interventions for specific target populations designed for responsive systematic evaluation.

Additionally, a study conducted by Choi et al. (2022) during the COVID-19 pandemic noted a sharp increase in the use of telehealth services by older adults from 4.6% to 21.1% during the pandemic. This increase, alongside a greater percentage of younger populations adopting these technologies, illustrates the disparity in the adoption of such services and the need for further initiatives focused on improving the digital literacy and technology use of the elderly.

Adoption Rates, Satisfaction, and Constraints

Older adult uptake of tele-physiotherapy has risen but is uneven. Akinola et al. (2024) noted in a study conducted in Nigeria that 38% of older patients would only use tele-physiotherapy platforms, primarily due to poor digital literacy and poor internet connectivity. The majority of older users required support from younger family members to complete sessions.

Internationally, tele-physiotherapy service satisfaction is high when technology is simple to use and there is support. Man et al. (2024) said that 78% of elderly users

found tele-physiotherapy convenient and less stressful than attending clinics. But barriers such as technical issues, lack of personalization, and communication lower satisfaction (Wang et al., 2023).

In rural Africa, cost, limited connectivity, and lack of awareness were significant deterrents (Owolabi et al., 2022). Even if services were in reach, older adults shied away from using distant healthcare because of fear of poor care quality and privacy infringement. Despite all these, literature is in agreement that tele-physiotherapy, if properly planned, trained, and supported, can improve the health status and self-independence of older persons.

2.7 Gaps in Literature

Absence of Localized Studies in Nigeria

Most of the tele-physiotherapy research is carried out in Europe, Asia, or North America. Most of the research on Nigeria's health care systems and its elderly population is limited. For instance, Akinola et al. (2024) found that most of the research lacks the infrastructural problems experienced by Nigerian healthcare workers and patients. This complicates the generation of local policies or solutions that successfully work (Akinola et al., 2024).

Limited Attention to Older Perspectives towards Technology Use

Few surveys ask the elderly about their views on the use of tele-physiotherapy tools. In Nigeria, the majority of elderly persons are not familiar with digital devices, yet their opinions are rarely considered. Adeniji et al. (2024) noted older

users feel marginalized or confused with technology-driven rehabilitation schemes. Without them being heard, service design may fail to meet their true needs (Adeniji et al., 2024).

Few Longitudinal or Large-Scale Studies

Most of the studies that have been done are short and involve small populations. This limits how much we can use findings in the long run. Sarfo et al. (2024) pointed out that large-scale or long-duration studies of tele-physiotherapy in African settings are rare. Therefore, we do not know much about the effectiveness of these interventions a few months or years later (Sarfo et al., 2024).

2.8 Summary of Literature Review

Tele-physiotherapy helps ageing individuals to improve movement, strength, and daily function. They are found to reduce travel anxiety and reduce hospital attendance (Man et al., 2024; Wang et al., 2023). Technology in the form of video calls, mobile applications, and movement sensors makes treatment easier and more flexible (WHO, 2021).

Tele-physiotherapy is growing in the developed countries. The older adults in Canada, Sweden, and the UK use it for stroke, arthritis, and fall rehabilitation (Shafiee et al., 2022). Africa lags behind. Nigeria faces challenges like poor internet, lack of training, and digital trust (Akinola et al., 2024; Owolabi et al., 2022). All studies agree that virtual care works if it is convenient and well supported. Programs work best when caregivers or family members are helping the patient use the technology (Choi et al., 2022).

There are still gaps. Few studies focus on Nigerian elderly. Most ignore their views or feelings towards using new gadgets (Adeniji et al., 2024). Longitudinal studies are rare. There is a necessity for more studies on what works best locally (Sarfo et al., 2024). This study is affirmed by the present review. It proves that there can be virtual care for the elderly if there are challenges being addressed. It also shows why a domestic study has to be done in Nigeria. These findings guide the focus, instrument, and research approach of the study.

2.9 Empirical Review

Author/Year/Country	Title	Aim of Study	Study Type	Outcome Measures	Findings
Ahmed et al., 2022, Global	Virtual physiotherapy services: A global review	To evaluate global virtual physiotherapy services	Systematic Review	Service models, effectiveness	Virtual physiotherapy is effective and widely adopted globally.
Akinola et al., 2024, Nigeria	Acceptance of tele-physiotherapy by Nigerian physiotherapists	To assess Nigerian physiotherapists' acceptance of tele-physiotherapy	Cross-sectional Study	Acceptance levels, barriers	High acceptance with noted barriers like infrastructure.
Alharbi et al., 2022, Saudi Arabia	Adoption of Health Mobile Apps during the COVID-19 Lockdown	To investigate health app adoption during COVID-19	Quantitative Study	App usage, user behavior	Increased adoption influenced by perceived benefits.
Babatunde et al., 2021, Nigeria	Leveraging mobile health technology towards Achieving	To explore mobile health technology's role in Nigeria's	Review Article	Technology adoption, health	Mobile health tech is pivotal for universal

	Universal Health Coverage in Nigeria	health coverage		outcomes	health coverage.
Boston College Libraries, n.d., USA	Phase 1: Scope of Review – Writing a Literature Review	To guide literature review writing	Educational Guide	Review scope, methodology	Provides structured approach to literature reviews.
Brodsky (2022)	How Virtual Reality Is Expanding Health Care	To explore VR's role in healthcare	Feature Article	VR applications, patient experiences	VR is expanding possibilities in patient care.
Chen, C., 2023, Global	Digital health for aging populations	To examine digital health's impact on aging populations	Perspective Article	Technology types, health outcomes	Digital health enhances care for the elderly.
Choi et al., 2022, USA	Older adults' telehealth use and mental health during the COVID-19 pandemic	To assess telehealth's impact on older adults' mental health	Observational Study	Telehealth usage, mental health indicators	Telehealth use linked to better mental health outcomes.
Ekoha et al., 2021, Nigeria	Digital and Physical Social Exclusion of	To study social exclusion among	Mixed-Methods Study	Social inclusion, technology	High levels of exclusion and

	Older People in Rural Nigeria in the Time of COVID-19	rural elderly during COVID-19		access	limited tech access found.
Kumar et al., 2021, Global	Use of wearable devices in physiotherapy: A study on patient outcomes	To assess wearable devices' impact in physiotherapy	Experimental Study	Patient outcomes, device usage	Wearables improve patient engagement and outcomes.
Man et al., 2024, Global	Effectiveness of tele-physiotherapy among older adults: A systematic review and meta-analysis	To evaluate tele-physiotherapy's effectiveness in older adults	Systematic Review & Meta-analysis	Functional improvement, adherence	Tele-physiotherapy is effective for elderly rehabilitation.
Omotayo, F. O., 2020, Nigeria	Adoption and use of Smartphones by the Elderly in Nigeria	To explore smartphone usage among Nigerian elderly	Survey Study	Usage patterns, barriers	Low adoption due to lack of skills and resources.
Owolabi et al., 2022,	Improving stroke care with telehealth	To assess telehealth's role in	Review Article	Access to care, recovery	Telehealth improves stroke care

Africa	in Africa	stroke care in Africa		outcomes	accessibility.
PhysioOnPatterson, 2023, Global	Incorporating Technology in Physiotherapy: The Role of Apps and Wearable Tech in Healthcare	To explore technology integration in physiotherapy	Commentary	Tech applications, patient engagement	Technology enhances physiotherapy practice and outcomes.
Rahman et al. (2025)	Psychosocial wellbeing of older adults during COVID-19 in Nigeria	To evaluate elderly mental health during the pandemic	Qualitative Study	Stress levels, coping mechanisms	Increased stress and need for mental health support.
Rees, 2020.	Largest ever virtual physio study shows it is just as effective as in-person	To compare virtual and in-person physiotherapy effectiveness	Clinical Trial	Recovery rates, patient satisfaction	Virtual physiotherapy matches in-person effectiveness.

	treatment				
ResearchGate, n.d., Nigeria	The Definitions and Onset of an Old Person in South-Western Nigeria	To define the onset age of old age in Nigeria	Qualitative Study	Cultural perceptions, age thresholds	Old age perceived to begin at 50 years in some regions.
Sang Dol Kim, 2024, Global	Application and Challenges of the Technology Acceptance Model in Elderly Healthcare	To examine TAM's application in elderly healthcare	Descriptive Study	Technology acceptance, barriers	Identifies challenges in tech adoption among elderly.
Shafiee et al., 2022, Global	Effectiveness of telecare in the quality of life of elderly: A systematic review	To assess telecare's impact on elderly quality of life	Systematic Review	Quality of life indicators	Telecare improves elderly quality of life.

Stefanacci, 2024.	Quality of Life in Older Adults	To discuss factors affecting older adults' quality of life	Educational Resource	Health status, life satisfaction	Emphasizes holistic approach to elderly care.
Sword Health, 2024, Global	Virtual Physical Therapy Outcomes	To report outcomes of virtual physical therapy	Observational Study	Recovery metrics, patient feedback	Positive outcomes observed with virtual therapy.
Taukeni, S. G., 2020, Global	Biopsychosocial Model of Health	To discuss the biopsychosocial health model	Theoretical Article	Health determinants	Advocates for integrated health approaches.
Toxigon, 2023, Global	Telehealth and Physical Therapy: How Virtual Care is Changing the Game	To discuss telehealth's impact on physical therapy	Commentary	Service delivery, patient access	Telehealth is transforming physical therapy practices.
Tousignant et al., 2021, Canada	In-home telerehabilitation for stroke patients	To evaluate in-home telerehabilitation for stroke	Clinical Study	Functional recovery, adherence	In-home telerehabilitation is effective for stroke recovery.

USAHS, 2021, USA	What Is Virtual Physical Therapy? Benefits of Online PT	To explain virtual physical therapy benefits	Informational Article	Accessibility, convenience	Highlights increased access and flexibility.
USC Upstate Library Guides, n.d., USA	Purpose of a Literature Review	To define the purpose of literature reviews	Educational Guide	Research synthesis, gap identification	Emphasizes critical analysis in literature reviews
Vanguard News, 2021, Nigeria	FG targets 95% digital literacy in Nigeria by 2030	To report on Nigeria's digital literacy goals	News Article	Digital literacy rates	Government aims for high digital literacy by 2030
Wang et al., 2023, Global	Effects of physiotherapist-led telerehabilitation for older adults: A systematic review	To assess telerehabilitation effects in older adults	Systematic Review	Functional outcomes, adherence	Telerehabilitation benefits older adult patients.
WHO, 2021, Global	Rehabilitation	To provide guidelines on rehabilitation	Policy Document	Rehabilitation practices	Sets global standards for rehabilitation services.

WHO, 2021, Global	Telehealth: A key tool for health systems	To advocate for telehealth integration	Policy Brief	Health system strengthening	Telehealth is essential for modern health systems.
WHO, 2021, Global	Digital Health and Ageing: Promoting Healthy Ageing with Technology	To promote digital health in aging	Policy Document	Technology adoption, aging	Encourages tech use for healthy aging.
Withers et al. (2024)	Remotely delivered physiotherapy is as effective as face-to-face physiotherapy for musculoskeletal conditions	To compare remote and face-to-face physiotherapy	Randomized Controlled Trial	Treatment outcomes, patient satisfaction	Remote physiotherapy is equally effective.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Participant

The population of this study is the elderly aged 60 years and older. The research subjects were chosen from one community (Evbuomodu) in Ikpoba-Okha LGA, Edo State.

3.1.1 Inclusion Criteria

- Adults male and female aged 60 years and older.
- Must reside in the selected community in Ikpoba-Okha LGA in Edo State (not in hospitals or nursing facilities).
- Capable of understanding and providing informed consent.
- Adults who can ambulate independently with or without aid.
- Respondents who could complete the survey independently with minimum assistance, either by reading or understanding the questions.

3.1.2 Exclusion Criteria

- Older adults with severe mental illness like dementia or schizophrenia or any form of cognitive impairment.
- Individuals with acute physical illness or disability that would render participation impossible.

3.2 Materials

This study used mobile device for tele-physiotherapy sessions. Standard items such as stopwatches, chairs, cones, and measuring tapes were also used for physical tests. These tools help track movement, balance, and strength changes in the participants.

3.2.1 Apparatus/Instrument

1. Time Up and Go (TUG) Test
2. Geriatric Depression Scale (GDS-15)
3. UCLA Loneliness Scale (Version 3)
4. Barthel Index of Activities of Daily Living

This study used four tools. One to test mobility, the second and third to test depression and loneliness, and the fourth was used to test how well a person can do basic daily tasks. All tools are simple, short, and made for older people.

Timed Up and Go (TUG) Test

The Timed Up and Go (TUG) test was used to check movement and strength. It is simple and safe for older adults.

Each participant followed the procedure as outlined below:

- Sit on a chair,
- Stand up,
- Walk three meters,
- Turn around,

- Walk back,
- And sit down again.

A stopwatch was used to time the task. Faster times show better movement. Longer times suggest weaker strength or balance, while shorter times mean better strength and movement.. This test will help compare those who receive tele-physiotherapy and those who do not. The TUG test has been widely used in studies with older people. It gives quick and clear results. Sancar et al. (2024)

How it is scored:

- 1–10 seconds: Normal movement.
- 11–20 seconds: Fair but may be slower with age.
- Over 20 seconds: Risk of falling or weak movement.

Geriatric Depression Scale (GDS-15)

The GDS-15 is a brief assessment consisting of 15 yes-or-no items. It is designed to identify signs of depression in older adults. The questions focus on feelings of sadness, fatigue, disinterest, and other emotional shifts.

Each answer is scored 0 or 1. The total score is out of 15. A score between 0 and 4 means no signs of depression. A score from 5 to 9 means mild depression. A score of 10 or more shows moderate to severe depression. The GDS-15 is quick to complete. It takes about 5 to 10 minutes. It works well even for people who don't speak much English or who are not well-educated. It has been tested in many

countries, including Nigeria, and has shown good results. Studies report high accuracy and consistency (Yesavage et al., 1983; Aloba et al., 2020).

The Geriatric Depression Scale (GDS-15) is a self-report questionnaire of 15 items designed to evaluate depression in the elderly. Like other self-report questionnaires, respondents answer to yes/no questions based on their feelings and experiences in the past week. The GDS-15 is a popular instrument due to its efficiency, being a modified version of the original 30-item GDS.

Validity and Reliability

GDS-15 has produced a reliability score (Cronbach's alpha) of 0.80 to 0.94 in the majority of studies. That means most of the respondents reply to it consistently. Soysal et al. (2019)

Key Features and Uses:

- **Purpose:** Screens for depression in older adults aged 60 years and above.
- **Structure:** A total of 15 questions focused on positive and negative expressions regarding individuals' moods, emotions, and feelings.
- **Scoring:** The maximum score for the scale is 15 with higher scores depicting more likelihood of depression. Each of the "yes" answers to depression suggesting items earns one point indicating depression.
- **Interpretation:** The results of the scale can provide insight into what level of depression the elderly might be experiencing, even though diagnostic cases are assessed with different standards.

- **Administration:** Can be conducted in different contexts such as within community settings.

Scoring and Interpretation Guidance:

0 - 4 points: Considered to be within the average range indicating the respondents do not or experience very little depressive symptoms.

5 - 8 points: Indicates that further assessment may be clinically reasonable due to mild depression that might be suggested.

9 - 11 points: Indicates moderate depression perhaps needing further assessment and diagnosis from a specialist.

12 - 15 points: Indicates a stage of severe depression suggesting that the individual is at risk where immediate help from a medic needs to be sought.

For Social Solitude or Sadness: UCLA Loneliness Scale (Version 3)

The UCLA Loneliness Scale (Version 3) is a 20-question form used to check loneliness in older adults. Each question asks how often someone feels left out, alone, or without company. Examples include “How often do you feel left out?” and “How often do you feel you lack companionship?”

Each question is scored on a 4-point scale:

1 – Never

2 – Rarely

3 – Sometimes

4 – Often

Scores range from 20 to 80. A higher score means the person feels lonelier. The tool uses simple questions to learn how people feel about their social life without asking directly, “Are you lonely?” This scale works well with both old and young people. It has been tested in many countries and languages. Research shows that it gives steady and clear results (Russell, 1996; Igbokwe et al., 2021).

Validity and Reliability

UCLA Loneliness Scale has similar scores as Geriatric Depression Scale (GDS-15) typically greater than 0.85. It gives a satisfactory measurement of the degree of loneliness one perceives. Zarei et al. (2021)

UCLA Loneliness Scale (Version 3) – Scoring Categories

The scale has 20 questions. Each question scores from 1 to 4. Total scores range from 20 to 80. Higher scores show more loneliness.

Score Categories:

- 20–34: Low loneliness
- 35–49: Moderate loneliness
- 50–64: High loneliness
- 65–80: Very high loneliness

These ranges help find people who may need social help.

How the UCLA Loneliness Scale (Version 3) is Scored and Calculated

There are 20 questions on the scale. Each has four answer options:

1 = Never

2 = Rarely

3 = Sometimes

4 = Often

Each answer gives a score. Add all the scores together.

Total Score = sum of all 20 answers

Lowest score: 20

Highest score: 80

Some questions are worded positively. These need reverse scoring.

For example:

If the item says, “How often do you feel part of a group of friends?”

Then:

- 4 becomes 1
- 3 becomes 2
- 2 becomes 3

- 1 becomes 4

This flip keeps higher scores linked to more loneliness.

After reversing where needed, add all scores to get the final result.

Barthel Index of Activities of Daily Living

The Barthel Index checks how well a person can do basic daily tasks. It is used to measure independence in older people.

It includes 10 tasks:

- Feeding
- Bathing
- Grooming
- Dressing
- Bowel control
- Bladder control
- Toilet use
- Moving from bed to chair
- Walking
- Climbing stairs

The original Index uses three levels to rate ability. It's quick and takes about 2–5 minutes to complete. Anyone on the rehab team, like a therapist or caregiver, can fill it out.

Each task is scored like this:

- 0 means the person can't do it at all.
- 1 means they need help.
- 2 means they can do it on their own.

There are ten tasks. The scores for all are added, and then multiplied by 5. The total is out of 100.

Here is how to understand the scores:

- 0–20 means total dependence.
- 21–60 means severe dependence.
- 61–90 means moderate dependence.
- 91–99 means slight dependence.

Most studies treat a score of 60 or below as the mark for serious dependency.

Validity:

The Barthel Index has been tested many times. It gives a true picture of how much help a person needs. It is trusted worldwide.

Reliability:

It gives stable results when used more than once. The test-retest reliability is usually above 0.90. This means the scores do not change much if the person's condition is the same.

3.3 Methods

3.3.1 Research Design

The study used a single-group pretest - posttest quasi-experimental design. Fifty-eight participants were recruited and assessed before and after the intervention. Pre and post differences were analysed using paired test.

3.3.2 Sampling Technique/ Sample Size Calculation

Convenience sampling was used to select older adults from the community. Those who met the criteria and gave their consent were enrolled.

Sample Size Estimation

The sample size was determined using G*Power version 3.1 for a paired-sample t-test.

The test assumed a medium effect size ($d = 0.40$), a power of 0.80, and a significance level of 0.05. The result showed that 52 participants were required to detect a meaningful difference between pre-test and post-test scores.

t tests - Means: Difference between two dependent means (matched pairs)

Analysis: A priori: Compute required sample size

Input:	Tail(s)	=	Two
	Effect size dz	=	0.4
	α err prob	=	0.05
	Power (1- β err prob)	=	0.8

Output: Noncentrality parameter δ = 2.8844410
Critical t = 2.0075838
Df = 51
Total sample size = 52
Actual power = 0.8077878

To account for possible attrition, an additional 10% was added to the sample:

$$N = 52 \div (1 - 0.10) = 52 \div 0.90 = 57.8 \approx 58$$

Rounded up, the study recruited 58 participants. This number was expected to provide at least 52 complete data sets after accounting for loss to follow-up

The final analysis included all participants who completed both baseline and follow-up assessments. Those who dropped out were tracked and reported with reasons for withdrawal.

Sampling Procedure

- i. The study took place in Evbuomodu, Ikpoba-Okha LGA, Edo State.
- ii. A house-to-house count was done to find adults aged 60 years and above.
- iii. From the list, those who met the study criteria formed the main pool.
- iv. Names were picked at random until fifty-eight participants were chosen.
- v. Since about ten percent may drop out, fifty-eight participants were recruited to keep the number steady.
1. Each participant signed the consent form.

2. Each participant was given a unique identification, and the master list was stored safely.

3.3.3 Research Procedure/Procedure for Data Collection

Data was gathered in clear steps. First, older adults were identified. This happened in their homes. The study's goal was clearly explained and only those who agreed were recruited. Then, a written informed consent was obtained from each participant.

Four tools were used: Timed Up and Go (TUG) Test, the UCLA Loneliness Scale, the GDS-15, the Barthel Index of Activities of Daily Living.

All the tools are short and simple and they were read out loud to those who needed assistance.

Two main channels of data gathering are utilized:

- **Face-face questionnaire administration:** This is the first choice. It helped those who do not read or who have no telephones.
- **Telephone-based questionnaire administration:** This helped individuals who cannot come out or who want to talk at home.

One session (filling the questionnaires) took around 20 to 30 minutes. Special care was taken not to rush or confuse the participants. Notes were stored securely and confidentially. Each response was used only for this research.

The test group received tele-physiotherapy; they took part in guided virtual exercise sessions which was delivered as follows:

- Sessions (virtual exercises) held twice a week for 4 weeks
- Each session lasted 30–40 minutes long.
- The sessions included aerobic exercises, balance training, strengthening, and stretches.
- Participants used WhatsApp video as the primary interface
- Pre-test: All participants were assessed using TUG, GDS-15, UCLA, and the Barthel Index of Activities of Daily Living. The participants received aerobic exercises, balance training, strengthening, and stretches two times weekly for 4 weeks.
- Post-test: All participants were tested again after 4 weeks.

Internet Data Provision

- All virtual sessions were carried out using WhatsApp. The participants provided their own mobile data for these sessions. All participants were informed in advance about the expected data usage per week. They were also guided on how to manage data to avoid waste.

3.3.4 Ethical Considerations

Ethical consideration for this research was obtained from Ministry of Health, Edo State.

3.3 .5 Data Analysis

All forms were checked to make sure answers are complete and easy to read. The data was typed into Excel, then analysed with SPSS. Significance level was set at **$p \leq 0.05$** and 95% confidence intervals shown.

Tables were used to display group means, medians, and spread.

Shapiro–Wilk in SPSS was used to check if the difference scores were normal.

This test showed if the scores followed a shape that allowed the use of paired t-test.

If the Shapiro-Wilk gave a p-value above .05, the scores were treated as normal. In that case a paired t-test would be used to test the change. If the p-value was .05 or below, the scores were not normal. In that case, the Wilcoxon signed-rank test would be used to test the change.

CHAPTER FOUR

RESULTS

4.1 Demographic Characteristics of Participants

Table 4.1 shows the demographic characteristics of the fifty-eight participants in the study. The data include gender, age group, and occupation. The gender distribution shows that most participants were female, with 31 out of 58 participants (53.4%), while 46.6% were male. Regarding age groups, the largest group was 70 - 74 years with 22 participants (37.9%), followed by 65 - 69 years with 20 participants (34.5%). The smallest group was 80 - 84 years (1.7%). In terms of occupation, nearly half were retired (48.3%). Traders made up 20.7%, and farmers 5.2%.

Table 4.1: Sociodemographic Characteristics of Participants

Variable	Category	Frequency	Percentage	Valid Percentage
Gender	Male	27	46.6	46.6
	Female	31	53.4	53.4
		58	100	100
Age Group / Years	60 – 64	8	13.8	13.8
	65 – 69	20	34.5	34.5
	70 -74	22	37.9	37.9
	75 – 79	7	12.1	12.1
	80 – 84	1	1.7	1.7
		58	100.0	100.0
Occupation	Farmer	3	5.2	5.2
	Retired	43	74.1	74.1
	Trader	12	20.7	20.7
		58	100.0	100.0

4.1.2 Normality Check for the Variables

The Shapiro-Wilk test was used to check the normality of the variables. The results showed that all four variables (mobility, Social Solitude, Depression, and Independence in daily activities of living) were not normally distributed ($p < 0.05$). Therefore, the Wilcoxon Signed-Ranked Test was used for further analysis. (Table 4.2)

Table 4.2: Shapiro-Wilk for Normality for Study Variables

Variable	Statistic	p-value	Decision
Mobility	0.551	< .001	Not normal
Social Solitude	0.912	< .001	Not normal
Depression	0.952	< .022	Not normal
Independence in daily activities of living	0.796	< .001	Not normal

4.1.3 Mobility of Respondents

This is shown in tables 4.3 and 4.4. At pretest, the mean time was 20.41 seconds (SD = 1.99). The median was 20.35 seconds with an interquartile range of 3.1. At posttest, the mean time dropped to 17.14 seconds (SD = 1.78). The median was 17.10 seconds with an interquartile range of 2.6. These values show that participants walked faster after the program. The minimum posttest time recorded was 13.90 seconds, and the maximum was 20.60 seconds, further supporting that mobility was improved across the group.

The Wilcoxon signed-rank test supported this improvement. Fifty-seven participants showed lower times after training. Only one participant showed higher times. The test gave a Z value of -6.63 with a p-value less than 0.001. The effect was very strong. The correlation measure was $r = -0.87$ which shows that the reduction in time was substantial and consistent across the participants. The standardized mean change (Cohen's d_z) was 5.11. This is well above the threshold for a large effect. The program produced a major improvement in mobility.

Table 4.3: Descriptive Statistics for Mobility

Statistics	Pretest	Posttest	Mean Difference	Z Value	p-value
N	58	58		−6.63	< .001
Mean (seconds)	20.41	17.14	3.27		
Median (seconds)	20.35	13.90	6.45		
Standard Deviation	1.99	1.78			
Variance	3.95	3.16			
Range	7.5	6.8			
Minimum	16.80	13.90			
Maximum	24.70	20.60			
Interquartile Range	3.1	2.6			

Table 4.4: Wilcoxon Signed Ranks Test for Mobility **N = 58**

Ranks	N	Mean Rank	Sum of Ranks
Negative Ranks	1	1.00	1.00
Positive Ranks	57	30.00	1710.00
Ties	0		
Total	58		
Test Statistics			
Z	-6.635		
Asymp Sig	< .001		

4.1.4 Social Solitude amongst Respondents

This is shown in tables 4.5 and 4.6. Lower scores meant less loneliness. At pretest, the mean score was 55.08 (SD = 9.56). The median score was 57.50, with an interquartile range of 11. At posttest, the mean score dropped to 44.90 (SD = 9.92). The median score was 45.00, with an interquartile range of 14. These results show a clear drop in loneliness after the program.

The Wilcoxon signed-rank test showed strong changes. Fifty-seven participants scored lower after the program. Only one scored higher. The test gave a Z value of -6.62 with a p-value less than 0.001. The effect size was large, $d_z = -1.55$. The rank correlation was $r = -0.87$.

Table 4.5: Descriptive Statistics for Social Solitude

Statistics	Pretest	Posttest	Mean	Z Value	p-value
			Difference		
N	58	58		-6.62	< .001
Mean	55.09	44.90	10.19		
Median	57.50	45.00	12.56		
Standard Deviation	9.56	9.92			
Variance	91.38	98.41			
Range	38	49			
Minimum	31.00	21.00			
Maximum	69.00	70.00			
Interquartile Range	11.00	14.00			

Table 4.6: Wilcoxon Signed Ranks Test for Social Solitude N = 58

Ranks	N	Mean Rank	Sum of Ranks
Negative Ranks	1	1.50	1.50
Positive Ranks	57	29.99	1709.50
Ties	0		
Total	58		
Test Statistics			
Z	-6.617		
Asymp Sig	< .001		

4.1.5 Depression amongst Respondents

This is shown in tables 4.7 and 4.8. Lower scores meant fewer signs of depression. At pretest, the mean score was 9.03 (SD = 2.11). The median score was 9.00, with an interquartile range of 2. At posttest, the mean score dropped to 5.47 (SD = 2.20). The median score was 5.00, with an interquartile range of 3. These changes showed a clear drop in depression symptoms after the sessions.

The Wilcoxon signed-rank test showed a strong shift in scores. Fifty-one participants scored lower after the program. Seven scored higher. There were no ties. The test gave a Z value of -6.107 with a p-value less than 0.001.

Using the Wilcoxon output, the effect size was calculated as $r = Z/\sqrt{N} = -6.107/\sqrt{58} \approx -0.80$. This is a large effect, showing that the intervention had a strong influence on reducing depression symptoms.

Also, Cohen's d_z was computed from the mean difference scores. The mean change between pretest and posttest was 3.56 points (SD of difference = 2.74). Cohen's d_z was 1.30, which is a large effect size.

Table 4.7: Descriptive Statistics for Depression amongst Respondents

Statistics	Pretest	Posttest	Mean Difference	Z Value	p-value
N	58	58		-6.107	< .001
Mean ± SD	9.03 ± 2.11	5.47 ± 2.20	3.56		
Median	9.00	5.00	4.00		
Variance	4.46	4.85			
Range	9.00	10.00			
Minimum	4.00	2.00			
Maximum	13.00	12.00			
Interquartile Range	2.00	3.00			

Key: SD = Standard Deviation

Table 4.8: Wilcoxon Signed Ranks Test for Depression amongst Respondents **N = 58**

Ranks	N	Mean Rank	Sum of Ranks
Negative Ranks	7	9.93	69.50
Positive Ranks	51	32.19	1641.50
Ties	0		
Total	58		
Test Statistics			
Z	-6.107		
Asymp Sig	< .001		

4.1.6 Independence of Activities of Daily Living amongst Respondents

This is shown in tables 4.9 and 4.10. Higher scores meant greater independence. At pretest, the mean score was 64.43 (SD = 5.89). The median was 65.00 with an interquartile range of 9. At posttest, the mean score increased to 73.93 (SD = 6.48). The median was 74.50 with an interquartile range of 8. These results showed clear improvement in daily living skills after the program.

The Wilcoxon signed-rank test confirmed this improvement. All 58 participants showed higher scores at posttest. None showed lower scores. The test gave a Z value of -6.73 with a p-value less than 0.001.

The effect was very large. The correlation measure was $r = -0.88$. The standardized mean change (Cohen's d_z) was 3.35. These values confirmed that the program strongly increased independence in daily living.

Table 4.9: Descriptive Statistics for Independence in Daily Activities amongst Respondents

Statistics	Pretest	Posttest	Mean Difference	Z Value	p-value
N	58	58		-6.73	< .001
Mean ± SD	64.43 ± 5.89	73.93 ± 6.48	9.50		
Median	65.00	74.50	9.50		
Standard Deviation	5.89	6.48			
Variance	34.71	41.93			
Range	24.00	30.00			
Minimum	50.00	58.00			
Maximum	74.00	88.00			
Interquartile Range	9.00	4.00			

Key: SD = Standard Deviation

**Table 4.10: Wilcoxon Signed Ranks Test for Independence in
Activities of Daily Living Amongst Respondents** **N = 58**

Ranks	N	Mean Rank	Sum of Ranks
Negative Ranks	0	0.00	0.001
Positive Ranks	58	29.50	1711.00
Ties	0		
Total	58		
Test Statistics			
Z	-6.73		
Asymp Sig	< .001		

4.2 Test of Hypotheses

Hypothesis 1

Statement: There would be no significant difference in strength of participants before and after receive tele-physiotherapy.

Alpha level: 0.05

Test statistic: Wilcoxon Signed Ranks Test

Observed: $p < .001$

Since the observed p value was lesser than 0.05 Alpha level. The hypothesis was therefore **REJECTED**

Hypothesis 2

Statement: There would be no significant difference in signs of depression of participants before and after receiving tele-physiotherapy.

Alpha level: 0.05

Test statistic: Wilcoxon Signed Ranks Test

Observed: $p < .001$

Since the observed p value was lesser than 0.05 Alpha level. The hypothesis was therefore **REJECTED**

Hypothesis 3

Statement: There would be no significant difference in signs of loneliness of participants before and after receiving tele-physiotherapy.

Alpha level: 0.05

Test statistic: Wilcoxon Signed Ranks Test

Observed: $p < .001$

Since the observed p value was lesser than 0.05 Alpha level. The hypothesis was therefore **REJECTED**

Hypothesis 4

Statement: There would be no significant difference in daily living activities of participants before and after receiving tele-physiotherapy.

Test Statistics: Wilcoxon Signed Ranks Test

Alpha level: 0.05

Observed: $p < .001$

Since the observed p value was lesser than 0.05 Alpha level. The hypothesis was therefore **REJECTED**

CHAPTER FIVE

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

5.1 Discussion

A total of fifty-eight participants took part in the program, with slightly more females than males. The participants came from a wide range of ages with a majority falling within 70 -74 years. Most were retired, while others were traders, and farmers. This mix showed that the study included older adults with varied backgrounds and daily routines.

Participant's mobility improved noticeably after the tele-physiotherapy program. The statistical test used confirmed that this improvement was significant. This indicated that the tele-physiotherapy program significantly improved respondents walking speed and overall mobility. These findings were consistent with studies by Man et al. (2024) and Rees (2020), who reported similar improvements in older adults following tele-physiotherapy interventions.

Feelings of social solitude also reduced after the intervention. Statistical evidence again showed a significant decrease, and the large effect size indicated a strong impact of the program. This implies that participants felt less lonely after taking part in the tele-physiotherapy sessions. The regular online interactions may have offered a sense of connection and purpose. Similar results were reported by Choi et al. (20 22) and Ekoha et al. (2021), showing digital health interventions can reduce loneliness among homebound older adults.

Symptoms of depression also dropped following the program, showing a clear reduction in depressive tendencies among respondents. Ahmed et al. (2022) and Shafiee et al. (2022) also found improvements in mental health among older adults using tele-physiotherapy. Likewise, participants became more independent in carrying out their daily activities after the intervention. The statistical test confirmed that this improvement was significant, indicating that tele-physiotherapy helped strengthen functional independence. This aligned with the findings by Kumar et al. (2021) and PhysioOnPatterson (2023), who noted that technology-assisted physiotherapy supports functional independence.

Across all measures, the results showed consistent, and significant improvement after tele-physiotherapy. All p-values were less than 0.001, which meant the changes were not due to chance. This confirmed that tele-physiotherapy is an effective and accessible way to improve both physical and mental health in older adults. It gives them the chance to stay active, connected, and independent from their homes (Salisbury et al., 2020).

The findings met the research objectives, showing that tele-physiotherapy can reduce depression and loneliness, improve mobility and balance, and increase independence in daily activities.

These results showed that tele-physiotherapy can play an important role in elderly care, especially when in-person visits are limited.

5.2 Conclusion

The research showed that tele-physiotherapy program significantly improved the physical, psychological, and social well-being of elderly respondents. Respondents moved faster and more confidently, feelings of loneliness decreased leading to better social engagement, mental health improved as depression levels dropped, and the respondents became more capable of performing daily activities on their own.

Digital tele-physiotherapy is an effective approach for enhancing the overall quality of life in older adults, particularly in communities where in-person physiotherapy may not be easily accessible.

5.3 Recommendations

Based on the findings, the following recommendations were made:

For Individuals: Older adults should try home-based tele-physiotherapy to improve mood and function.

For Health Practitioners: Incorporate tele-physiotherapy into regular elderly care programs to improve mobility and independence. Offer ongoing support to help older adults use digital tools confidently and consistently.

For Health Institutions: Hospitals and clinics should provide technical support for patients during tele-physiotherapy.

For policymakers: Government should create policies that improve older adult's access to digital devices and the internet. Include tele-physiotherapy in national strategies for ageing populations.

For Researchers: Conduct larger studies to examine the long-term effects of digital physiotherapy on older adults. Develop culturally adapted tele-physiotherapy programs to increase engagement and acceptance.

For Caregivers and Families: Encourage older adults to take part in tele-physiotherapy programs. Provide technical help and emotional support during online sessions. These steps will help extend the benefits of this study to real life.

5.4 Implications for Further Studies

The impact of Tele-physiotherapy shows that our elderly population can achieve improved mobility and a healthier lifestyle. Further research should look into studying different Local Government Areas for a broader demographic base, and include older adults with a diverse range of comorbidities. Since the study lasted for only four weeks, further studies should be done to examine the long term effects of tele-physiotherapy on mobility, social solitude, depression, and independence amongst the elderly, check the cost effectiveness of tele-physiotherapy compared to traditional care, and examine how Local Government Structures can support the integration of tele-physiotherapy into public health centres. Lastly, there is need for more studies to check barriers such as poor internet access, and digital illiteracy amongst the elderly in accessing tele-physiotherapy.

References

- Abdullahi, A., Thomson Wai-Long Wong, Shamay Sheung-Mei Ng (2024). Effects of home-based and telerehabilitation exercise on cognitive function and activities of daily living. *Physiotherapy Practice and Research*, 45(2), 123–132.
- Adesola Oyinkansola, A., Olubukola A. Olaleye, Ayomide Daniel A (2024). Acceptability of telerehabilitation among stroke survivors in Nigeria. *Neurorehabilitation and Neural Repair*.
- Ahmed, S., Hasan, M., & Abdalla, M. (2022). Virtual physiotherapy services: A global review.
- Akinola, B., Adesola, A., & Jimoh, S. (2024). Acceptance of tele-physiotherapy by Nigerian physiotherapists.
- Akinola, B., Adesola, A., & Jimoh, S. (2024). Acceptance of tele-physiotherapy by Nigerian physiotherapists. *Bulletin of Faculty of Physical Therapy*, 29(1), 35.
- Akinwuntan, A. E., Owolabi, M. O., & Gebregziabher, M. (2022). Telerehabilitation in African settings: A scoping review.

- Alharbi, N. S., AlGhanmi, A. S., & Fahlevi, M. (2022). Adoption of Health Mobile Apps during the COVID-19 Lockdown: A Health Belief Model Approach. *International Journal of Environmental Research and Public Health*, 19(7), 4179.
- Babatunde, A. O., Abdulkareem, A. A., Akinwande, F. O., Adebayo, A. O., Omenogor, E. T., Adebisi, Y. A., & Ilesanmi, E. B. (2021). Leveraging mobile health technology towards Achieving Universal Health Coverage in Nigeria. *Public Health in Practice*, 2, 100120.
- Boston College Libraries. (n.d.). Phase 1: Scope of Review - Writing a Literature Review.
- Brodsky (2022). How Virtual Reality Is Expanding Health Care.
- Choi, N. G., DiNitto, D. M., & Marti, C. N. (2022). Older adults' telehealth use and mental health during the COVID-19 pandemic. *Journal of Applied Gerontology*, 41(10),
- Choi, N. G., DiNitto, D. M., & Marti, C. N. (2022). Older adults' telehealth use and mental health during the COVID-19 pandemic. *Journal of Applied Gerontology*, 41(10),
- Chuanrui Chen, (July 2023). Digital health for aging populations
- Chukwu et al. (2023) (2024). Geriatric physiotherapy care in Nigeria.

- Coletta, G., Noguchi, K. S., Beaudoin, K. D., McQuarrie, A., Tang, A., Griffin, M., Ganann, R., & Phillips, S. M. (2024). A live online exercise program for older adults improves depression and life-space mobility: A mixed-methods pilot randomized controlled trial. *PLoS ONE*, 19(11), e0312992.
- Ekoha, P. C., George, E. O., & Ezulike, C. D. (2021). Digital and Physical Social Exclusion of Older People in Rural Nigeria in the Time of COVID-19. *Journal of Gerontological Social Work*, 64(6), 629 – 642.
- Eniola O. Cadmus, Lawrence A. Adebuseye, Eme T. Owoaje (2021). Rural–urban differences in quality of life and associated factors among community-dwelling older persons in Oyo State, South-Western Nigeria
- Frances Amara C., Adione Juliet O., Olasunkanmi Faith (2024). Healthcare accessibility and affordability among older persons in Nigeria.
- Gamble, C. J., Jcm van Haastregt, EF van Dam van Isselt, Smg Zwakhalen (2023). Effectiveness of guided telerehabilitation on functional performance in community-dwelling older adults. *International Journal of Telerehabilitation*, 15(1), e23.
- Hjelmås, T. A., Berntzen, H., & Walle-Hansen, M. (2021). Learning from the Sunnaas telerehabilitation model.
- Jawed & Hogan (2024). Prevalence of mental illness among the elderly in Nigeria

- Joyce Faronbi, Adebayo Ajadi, Robbert J. J. Gobbens (2020). Associations of chronic illnesses and socio-demographic factors with health-related quality of life of older adults in Nigeria: A cross-sectional study
- Kumar, A., Danishta, Anchit Gugnani (2021). Use of wearable devices in physiotherapy: A study on patient outcomes. *Physical Therapy Journal*.
- Laver, K. E., Adey-Wakeling, Z., Crotty, M., Lannin, N. A., George, S., & Sherrington, C. (2020). Telerehabilitation services for stroke. *Cochrane Database of Systematic Reviews*, 2020(1).
- Man, D. W. K., Tam, S. F., & Leung, A. S. W. (2024). Effectiveness of telephysiotherapy among older adults: A systematic review and meta-analysis. *Physiotherapy Research International*, 29(1), e1995.
- Man, D. W. K., Tam, S. F., & Leung, A. S. W. (2024). Effectiveness of telephysiotherapy among older adults: A systematic review and meta-analysis. *Physiotherapy Research International*, 29(1), e1995.
- Man, S.-S., Wen, H., Chiu, K.-T., Wang, F., & Chan, H.-S. (2024). Effectiveness of telephysiotherapy in improving older adults' physical and psychological outcomes: A systematic review and meta-analysis. *Healthcare*, 12(17), 1775.
- Nigerian Journal of Medicine 32(3):p 251-258, May–Jun 2023

- Omotayo, F. O. (2020). Adoption and use of Smartphones by the Elderly in Nigeria.
- Ortiz-Piña, M., Pablo Molina-Garcia, Pedro Femia, Maureen C. Ashe, Lydia Martin-Martin (2021). Effects of tele-rehabilitation compared with home-based in-person rehabilitation. *Clinical Rehabilitation*, 35(10), 1381–1390.
- Owolabi, M. O., Sarfo, F., & Ogunniyi, A. (2022). Improving stroke care with telehealth in Africa.
- Owolabi, M. O., Sarfo, F., & Ogunniyi, A. (2022). Telemedicine for stroke care in Africa: Opportunities and challenges. *International Journal of Stroke*, 17(4), 404–412.
- PMC. (2022). Transforming the Provision of Physiotherapy in the Time of COVID-19: A Call to Action for Telerehabilitation.
- Pope (2024). Incorporating Technology in Physiotherapy: The Role of Apps and Wearable Tech in Healthcare.
- Preitschopf, A. D., Pol, M., Buurman, B., & Holstege, M. (2025). Home-based geriatric rehabilitation after inpatient rehabilitation: A redesign and feasibility study. *BMC Geriatrics*, 25, 398.
- Rahman Naz farah, Anthony Obinna I., Christopher Ndubuisi N., Michael Ebe K., Amani Kasherwa, Anika Tasnim, Mohamman rocky Khan, Mamunur

- Rashid & Manzur Kader (2025). Psychosocial wellbeing of older adults during COVID-19 in Nigeria.
- Rees, 2020. Largest ever virtual physio study shows it is just as effective as in-person treatment.
- REFORM Trial. (2024). Remotely delivered physiotherapy is as effective as face-to-face physiotherapy for musculoskeletal conditions
- ResearchGate. (n.d.). The Definitions and Onset of an Old Person in South-Western Nigeria.
- Sancar Behire, Aysel Dogan & Serkan Tas (2024). Reliability of the Timed Up and Go (TUG) test in community-dwelling older adults.
- Sang Dol Kim, 2024. Application and Challenges of the Technology Acceptance Model in Elderly Healthcare
- Sarfo, F. S., Oshomoji O. I., Ajiroba J. O., & Olayemi M. A. (2024). Telephysiotherapy in African rural areas: a systematic review. *Bulletin of Faculty of Physical Therapy*, 29(1), 20.
- ScienceDirect. (2021). Effectiveness of virtual reality-based exercise therapy in rehabilitation: A scoping review.
- Shafiee, A., Mohammadi Shahboulaghi, F., & Shabanloei, R. (2022). Effectiveness of telecare in the quality of life of elderly: A systematic review. *BMC Geriatrics*, 22(1), 742.

- Shafiee, A., Mohammadi Shahboulaghi, F., & Shabanloei, R. (2022). Effectiveness of telecare in the quality of life of elderly: A systematic review. *BMC Geriatrics*, 22(1), 742
- Stefanacci, 2024. Quality of Life in Older Adults.
- Sword Health. (2024). Virtual Physical Therapy Outcomes.
- Taukeni, S. G. (2020). Biopsychosocial Model of Health.
- Tousignant, M., Moffet, H., & Boissy, P. (2021). In-home telerehabilitation for stroke patients.
- Toxigon. (2023). Telehealth and Physical Therapy: How Virtual Care is Changing the Game.
- USAHS. (n.d.). What Is Virtual Physical Therapy? Benefits of Online PT 2021
- USC Upstate Library Guides. (n.d.). Purpose of a Literature Review. University of South Carolina Upstate.
- Vanguard News. (2021, October 21). FG targets 95% digital literacy in Nigeria by 2030.
- Wang, T., Qu, S., Zhang, Y., & Huang, Y. (2023). Effects of physiotherapist-led telerehabilitation for older adults: A systematic review. *Journal of Telemedicine and Telecare*, 29(3), 145-159.

- Wang, T., Qu, S., Zhang, Y., & Huang, Y. (2023). Effects of physiotherapist-led telerehabilitation for older adults: A systematic review. *Journal of Telemedicine and Telecare*, 29(3), 145-159.
- WHO. (2021). *Digital Health and Ageing: Promoting Healthy Ageing with Technology*.
- WHO. (2021). *Telehealth: A key tool for health systems*.
- Withers G., Joanne Glinsky, Jackie Chu, Matthew Jennings, Ian Starkey, Rachel Parmeter & Max Boulos et al. (2024). Remotely delivered physiotherapy is as effective as face-to-face physiotherapy for musculoskeletal conditions. *Journal of Physiotherapy*.
- Yerlikaya, T., Öñiz, A., & Özgüren, M. (2021). The effect of an interactive telerehabilitation program on balance in older individuals. *Neurological Sciences and Neurophysiology*, 38(3), 180–186.
- Zhang Lu, Ying Ge, Wowa Zhao, Xuan Shu, Lin Kang, Qiumei Wang & Ying Lu (2025). A 4-week mobile app-based telerehabilitation program improves strength, balance, and IADL in older adults with sarcopenia. *Journal of Medical Internet Research*, 27(1), e67846.

APPENDICES

APPENDIX A

Geriatric Depression Scale – Short Form (GDS-15)

No.	Question	Yes	No
1	Are you basically satisfied with your life?	☐	☐
2	Have you dropped many of your activities and interests?	☐	☐
3	Do you feel that your life is empty?	☐	☐
4	Do you often get bored?	☐	☐
5	Are you in good spirits most of the time?	☐	☐
6	Are you afraid that something bad is going to happen to you?	☐	☐
7	Do you feel happy most of the time?	☐	☐
8	Do you often feel helpless?	☐	☐
9	Do you prefer to stay at home, rather than going out and doing new things?	☐	☐
10	Do you feel you have more problems with memory than most people?	☐	☐
11	Do you think it is wonderful to be alive now?	☐	☐
12	Do you feel pretty worthless the way you are now?	☐	☐
13	Do you feel full of energy?	☐	☐
14	Do you feel that your situation is hopeless?	☐	☐
15	Do you think that most people are better off than you are?	☐	☐

UCLA Loneliness Scale (Version 3)

No.	Statement	Never	Rarely	Sometimes	Often
1	I feel in tune with the people around me. <i>(R)</i>	☐	☐	☐	☐
2	I lack companionship.	☐	☐	☐	☐
3	There is no one I can turn to.	☐	☐	☐	☐
4	I do not feel alone. <i>(R)</i>	☐	☐	☐	☐
5	I feel part of a group of friends. <i>(R)</i>	☐	☐	☐	☐
6	I have a lot in common with the people around me. <i>(R)</i>	☐	☐	☐	☐
7	I am no longer close to anyone.	☐	☐	☐	☐
8	My interests and ideas are not shared by tho/se around me.	☐	☐	☐	☐
9	I am an outgoing person. <i>(R)</i>	☐	☐	☐	☐
10	There are people I feel close to. <i>(R)</i>	☐	☐	☐	☐
11	I feel left out.	☐	☐	☐	☐
12	My social relationships are superficial.	☐	☐	☐	☐
13	I feel understood by the people I know. <i>(R)</i>	☐	☐	☐	☐
14	I feel distant from people.	☐	☐	☐	☐
15	I feel at ease conversing with people. <i>(R)</i>	☐	☐	☐	☐
16	I feel that no one really knows me well.	☐	☐	☐	☐
17	I feel isolated from others.	☐	☐	☐	☐
18	I can find companionship when I	☐	☐	☐	☐

No.	Statement	Never	Rarely	Sometimes	Often
	want it. (<i>R</i>)				
19	There are people who really understand me. (<i>R</i>)	☐	☐	☐	☐
20	I am unhappy being so withdrawn.	☐	☐	☐	☐

Barthel Index Questionnaire

Instructions:

Tick (✓) the option that best describes the patient's current ability in each activity.

Scoring: 2 = Independent, 1 = Needs some help / supervision, 0 = Dependent.

Activity	Description	Score (0–2)
Feeding	0 = Unable to feed self 1 = Needs help with cutting food or supervision 2 = Independent	☐ 0 ☐ 1 ☐ 2
Bathing	0 = Dependent 1 = Needs some help 2 = Independent	☐ 0 ☐ 1 ☐ 2
Grooming (face, hair, teeth, shaving)	0 = Needs help 1 = Needs minimal assistance 2 = Independent	☐ 0 ☐ 1 ☐ 2
Dressing	0 = Dependent 1 = Needs some help (e.g., with buttons, zips) 2 = Independent	☐ 0 ☐ 1 ☐ 2
Bowel Control	0 = Incontinent 1 = Occasional accident 2 = Continent	☐ 0 ☐ 1 ☐ 2
Bladder Control	0 = Incontinent 1 = Occasional accident 2 = Continent	☐ 0 ☐ 1 ☐ 2
Toilet Use	0 = Dependent 1 = Needs some help 2 = Independent	☐ 0 ☐ 1 ☐ 2
Transfers (bed to chair and back)	0 = Unable / needs full help 1 = Needs some help 2 = Independent	☐ 0 ☐ 1 ☐ 2

Mobility (on level surfaces)	0 = Immobile	☐ 0	☐ 1
	1 = Needs help (uses cane, walker, or supervision)	☐ 2	
	2 = Independent		
Stairs	0 = Unable	☐ 0	☐ 1
	1 = Needs help	☐ 2	
	2 = Independent		

APPENDIX B

Consent Form for Participation in a Research Study

Project Title:

Digital Longevity: Digital Longevity: Tele-Physiotherapy In Enhancing Quality Of Life Among The Elderly In Selected Areas Of Ikpoba-Okha, Edo State.

Researcher:

Asikagbon Anna Ibhadde

Physiotherapy

University of Benin

Purpose of the Study:

This study will test how tele-physiotherapy helps older adults move better, feel less lonely, and enjoy life more.

What You Will Do:

If you agree to take part, you will:

Be assessed before and after the program

Join the program twice a week for 4 weeks

Answer simple health questions

Take part in light movement tests

Voluntary Participation:

You do not have to join. You can stop at any time without punishment.

Privacy:

Your name will not appear in any report.

All your information will be kept private and safe.

Risks and Benefits:

You may feel tired after some exercises.

You may feel stronger, more active, and less lonely over time.

Questions:

Ask the researcher if you don't understand anything.

Declaration:

I have read or listened to the purpose of this study. I understand what I will do. I agree to join.

Participant's Name: _____

Signature/Thumbprint: _____

Date: _____

Researcher's Name: _____

Signature: _____

Date: _____

APPENDIX C

ETHICAL APPROVAL



EDO STATE MINISTRY OF HEALTH HEALTH RESEARCH ETHICS COMMITTEE



PROTOCOL NUMBER	HA/737/25/D/07180821 (PLEASE QUOTE IN ALL ENQUIRIES)
APPROVAL NUMBER	HA/737/25/D/09190821
TITLE OF RESEARCH PROPOSAL	DIGITAL LONGEVITY: TELE-PHYSIOTHERAPY IN ENHANCING QUALITY OF LIFE AMONG THE ELDERLY IN SELECTED AREAS OF IKPOBA-OKHA, EDO STATE
PRINCIPAL INVESTIGATOR (S)	ASIKAGBON ANNA IBHADE
DATE CONSIDERED	19 TH SEPTEMBER, 2025.
DECISION OF THE COMMITTEE	APPROVED

THIS APPROVAL DATES 19/09/2025 TO 19/09/2026. IF THERE IS A DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC EDO SMoH SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK: Please kindly note that the HREC Edo SMoH seal authenticates this approval

DR (MRS) Omoniyemen B. BELLO
(MBBS, MPH, FPHCM) (CHAIRMAN)

SIGNATURE & DATE.....
Prothge
12/9/2025

SUPERVISOR(S)

ATTESTATION BY INVESTIGATOR(S)

No participant accrual or activity related to this research may be conducted outside of the approval dates. All informed consent forms used in this study must carry the Edo SMoH HREC-assigned number and duration of your research. No changes are permitted in the research without prior approval of the Edo SMoH HREC except in circumstances outlined in the Code. The Edo SMoH HREC reserves the right to conduct compliance visits to your research site without previous notification.



Signature & Date.....



edohrec@edostate.gov.ng



Room 16, Block D, 2nd floor, State secretariat building.



Elderly participant during Time Up and Go (TUG)



Walking phase of the Time Up and Go (TUG) test showing functional mobility and gait performance of an elderly participant



Start and return phases of the Timed Up and Go (TUG) test



Stages of the Timed Up and Go assessment