

**COST EFFECTS OF ASSISTIVE DEVICES ON THE HOUSEHOLD WELFARE
OF PERSONS WITH DISABILITIES IN KAKAMEGA COUNTY, KENYA.**

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**A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of
Masters of Arts in Development Studies in the School of Business
and Economics, Masinde Muliro University of Science and Technology**

November, 2025

DECLARATION AND CERTIFICATION

This research thesis is my original work and has not been presented for a degree or any other award in any other university.

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CERTIFICATION BY SUPERVISOR

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DEDICATION

I would like to dedicate my work to my daughters Goldah Geliah and Shirnel Matekwa, and my son Hansel Zinnel. To my loving parents Mukuvi Jotham and Selinah Matekwa for their support and encouragement even when things were tough. My husband Saleh Shitandi and my friend Grace Bakesia who have never left my side.

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ACKNOWLEDGEMENTS

I give thanks to the Highest God for enabling me to get this far. I would also like to express my appreciation to my academic advisors and supervisors, Dr. Edwin Jairus Simiyu and Dr. Angela Mungai, for their continuous guidance, valuable insights, and constructive feedback. I am most grateful to Masinde Muliro University of Science and Technology that gave me an enabling environment and inspiration towards this work. Some other members of the School of Business and Economics deserve special mention due to the support they provided, the encouragement they offered, the valuable advice that they gave and the support they provided and contributed even when it was not their duty.

I greatly appreciate all the people with disabilities and their families in the Kakamega County who were involved in this research. Your willingness to share your experiences and challenges has been invaluable in understanding the effect of cost of assistive devices on household welfare.

Special thanks to the local authorities in Kakamega County, as well as National Council for Persons with Disabilities Kakamega chapter that facilitated access to participants and provide critical information and support for this research.

I am eternally grateful to my daughters Goldah Geliah and Shirnel Matekwa, my son Hansel Zinnel in addition to my husband Saleh Shitandi for their unwavering support, encouragement, and understanding throughout the research process. Your moral support has been a pillar of strength for me and has made me who I am today.

ABSTRACT

Persons with disabilities have been recognized by United Nations Convention on the Rights of persons with disabilities that, such individuals should have the same rights to freedom, respect, equality and dignity as everyone else. This study analysed the relationship between the cost of assistive devices and the house hold welfare of persons with disabilities (PWDs) in Kakamega County, Kenya. The objectives of the study were to investigate the effect of financial costs of assistive devices on household welfare for persons with disabilities, to examine the effect of labour costs, and to assess the supportive programs on household welfare for PWDs in Kakamega County. A descriptive survey design was adopted. The study target was the 1110 registered PWDs in Kakamega County (January 2020 to December 2022). Proportionate sampling technique was used to get the 113-sample size. A closed ended questionnaire was used to collect the data. A pilot study was undertaken in Vihiga County to pre-test the validity and reliability. SPSS version 20 to analyse the data. Frequencies tables, percentages and figures were used to present the data. Study approvals were sought. Anonymity and confidentiality and consenting were adhered to. The findings of the study highlight the economic burden faced by households of PWDs that may inform policy makers. The study found a statistically significant association between household welfare and Supportive Programmes for PWDs at 95% confidence interval ($t=13.8$; p value = 0.000). Additionally, the relationship between Labour Costs of Assistive Devices and household welfare was statistically significant at 95% confidence interval with a p value of 0.004 and a t -value of 2.929. There was no statistically significant association between Economic Cost of Assistive Devices and household welfare (p value = 0.695 and t value = -0.393). The economic cost of assistive devices ($p=0.037$), labour cost effects of assistive devices (0.000), support programs costs of assistive devices (0.000). In conclusion, based on findings of this study, the empowerment of communities of PWDs is difficult to achieve due to the high dependencies. However, although it may be costlier to purchase, maintain or upgrade, assistive devices greatly improve the overall quality of life for persons with disability. Similarly, the ability to participate in gainful economic activities by PWDs is vital. Households should therefore not find it hard to access assistive devices to successfully contribute to household incomes. Hence, availability of cost effective and efficient assistive devices in households should be prioritized as this greatly determines the level of PWD participation and engagement in gainful opportunities. The study recommends that collective responsibility is needed to initiate reasonable and expanded interventions that would benefit the empowerment of vulnerable PWD households.

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ABBREVIATIONS AND ACRONYMS

AD	Assistive Devices
BCR	Benefit Cost Ratio
CBR	Community-Based Rehabilitation
CRPD	Convention on the Rights of Persons with Disabilities
ICF	International Classification of Functioning, Disability and Health
ILO	International Labour Organization
NCPD	National Council for Persons with Disabilities
NGO	Non-governmental Organization
NPV	Net Present Value
PWD	Persons with Disabilities
QOL	Quality of Life
SES	Socioeconomic status
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UN	United Nations
UNCRP	United Nations Convention of Rights on Persons with Disabilities
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

- Assistive Devices:** refers to the tools, equipment, or technologies designed to aid PWDs in activities challenging or impossible to accomplish such as wheelchairs, hearing aids, prosthetic limbs, crutches and white cane.
- Disability:** refers to a physical, sensory, mental or other impairment, including any physical incapability, which affects unfavourably on social, economic or environmental participation
- Financial Cost:** refers to the economic burden associated with the purchase, maintenance, and transport costs of assistive devices incurred by household of PWDs
- Healthcare Access:** refers to the ability of households of PWDS to obtain health services such as treatment, rehabilitation and support services that may be necessary for the use and maintenance of assistive devices.
- Household Welfare:** refers to the overall well-being and quality of life of a household, including economic stability, health, education, social inclusion, and access to essential services.
- Income level:** refers to the total earnings or income streams of all household of a PWDs including wages, business income, remittances, government assistance
- Literacy levels:** refers to PWDs enrolment by level, school attendance/ non-school attendance, Training on KSL and Braille languages, and an access to education aid

Productivity costs: refers the to the access to employment, reduced work time and reduced income loss by the household with a PWD

Quality of Life: refers to the general well-being of PWDs in terms of health, comfort, economic stability, and the ability to participate in community and social activities.

CHAPTER ONE:

INTRODUCTION

1.1 Background of the Study

International Classification of Functioning Disability and Health (ICF, 2023) defines disability as an umbrella word that encompasses impairments, activity limitations, and participation restrictions adding that disability is a contextual variable, dynamic over time and in relation to circumstances. People with disabilities may be excluded from the workforce and wealth creation platforms, have limited educational opportunities and or face institutional barriers that restrict their earnings (Smith, *et al.*, 2024). Consequently, this leads to lower standards of living among people with disabilities. The World Bank estimates that 20% of the world's poorest people have some kind of disability, and tend to be regarded in their own communities as the most disadvantaged.

In United Kingdom, Layton et al. (2020) informed that, households investing in assistive devices tend to save a lot of money in the long-run through less frequently used paid care giving services as well as through less purchased healthcare services. This provides greater financial planning, savings and the possibility to invest in such assets as property, education or small businesses. Families having PWDs and who utilized assistive technologies had a 15 percent rise in savings after five years, which resulted in greater financial security (Layton et al. 2020).

Conflict, poor access to healthcare and disease are some of the reasons why the prevalence of disability might be high in Africa. It means that more than 80 million Africans have a disability. It was estimated that in the low-income countries with a significant number of PWDs, such as many in Africa, only 5-15% of them have access to the assistive devices they require (WHO 2024). According to the World Health

Organization (WHO, 2024) the world has estimated that 1.3 billion (16%) of the populace have some type of severe disability. The United Nations (UN) estimates on the contrary that approximately 80 million Africans are living with different types of disability (UN report, 2019)..

The Kenya Population and Housing Census (KPHC, 2019) reports that 2.2% or 0.9 million of Kenyans above five years live with some form of disability, and a majority are living in rural areas. In a different survey, the Kenya National Survey of People with Disability (KNS-PWD) found that around 4.6% of the population (not aggregated by age), or 1.7 million Kenyans, live with a form of disability. Generally, 1.9% of men have a disability as compared to 2.5% of women (KPHC, 2019). People with disabilities (PWDs) in Kenya live in a vicious cycle of poverty due to stigmatization, limited education opportunities, inadequate access to economic opportunities, and access to the labour market (Zikhali, 2024).

Data from Kenya National Bureau of Statistics (KNBS) shows that Kakamega County is the second after Meru County with population of PWDs (KNBS, 2019). To address the challenges that PWDS face, the government enacted several policy documents that gradually contributed to the sustenance of the poor and vulnerable populations. Article 20 of the Constitution of Kenya for instance grants the administration's obligation to the advanced recognition of the rights of all Kenyans.

This is further buttressed in Article 43 which guarantees the right to the maximum standard of health care and services, education, accessible and adequate housing, food security, access to clean water, and social security with an emphasis on providing for those unable to support themselves or their dependents (Constitution of Kenya, 2010).

The government put in measures such as establishment of a State Agency i.e. the National Council for People with Disabilities (NCPWD) to deal with disability issues, the provision of wheel chairs, white cane, sunscreen lotions and other assistive technologies in addition to establishing a Disability Fund.

Provision of assistive devices and services to persons with disabilities in Kenya enable them to actively engage in society. These include wheelchairs, crutches, hearing aids, callipers, surgical boots and prosthetic arms or legs. A sign language interpreter is also included as provision of an assistive service. Priority is given to those in need of assistance in work, training and learning environments. Limited studies have shown how PWDs suffer in regards to the effect of the cost of this device in improving the living standards of the persons with disabilities. For instance, Ganle et al (2020), Calvert (2021) and Gupta and Priyadarshi (2020) among other studies agree that PWDs still face multiple challenges among them those of mobility, health issues, educational challenges and participation in income generational activities.

Because of the looming challenges that face disadvantaged people with disabilities, the Government of Kenya (2019) identified disability inclusion as a criterion to the attainment of the Sustainable Development Goals (SDGs) and its fundamental initiative 'leaving no one behind' (Mitra 2017; Abualghaib, *et al*, 2019). To do this, the government incessantly strived to ensure that PWDs were accounted for and could participate equally in every aspect of life. This helped in enhancing equal opportunity, inclusion, justice and economic growth for the nation. The government for instance established several interventions of improving the living standards of persons with disabilities. One of the approaches include the provision of PWDs with devices that

assist them in leading a normal life. Priority is given to those in need of assistance at work, training and learning environments.

While it is important to consider the financial and long-term impacts of assistive devices, prioritizing cost-effectiveness may lead to overlooking expensive but potentially more effective solutions for people with disabilities. A study conducted by Garland-Thomson (2020), and confirmed by Bal, Waitoller, Mawene and Gorham (2021) found that focusing solely on maximizing impact through resource allocation may neglect the importance of preferences and needs in selecting assistive devices. It is essential therefore to consider a holistic approach when addressing the needs of people with disabilities (Abualghaib *et al*, 2019). This includes considering unique abilities, challenges, and personal preferences to ensure that assistive devices are more suitable or effective for the individual. This consideration would lower chances of probable frustration, decreased independence, and a lack of success in performing daily tasks.

In most cases, assistive devices must be customized to every individual in terms of size, fitting and some other considerations (Pinilla-Roncancio and Alkire, 2021). While personalized care is important, it is also crucial to consider that not all individuals have access to or can afford customized assistive devices. In some cases, individuals may have to accept generic options that may not fully meet their needs. Madans, Loeb and Eide (2017) however, indicates that the generic options could still provide some level of support and functionality for those who need them. It is important in the long run to explore all available options and resources to find the best solution for the specific needs of persons with disabilities. In some cases, customization or additional support may be

necessary to ensure the best possible outcome. This may involve working closely with a healthcare provider or specialist to identify the most effective approach.

1.2 Statement of the problem

Kakamega County has a total population of 1,867,579 with a prevalence rate of disability at 2.9% which is slightly higher than the National disability prevalence rate of 2.2% (KPHC 2019). There is a strong link between poverty and disability where Johner (2016) reveals that poor people have a higher risk of acquiring a disability because they are more exposed to disabling diseases and conditions. At the same time, disability increases the possibility of falling into poverty by being excluded from participation of development initiatives (Rahman & Parvez, 2024). People with disabilities may be excluded from the workforce and wealth creation platforms, have limited educational opportunities and or face institutional barriers that restrict their earnings (Smith, et al., 2024). Consequently, this leads to lower standards of living among people with disabilities. Data from World Health organization (2024) indicates that 80% of disabilities are acquired majorly through chronic illnesses, accidents, and aging. PWDS often face higher poverty rates compared to the general population due to factors such as limited access to education, employment and social services.

The overall poverty level in Kakamega County stands at 49.2% making it one of the counties with the highest poverty rates in Kenya (KNBS 2019). Given the 49.2% overall poverty rate in Kakamega, it is reasonable to infer that the poverty rate among PWDS in the County is higher due to additional barriers they face. Statistics have indicated that 2.5 billion PWDs need one or more assistive devices, yet nearly one billion of them are denied access where accessibility can be as low as 3%. Affordability is the major barrier to access (WHO 2021). The number of people in need of assistive devices is likely to

rise to 3.5 billion because of increase in the prevalence of non-communicable diseases (WHO 2022). The WHO's Global Report on Assistive devices presents evidence on the need and access to assistive products.

Assistive devices that were covered by National Health Insurance are only 7 out of 50 types recommended by WHO (KNBS, 2019). This means PWDS have to purchase out of pocket to get the device or rely on family and friends for financial support. There are limited studies that highlight how the cost of assistive devices affects the household welfare of PWDS

A study by Restrepo (2015) that used comparable data from 14 developing countries found not only that people with disabilities tended to be less well off in terms of education, employment, living conditions, consumption and health, but also that, on average, households with disabilities also report spending a higher fraction of their expenditure on health care. The study did not shed light on how the cost of assistive devices affect the household welfare of persons with disabilities. This study has helped the researcher to a more understanding there has been an increased and progressive interest in the study of living conditions of people with disabilities. Migo (2018) reports construct gap purchasing and maintaining costs, Kilonzo *et al* ((2021) was on a different sector Makueni NGOs as Borg and Ostergren (2015) narrowed on students and governance thus Kisumu County.

Further, understanding that people with disabilities fully depend on others for their independence, there is scarce data on living standards of these people even when they possess assistive devices. Therefore, this study aims to fill this gap by shedding more

light on the costs and welfare effects of assistive devices to bring about long-term solutions.

1.3 Objectives of the Study

The aim of this study is to find out the cost effects of assistive devices on the household welfare of persons with disabilities in Kakamega County.

1.3.1 Specific Objectives:

The following are specific objectives for this study;

- i. To find out effects of Economic Costs of assistive devices on household welfare for persons with disabilities in Kakamega County.
- ii. To determine the labour costs effects of Assistive Devices on the household welfare for persons with disabilities in Kakamega County.
- iii. To assess the effects of supportive programs on household welfare for persons with disabilities in Kakamega County.

1.4 Research Hypothesis

This study tested the following hypotheses;

Ho1 Economic Costs of assistive devices significantly affect household welfare for persons with disabilities in Kakamega County

Ho2 Labour cost effects of Assistive Devices significantly affect the household welfare for persons with disabilities in Kakamega County

Ho3 Supportive programs significantly affect household welfare for persons with disabilities in Kakamega County.

1.5 Significance of the Study

The value of the research on the cost implications of assistive devices to the household welfare of people with disabilities in Kakamega County, Kenya, is multidimensional and comprehensive. It deals with a number of critical areas:

This paper gives a comprehensive discussion of the monetary cost of purchasing and sustaining assistive equipment. Through measurement of such costs, it provides useful information on the economic issues of households that have a member with disability.

The results can empower the policymakers with the needs and challenge of persons with disabilities. This awareness is critical to the formulation of specific policies and programs which can reduce financial limitations and enhance the availability of the required assistive devices.

The barriers to access, including the cost and availability, are mentioned in the study, which can initiate the discussion of reducing the costs of assistive devices and making them more accessible. This has the potential of creating independence and better living standards of the disabled persons.

The effect of assistive devices on the welfare of the household is not limited to the economic parameter. The paper also illuminates the role that these devices play in the social, emotional, and physical welfare of people with disabilities and their families.

The study will be able to inform governments and non-governmental bodies in the more effective distribution of resources. It can be used to make certain that resources are invested in areas where they make the most sense by determining the most urgent needs and the most helpful interventions.

The research creates awareness to the general population and stakeholders regarding the problems that persons with disabilities have to endure. The sense of awareness can help

create a more inclusive society that helps to fulfill the rights and needs of each participant.

The study offers a basis to future researches on disability and welfare in Kenya and other related situations. It presents possibilities to investigate the related issues, including the long-term consequences of using assistive devices and the impact of technology on the improvement of accessibility.

The study will enable persons with disabilities to fight for their rights and needs by shedding light into their experiences and issues. It assertively highlights the need to involve them in the decision-making processes which impact their lives. To sum up, this study is not only relevant to the academic knowledge but also has practical implications on how the life of persons with disabilities and their families in Kakamega County can be improved. It is a driver of good change and it promotes a less discriminatory and more inclusive society.

1.6 Scope of the Study

This research is a geographical study which is limited to the geographical area of Kakamega County in Kenya. The sample was chosen because of the varied demographic and social-economic backgrounds of this area, which would give a holistic picture of issues encountered by the household of persons with disabilities living in the city and in rural areas. The members who were registered with the National Council of persons with disability (NCPD) in different sub-counties in Kakamega county, Lugari, Likuyani, Malava, Lurambi Navakholo, Mumias East, Mumias West, Matungu, Butere, Khwisero, Shinyalu and Ikolomani were covered in this study.

This wide geographical coverage would provide a representative sample that would capture the diversity in experience and effects of assistive devices on household welfare

countywide particularly those registered With National Council of Persons with Disability Kakamega Chapter. This paper was restricted to the theories of Social Model of Disability, Capability Approach theory, the Economic Theory of Welfare and the cost benefit analysis. The interval of time covered in this study is three years, that is, between January 2020 and December 2022. This time is between 2020 and 2022 and also included the beginning and the end of the COVID-19 pandemic that had immense economical, social, and health consequences in the world and Kenya in particular.

The pandemic aggravated the situation of persons with disabilities by raising the cost of health care, reducing mobility with lockdowns, and messing with the supply chain of devices of assistive nature. The 2020-2022 witnessed the introduction of different government and non-governmental measures, which would enhance the welfare of persons with disabilities, including cash transfer programs, inclusive education policies, and healthcare support. The period (2020-2022) will guarantee the presence of current and up-to-date information on household income, spending, health performance, and access to assistive devices. All the 1110 PWDS registered with the National Councils of Persons with disability (NCPD, January 2020-December 2022) in the Kakamega County were the target population of the study. This research was done in the whole 12-sub county.

1.7 Limitations of the Study

The following were some of the challenges that the researcher faced in conducting a research and in the process of data collection and how they were overcome;

Accessing the disabled individuals in the remote and rural parts of Kakamega County was extremely hard since the infrastructure was bad and there were no means of transportation available. The researcher used the help of the local community leaders

who made introductions. The use of local networks also aided in the identification and contacting of the participants more efficiently in NCPD register.

Some respondents had problems with communication because they were disabled and it was difficult to gather correct and full information. The researcher utilized various data collection techniques which included visual aids, sign language interpreters and adaptive communication technology. It was also imperative to train disability-sensitive communication techniques to the research assistants.

The willingness to provide information and/or take part in the study was influenced by cultural beliefs and stigma about disability among the participants. The researcher would hold awareness talks to inform the researchers of the purpose and the advantages of the research. Developing trust and creating confidentiality was a way of providing a greater degree of open-minded and honest involvement. The engagement was also enhanced by hiring local researchers who were familiar with the cultural context.

The process of data collection in different sub-counties was not easy to coordinate especially in poorly networked and road infrastructure areas. The researcher came up with a comprehensive logistical plan, which involved scheduling, transport and communication plans. The researcher made use of mobile technology to keep in touch with field teams and facilitate data collection procedures.

Maintaining ethical principles particularly in the informed consent and privacy of the participants was complicated. The ethics was adhered to by the researcher as he sought the consent of the ethics review boards. The researcher also ensured that there was easy and understandable information on the study and informed consent on all subjects was obtained.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter outlines the reviewed literature

2.2 Theoretical Literature Review.

The theoretical framework of this study is grounded in the following concepts and theories.

2.2.1 Social Model of Disability

Social Model of Disability which was developed by Mike Oliver in 1980 is a shift in emphasis that places the emphasis in the societal barriers limiting the people with disabilities rather than their impairments. It questions the conventional belief of disability as a personal issue and that through elimination of social, environmental, and economic barriers, people with impairments would be able to engage fully into the society. This has been furthered by Tom Shakespeare and Colin Barnes who have refined this model to take into consideration both biological and systemic barriers that disable people. The two have jointly contributed to the development of legislation and policy that understands disability as a social not an individual problem.

When the Social Model is directed to the setting of assistive devices in Kakamega County, Kenya, we no longer look at the impairment of the individual but the greater economic and social barriers that impair inclusion. Assistive devices are expensive, and this is a huge financial burden to low-income families that are already facing low income and the added burden of providing care. Such economic difficulties reduce welfare in households and limit the freedom and access to people with disabilities.

Families are pushed even more toward the margins and economic strain because of the inability to afford assistive devices.

The Social Model also stresses the fact that when disabled individuals cannot use the help of assistive devices, they lose the right to study, to work and social life and it contributes to the reinforcement of negative stereotypes and promotes social isolation. This creates the dynamics of poverty and dependency further burdening the households and hobbling the potential contribution of people with disabilities to their societies. The high price of assistive devices increases these challenges in localities with limited resources such as Kakamega County and explains why collective action is necessary.

A cost barrier should be tackled by the government, health insurance offered by the populace, or by NGOs to make the assistive devices affordable. With these financial strains decreased, the society can be more independent, better the welfare of the households with disabled members, and make the environment more inclusive. The Social Model offers a theory of disability as a social problem and the promotion of solutions, eliminating obstacles to full inclusion.

Nonetheless, critics state that the model should be continually revised in order to fit into new conditions and resolve long-term issues. Much progress has been made, but people with disabilities continue to encounter restrictions and obstacles to full inclusion in society, and there is still a necessity to promote change and advocacy.

2.2.2 Capability Approach

Amartya Sen is an economist and philosopher whose idea of Capability Approach questions the conventional economic indicators of development such as GDP (1980). Such measures are not able to reflect the actual quality of life and well-being, and Sen believed. Rather, he centered on individual potentials- the actual possibilities of people to live the kind of life that they appreciate. This approach is based on the 1985 book of his (Commodities and Capabilities) that has made a great impact in the areas of development studies, welfare economics and social justice.

Later on in 1990 and 2000, a philosopher Martha Nussbaum furthered on the Capability Approach and introduced an ethical component. Nussbaum (2000) came up with a list of ten central human capabilities in order to lead a dignified life where she in her book, Women and Human Development: The Capabilities Approach, listed them to include: bodily health and practical reason. In contrast to Sen, who did not establish a fixed list, this particular list of Nussbaum has inspired feminist philosophy and human rights, especially in evaluating and advocating social justice to marginalized groups.

Together, Sen and Nussbaum have developed the Capability Approach to become a powerful model of assessing the quality of human well-being and social development. Their work has changed the perspective of material wealth into real freedoms and opportunities which influences our perception of development, poverty and justice. Their model focuses on improvement of individual capabilities more than just on improving economic measures.

Using the Capability Approach to the cost implications of the assistive device to individuals with disabilities in Kakamega County, Kenya, brings out the implication of

the affordability on the individual and family well-being. Expensive prices may also restrict the availability of vital appliances which consequently inhibit the capacity of individuals to participate in the whole aspect of everyday life and possibilities. Household welfare is also subject to this financial pressure so that families reduce other needs. These barriers can be counteracted with supportive policies, like subsidies or financial support, which will increase access to assistive devices and the overall quality of life, thus creating a more inclusive and more equal society.

2.3 Economic Theory of Welfare

Amartya Sen (1980), Economic Theory of Welfare, is a welfare economics theory that is focused on enhancing social welfare by ensuring the optimal allocation of resources and policy interventions. This theory has been influenced by such figures as Pigou, Hicks, Samuelson, and Arrow, where some of the concepts that they explored included the externalities, compensating variations, Pareto efficiency, and capabilities. Their joint efforts give them some grounds on how economic policies and government intervention can rectify market failures and enhance the personal well being of the people. As an example, the theory of externalities by Pigou, has pointed to the solution of market failure through implementing taxes and subsidies, whereas the Capability Approach by Sen expanded the understanding of welfare beyond the conventional economic framework, focusing on real freedoms and opportunities of individuals.

When applied in the context of assistive devices in Kakamega County, Kenya, the Economic Theory of Welfare can be a useful theory to solve the problem of high costs of the assistive devices, which may restrict access and lower social welfare. The theory considers the high costs a market failure, so the government should intervene in the

market, which could be by subsidizing its products, or providing financial support to make them more accessible to more people and increase the general social welfare. These policies do not only help in minimizing the financial constraints on households but also enhance equity and economic efficiency. The affordability of assistive devices would be in line with the welfare economics objective of enhancing the welfare of individuals and the community, especially the individuals with disabilities in low-income regions such as Kakamega County.

2.3.1 Cost-Benefit Analysis (CBA) Framework

The work by Musgrave in 1959 provided the foundations by describing how the public expenditures could be evaluated; the article takes into consideration the influence of political and other institutional elements on the issue of public spending. Harold and William (1971) also expanded CBA procedures and added insights on political incentives and allocation of resources making the framework more applicable and rigorous.

Under the use of the CBA in the assistive devices in Kakamega County, Kenya one emphasizes the discounting of the overall costs of sourcing and servicing the devices and the overall benefits. Examples of costs are direct costs such as purchase and maintenance, and indirect costs such as the financial strain on households, and opportunity costs due to diversion of resources. The positive outcomes of the assistive devices are both tangible and intangible such as enhanced mobility, communication, and social and economic involvement. These can be used to boost productivity, minimize dependency and also lead to general household welfare.

The quantification of the costs and benefits entails the collection of data regarding the cost of assistive devices and the measurement of the enhancement of the capabilities and welfare of households among individuals. As an example, a wheelchair user who is able to move more often can be associated with receiving more education and jobs, whereas when a deaf person can hear using a hearing aid, it can translate into a higher level of socialization and education results. A CBA entails calculation of such metrics as net present value (NPV) or benefit-cost ratio (BCR) to decide whether the benefits of assistive devices pay off their expenses.

The outcomes of a CBA can inform policy choices with regard to the supply and financing of assistive equipment. When the benefits are substantially greater than the costs, this would justify the argument of government-subsidies (or other finance-assistance programs) in order to make it more affordable. Also, the analysis will be able to determine cost-cutting measures, i.e. bulk buying or manufacturing locally to make the provision of assistive devices more effective and efficient. In general, CBA offers a holistic assessment of economic and social implications of assistive devices, and it is used to make evidence-based choices to enhance the access of children with disabilities and the quality of life.

2.4 Conceptual Literature Review

This theoretical review examines the complex correlation between the expenses of the assistive devices and the house hold wellness of PWDs in Kakamega County and how these assistive devices impact the lives of the persons with disabilities.

2.4.1 Economic Costs of assistive devices on household welfare for persons with disabilities in Kakamega County

Financial cost direct and indirectly is a very crucial point in obtaining assistive devices. This variable will include cost of the purchase and maintenance of assistive devices including upfront purchase cost, cost of failure, spare parts, and replacement maintenance and service costs. Indirect Costs consist of obscured or indirect financial implications of owning or utilizing assistive devices, e.g. Cost of training or technical support. Lost revenue in terms of loss of time in maintenance or repair or usage. Greater costs on health-related costs as a result of using the device or injuries. The variables were measured based on opportunity costs of time spent in search of device related services in this research income and savings.

In other instances, families can be forced to trade-offs between buying basic needs such as food and investing in assistive technology. Moreover, the costs of maintenance and repair may be recurrent expenses that households may encounter in addition to exacerbating financial stress. Affordable assistive devices continue to be a major problem to low-income households.

2.4.2 Labour costs effects of Assistive Devices on the household welfare for persons with disabilities in Kakamega County

Working age individuals (15 to 64 years) with disabilities are less prone to be engaged in an economic activity (59.7 per cent) as compared to the other members of the society (69.9 per cent). The economic activity involves working at least one hour during the past 7 days: as an employee, as own account worker in a business or on a farm, contributing family worker, intern or volunteer. (Owuor et al. 2021) ILO statistics show that the unemployment rate among PWD is 76% in comparison to 6% among the non-disabled

(ILO, 2022). The income level of every house hold served as the measure of the employment and productivity of PWDs using assistive devices and those who did not.

2.4.3 Supportive programs on household welfare for persons with disabilities in Kakamega County

The investigator tested the efficiency of government and non-governmental organization interventions in enhancing household welfare of people with disabilities in Kakamega County Kenya. The assessment can provide some information on how to improve the existing programs and make them effective to demonstrate the way PWDs and their families can be offered better lives by the government and non-governmental organizations: Government and NGO interventions are the tools to lead vulnerable populations out of poverty and social exclusion (Amartya). The effectiveness of government and NGOs programs to PWDs in Kakamega County were measured by the provision of assistive devices by the government and NGOs.

2.5 Empirical Literature Review

The delivery and consumption of assistive devices are important in the improvement of life quality of persons with disabilities (PWDs). The current review addresses empirical literature evaluating the cost implications of assistive devices on the welfare of the households with respect to economic, social and psychological aspects.

2.5.1 Economic Costs of assistive devices on household welfare for persons with disabilities in Kakamega County

A study conducted by Mitra et al. (2017) demonstrated that in low-income countries, the initial price of devices such as wheelchairs or hearing aids can easily be more than half of the monthly income of the average household causing the burden and less accessibility. According to a study conducted by Yeager et al. (2018), caregivers in homes with PWDs using assistive devices had less caregiving load and stress, which meant that they could do more paid employment or enter into entrepreneurial ventures. With assistive devices being given to the dependents, caregivers who used to spend up to 40 percent of their time in direct care were able to divert their attention to income generating activities.

In a Kenyan study, Migo et al. (2018) showed that the rural households in Kenya including Kakamega spend between 20-40 percent of their earnings on purchasing assistive equipment and thus were less able to join other demands like food, education and housings, in a study that specifically targeted Kenya, Owuor et al. (2021) explained that the ability to acquire assistive equipment enabled the PWDs to participate more in both formal and informal sector. The monthly income reported by households with PWDs who were able to access assistive devices had increased by 25 percent as a result of the effectiveness of assistive devices in getting better job opportunities and being productive. Assistive devices are linked to less expenditure on healthcare and less dependency thus having long-term economic gains to households.

Assistive devices are also costly to maintain and repair, which also become a significant burden to households. Borg and Ostergren (2014) state that regular maintenance is also

required to guarantee that the devices will be functional, and often, the costs of the parts and repairs, as well as professional services, are prohibitive to most families. The found that it is possible to spend up to 15% of the original purchase price on maintenance per year, which additionally pushes the budgets of households to the limit and may result in the abandonment of devices. Healthcare expenditures are also considered to be an increase in the indirect costs. Certain researches indicate that assistive devices, which are aimed at enhancing the quality of life, may require further medical appointments, rehabilitation, and special accommodations. According to Awuor et al. (2021), households who have PWDs tend to spend 50 percent of healthcare expenses than those without such individuals because of specialized care required and health problems associated with the device.

2.5.2 Labour costs effects of Assistive Devices on the household welfare for persons with disabilities in Kakamega County

In a study conducted by Owuor et al. (2021) in Kenya, assistive tools such as prosthetic limbs and wheelchairs were found to enhance mobility of PWDs enabling them to move to workplaces that could not be accessible. The analysis also found that, the proportion of persons with disabilities utilizing assistive devices worked in higher rates in the education, healthcare, and information technology sectors than their counterparts who did not utilize the device.

A study by Cook and Polgar (2019) indicated that assistive technologies can be used to reduce fatigue and injuries at workplace, and employees with disabilities can continue to perform their jobs and keep their jobs. The researchers discovered that the employees

that used the right assistive devices had a higher chance of making a career progress because they were more productive, independent, and confident in their work.

Research by Phillips and Zhao (2020) concluded that ergonomic workstations, speech recognition software, and mobility aids were found to enhance the productivity of physically impaired employees as they were able to work more comfortably and efficiently. It was established that the availability of affordable assistive devices resulted in a 20 percent rise in the number of PWDs who have been employed both in the formal and informal sectors. Applying the aforementioned observations to Kenya, a research conducted by Mugo et al. (2022) found out that agricultural productivity among farmers with disabilities who employed assistive technology, including adaptive ploughing and modified farming equipment, has risen by 30 percent compared to the researched group who did not utilize the technology.

According to a research study by De Jonge et al. (2015), with the assistance of some gadgets all pain and discomfort related to particular disability are reduced, which means a decrease in absenteeism and increased job satisfaction. It emerged that, among employees who utilized the assistive technologies, there were more job satisfaction levels, because there were less obstacles to accomplishing their tasks and they felt that they were included at the workplace. A study by Nas et al. (2016) in Turkey revealed that PWDs using assistive technologies were much less dependent on the help of co-workers and supervisors that positively influenced their overall productivity and integration into the workplace.

2.5.3 Supportive programs on household welfare for persons with disabilities in Kakamega County

The Kenyan government has undertaken a number of social protection measures that are meant to enhance the welfare of PWDs. National Council of Persons with Disabilities (NCPWD), as a sub-organization of the Ministry of Labor and Social Protection, runs the program Cash Transfer Program to Persons with Severe Disabilities (CTPWSD). Research, including Mugo et al. (2022), has demonstrated that the program offers small, but significant, financial aid to households with severely disabled individuals, including basic needs, like food, medical care, and education.

In a mission, Ochieng et al. (2021) have discovered that families who received cash transfers have stated that the capacity to fulfill their basic needs has enhanced by 20 percent, and poverty levels have decreased by 15 percent. Nonetheless, it was also noted in the study that delays in payment, insufficient quantity of the payment and ignorance on the program affect its overall success. Mutuku et al. (2019) observed that the provision of wheelchairs, hearing aids, and prosthetics was a major success factor as it improved the social inclusion and mobility of PWDs. Nevertheless, the obstacles that the study also identified, include the prohibitive price of the devices, low supply, and follow-up services are not effective, which lowers the effectiveness of the program.

According to a study conducted by Omondi et al. (2018), Community Based Rehabilitation (CBR) programs resulted in a 30 per cent rise in school enrolment of children with disabilities and availability of healthcare services to adult PWDs. The research proved that CBR initiatives enhanced economic inclusion of PWDs through the delivery of vocational training and access to microfinance. The households enrolled in

the CBR programs had reported that there was a rise in the level of income by 25 percent and that the poverty level had significantly reduced.

In a study by Kilonzo et al. (2021), NGOs such as Action Network for the Disabled (ANDY) and Kenya Society for the Blind (KSB) were found to have a great effect on the population regarding the perception of PWDs by creating sensitization and capacity-building programs in the community. These initiatives have led to social inclusion, workplaces acceptance, and the accessibility of services.

Studies conducted by De Jonge et al. (2016) indicated that the use of assistive tools minimized the number of doctor visits, hospitalizations, and long-term care that is usually costly and a considerable financial liability to the family. The elderly with assistive technologies to aid locomotion and self-management were found to have reduced healthcare spending by as much as 35%. This saving on direct healthcare costs has an indirect positive impact on economic well-being of households that can use the resources on other basic needs like education, nutrition, and shelter.

Table 2.1: Research Gaps

Author(s)	Title	Methodology	Findings	Research gap
Dr Jose Fernando Arango Restrepo (2015)	Disability, living conditions and Quality of life The case of the Municipality of Anapoima in rural Colombia	Case control	Disability affects the quality of life	Having chosen to use a voluntary sample posed the risk of involuntary over-representing individuals with strong opinion
Mitra <i>et al</i> (2017)	The Use of Assistive Devices in Daily Living: A Cross-Sectional Study	cross-sectional survey	study reported improved independence and quality of life due to the use of these devices	Study overlooked indirect costs, such as maintenance cost
Owuor <i>et al</i> (2021)	Does assistive technology contribute to social inclusion for people with intellectual disability?	Linear regression	PWDs who used assistive technologies had significantly lower dependency on co-workers	Looked at formal employment only
Mugo <i>et al.</i> (2022)	Assistive Technology for the Inclusion of Students with Disabilities: A Systematic Review.	Bibliographic analysis,	Despite the positive impact of assistive devices various barriers exist, including insufficient funding	insufficient exploration of how government programs, subsidies, or NGO interventions affect the cost of assistive devices and their accessibility
Polgar (2014)	Assistive Technologies:	Case Study	Successful integration	Study has not sufficiently

			of assistive technologies addressed the cultural and is contingent upon regional variations in the usage tailoring them to the of assistive devices individual's specific needs, psychosocial context, and cultural background
Borg and Ostergren (2015)	The Role of Assistive Technologies on Quality Educational Outcomes of Student with Visual Impairment in Kisumu County, Kenya	Descriptive method	Maintenance costs can account for up to 15% of the initial purchase price annually, further straining household budgets and potentially leading to the abandonment of devices. There is less clarification on how much the house hold was spending before it acquired the assistive device
Ochieng <i>et al</i> (2020)	Attaining 100% Transition from Primary Schools for Learners with Disabilities in Kenya: Reality or Fantasy?	Descriptive analysis	households receiving cash transfers reported a 20% improvement in their ability to meet essential needs No clarity whether the cash transfer money is used for payment of school fees for the PWDs
Mutuku <i>et al</i> (2019)	Factors Influencing Performance of Income Generating Enterprises Owned by Youth Living	Thematic analysis	distribution of wheelchairs, hearing aids, and prosthetics significantly enhanced No information on number of youths who own and do not own income generating enterprises

	with Disabilities in Chuka/Igamba Ng'ombe Sub-County, Tharaka Nithi County, Kenya (Doctoral dissertation, Chuka University		the mobility and social inclusion of PWDs
Omondi <i>et al</i> (2018)	use of modern assistive technology and its effects on educational achievement of students with visual impairment at kibos special secondary school Kisumu County, Kenya	Case study	Community Based No clarity on how CRB Rehabilitation (CBR) initiatives improved the programs led to a 30% economic participation of increase in social PWDs inclusion
Kilonzo <i>et al</i> ((2021)	Living Conditions and Quality of Life of PWDs in Makueni County, Kenya	Correlational	NGOs significantly improved public attitudes toward PWDs Did not give examples of NGOs that are implementing programs in Makueni County
Layton <i>et al</i> (2020)	Diversity beyond disability in assistive technology.	Mixed methods	households that invest in assistive devices often experience significant cost savings over time due to reduced

Ndonga <i>et al</i> (2019)	How poor are people with disabilities? Evidence based on the global multidimensional poverty	Linear regression	PWDs who used assistive devices reported a 15% increase in savings	Did not clarify how PWDs suffered before acquiring the device
Yeager <i>et al</i> (2018)	It's Bigger than Me:" Influence of Social Support on the Development of Self-Advocacy for College Students with Disabilities. Journal of Postsecondary Education and Disability	Case study	Caregivers in households with PWDs who use assistive devices experienced reduced caregiving responsibilities and stress levels.	Did not clarify whether the caregiver was hired or is a family member
Migo (2018)	Disability and Learning at the Bottom of the Pyramid. Learning, Marginalization, and Improving the Quality of Education in Low-income Countries.	Multiple regression	The costs associated with maintaining and repairing assistive devices contribute significantly to household financial burdens	Study looked at purchasing and maintaining costs only

2.6 Conceptual Framework

The theoretical structure of this paper was based on the interaction between the important variables. Direct and indirect cost Financial cost of assistive devices on household welfare can be divided into the direct and indirect cost. Direct costs include the expenses which can be quantified physically such as the initial purchase price, and maintenance costs that can be costly and may cut off funds to other basic requirements and such expenditures may negatively impact the well-being of families with persons with disabilities (PWDs). Less apparent costs like transportation, time spent in the acquisition, and opportunity costs are considered as the indirect costs, which are also the causes of financial pressure and economic vulnerability.

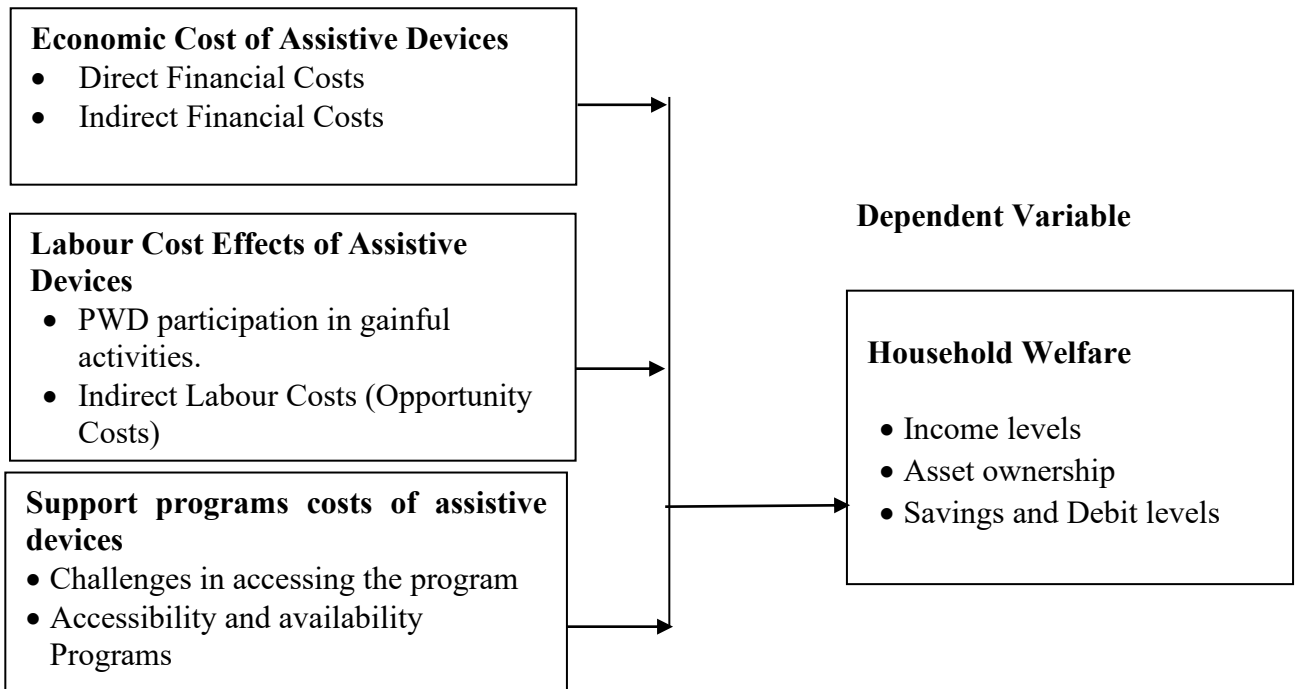
On the other hand, employment opportunities and productivity is greatly increased when the PWDs are able to access and use assistive devices. These machines are capable of providing the workforce to work and have a better job performance and therefore they resulted into a rise in the levels of employment and a rise in income thus reducing some of the financial strains of direct and indirect costs.

Government and NGO programs on household welfare are evaluated based on household welfare programs that target persons with disabilities, including financial aid and vocational training, in terms of quantity, enrollment data and aspects of the program. The welfare of households was measured using such indicators as income levels, access to basic needs, quality of life, and social inclusion. Also, the economic implications on the family budget and general well-being of the assistive devices usage both in terms of the

type and frequency of use is studied regarding the long-term economic costs of the usage of the assistive devices.

Independent variable

Cost Effects of Assistive Devices



Source: Adopted from Mishan & Quah (2020)

Figure 2.1: Conceptual Framework

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the approach that was used to determine the cost effects of assistive devices on the household welfare of persons with disabilities in Kakamega County, Kenya. This chapter offered a detailed description of the research design, research population, sample size, sampling procedures, research tools, data processing, and data analysis were described. It also displays ethical consideration this study took account of.

3.2 Study Area

The research was done in Kakamega County. The Kakamega County that lies in the West of Kenya. The County is an area of 3,051.3 km². The fourth and most populous county is the one that contains the largest rural population (CIDP, 2018/2020). The statistics of Kenya Population and Housing Census (2019) indicate that the county has 1,867,579 people, comprising 897,134 males and 970,406 females. Regarding administration, the county consists of three regions; the southern, central and northern region that comprise twelve sub counties and thirteen constituencies (CIDP, 2018/2020).

The county of Kakamega in the western part of Kenya would be suitable in studying the cost implication of assistive devices on the welfare of the household of persons with disability. There is a high number of people with disabilities living in this county most of whom have high socio-economic demands. These problems are usually compounded by

the cost of getting and maintaining assistive devices, which is necessary to enhance their quality of life.

The choice of Kakamega County is also informed by the fact that it has a socio-economic diversity that cuts across both low-income rural families, and those with higher income and living in urban areas. Such a diversity means that one can thoroughly analyze the impact of various income levels and economic activities on the capacity to afford assistive devices and subsequently, the impact on welfare of the household. Furthermore, Kakamega County is characterized by both rural and urban environments, which will provide a unique chance to compare the differences in the availability of healthcare services, including the assistive devices, in the rural and urban settings. This kind of inequality may have a substantial impact on the price and availability of these devices, which in turn may have an impact on the well-being of the household of a disabled person.

Also, Kakamega County has been a centre of different government as well as non-governmental projects, which are meant to enhance lives of persons with disabilities. The analysis of the cost-effectiveness of assistive devices in this case was a good step to understanding the effectiveness of these interventions and to identify the areas that could use additional consideration. The cultural aspects of the county are also quite crucial since the attitudes to disability and the use of assistive devices may be influenced by the local beliefs and practices that may further determine the degree of acceptance and the perceived usefulness of these devices in increasing household welfare.

Moreover, the Kakamega County health infrastructure, though on its growing path, also has its troubles in the form of the accessibility and cost of assistive devices, especially in less accessible rural regions. This renders it a relevant site to research the effect of these factors on the well-being of the household with individuals living with disabilities. On the whole, the choice of Kakamega County as the site of the study can be explained by its demographic, socio-economic, and cultural features, which offer a full context of cost implications of assistive devices on the well-being of people with disabilities and their families.

3.3 Research Design

The research on the cost implications of the assistive devices on the household well-being of individuals with disabilities in Kakamega County, Kenya, was in the form of a descriptive survey research design. The design can be applied in this way in particular because it will be possible to have a comprehensive picture of both the quantitative and qualitative side of the problem. Through the combination of both methods, the research would be able to successfully gauge the economic effects of assistive devices on the household well-being and also be able to gain insight into the experiences and perceptions of the disabled individuals.

There was a comparison of data on different economic measures e.g. household income, spending and saving prior to and following the purchase of assistive devices. This information would give a clue on what the financial cost of such devices is and how the same affects the general health of households in terms of economic well-being.

3.4 Target Population

The target population for the study was all PWDS in Kakamega County registered with the National Councils of Persons with disability (NCPD, January 2020-December 2022).

This study was carried out in all the 12-sub county.

Table 3.1 Showing target population

SR.NO	Sub County's	Total Population	Sampling method	Sample size
1.	Lugari Sub-County	90		9
2.	Likuyani Sub-County	100		10
3.	Navakholo Sub-County	35		4
4.	Lurambi Sub-County	120		12
5.	Malava Sub-County	55		6
6.	Ikolomani Sub-County	45		5
7.	Shinyalu Sub-County	220		22
8.	Kakamega Central Sub-County	110		11
9.	Mumias East Sub-County	140		14
10.	Mumias West Sub-County	95		10
11.	Matungu Sub-County	30		3
12.	Butere Sub-County	70		7
Total		1110		113

Source: Researcher, 2025

3.5 Sampling Design and Sampling Procedure

Sampling design refers to a scientific function that provides a researcher with the probability of whatever given sample being drawn. Sampling methods on the other hand refers to the way that sample units are selected. Sampling methods for this study was proportionate stratified sampling.

According to Mugenda and Mugenda (2008) if the accessible population is less than 10,000, a researcher can select 10% to be the representative sample size. Kothari (2022) points out that a representative sample should be at least 10 percent of the population

3.6 Data Collection

Primary data was collected. The selected PWDs were informed prior to the days of study. The introductory letter from university was read to the selected respondents. Any concerns and questions from the respondents were attended to at this time. This study utilized closed ended questionnaires with a five-point Likert scale items. If the disabled person was not available, too young or unable to comprehend the questionnaire, a suitable proxy was asked to respond on his/her behalf. The questionnaires collected personal information of the respondents and that concerning the cost of assistive devices on household welfare. They were distributed to the respondents by the researcher and interpretation was made on a need basis through use of research assistants mostly specialized in sign language interpretation. This method was appropriate since it was easy to analyse and classify the collected information especially on closed ended questions. It also catered for this large population in relation to available time.

3.7 Reliability and validity of the research instruments

Validity is the extent to which a research instrument measures what it intended to measure (Mugenda 2008). Reliability on the other hand denotes the trustworthiness or consistency of the research tool used (Everitt & Skrondal, 2015) This study ensured validity and reliability of the research instruments.

3.7.1 Reliability

To ensure reliability the respondents to this research were selected using the proportionate sampling. The study then conducted a pilot study in Sabatia Sub County in Vihiga County. The scores obtained were correlated using SPSS version 20

3.7.2 Validity

Content validity was achieved by reviewing literature to identify relevant contents. This enabled the researcher to identify different concepts that relates to cost effects of AD on PWDs. Opinion and suggestions from experts were also sought from supervisors of Masinde Muliro of Science and Technology. The expert were research supervisors who reviewed the tool. Their input and suggestions were incorporated and this led to improvement of research instruments. The researcher also ensured internal validity whereby multi-dimensional welfare measures were used. This is whereby household welfare was assessed across several dimensions (income, health care expenses, education, employment, social participation) to capture the comprehensive effects of assistive devices.

3.8 Data analysis and Presentation

Qualitative and quantitative methods of data analysis were used in analysing the collected data. The researcher edited, code and analyse data using SPSS version 20, a statistical software widely recognized for its user-friendly interface and advanced analytical capabilities. This software is appropriate for the study due to its ability to perform cost-benefit analysis and regression analysis efficiently, enabling the researcher to assess the effect of adaptive device (AD) on household welfare. SPSS version 20 is particularly suitable for handling descriptive statistics, including computation of mean scores and standard deviation, which are crucial for describing the demographic characteristics of respondents. Additionally, its capability to test data normality through measures of dispersion, such as standard deviation, aligns with the study's objectives.

Descriptive data analysis techniques which comprise percentages, frequencies and means were used. It then presented in tables in terms of frequencies and percentages. The researcher also employed multiple Regression in analysing quantitative data. Faraway (2002) argued multiple regression is used when analysing statistical significance of more than two independent variable on one dependent variable.

To establish the statistical significance of the research questions, SPSS version 20 supports the use of ANOVA and multiple linear regression analysis at a 95 percent confidence level ($\alpha=0.05$). The software facilitates the coding, editing and entry of data from the field into the computer for statistical analysis. Its functionality allows for the computation of the coefficient of determination (R^2) to determine the goodness of fit of different models, indicating whether the combined predictor variables adequately explain the variations in household welfare. The ability of SPSS version 20 to analyse both

independent and dependent variables through multiple regression makes it an ideal tool for evaluating continuous variables, as recommended by Steel and Ovalle (1984). Thus, SPSS version 20 ensures accurate, reliable and comprehensive statistical analysis for this study. Both tables and graphs were used in data presentation.

Model Specification

For the purposes of this study, the following linear regression model was used

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots \text{Model 1}$$

Where;

Y = Aggregate mean score of Household welfare

α = y-intercept/constant

β_1 = Regression coefficient for Economic cost of assistive devices

X_1 = Aggregate mean score of Economic cost of assistive devices

β_2 = Regression coefficient for Labour cost of assistive devices

X_2 = Aggregate mean score of Labour cost of assistive devices

β_3 = Regression coefficient for PWD support programs

X_3 = Aggregate mean score of PWD support programs

ε = error term-random variation due to other unmeasured factors

3.9 Diagnostic Tests

The following diagnostic tests were performed before completing the regression analysis in order to reduce the possibility of bias introduced by the gathered data. The study conducted the following tests:

3.9.1 Multi-collinearity

The independent variables have a close link to one another, a phenomenon known as multicollinearity. Multicollinearity occurs when the correlations among the independent variables are high ($r = 0.9$ and higher). This is a highly critical issue for multiple regressions. Bell, Bryman and Harley, (2022) advise caution before combining analyses using variables that have a bivariate correlation of 0.7 or higher. It is more difficult to discern the specific effects of each independent variable on the dependent variable when there is multicollinearity, and as a result, the standard errors for those variables tend to be exaggerated (Chourou, Saadi & Zhu, 2018). Assessing the potential for multicollinearity There was a combination of a variation inflation factor and a tolerance level. Tolerance intervals larger than 0.1 or VIFs below 10 are considered suitable.

3.9.4 Linearity

This study used bi-variate correlational analysis to assess the strength and direction of the relationship between the variables. According to Kimiti, (2022), when significance level is very small (less than 0.05) then the correlation is significant and the two variables are linearly related and if the significance level is relatively large, for example, 0.50 or more, then the correlation is not significant and the two variables are not linearly related.

The relationship between the independent and dependent variables must be linear in order for linear regression to be performed. As linear regression is so vulnerable to outlier effects, checking for outliers is especially essential. Scatter plots are ideal for verifying the linearity assumption (Al-Harbi, 2023).

3.9 Ethical Considerations

When undertaking this, it was necessary to follow strict ethical standards that would protect and respect all the participants. The ethical principles that were of interest to this study include respect of the people, beneficence, justice and informed consent that are essential in ensuring the integrity of the research and the well being of the subjects. The Masinde Muliro University of Science and Technology, Ministry of Social Services, Sports, Youth, Gender and Culture and NCPDs at Kakamega chapter gave ethical approval in carrying out this research.

Respect for Persons is the principle in which all the participants, especially the person with disabilities may be regarded as a vulnerable group should be recognized as autonomous and with dignity. In this study, the participants have been made well aware of the nature, the purpose of the study, the possible risks involved as well as the benefits of the study. The decision on whether to take part or to pull out at any point was given to them freely without any form of coercion or consequences. Moreover, the researcher also employed available means of communication based on the requirements of the participants i.e. the researcher employed sign language, braille or any other suitable format so that the participants can fully comprehend the objectives and steps of the study.

The informed consent was one of the most significant ethical requirements. The detailed information about the study was given to the participants or their legal guardians where it was required in a language and easily readable form. Consent forms were included, the objective of the research, the methodology of the research, the risks, and benefits that could be encountered and the steps that would be used to guarantee confidentiality. The consent has been taken in a voluntary manner and free of any pressure or influence. In case of the participants who are cognitively impaired or likely to fail to understand the

details of the study, extra support was given to them so that they could know their rights to participate in the study.

During the research, the confidentiality and privacy of the participants was preserved. The researcher took precautions to protect the identity and personal data of the participants by using anonymization of data and storing all sensitive data in a safe location. The principle of beneficence was adhered to. The study was expected to have a positive impact on the participants and the general community and reduce the likelihood of being harmful. This database and MMUST ethics review committee were given ethical clearance and permission to gain access to the database and consent forms as well as confidentiality protection.

CHAPTER FOUR:

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.1 Overview

This study issued 113 questionnaires and upon the end of the data collection period, a total of 97 of the questionnaires that were returned were approved for analysis considering factors such as completeness of the survey and eligibility of respondents. This led to a response rate of $97/113$ which is equivalent to 85.8%. The high response was achieved through drop and pick later approach as well as use of research assistants hence strengthened credibility of the study.

4.2 Demographic data

The demographic data collected from respondents include their gender, age, marital status and education.- The use of background information by the study is justified because it helped the researcher have basic information of the respondents The basic information affects their level of responses to the researcher questions. Data about the age of the respondents is indicated in table 4.1 below.

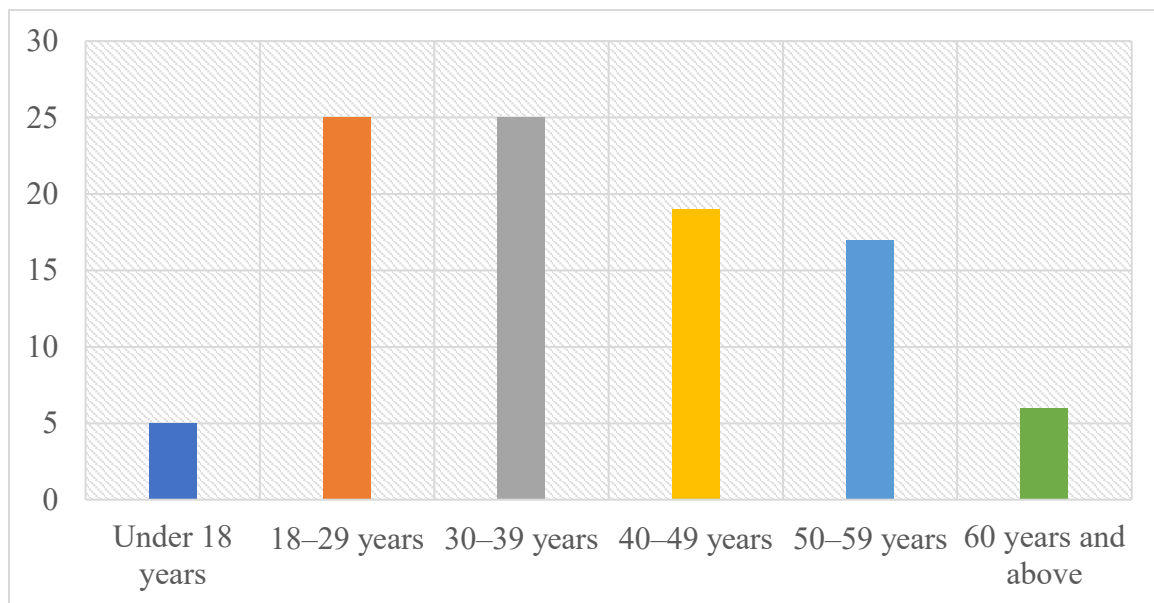
Table 4.1: Age of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Under 18 years	5	5.2	5.2	5.2
18–29 years	25	25.8	25.8	30.9
30–39 years	25	25.8	25.8	56.7
40–49 years	19	19.6	19.6	76.3
50–59 years	17	17.5	17.5	93.8
60 years and above	6	6.2	6.2	100.0
Total	97	100.0	100.0	

Source: Field data (2025)

The findings show that half of the of the respondents were aged 18-39 years i.e. 25.8% aged 18-29 and another 25.8% aged 30-39 years. Apparently issues of disability mostly affect young people and young adults whether directly (the ones having a disability) or indirectly as caregivers etc. about a fifth of the respondents were aged 40-49 years while 17.5% were aged 50-59 years. The data was graphically presented as follows:

Figure 4.1: Age of Respondents



Source: Researcher 2025

As shown on the graph, just a few of the respondents were aged 60 years and above (6.2%) or under 18 years (5.2%). The burden of disability can therefore be said to affect mostly the working age people (18-60 years) which if untamed could be costly to the empowerment of communities due to high dependencies. The table below shows the gender of the respondents.

Table 4.2: Respondent's gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	31	32.0	32.0	32.0
	Female	66	68.0	68.0	100.0
	Total	97	100.0	100.0	

Source: Field data (2025)

The data shows that more than two thirds of the respondents were female i.e. 68% while the male respondents were only 32% of the sample. The results in Table 4.2 depict that less men (1.9%) have a disability as compared to 2.5% of women (KPHC, 2019). Data was also collected regarding the marital status of respondents as shown in the table below.

Table 4.3: Marital status of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	40	41.2	41.2	41.2
	Single	36	37.1	37.1	78.4
	Widowed	21	21.6	21.6	100.0
	Total	97	100.0	100.0	

Source: Field data (2025)

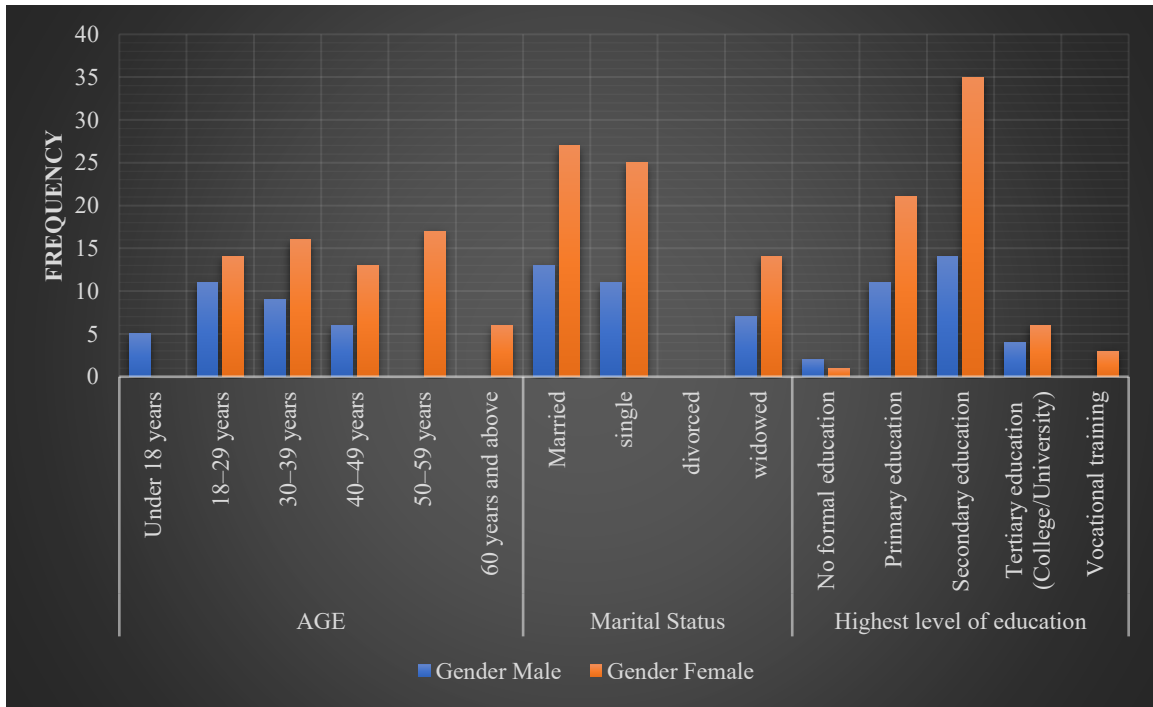
From the data on marital status, majority of the respondents were either single or married. Two fifths were married (41.2%) while 37.1% of the respondents were single with only one in five respondents reporting to be widowed. This means that quite a substantial number of the persons with disability still suffer a stigma for towards marriage. Data about highest level of education of respondents is summarized in the table below

Table 4.4: Highest level of education

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
No formal education	3	3.1	3.1	3.1
Primary education	32	33.0	33.0	36.1
Secondary education	49	50.5	50.5	86.6
Tertiary education (College/University)	10	10.3	10.3	96.9
Vocational training	3	3.1	3.1	100.0
Total	97	100.0	100.0	

Source: Field data (2025)

The majority of the respondents did not school to the level of college or university education. From the data, half of the respondents had acquired secondary education, while a third had attained up to primary level of education. One in ten respondents had attained tertiary education whereas very few (3.1%) had vocational training and another 3.1% had no formal education. The findings imply that PWDs in Kakamega County face various obstacles in attaining higher education that could be attributed socio-economic factors such poverty. The study findings are consistent with research findings of Restrepo (2015) that found that people with disabilities tended to be less well off in terms of education, employment, living conditions, consumption and health. The findings on demographic characteristics of the respondents were also presented in clustered cross tabulated bar charts shown below.



Source: Field data (2025)

Figure 4.2: Demographic Characteristics

The cross-tabulation bar chart above indicates that there were no female respondents under 18 years and further shows that there were no male respondents aged above 50 years. This means that the burden of disability lies more on women. There was no significant association in terms of marital status for both genders. On education, the data indicates more PWD women have attained vocational skills training compared to male PWDs. This may be because there were more male PWDs who had not attained any formal education. The survey also analysed the relationship between the respondents and the people with disabilities as shown in the Table 4.5 below.

Table 4.5: The relationship to the person with a disability in the household

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Self	47	48.5	48.5	48.5
	Parent	26	26.8	26.8	75.3
	Child	17	17.5	17.5	92.8
	Spouse or Partner	7	7.2	7.2	100.0
	Total	97	100.0	100.0	

Source: Field data (2025)

The data in the Table 4.5 above shows that the majority of the respondents (48.5%) were PWD members responding on their own behalf. Furthermore, 26.8% of the respondents were parents, while 17% were children and 7.2% were spouses to the targeted PWD respondents. This study also investigated the types of disability and assistive devices that prevail among respondents as shown in the Table 4.6 below.

Table 4.6: The primary type of disability affecting the household

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Visual Impairment	25	25.8	25.8	25.8
	Hearing Impairment	22	22.7	22.7	48.5
	Physical/Mobility Impairment	37	38.1	38.1	86.6
	Intellectual Disability	2	2.1	2.1	88.7
	Other	11	11.3	11.3	100.0
	Total	97	100.0	100.0	

Source: Field data (2025)

The data indicates the most prevalent type of disability was physical impairment which was prevalent among 38.1% of the respondents. This was followed by visual impairment with a prevalence of 25.8% and further hearing impairment with a 22.7% prevalence among the respondents. Intellectual disability was the least prevalent only among 2.1% of

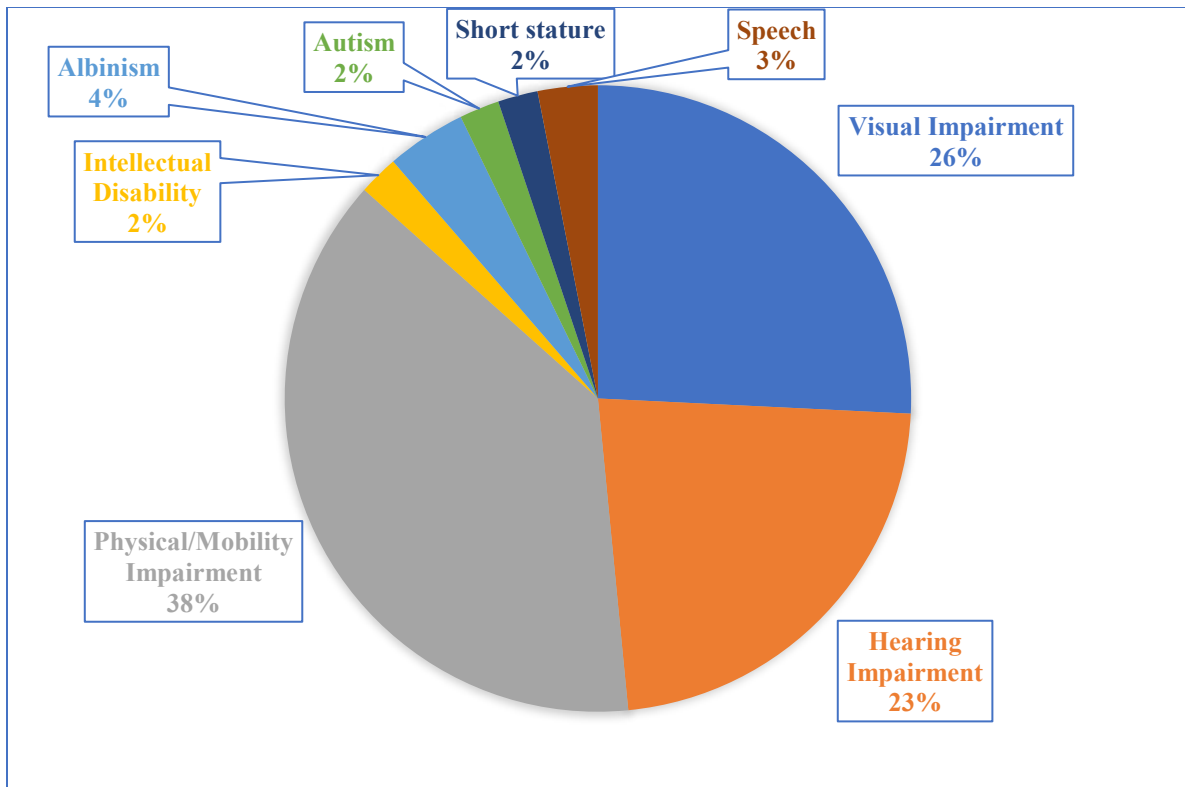
the respondents. Additionally, 11.3% of the respondents had other types of disabilities as summarized in the table below.

Table 4.7: Other forms of disability

	Frequency	Percent	Valid Percent
Albino	4	36.4	36.4
Autism	2	18.2	18.2
Short stature	2	18.2	18.2
Speech	3	27.3	27.3
Total	11	100.0	100.0

Source: Field data (2025)

As shown above, 36.4% of the respondents were people with albinism. Those with autism and short stature were each 18.2% prevalent while people with speech disability were 27.3% of other forms of disability identified by the survey. This information is summarized in the below pie-chart.



Source: Field data (2025)

Figure:4.3. The primary type of Disability

From the findings, there was highest prevalence of Physical, visual and hearing impairments among the respondents participating in the survey. The table below presents data collected on the types of assistive devices (if any) that PWDs used to ease the severability of their disabilities and promote their independence and empowerment.

Table 4.8: Type of assistive device(s) used

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Wheelchair	11	11.3	11.3	11.3
	Prosthetics	8	8.2	8.2	19.6
	Hearing aid	10	10.3	10.3	29.9
	Braille devices	7	7.2	7.2	37.1
	Others	61	62.9	62.9	100.0
	Total	97	100.0	100.0	

Source: Field data (2025)

Consistent with the types of disability, there were more respondents using physical assistive devices than other devices. For instance, the prevalence of wheelchair assistive device had a prevalent rate of 11.3% whereas prosthesis had a prevalent rate of 8.2%. Hearing aid was at 10.3%, Braille devices was at 7.2%.

4.3 Effect of economic costs of assistive devices on household welfare

This study in the first objective investigated the effect of direct costs of assistive devices on households of PWDs. Respondents rated responses on a five-point Likert scale where ‘1’ represented strongly disagree while ‘5’ represented strongly agree. Mean coefficient ratings were interpreted as follows: 1.0 - 1.4 ‘strongly disagree’, 1.5 – 2.4 ‘disagree’, 2.5 – 3.4 ‘neutral’, 3.4 – 4.4 ‘agree’, 4.4 - 5.0 ‘strongly agree’. The findings of this variable were presented in the Table 4.9

Table 4.9: Direct Economic costs of assistive devices on household welfare

Variable	N	Mean	Std. Deviation	Variance
1) The initial purchase cost of the assistive device was affordable for my household	9 7	1.9588	1.145	1.311
2) The ongoing maintenance and repair costs of the assistive device are manageable for my household.	9 7	1.7216	1.077	1.161
3) The cost of replacing parts or upgrading the assistive device is affordable.	9 7	1.6495	.89024	.793

Source: Field data (2025)

The findings generally indicated that majority of the respondents found assistive devices not affordable either during purchase or maintenance, repair and replacement of parts. Specifically, with a very low mean coefficient rating of 1.9588 and a standard deviation of 1.145, respondents strongly disagreed that the initial purchase cost of the assistive device was affordable for the household. Similarly, many respondents further strongly disagreed, with a mean coefficient rating of 1.7216 and a standard deviation of 1.077 that the ongoing maintenance and repair costs of the assistive device were manageable for their households. There was also a strong affirmation that the cost of replacing parts or upgrading the assistive device was not affordable based on the lowest mean rating of 1.6495 with a standard deviation of 1.077. The study findings are consistent with research results of Borg and Ostergren (2014) which linked the purchasing, maintaining and repairing assistive devices to be contributing significantly to household financial burdens.

In summary, PWDs found it costly to acquire or purchase assistive devices as well as maintain, replace or upgrade parts. This finding was consistent with past research on utilization of assistive technologies. For instance, Pinilla-Roncancio and Alkire, (2021) found that poverty was a key indicator on the ability to acquire, maintain or upgrade assistive technologies and further reiterated by Palmer and Saval. (2021) that inability to access appropriate assistive devices was a major challenge associated with disability population in Kakamega.

4.3.1 Indirect costs of assistive devices

The study examined the effect of indirect costs of assistive devices on PWD households and the findings are shown in the Table 4.9.

Table 4.10: In-direct Economic costs of assistive devices on household welfare

Variable	N	Mean	Std. Deviation	Variance
1) My household has incurred additional costs for transportation to acquire or maintain the assistive device.	9 7	3.752 6	.85429	.730
2) The time spent on maintaining or servicing the assistive device is burdensome for the household.	9 7	4.463 9	.70802	.501

Source: Field data (2025)

The study found out that respondents faced challenges due to indirect costs of assistive devices which limited their proper participation in socio-economic activities. For instance, majority of the respondents agreed that their households had incurred additional costs for transportation to acquire or maintain the assistive devices as evident from the mean coefficient rating of 3.7526 with a standard deviation of 0.85429. Additionally, the respondents strongly agreed that the time spent on maintaining or servicing the assistive device was burdensome for the households based on a very high mean coefficient rating of 4.4639 with a standard deviation of 0.70802

4.3.2 Financial impact assistive devices on households

Table 4.11: Financial impact assistive devices on households

Variable	Mean	Std. Dev.	Variance
1) The financial costs of the assistive device have negatively impacted my household's ability to afford other basic needs (e.g., food, healthcare).	3.6289	1.139	1.298
2) The cost of the assistive device has led to borrowing money or seeking financial assistance from others.	3.5464	.67732	.459
3) The financial burden of the assistive device has affected the ability of other household members	4.3196	1.01598	1.032

to participate in the workforce or school.

Source: Field data (2025)

The findings indicated that a household with a PWD member faced challenges whereby the cost of assistive device had a negative financial impact. This is evidenced by responses where the majority of them strongly agreed that the financial costs of the assistive device had negatively impacted their household's ability to afford other basic needs such as food and healthcare with a mean coefficient rating of 3.6289 and a standard deviation of 1.139. furthermore, with a mean rating of 3.5464, the majority of the respondents agreed that the cost of the assistive devices had led to borrowing money or seeking financial assistance from others to be able to sustain their livelihoods. The study, in tandem with past research by Migo *et al.* (2018) also established that the financial burden of the assistive devices had affected the ability of other household members to participate in workforce or attend school based a very high mean rating of 4.3196 as presented in table 4.12 below.

Table 4.12: Access to financial assistance to cover assistive devices

Variable	N	Mean	Std. Dev	Variance
1) My household has received financial assistance (e.g., subsidies, donations) to help cover the cost of the assistive device.	97	1.5361	.73686	.543
2) Government programmes or NGO support have made the acquisition and maintenance of assistive devices more affordable.	97	1.5361	.73686	.543

Source: Field data (2025)

The findings show that majority of the respondents disagreed that their households had benefited from financial assistance such as subsidies, donations to help cover the cost of

the assistive devices with a mean of 1.5361 and a standard deviation of 0.73686. The respondents also disagreed that government programmes or NGO support had made the acquisition and maintenance of assistive devices more affordable with a mean rating of 1.5361.

The responses in this study reveal that government or NGO support is not sufficient in most parts of the county and that many qualifying people had not benefited from such programmes. As a result, consistent with findings by Mitra *et al.* (2017), many PWDs could not relate how such programmes whose coverage was minimal contributed to affordable acquisition and or maintenance of assistive devices yet available household incomes were much far less than the cost of an ordinary assistive device. There is a need for expansion of support scope within Kakamega County to target as many vulnerable PWDs as possible towards advancing PWD independence and empowerment.

4.4 Labour Costs of Assistive Devices

The study on its second objective examined the impact of the cost of assistive devices on the ability of PWD members in households to contribute to socio-economic development at home and within the community. Mean coefficient ratings were interpreted as follows: 1.0 - 1.4 'strongly disagree', 1.5 – 2.4 'disagree', 2.5 – 3.4 'neutral', 3.4 – 4.4 'agree', 4.4 - 5.0 'strongly agree'.

4.4.1 Participation in gainful Labour activities

The study on this indicator investigated three aspects i.e. PWD involvement in fulltime employment, PWD engagement in business or self-employment, and the contribution of assistive devices towards PWD participation in economic activities. To find out whether the cost of assistive devices made the devices available to allow for PWD participation in gainful labour practices, the findings are shown in the Table 4.13 below.

Table 4.13: Participation in gainful Labour activities

	Mean	Std. Deviation	Variance	Skewness
1) The household currently has a PWD member as a full-time employee	3.4845	1.19123	1.419	-.982
2) The household has a PWD member who is engaged in successful business or self-employment	3.3711	1.23592	1.527	-.948

3) The use of assistive device has enhanced the ability of PWD member(s) in the household to participate in employment and or other gainful productivity duties for self-empowerment	3.9794	1.43217	2.051	-0.273
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Source: Field data (2025)

Graphical presentation of these findings is shown below:

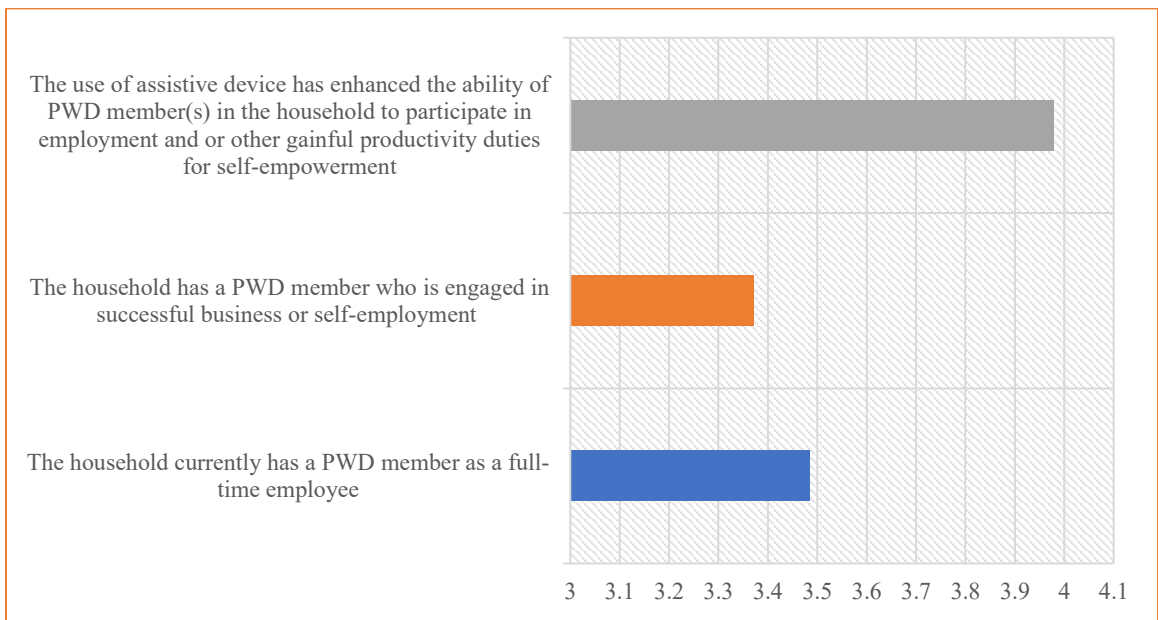


Figure 4.5: Participation in gainful Labour activities

Source: Field data (2025)

The data shown above indicates that availability of assistive devices in households helped PWD members to be engaged in gainful employment or self-employment. For instance, respondents agreed (mean rating of 3.9794 with a standard deviation of 1.43218) that the use of assistive device enhanced the ability of PWD member(s) in the household to participate in employment and or other gainful productivity duties for self-empowerment practicably because the devices promoted PWD independence.

Because of affording an assistive device, respondents agreed that their households currently had a PWD member in full-time employment based on a mean rating of 3.4845 with a standard deviation of 1.19123. Likewise, the respondents agreed that their households had a PWD member who was engaged in successful business or self-employment. This variable had a mean rating of 3.3711 with a standard deviation of 1.23592 and a variance of 1.527.

Basing on the findings, it is possible to conclude that ability to participate in gainful economic activities by PWDs and therefore reduce their dependence on other members of households squarely depends on accessibility to affordable and free maintenance assistive devices. The findings share similarities with past research where for instance Owuor et al. (2021) argued that affording assistive devices allowed PWDs to be independent while saving funds for investment to successfully contribute to household incomes. Hence, just as Borg and Ostergren (2014) earlier observed, the availability of assistive devices in households is not enough; affordability at acquisition and maintenance levels greatly determines the level of PWD participation and engagement in gainful employment or self-employment opportunities.

4.4.2 Caregiving and External Labour Costs

The study also investigated the impact of external or caregiving or disposal incomes among households with PWD members. The findings on this variable are shown in the Table 4.14

Table 4.14: Care giving and External Labour Costs as assistive devices

	Mean	Std. Deviation	Variance
1. The need for external caregivers or additional household help to assist with the device has increased household labour costs.	3.5258	1.19976	1.439
2. My household has had to hire external help for the use or maintenance of the assistive device.	3.0412	1.54055	2.373
3. The labour costs associated with the device have created a financial strain on the household, requiring family members to work extra hours or take on additional jobs.	2.9897	1.52408	2.323

Source: Field data (2025)

From the findings, respondents presented a neutral observation on the fact that labour costs associated with the device created a financial strain on the household, requiring family members to work extra hours or take on additional jobs based on a mean rating of 2.9897 with a standard deviation of 1.52408. Although it is true that labour costs impart a financial constrain on households, the findings could be so because the economic situation in Kenya at large hardly allows for people to have extra working hours or additional jobs owing to high unemployment rates.

From the study findings also, respondents generally agreed that their households had to hire external help for the use or maintenance of the assistive device with a mean of 3.0412 and a standard deviation of 1.54055. Additionally, respondents agreed that the need for external caregivers or additional household help increased household labour costs thereby reducing amount of available disposable incomes for socio-economic empowerment.

Generally, extreme disability dictates that a member must be aided almost throughout their lives but this level of aide can be reduced through efficient and effective assistive devices. However, the cost implications of PWD assistive devices as well as their availability forces households to resort to measures such as seeking external assistance or hiring caregivers which further reduces the available disposal incomes that would have been used for socio-economic empowerment. Nonetheless, based on past research for example by Yeager *et al.* (2018) and Layton *et al.* (2020) asserted that caregivers services reduced general household incomes whereas who use assistive devices up to 40% whereas with an assistive device, households would reduce caregiving responsibilities and stress levels, allowing them to engage in more paid work or entrepreneurial activities.

4.4.3 Opportunity costs of labour

The study examined the opportunity costs of labour in PWD households and the findings are summarized in the Table 4.15 below.

Table 4.15: Opportunity costs of labour for households with Persons with Disability

	Mean	Std. Deviation	Variance
1. Family members have had to reduce or delay their own economic activities (e.g., employment, education) to assist with the use or maintenance of the assistive device.	3.4639	1.19078	1.418
2. The time and labour spent on maintaining the assistive device would have been used for more productive activities if the device required less attention or support.	3.4742	1.29978	1.689
3. The labour costs involved in supporting the use of the assistive device have led to lower household income or financial stability.	3.1237	1.42345	2.026

Source: Field data (2025)

The findings indicate that respondents generally agreed that family members had to reduce or delay their own economic activities for example employment or education to assist with the use or maintenance of the assistive device for their PWD members with a mean coefficient rating of 3.4639. The findings also indicate that respondents agreed that the time and labour spent on maintaining assistive devices would have been used for more productive activities if the device required less attention or support based on a mean rating 3.4742. Finally, respondents also agreed, with a mean rating of 3.1237, that the labour costs involved in supporting the use of assistive device led to lower household incomes and subsequently poor financial stability where the mean coefficient rating was 3.1237.

In summary, households have to choose between being there for their PWD siblings or participation in own economic activities. Consequently, majority of these households suffer economic downturns as they have to spend a lot of time or financial resources assisting their PWD siblings to use or maintain their assistive devices at the cost of participation in other productive activities. The household thus pays for this cost by finding it hard to participate in other gainful socio-economic activities consistent with earlier research conducted by Cook and Polgar (2019) on PWD assistive devices and productivity.

4.4.4 Long-Term Labour Costs Impact

The study also examined the long-term labour costs associated with assistive devices as summarised in the Table 4.16 below.

Table 4.16: long term labour costs associated with assistive devices

	Mean	Std. Deviation	Variance
1) Over time, the labour costs associated with assistive devices have become a long-term burden on my household.	3.1546	1.53664	2.361
2) The increased time and effort required for assistive device maintenance have reduced the opportunity for household members to engage in full-time or part-time employment.	3.2784	1.34430	1.807
3) The labour input required for the use and maintenance of the assistive device is justified by the improvements it has made to the person with a disability's quality of life.	3.1959	1.32790	1.763

Source: Field data (2025)

The respondents generally agreed that over time, the labour costs associated with assistive devices have become a long-term burden on the household with a mean of 3.1546 and standard deviation of 1.53664. The respondents also agreed, with a mean of 3.2784 and a standard deviation of 1.3443, that the increased time and effort required for assistive device maintenance reduced the opportunity for household members to engage in full-time or part-time employment.

Nonetheless, respondents agreed that the labour input required for the use and maintenance of the assistive device was justified by the improvements made to the person with a disability's quality of life. That is to say, whereas it was costlier to purchase, maintain or upgrade assistive devices, in the event that the devices are acquired, they greatly improve the quality of life for persons with disability and this was therefore considered a worth opportunity cost for household members. This finding was also

consistent with Phillips and Zhao (2020) who found that assistive devices significantly increased the productivity of employees with physical disabilities by enabling them to work more comfortably and efficiently.

4.5 Supportive Programmes and Household Welfare

The third objective of the study sought to analyse available supportive programmes for PWD and or their households. The indicator had five sub-indicators i.e. the analysis of (a) Accessibility and Availability of Supportive Programmes, (b) Impact of Supportive Programmes on Household Financial Welfare, (c) Impact on Social and Psychological Well-Being, (d) Long-Term Effects on Household Independence and Empowerment, and (e) Challenges in Accessing Supportive Programmes.

4.5.1 Accessibility and Availability of Supportive Programmes

In this sub-indicator, the aim was to examine whether PWD or their caregivers were able to access and benefit from prevailing government and NGO support programmes for people with disabilities. For instance, during the study period, the County Government of Kakamega was actively training PWDs and issuing eligible ones with assistive devices. The findings on this sub-indicator are summarized in the Table 4.16 shown below.

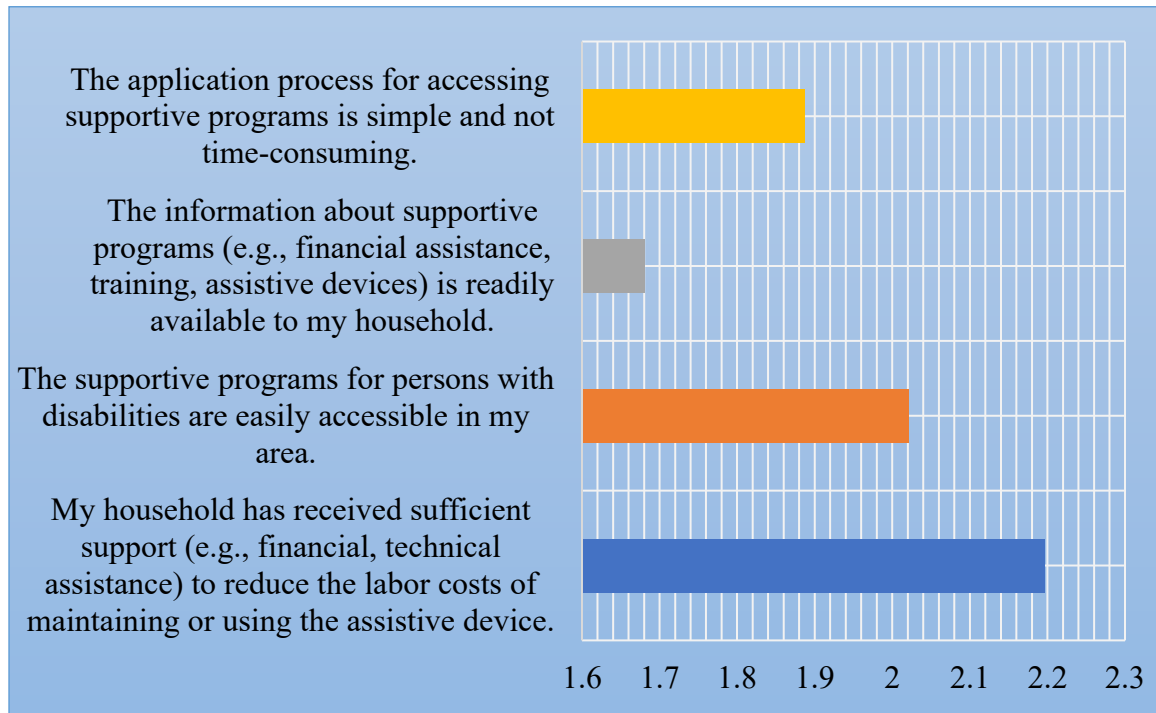
Table 4.17: Accessibility and Availability of Supportive Programmes

	Mean	Std. Deviation	Variance
1) My household has received sufficient support (e.g., financial, technical assistance) to reduce the labour costs of maintaining or using the assistive device.	2.1959	1.26359	1.597
2) The supportive programmes for persons with disabilities are easily accessible in my area.	2.0206	1.20744	1.458
3) The information about supportive programmes (e.g., financial assistance, training, assistive devices) is readily available to my household.	1.6804	.72953	.532
4) The application process for accessing supportive programmes is simple and not time-consuming.	1.8866	.87650	.768

Source: Field data (2025)

As shown in the Table 4.17 above, all response mean ratings on five-point Likert scale were below 2.2 implying that respondents disagreed on all variables. For instance, the respondents disagreed that their household received sufficient support (e.g., financial, technical assistance) to reduce the labour costs of maintaining or using the assistive device (mean=2.1959) with a standard deviation of 1.597. The respondents also disagreed that supportive programmes for persons with disabilities were easily accessible in their areas hence a low mean rating of 2.0206 with a standard deviation of 1.20744. The respondents nonetheless strongly disagreed that information about supportive programmes (e.g., financial assistance, training, assistive devices) was readily available to their household (mean=1.6804 with standard deviation=0.72953). Finally, respondents strongly disagreed that the application process for accessing supportive programmes was

simple and not time-consuming as indicated by a mean of 1.8866 and standard deviation of 0.8765. For clarity of the data distribution, a bar chart was computed as shown in the Figure 4.6 below.



Source: Field data (2025)

Figure 4.6: Accessibility and Availability of Supportive Programs.

In summary, it was notable that although there were support programmes, majority of the PWDs had not benefitted from them. Although there the scope of the programmes was low, it was also evident from the research that where available, the PWD programmes were not adequately or purposively communicated to the targeted beneficiaries who mostly failed to get the information. It was also arguably true according to the findings consistently with the findings of Ochieng et al. (2021) that PWDs and or their households despaired from seeking assistance form the support programmes because of tedious

application processes that were fairly complicated and inaccessible according to the capacity of a majority of the PWDs.

4.5.2 Impact of Supportive Programmes on Household Financial Welfare

The study also sought to review supportive programmes based on their impact on households. The finding on this sub-indicator is shown in the Table 4.18 below.

Table 4.18: Impact of Supportive Programmes on Household Financial Welfare

		Mean	Std. Deviation	Variance
1)	The financial support provided through disability programmes has improved my household's financial stability.	3.7629	.93289	.870
2)	The financial assistance from government or NGO programmes has helped my household afford assistive devices or other disability-related expenses.	3.7113	1.14527	1.312
3)	The training or skills development programmes offered by supportive services have enabled household members to find better employment or income-generating activities.	3.2371	1.47035	2.162

Source: Field data (2025)

Notably, respondents agreed, with a mean of 3.7629 and a standard deviation of 0.93289, that financial support provided through disability programmes improved household's financial stability. Moreover, with a mean of 3.71131 and a standard deviation of 0.14527, respondents agreed that financial assistance from government or NGO programmes helped households to afford assistive devices or other disability-related expenses. The study also found that with a mean of 3.2371 and a standard deviation of

1.47035, respondents agreed that the training or skills development programmes offered by supportive services had enabled household members to find better employment or income-generating activities.

By implication, the positive affirmations on the impact of PWD support programmes in this study point toward a high potential for the support programmes to emancipate PWDs and their household's socio-economically. This argument has been theoretically supported in the studies of Mugo et al. (2022), Ochieng et al. (2021) and Mutuku et al. (2019), However, this could be possible only if the scope and coverage of the programmes was enhanced to reach as many beneficiaries as possible.

4.5.3 Impact on Social and Psychological Well-Being

Data was collected concerning the impact of support programmes on Social and Psychological Well-Being of PWDs and their household members/caregivers. The findings are shown in the Table 4.19 below.

Table 4.19: Impact on Social and Psychological Well-Being

	Mean	Std. Deviation	Variance
1) Supportive programmes have improved the social integration of persons with disabilities in my household (e.g., inclusion in social activities, community participation).	2.958	1.51326	2.290
2) The availability of emotional and psychological support programmes has helped improve the mental well-being of persons with disabilities in my household.	3.762	.93289	.870
3) The assistance programmes have contributed to reducing stigma and discrimination against persons with disabilities in my community.	3.762	.93289	.870

Source: Field data (2025)

There was a neutral response on whether supportive programmes for PWDs had improved the social integration of persons with disabilities in households for example their inclusion in social activities, and community participation with a mean of 2.9588 and standard deviation of 1.5132. The high deviation was negatively skewed (-0.242) meaning most responses were smaller than the mean. However, with the same mean rating of 3.7629 and standard deviation of 0.93289, respondents agreed that the availability of emotional and psychological support programmes had helped improve the mental well-being of persons with disabilities. Furthermore, respondents agreed that assistance programmes contributed to reducing stigma and discrimination against persons with disabilities in the community.

Whereas it is common place that support programmes should help improve social integration of persons with disabilities such as inclusion in social activities and community participation, this study underscored the fact that this impact had not been achieved at the moment because of low scope of coverage and high number of people with disabilities that had not so far received substantial support. Enhancing the scope and coverage of these programmes could effectively contribute to the overall wellbeing of PWDs for instance enhanced social integration, improved mental well-being and reduced stigma and discrimination against persons with disabilities in the community (Mugo et al, 2022; Ochieng et al. 2021; Mutuku et al. 2019).

4.5.4 Long-Term Effects of support programmes on Households

The study explored the long-term effects of PWD support programmes on household independence and empowerment. The results of the analysis are shown in the Table 4.19 below.

Table 4.20: Long-Term Effects on Household Independence and Empowerment

	Mean	Std. Deviation	Variance
1) Supportive programmes have helped my household become more self-sufficient and less reliant on external aid.	3.7113	1.14527	1.312
2) The programmes have provided long-term benefits, such as improved education and skills development for persons with disabilities in my household.	3.2371	1.47035	2.162

Source: Field data (2025)

The results of the findings show that disability support programmes make the households more independent and less dependent on the external assistance in the long term. Other long-term benefits of the programmes include better education and skills acquisition of persons with disabilities when properly and fairly implemented. The mean of 3.7113 and standard deviation of 1.14527 resulted in the respondents agreeing that the supportive programmes had assisted their households in becoming less dependent and reliant on external assistance. Moreover, the mean of 3.2371 and standard deviation of 1.47035 indicated that respondents were more inclined to believe that the PWD support programmes had given the long-term benefits, including the enhanced education and skills development of disabled people in their families.

4.5.5 Challenges in Accessing Supportive Programmes

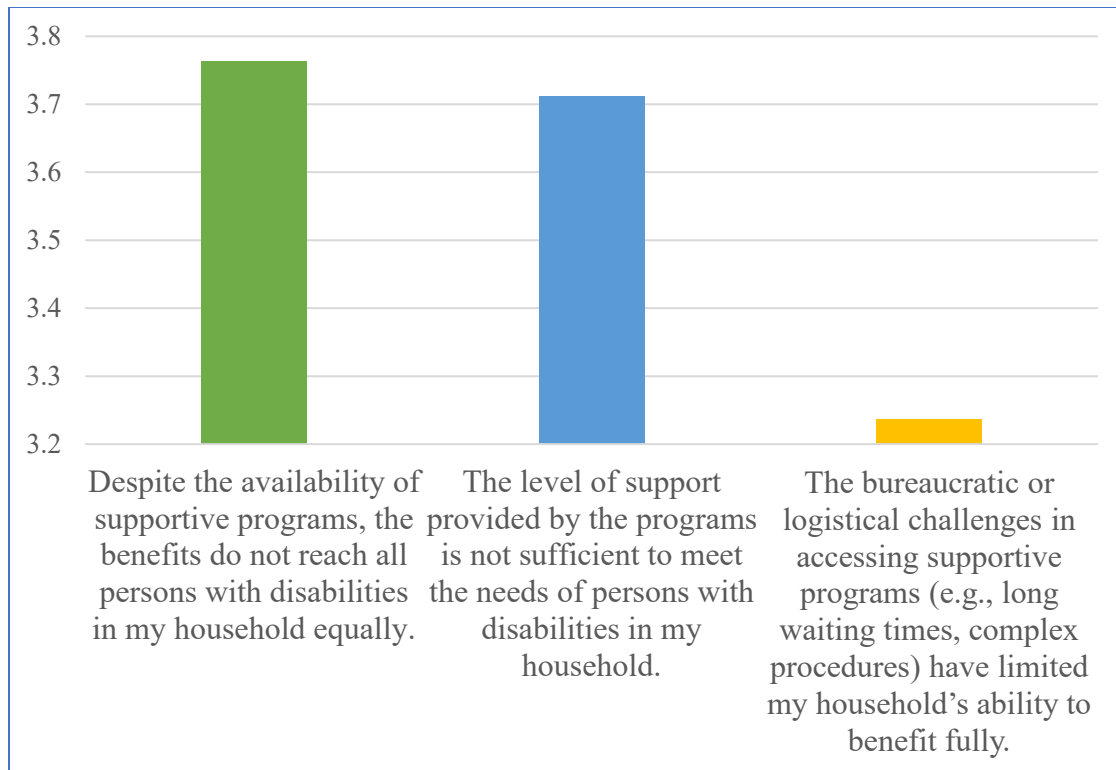
The analysis on the challenges affecting access to PWD support programmes was performed and findings presented in the Table 4.21 below.

Table 4.21: Challenges in Accessing Supportive Programmes

	Mean	Std. Deviation	Variance
1) Despite the availability of supportive programmes, the benefits do not reach all persons with disabilities in my household equally.	3.7629	.93289	.870
2) The level of support provided by the programmes is not sufficient to meet the needs of persons with disabilities in my household.	3.7113	1.14527	1.312
3) The bureaucratic or logistical challenges in accessing supportive programmes (e.g., long waiting times, complex procedures) have limited my household's ability to benefit fully.	3.2371	1.47035	2.162

Source: Field data (2025)

The biggest challenge in accessing supportive programmes for persons with disability according to the findings is low scope and reach. According to majority of the respondents, with a mean of 3.7629 and a standard deviation of 0.93289, the benefits do not reach all persons with disabilities in households equally despite the availability of supportive programmes. Additionally, respondents agreed that the level of support provided by PWD support programmes was not sufficient to meet the needs of persons with disabilities in their household with a mean of 3.7113 and standard deviation of 1.14527. the respondents also agreed that the bureaucratic or logistical challenges in accessing supportive programmes such as long waiting times and complex procedures limited household's ability to benefit fully from support programmes with a mean of 3.2371 and standard deviation of 1.47035. the data is presented graphically as below.



Source: Field data (2025)

Figure 4.7: Challenges in Accessing Supportive Programmes

Although most of the studies in the literature review did not cover this aspect, the conclusion by De Jonge *et al.* (2016) was in tandem with findings on the need to enhance the coverage of PWD assistive programmes for better outcomes to be realized. The impact of PWD support programmes can further be strengthened by applying other administrative actions such as reducing bureaucracies needed when conceptualizing programmes and interventions that support persons with disabilities. Owing to the responses in the survey, the respondents were asked whether they would recommend that more assistance or support for instance funding for caregivers or device maintenance be provided to ease the burden encountered by persons with disabilities. The findings are shown in the table below.

Table 4.22: Recommend that more assistance or support

	Mean	Std. Deviation	Variance
Would you recommend that more assistance or support (e.g., funding for caregivers or device maintenance) be provided to ease the labour burden of assistive devices for persons with disabilities?	3.3608	1.29249	1.671

Source: Field data (2025)

The findings show that respondents affirmatively agreed that it was necessary that assistance or support (funding for caregivers or device maintenance) should be provided to ease the labour burden of assistive devices for persons with disabilities as rated with a mean coefficient of 3.3608 with a standard deviation of 1.29249 and a variance of 1.671. Such assistance would enable the PWD as well as their other household members to effectively participate in other socio-economic activities that enhances their independence and empowerment. This study asked respondents to suggest ways of improving support programmes for persons with disabilities as presented next. The responses suggested that there is need for the government to expand its scope of support for persons with disabilities by for instance increasing budgetary allocations. The study revealed also that PWD needed a more empowering and inclusive than dependency intervention programme that enables them to be self-reliant as much as possible. Exact findings are shown in the table below.

Table 4.23: Suggestions for Improving Supportive Programmes

	Mean	Std. Deviation	Variance	Skewness
1. I believe that the government and NGOs should increase financial support for persons with disabilities to improve household welfare.	2.9588	1.51326	2.290	-.242
2. Support programmes for persons with disabilities should focus more on long-term empowerment, such as vocational training and employment support	3.7629	.93289	.870	-.685
3. There is a need for more inclusive and accessible community-based programmes that target persons with disabilities in rural areas like Kakamega County.	3.3196	1.08538	1.178	-.421

Valid N (listwise)

Source: Field data (2025)

As shown above, majority of respondents suggested that there was need for support programmes for persons with disabilities focussing more on long-term empowerment, such as vocational training and employment support as supported by a mean coefficient rating of 3.7629 (agree) and a standard deviation of 0.93289 and a variance of 0.870. The second priority on the list of suggestion was the need for accessible community-based programmes that target persons with disabilities in rural areas of Kakamega County (mean and standard deviation being 3.3196 and 1.08538 respectively. The available programmes generally had little adequacy to be felt in the rural areas. With a mean of 2.9588, respondents averred that there was need for government and NGOs to increase financial support for persons with disabilities to improve household welfare.

4.6 Household welfare Analysis

This study analysed household welfare as a dependent variable through four indicator variables on income levels, asset ownership, savings status and debt status of the respondents. The findings are summarized in the table below:

Table 4.24: Household welfare Analysis

	Mean		Std.	Variance
	Statistic	Std. Error	Deviation Statistic	Statistic
1) There is adequate income that helps to meet all the basic needs of the household such as food, shelter, education etc.	2.2165	.09964	.98136	.963
2) The household owns adequate arable land, domestic animals and a decent house	2.3711	.12024	1.18427	1.402
3) The household has enough savings to handle emergencies and other threatening eventualities	2.3505	.08424	.82967	.688
4) The household does not currently survive on loans from institutions, friends or relatives	2.4330	.09930	.97796	.956
Valid N (listwise)				

Source: Field data (2025)

In the findings, respondents disagreed that there was adequate income to meet all the basic needs of the household such as food, shelter, education etc. with a mean rating of 2.2165. the respondents also disagreed, with a mean of 2.3711, that their households owned adequate arable land, domestic animals and a decent house. Further, the respondents with a mean of 2.3505 disagreed that their households had enough savings to handle emergencies and other threatening eventualities and finally, they disagreed that their households did not currently survive on loans from institutions, friends or relatives.

Findings show that the general welfare of PWD households' is poor. The respondents did not generally have adequate incomes and neither did they own adequate productive assets. They also were not able to maintain savings for the future or emergencies but had accumulated reasonable amounts of debts from friends, relatives and other financing instructions. The households were underprivileged in most aspects because of insufficient mechanisms for support nor their own empowerment.

4.7 Diagnostic Test

Table 4.25 Summary Results Diagnostic Test

Diagnostic Test	Method applied	Threshold/Rule of thumb	Findings	Decision
Normality Test	Kolmogrov and Shapiro Wilk test	typically > 0.05 ;	Probability values were 0.912 hence above 0.05	Data follows a normal distribution
Multi-collinearity	Variance Inflation Factor(VIF)	Less than 10; no multicollinearity	All variables had VIF less than 10 and a mean of 2.9	absence of multicollinearity
	Tolerance Value(Reciprocal of VIF)	less than 1; no multicollinearity	Values less than 1	absence of multicollinearity
Linearity test	Scatter plots:	Points situated along a straight diagonal line	Points are predominantly situated along a straight diagonal line	Explains a linear correlation between the independent
Autocorrelation	Wooldridge test	If p value >0.05 ;	probability 0.951 >0.05	No autocorrelation
Heteroscedasticity	Breuch Pagan Test	If $p>0.05$: No Heteroscedasticity	p0.905 >0.05	No Heteroscedasticity

Source: Field data (2025)

4.8 Inferential statistics

The purpose of the inferential statistical analysis was to compare relationships between the dependent variable (house hold welfare) and independent variables (Economic costs, Labour costs and PWD support programmes) as well demographic characteristics of persons with disabilities.

4.8.1 Correlation analysis

The table below shows the correlations analysis of the variables indicated above.

Table 4.26: Correlation Analysis

		Household Welfare	
		Spearman's rho	Pearson Correlation
Gender	Correlation Coefficient	.077	.081
	Sig. (2-tailed)	.456	.431
Age	Correlation Coefficient	.168	.193
	Sig. (2-tailed)	.099	.058
Primary Type of Disability	Correlation Coefficient	-.038	-.061
	Sig. (2-tailed)	.709	.556
Marital Status	Correlation Coefficient	.067	.108
	Sig. (2-tailed)	.513	.293
Highest Level of Education	Correlation Coefficient	.800**	.829**
	Sig. (2-tailed)	.000	.000
Economic Cost of Assistive Devices	Correlation Coefficient	-.083	-.040
	Sig. (2-tailed)	.419	.699
Labour Costs of Assistive Devices	Correlation Coefficient	.282**	.270**
	Sig. (2-tailed)	.005	.008
Supportive Programmes For PWDS	Correlation Coefficient	.805**	.817**
	Sig. (2-tailed)	.000	.000
N		97	97

Source: Field data (2025)

The analysis above shows significant correlations between household welfare and Labour Costs of Assistive Devices which is significant at 95% confidence interval with spearman's rho=0.282 at p-value of 0.005. Secondly, there was a very strong significant correlation in direct proportion at 95% confidence interval between household welfare and supportive programmes for PWDS where spearman's rho=0.805 at a p value of 0.000. There was no significant association between household welfare and Economic Cost of Assistive Devices based on a spearman's correlation coefficient of -0.083 (indirectly proportional) and p value of 0.419. among the demographic characteristics, there was no significant association between household welfare and age, gender, type of disability and marital status. However, there was a very strong correlation between household welfare and the Highest Level of Education attained based on a Spearman's correlation Coefficient of 0.800. Correlation was significant at 95% confidence interval at p value of 0.000.

By implication, the findings indicate that households that benefit from PWD support programmes (such as donation of assistive devices) are likely to experience improved welfare for their overall wellbeing. Similarly, when households are empowered by for instance accessing assistive devices, they are more likely to participate in labour activities such as business entrepreneurship and employment, and in the long run, their wellbeing is significantly improved. This is consistent with past research conducted by Omondi *et al.* (2018), Kilonzo *et al.* (2021), De Jonge *et al.* (2016), Layton *et al.* (2020) among other scholars. However, although there was no significant association between household welfare and economic costs of assistive devices, the relationship was indirectly

proportional which implies that in order to improve the household welfare, the economic costs of assistive devices should be lowered.

Similar to past studies, for example Kilonzo *et al.* (2021), there were a significant association between household welfare and the highest level of education attained which implies that household welfare improves when PWD members acquire education and training skills because this promotes their empowerment and independence. The correlation analysis further indicated that there was significant association between the highest education level attained and Labour Costs of Assistive Devices (Spearman’s coefficient was 0.216 with a p-value of 0.033) meaning achieving higher education level increases the chances of gainfully participating in socio-economic activities.

4.8.2 R square Model analysis

The table below shows the regression model summary between dependent and independent variables.

Table 4.27: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834 ^a	.696	.686	.31072

a. Predictors: (Constant), Supportive Programmes for PWDs, Economic Cost of Assistive Devices, Labour Costs of Assistive Devices

Source: Field data (2025)

The model shows an R square value of 0.696 which means that the model, in predicting the dependent variable, was 69.6% perfect. The table below presents data on the analysis of variance.

4.8.3 Analysis of Variance

Table 4.28: Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.567	3	6.856	71.009	.000 ^b
	Residual	8.979	93	.097		
	Total	29.546	96			

a. Dependent Variable: Household Welfare
b. Predictors: (Constant), Supportive Programmes for PWDs, Economic Cost of Assistive Devices, Labour Costs of Assistive Devices

Source: Field data (2025)

The variance presented a statistically significant model at 95% confidence interval where p-value was 0.000 and F coefficient of 71.009. This was an indicator that the regression model significantly predicted the dependent variable (household welfare). The table below shows the analysis of regression coefficients.

Table 4.29: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.490	.419		-1.169	.245
	Economic Cost of Assistive Devices	-.034	.086	-.022	-.393	.695
	Labour Costs of Assistive Devices	.188	.064	.169	2.929	.004
	Supportive Programmes for PWDs	1.181	.086	.795	13.800	.000

a. Dependent Variable: Household Welfare

Source: Field data (2025)

The findings indicate that there was statistically significant association between household welfare and Supportive Programmes for PWDs at 95% confidence interval (p value = 0.000) with a high t-value coefficient of 13.800. Further, the relationship between Labour Costs of Assistive Devices and household welfare was statistically significant at 95% confidence interval with a p value of 0.004 and a t-value of 2.929. There was no statistically significant association between Economic Cost of Assistive Devices and household welfare (p value = 0.695 and t value = -0.393). The model equation $Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \alpha$ was therefore substituted as follows: $Y = 13.8X_1 + 2.929X_2 - 0.393X_3 - 1.169$ where Y= Aggregate mean score of Household welfare; α = constant; X_1 = Aggregate mean score of PWD support programmes; X_2 =Aggregate mean score of Labour cost of assistive devices; and X_3 =Aggregate mean score of Economic costs of assistive devices.

4.8.4 Dependent variable and Demographic characteristics effect

The study analysed the relationship between the dependent variables and the demographic characteristics of PWDs. Regression coefficients are shown in the table below.

Table 4.30: Regression Coefficients for demographic characteristics

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	2.092	.155		13.535	.000
	Gender	-.081	.068	-.068	-1.195	.235
	Age	.040	.024	.097	1.686	.095
	Primary Disability Type	-.111	.024	-.245	-4.646	.000
	Marital Status	.035	.025	.073	1.411	.162
	Highest level of education	.608	.037	.873	16.387	.000

a. Dependent Variable: Household Welfare

Source: Field data (2025)

From the regression statistics, the study indicated that there was no statistically significant relationship between gender and household welfare (p value = 0.235). Likewise, the relationship between household welfare and age as well as marital status was not statistically significant where p-values respectively were 0.095 and 0.162. This means that household welfare status is not dependent on age, gender and marital status. However, disability type and education level achieved significantly determine the household welfare status for people with disabilities where respectively the t-value was -4.646 and 16.387 both significant at 95% confidence interval. The findings imply that the severability of disability has an inversely proportional impact on household welfare. Additional, when more PWD members access education and skills, the overall wellbeing of the household is improved.

4.8 Multiple Regression Analysis

The study carried out a multiple regression by regressing the dependent variable cost effects of assistive devices on multiple independent variables household welfare.

Table 4.31 Model Summary of Cost Effects of Assistive Devices and Household Welfare

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.760 ^a	.578	.574	.388		
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	57.045	3	19.015	126.059	.000 ^b
	Residual	41.632	276	.151		
	Total	98.677	279			
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	.930	.238		3.904	.000
	Economic cost of assistive devices	.114	.055	.085	2.092	.037
1	Labour cost effects of assistive devices	.579	.057	.523	10.175	.000
	Support programs costs of assistive devices	.304	.045	.336	6.709	.000

A. Dependent Variable: Household Welfare

A. Predictors: (Constant), Economic cost of assistive devices, Labour cost effects of assistive devices, Support programs costs of assistive devices

B. Dependent Variable: Household Welfare

Source: Field data (2025)

Table 4.31 above demonstrates the amount of change that is observed on the dependent variable (Household Welfare) as predicted by the independent variables (cost effects of assistive devices). The multiple regressions produced an R value of 0.760 and the R² of 0.578, which implies that 57.8 per cent of the observed changes in performance can be explained by cost effects of assistive devices. Additionally, the adjusted R square (.574)

strives to provide a more honest value estimating the R squared value for the entire population of the study at 57.4%.

The multiple regression model summary (ANOVA). The results demonstrate that the model is valid and useful in explaining household welfare (P=0.000). These values are adequate to demonstrate that the model is a good fit in explaining the variations in the dependent variable (household welfare) as a result of the changes in the predictor variable (cost effects of assistive devices).

The purpose of this phase of the study was to examine the effect of dimensions of social capital (Economic cost of assistive devices, labour cost effects of assistive devices, Support programs costs of assistive devices) on household welfare. The regression analysis revealed varied levels of influence across the three dimensions, providing valuable insights into the primary drivers of household welfare.

The findings show that labour cost effects of assistive devices has the most significant positive impact on organizational performance, with a standardized beta coefficient of 0.523 and a highly significant p-value (p = 0.000). This findings agrees with Kilonzo *et al.* (2021), who found that there were a significant association between household welfare and the highest level of education attained which implies that household welfare improves when PWD members acquire education and training skills because this promotes their empowerment and independence.

The multiple regression equation model given was as shown:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

$$Y = 0.930 + 0.114X_1 + 0.579 X_2 + 0.304X_3$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

The aim of this study was to find out the cost effects of assistive devices on the household welfare for persons with disabilities in Kakamega County. Among others, the study intended to investigate effects of economic Costs of assistive devices, the labour costs effects of Assistive Devices and assess the effects of supportive programs on household welfare for persons with disabilities in Kakamega County. This chapter presents a summary of the findings and generates conclusions while suggesting recommendations.

5.2 Summary of Findings

In summary, this study found out that the most prevalent type of disability among Kakamega county residents was physical followed by visual impairments. Similarly, it was clear that the burden of disability mostly affected the working members of households with people with disabilities i.e. those (18-60 years). The study also found out that quite a substantial number of the persons with disability still suffered stigma affecting their marriage success as a majority were not living a marriage system. From the findings, PWDs in Kakamega County faced various obstacles in attaining higher education attributed socio-economic factors such as poverty. Nonetheless, comparatively more PWD women attained vocational skills training while more male PWDs had not attained any formal education.

On the first objective, this study investigated the effect of direct costs of assistive devices on households of PWDs and generally found that assistive devices were not affordable either during purchase, maintenance, repair and or replacement of parts. Additionally, PWDs in the county faced challenges due to indirect costs of assistive devices such as engagement of aides, and costs incurred towards using their devices which limited their proper participation in socio-economic activities. The study found out that the financial costs of the assistive device negatively impacted PWDs household's ability to afford other basic needs such as food and healthcare and more than often, these households resorted to borrowing money or seeking financial assistance from others to be able to sustain their livelihoods. Despite the struggle, majority of PWD households had never benefited from financial assistance such as subsidies, donations to help cover the cost of the assistive devices. Similarly, many households missed on benefitting from government programmes or NGO support towards acquisition and maintenance of assistive devices.

On the second objective, the study examined the impact of the cost of assistive devices on the ability of PWD members in households to contribute to socio-economic development at home and within the community. In summary, the study found that participation in gainful Labour activities was only possible if PWD assistive devices were accessible and affordable. Indeed, the study found that because of ability to afford an assistive device, households managed to have a PWD member in full-time employment or at least engaged in successful business and self-employment.

Additionally, it was noted from the study that extreme disability dictated that the member of the household be aided almost throughout. This notwithstanding, the level of aide can be reduced through efficient and effective assistive devices. However, the cost

implications of PWD assistive devices forces households to resort to measures such as seeking external assistance or hiring caregivers which further reduces the available disposal incomes that would have been used for socio-economic empowerment.

On opportunity cost, the study found out that family members had to reduce or delay their own economic activities for example employment or education to assist with the use or maintenance of the assistive device for their PWD members. In other words, households undergo a process of labour cost opportunity cost where they have to choose between being there for their PWD siblings or participation in own economic activities. Consequently, majority of these households suffer economic downturns as they have to spend a lot of time or financial resources assisting their PWD siblings to use or maintain their assistive devices at the cost of participation in other productive activities.

The third objective sought to analyse available supportive programmes for PWD and or their households. First, it was notable that although there were support programmes, majority of the PWDs had not benefitted from them. This means that the scope of the programmes was low. Nonetheless, the study established that where interventions were available, PWD programmes were not adequately or purposively communicated to the targeted beneficiaries who mostly missed out because of failure to get the information. It was also found that PWDs and or their households despaired from seeking assistance from various support programmes because of tedious application processes beyond the normal capacity of a majority of the PWDs.

From inferential statistical analysis, the study found that there was a very strong significant relationship between household welfare and supportive programmes for

PWDS. However, there was no significant association between household welfare and Economic Cost of Assistive Devices. Additionally, there was no significant association between household welfare across age, gender, type of disability or marital status.

5.3 Conclusions

The empowerment of communities of PWDs is difficult to achieve due to the high dependencies. Although it may be costlier to purchase, maintain or upgrade, assistive devices greatly improve the overall quality of life for persons with disability and acquisition of such devices is therefore a worth opportunity cost for household members. However, because the financial burden of the assistive devices, many households still find it difficult to participate in gainful socio-economic activities because of the need to cater for the needs of their PWD members.

The ability to participate in gainful economic activities by PWDs is vital. However, this is possible when households can access affordable and maintenance-free assistive devices which allows to save funds for investment to successfully contribute to household incomes. Hence, availability of assistive devices in households should be prioritized and be in tandem with their affordability during acquisition and maintenance as this greatly determines the level of PWD participation and engagement in gainful employment or self-employment opportunities. Therefore, highly organized and result driven interventions can help emancipate PWD communities in Kakamega County. The government and the private sector together with civil society organizations have the duty to initiate reasonable interventions that would benefit the empowerment of vulnerable PWD households.

Whereas there is an attempt to assist, the available support programmes are inaccessible to majority of the needy PWD households. As a result, the PWDs cannot relate with how such programmes contribute to their wellbeing. This then calls for an expansion of the support scope within Kakamega County to target as many vulnerable PWDs as possible in order to develop independence and empowerment of PWD. Notwithstanding programme accessibility and other logistical issues, financial support provided through aid programmes improve household's financial stability. This, there is a high potential for the support programmes to emancipate PWDs and their household's socio-economically. However, this could be more possible when the scope and coverage of the programmes is enhanced to reach as many beneficiaries as possible.

Whereas it may be common knowledge that support programmes should help improve social integration of persons with disabilities such as inclusion in social activities and community participation, this study underscored the fact that this impact had not been achieved at the moment because of low scope of coverage and high number of people with disabilities that had not so far received substantial support. Enhancing the scope and coverage of support programmes would effectively contribute to the overall wellbeing of PWDs for instance enhanced social integration, improved education and skills development, improved mental well-being and reduced stigma and discrimination against persons with disabilities in the community.

In conclusion, households that benefit from PWD support programs are likely to experience improved welfare for their overall wellbeing but households with empowered PWDs are happier with better welfare status. Thus, when households are empowered through various programmes such as education or skilling for self-employment, their

wellbeing is significantly improved. Moreover, in order to improve the household welfare, the economic costs of assistive devices should be lowered. Since there was a statistically significant association between household welfare and the highest level of education attained, household welfare can improve when PWD members acquire education and training skills because this promotes their empowerment and independence.

5.4 Recommendations

The biggest challenge in accessing supportive programmes for persons with disability according to the findings was low scope and reach. Therefore, this study recommends as follows:

- (i) Support institutions and agencies should enhance coverage of their PWD support programmes for better outcomes to be realized.
- (ii) There is need for support institutions such as government to apply simple administrative actions accessible by PWDs such as reducing bureaucracies needed when conceptualizing programmes and interventions that support persons with disabilities.
- (iii) More assistance or support to PWDs should also target their caregivers, aides and further cover aspects such as maintenance to ease the burden encountered by persons with disabilities.

5.5 Suggestions for further research

Since the study concentrated on supportive programs in general another study should be carried out on specific support program to evaluate the effectiveness of the Kakamega County PWDs support Programme on overall PWDs welfare.

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APPENDIX I: QUESTIONNAIRE FOR THE HOUSEHOLD

My name is Agnes Mukuvi and I am conducting research on the costs of assistive devices and their effects on the welfare of households of PWDs in Kakamega County. Your participation is highly valuable in helping to understand these important issues. Please be assured that any information you provide was treated with the utmost confidentiality. Your responses will be used solely for research purposes, and your identity will remain anonymous in any reports or publications resulting from this study.

Thank you for your time and participation.

A: Household Information

1. What is your gender? Male Female Other

2. What is your age?
 Under 18 18–29 30–39 40–49 50–59 60
and above

3. What is your relationship to the person with a disability in the household?
 Self Parent Child Spouse/Partner
 Other (Please specify): _____

4. What is the primary type of disability affecting the household?
 Visual Impairment Hearing Impairment Physical/Mobility
Impair Intellectual Disability Other (Please specify):

5. What is your marital status?

Married single divorced widowed

6. What is your highest level of education?

No formal education Primary education Secondary education

Tertiary education (College/University) Vocational training

7. Type of assistive device(s) used (Tick where Applicable)

a.	Wheelchair	
b.	Prosthetics	
c.	Hearing aid	
d.	Braille devices	
e.	Other (please specify	

Indicate the degree to which you agree with the following about your household welfare

PART A: Economic Costs of Assistive Devices

(a) Direct Costs (e.g., purchase, repair, maintenance)

SR.NO	QUESTION	SD	D	N	A	SA
1.	The initial purchase cost of the assistive device was affordable for my household					
2.	The ongoing maintenance and repair costs of the assistive device are manageable for my household.					
3.	The cost of replacing parts or upgrading the assistive device is affordable.					

(b) Indirect Costs (e.g., time, transportation, caregiver costs)

SR.NO	QUESTION	SD	D	N	A	SA
1.	My household has incurred additional costs for transportation to acquire or maintain the assistive device.					
2.	The time spent on maintaining or servicing the assistive device is burdensome for the household.					

(c) Financial Impact on Household Welfare

SR.NO	QUESTION	S.	A	N	D	SD
1.	The financial costs of the assistive device have negatively	A				

	impacted my household's ability to afford other basic needs (e.g., food, healthcare).					
2.	The cost of the assistive device has led to borrowing money or seeking financial assistance from others.					
3.	The financial burden of the assistive device has affected the ability of other household members to participate in the workforce or school.					

(d) Access to Financial Assistance

SR.NO	QUESTION	S. A	A	N	D	SD
1.	My household has received financial assistance (e.g., subsidies, donations) to help cover the cost of the assistive device.					
2.	Government programmes or NGO support have made the acquisition and maintenance of assistive devices more affordable.					

PART B: Labour Costs of Assistive Devices

(a) Participation in gainful Labour activities

SR.NO	QUESTION	S. A	A	N	D	SD
1.	The household currently has a PWD member as a full-time employee					
2.	The household has a PWD member who is engaged in successful business or self-employment					
3.	The use of assistive device has enhanced the ability of PWD member(s) in the household to participate in employment and or other gainful productivity duties for self-empowerment					

(b) Caregiving and External Labour Costs

SR.NO	QUESTION	S. A	A	N	D	SD
1.	The need for external caregivers or additional household help to assist with the device has increased household labour costs.					
2.	My household has had to hire external help for the use or maintenance of the assistive device.					
3.	The labour costs associated with the device have created a financial strain on the household, requiring family members to work extra hours or take on additional jobs.					

(c) Opportunity Costs of Labour

SR.NO	QUESTION	S. A	A	N	D	SD
4.	Family members have had to reduce or delay their own					

	economic activities (e.g., employment, education) to assist with the use or maintenance of the assistive device.					
5.	The time and labour spent on maintaining the assistive device would have been used for more productive activities if the device required less attention or support.					
6.	The labour costs involved in supporting the use of the assistive device have led to lower household income or financial stability.					

(d) Long-Term Labour Costs Impact

SR.NO	QUESTION	S. A	A	N	D	SD
1.	Over time, the labour costs associated with assistive devices have become a long-term burden on my household.					
2.	The increased time and effort required for assistive device maintenance have reduced the opportunity for household members to engage in full-time or part-time employment.					
3.	The labour input required for the use and maintenance of the assistive device is justified by the improvements it has made to the person with a disability's quality of life.					
4.	My household has received sufficient support (e.g., financial, technical assistance) to reduce the labour costs of maintaining or using the assistive device.					
5.	Would you recommend that more assistance or support (e.g., funding for caregivers or device maintenance) be provided to ease the labour burden of assistive devices for persons with disabilities?					

PART C: Supportive Programmes.

(a) Accessibility and Availability of Supportive Programmes

SR.NO	QUESTION	S. A	A	N	D	SD
1.	Has any member of your household, or any PWD you know benefited from a supportive program for persons with disabilities?					
2.	The information about supportive programmes (e.g., financial assistance, training, assistive devices) is readily available to my household.					
3.	The application process for accessing supportive programmes is simple and not time-consuming.					

(b) Impact of Supportive Programmes on Household Financial Welfare

SR.NO	QUESTION	S. A	A	N	D	SD
1.	The financial support provided through disability programmes has improved my household's financial stability.					
2.	The financial assistance from government or NGO programmes has helped my household afford assistive devices or other disability-related expenses.					
3.	The training or skills development programmes offered by supportive services have enabled household members to find better employment or income-generating activities.					

(c) Impact on Social and Psychological Well-Being

SR.NO	QUESTION	S. A	A	N	D	SD
1.	Supportive programmes have improved the social integration of persons with disabilities in my household (e.g., inclusion in social activities, community participation).					
2.	The availability of emotional and psychological support programmes has helped improve the mental well-being of persons with disabilities in my household.					
3.	The assistance programmes have contributed to reducing stigma and discrimination against persons with disabilities in my community.					

(c) Long-Term Effects on Household Independence and Empowerment

SR.NO	QUESTION	SA	A	N	D	SD
1.	Supportive programmes have helped my household become more self-sufficient and less reliant on external aid.					
2.	The programmes have provided long-term benefits, such as improved education and skills development for persons with disabilities in my household.					

PART D: Household Welfare

SR.NO	QUESTION	SD	D	N	A	SA
1.	There is adequate income that helps to meet all the basic needs of the household such as food, shelter, education etc.					
2.	The household owns adequate arable land, domestic animals and a decent house					
3.	The household has enough savings to handle emergencies and other threatening eventualities					
4.	The household does not currently survive on loans from institutions, friends or relatives					

(d) Challenges in Accessing Supportive Programmes

SR.NO	QUESTION	SÁ	A	N	D	SD
1.	Despite the availability of supportive programmes, the benefits do not reach all persons with disabilities in my household equally.					
2.	The level of support provided by the programmes is not sufficient to meet the needs of persons with disabilities in my household.					
3.	The bureaucratic or logistical challenges in accessing supportive programmes (e.g., long waiting times, complex procedures) have limited my household's ability to benefit fully.					

(e) Suggestions for Improving Supportive Programmes

SR.NO	QUESTION	SÁ	A	N	D	SD
1.	I believe that the government and NGOs should increase financial support for persons with disabilities to improve household welfare.					
2.	Support programmes for persons with disabilities should focus more on long-term empowerment, such as vocational training and employment support					
3.	There is a need for more inclusive and accessible community-based programmes that target persons with disabilities in rural areas like Kakamega County.					

Thank You for Participating

APPENDIX II: CONSENT FORM

You are participating in a research on the costs of assistive devices and their effects on the welfare of households of PWDs in Kakamega County. Your participation is highly valuable in helping to understand these important issues. Please be assured that any information you provide was treated with the utmost confidentiality. Your responses will be used solely for research purposes, and your identity will remain anonymous in any reports or publications resulting from this study. Your participation is voluntary and you may opt out at any stage. By signing this form, you confirm to have read and understood these requirements and consent to participate in the study and that the data you provide may be used for the purposes of this research.

Do you consent to participate in this study [] YES [] NO

If YES please sign below:

Name (Optional) _____

_____ SIGNATURE _____ DATE _____

APPENDIX III: SAMPLING FORMULA

SR.NO	Sub County s	Population	method	size
1.	Lugari Sub-County	90		9
2.	Likuyani Sub-County	100		10
3.	Navakholo Sub-County	35		4
4.	Lurambi Sub-County	120		12
5.	Malava Sub-County	55		6
6.	Ikolomani Sub-County	45		5
7.	Shinyalu Sub-County	220		22
8.	Kakamega Central Sub-County	110		11
9.	Mumias East Sub-County	140		14
10.	Mumias West Sub-County	95		10
11.	Matungu Sub-County	30		3
12.	Butere Sub-County	70		7
Total		1110		113

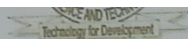
The 10% rule suggest that a sample size equivalent to 10 % of the total population is sufficient provided that the population is not too large and that the sampling is random and representative

Formula $n = 0.10 \times N$

Where n= sample size

N= total population

APPENDIX IV: LETTER OF APPROVAL



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

Tel: 056-30870
Fax: 056-30153
E-mail: directordps@mmust.ac.ke
Website: www.mmust.ac.ke

P.O Box 190
Kakamega – 50100
Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

9th April 2025

Agnes Mukuvi
MDS/G/01-70349/2022.
P.O. Box 190-50100,
KAKAMEGA.

Dear, Ms. Mukuvi.

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Masters proposal entitled '*Cost of Assistive Devices on the Household Welfare of Persons with Disabilities in Kakamega County, Kenya*' and appointed the following as supervisors:

- | | |
|----------------------|---------|
| 1. Dr. Edwin Simiyu | - MMUST |
| 2. Dr. Angela Mungai | - MMUST |

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Business and Economics Graduate Studies Committee and Chairman, Economics Department. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of two years from the date of registration to complete your Master's thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

APPENDIX VI: APPROVAL FROM NCPWD

NCPWD/ADM/19 VOL. VIII

Agnes Mukimi
Masinde Muliro University of Science and
Technology
KAKAMEGA

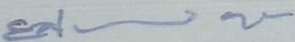
**RE: AUTHORITY TO COLLECT DATA FROM A HOUSEHOLD WITH A PERSON WITH
DISABILITY MEMBER IN KAKAMEGA**

Your email dated 16th April, 2025 on the above subject refers.

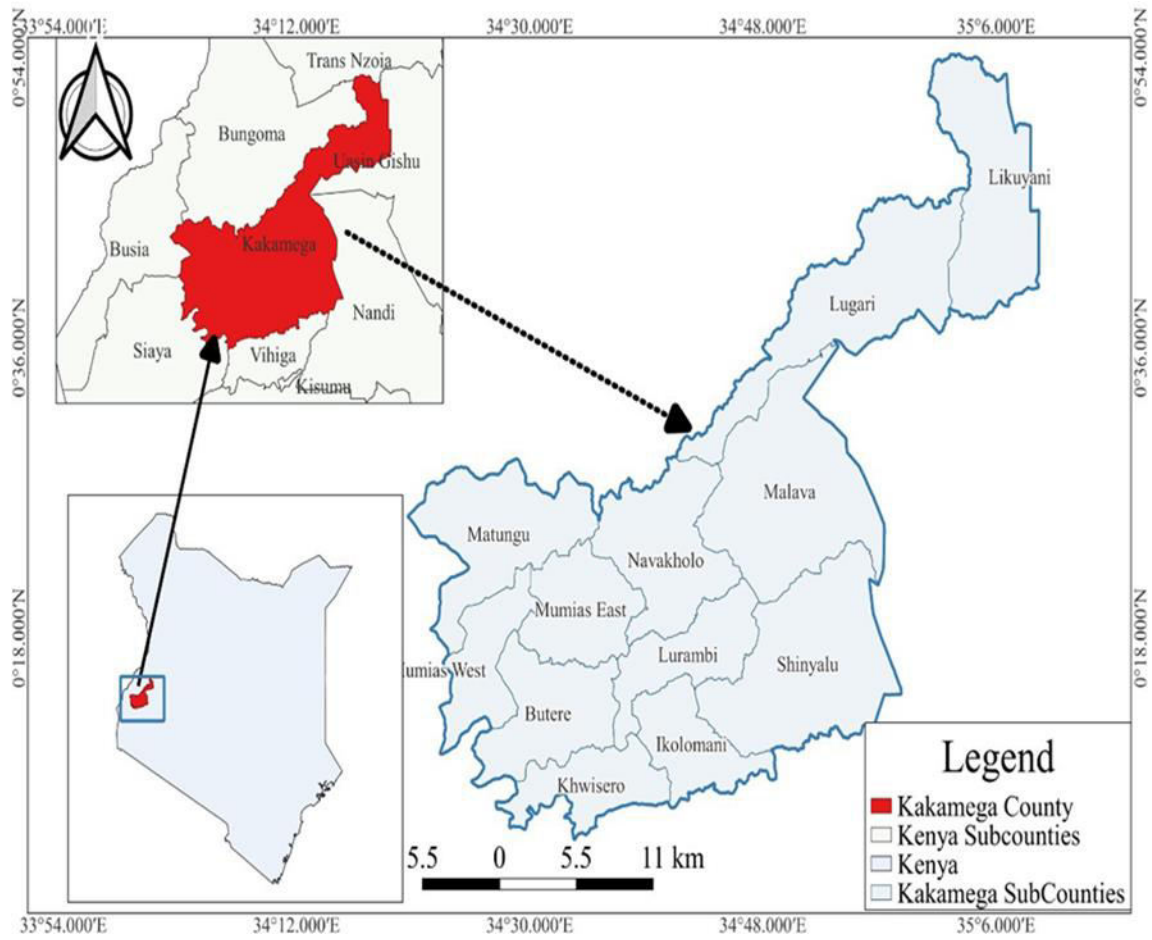
The National Council for Persons with Disabilities (NCPWD) was established through an Act of Parliament; the Persons with Disabilities (PWDs) Act No. 14 of 2003. The Mandate of the Council is to champion the rights, rehabilitation and equalisation of opportunities for Persons with Disabilities in Kenya.

Following your request to carry out your research thesis, permission is hereby granted. We hope the information which will be provided, will be used purely for academic purposes and will be treated with utmost confidentiality.


We wish you well in your endeavours.


Eva Njoroge
Ag. EXECUTIVE DIRECTOR/CEO

APPENDIX VII: GEOGRAPHICAL MAP OF KAKAMEGA COUNTY



APPENDIX VIII: RESEARCH PERMIT


REPUBLIC OF KENYA


NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **729496** Date of Issue: **05/June/2025**

RESEARCH LICENSE




This is to Certify that Ms. Agnes Amukohe Mukuvi of Masinde Muliro University of Science and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kakamega on the topic: **Cost Effect of Assistive Devices on Household Welfare of Persons with Disabilities in Kakamega County, Kenya for the period ending : 05/June/2026.**

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