

Case Report

Effectiveness of physiotherapy guided mobilisation on mobility and pain post cesarean section at kiboga hospital. A pre-post intervention study.

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Abstract

Background:

Caesarean section (C-section) delivery is associated with postoperative pain and mobility limitations, which can hinder maternal recovery and prolong hospital stays. Physiotherapy-guided mobilization has been shown to facilitate early recovery, reduce pain, and enhance functional independence. However, limited data exist on its effectiveness in resource-limited settings such as Uganda.

Objective:

This study aimed to evaluate the effectiveness of physiotherapy-guided mobilization in improving mobility and reducing pain among post-caesarean section mothers at Kiboga Hospital

Methods:

A pre-post-test study design was conducted among mothers who underwent caesarean delivery at Kiboga Hospital. A total of 60 participants were recruited using purposive sampling. Baseline assessments included pain levels (measured using the Visual Analog Scale) and mobility levels (measured using the Timed Up and Go test). The physiotherapy interventions included structured mobilization exercises tailored to individual needs, implemented within the first 24 hours postoperatively and continued for 7 days. Post-intervention assessments were conducted to evaluate changes in pain and mobility scores. Data was analyzed using paired t-tests to assess the effectiveness of the intervention.

Results:

A total of 60 mothers were assessed in the study. Almost half (45%) of the mothers were aged 18- 25 years, and only 3.33% were above 45 years. This study shows that the average pain score on the visual analogue (VAS) scale among pregnant mothers significantly decreased from 8.2 to 3.6. Additionally, there was a significant (p -value < 0.05) reduction in the average time taken by mothers to move from one place to another after physiotherapy intervention; from 17.5s to 11.10s.

Conclusion:

The study revealed that physiotherapy-guided mobilization is an effective intervention for enhancing mobility and reducing pain in post-caesarean mothers at Kiboga Hospital. Hospitals should institutionalize routine physiotherapy-led early mobilization programs for all post-caesarean patients to enhance maternal recovery outcomes and overall quality of postnatal care.

Key words: Physiotherapy; Mobility; Pain reduction; Cesarean section; Uganda.

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Introduction

Caesarean section (CS) is one of the most commonly performed obstetric procedures worldwide. It is a surgical operation used to deliver a baby through an incision in the mother's abdomen. It is typically advised that a normal vaginal delivery (VD) may endanger the mother, the baby, or both (Rahman et al 2022). Globally, CS rates are continuing to rise due to medical and elective reasons from 12% in 2000 to over 21% in 2021, surpassing the acceptable WHO rates between 10 to 15% (WHO, 2021). Uganda's caesarean section rate ranges from approximately 5% to over 15%, with substantial variation by level of health

facility, urban-rural residence, and geographic region (Atuheire et al., 2019; UBOS & ICF, 2022). Despite its life-saving potential, C-sections are associated with significant postoperative challenges, particularly pain and limited mobility, which can delay functional recovery and impact maternal well-being.

Physiotherapy-guided mobilization has emerged as an effective non-pharmacological intervention for enhancing postoperative recovery. Interventions such as breathing exercises, guided ambulation, and gradual functional movements are widely recommended to accelerate recovery and restore independence.(Razan & Wijianto, 2021). These

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encourage safe, early movement, which can alleviate post-surgical pain, reduce the risk of complications, and speed up functional mobility.

Studies have highlighted that physiotherapy interventions can lead to better patient outcomes, shorter hospital stays, and improved quality of life after surgery (Patman et al., 2019). Early mobilization, typically initiated within 24 hours after surgery, has been shown to reduce pain levels and improve circulation (Borges et al., 2021). Another study by Tanaka et al. (2020) demonstrated that post-caesarean mothers who engaged in early mobilization interventions showed a significant improvement in Timed Up and Go (TUG) test scores. Physiotherapy interventions can lead to better patient outcomes, short hospital stay, and improved quality of life after CS, it's therefore important to integrate it into the postnatal care routines within the hospitals. (Nicholas et al., 2026).

Despite the effectiveness of physiotherapy-guided mobilization in improving mobility and reducing pain specifically among post-C-section mothers, it remains underexplored in developing countries. This study therefore evaluated the effectiveness of physiotherapy-guided mobilization in improving mobility and pain reduction in CS mothers in Kiboga hospital.

METHODS

Study design

A pre- and post-intervention study was done at Kiboga General Hospital

Study setting

The study was conducted in the maternity ward of Kiboga hospital, a public facility known for maternal care in Kiboga district, and provides services to a catchment area of about 165,100 people from the seven districts of Kyankwanzi, Mityana, Bukuya, Nakaseke, Gomba, and Mubende districts. Kiboga General Hospital maternity ward handles 98 mothers for caesarean section on a monthly basis. It has a gynecologist, medical officers, midwives, and anesthetic officers who perform the caesarean sections in a well-equipped theatre handling at least two mothers at a time; it also has a physiotherapist who provides post-natal physiotherapy services.

Population and Sample

Target population: Mothers who underwent caesarean section during the time of study at the maternity ward, Kiboga hospital.

Inclusion criteria

All mothers who had undergone CS by the time of the study were medically and hemodynamically stable and cleared for mobilization by the attending medical officer and gynecologist, and are still stable after reassessment by the physiotherapist.

Exclusion Criteria

We excluded mothers with relapsed hemorrhage and Preeclampsia

Sample Size Determination

The sample size was calculated using the formula for paired samples, with an estimated power of 80% and a significance level of 0.05.

$$n = \left(\frac{Z_{\alpha} + Z_{\beta}}{2} \right)^2 \frac{\sigma_d}{d}$$
$$n = \frac{((1.96 + 0.84) 4.7)^2}{1.8}$$
$$n = 52$$

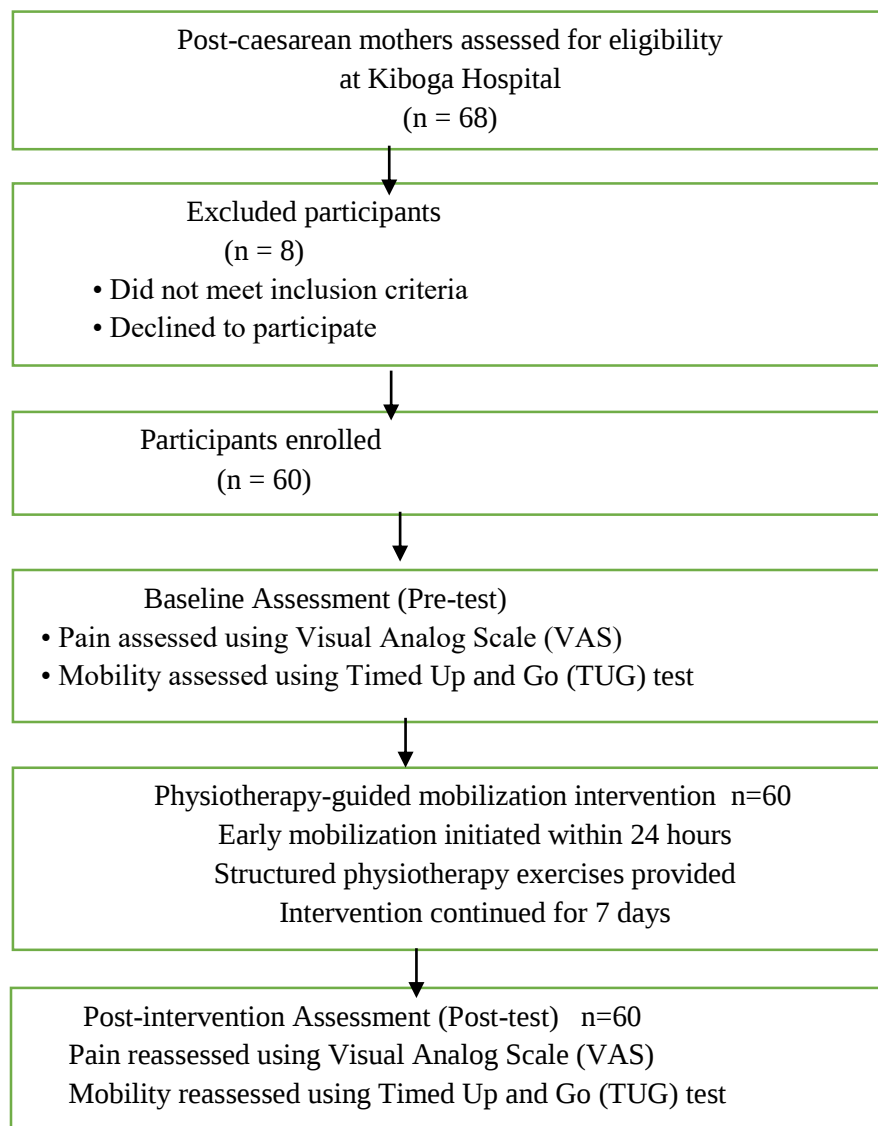
The sample size was calculated for a paired pre-test and post-test study using pain score as the primary outcome, measured on a 10-point Visual Analogue Scale (VAS). According to (Beresford & Norwood, 2022) A drop of 1.5 to 2.0 points is generally accepted as the baseline for a clinically meaningful improvement. Following this, we chose an expected mean reduction of 1.8 points and a standard deviation of paired differences of 4.7 points, with a significance level of 5% and 80% power; the minimum required sample size was estimated at 52 participants. To account for a potential 10% dropout rate, the sample size was increased to 58 participants. The number was rounded up, and a total of 60 participants were included.

Sampling Technique

Purposive sampling was used to select participants meeting the inclusion criteria.

Participant flow

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Instruments

Mobility Assessment: The Timed Up and Go (TUG) test evaluated functional mobility before and after the intervention.

Pain Measurement: The Visual Analog Scale (VAS) was used to measure pain intensity during the pre- and post-test phases.

Procedure

Participants underwent an initial assessment (pre-test), participated in a structured physiotherapy program, and then were reassessed (post-test) to determine changes in mobility and pain levels.

Mobility Assessment: The Timed Up and Go (TUG) test evaluated functional mobility before and after the intervention. The TUG test is a simple and widely used tool to assess mobility, balance, and risk of falls in individuals. It is especially useful in post-operative and rehabilitation settings.

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Procedure: The patient was asked to stand up from a standard chair, walk a distance of 3 meters, turn around, walk back to the chair, and sit down.

Measurement: The total time taken to complete this task was recorded in seconds.

Interpretation:

≤10 seconds: Normal mobility

11–20 seconds: Mild impairment

20 seconds: Indicates increased risk of falling or impaired mobility

Pain Measurement: The Visual Analog Scale (VAS) was used to measure pain intensity during the pre- and post-test phases. The VAS is a validated tool for assessing pain intensity in clinical settings.

Design: A horizontal or vertical 10-centimeter line anchored with "No pain" on one end and "Worst imaginable pain" on the other. **Procedure:** The patient marked a point on the line that best represented their pain level. **Scoring:** The distance from the "No pain" anchor to the patient's mark was measured in centimeters (0–10 scale).

0 = No pain

1–3 = Mild pain

4–6 = Moderate pain

7–10 = Severe pain

Structured physiotherapy program included the following (Intervention)

The physiotherapist delivered a protocol consisting of two supervised physiotherapy sessions per day, each lasting 20–30 minutes, for the first three postoperative days, combined with a structured home exercise program. Adherence was ensured through direct supervision of in-hospital sessions, use of a standardized treatment checklist to confirm completion of each session, daily attendance logs, patient counselling on the importance of mobilisation, and follow-up verification of home exercise performance through patient self-reporting and bedside review during ward rounds.

Breathing Exercises, deep breathing, and diaphragmatic exercises to improve oxygenation and relaxation. This was done by instructing the mother to support the incision site with her fingers interlocked, then instructing her to take in a deep breath through the nose, hold for 3 seconds, and sigh out through the mouth.

Pelvic Floor Exercises: Gentle exercises to strengthen the pelvic floor muscles and improve core stability. Here, the mother was instructed to be in a supine position, support the incision site, then lift up the head in an attempt to look at the toes, then rest, for 10 repetitions. The patient was then instructed to lift the feet just off the bed for 10 repetitions. Mother was then instructed to bend the knee and perform Russian twists to an angle of above 45°

Postural Support Techniques: Guidance on safe movements during coughing, sneezing, or transitioning from lying to sitting. Mothers were instructed to turn from supine lying to the side, use the arm on the top to support the body, and then push the body up to sitting.

The questionnaire used in this study was a structured, pre-tested tool designed to collect quantitative data on maternal pain levels, mobility status, and relevant demographic and clinical information before and after physiotherapy-guided mobilisation following cesarean section.

Structure of the Questionnaire

The questionnaire consisted of 3 main sections:

Section A: Demographic and Clinical Information

This section collected background information, including age, education, occupation, parity (number of previous deliveries)

Section B: Pain Assessment (VAS Scale)

This section used the Visual Analogue Scale (VAS) to measure pain intensity. Participants were asked to rate their pain at rest and during movement, both before and after the physiotherapy sessions. The responses were measured on a 10 cm line ranging from 0 (no pain) to 10 (worst imaginable pain).

Section C: Mobility Assessment (TUG Test Record)

Participants' performance on the Timed Up and Go (TUG) test was recorded. They were asked to perform the test before the intervention (baseline) and after the intervention period (typically 24–48 hours post-cesarean). The total time taken (in seconds) was noted and categorized as normal, mildly impaired, or impaired mobility.

The questionnaire was administered in person by researchers and was translated into the local language (Luganda) and pre-tested on a small group of post-cesarean mothers at Kiboga General Hospital to ensure clarity and reliability.

The data collected through the questionnaire were used to compare pre- and post-intervention scores on pain (VAS) and mobility (TUG), to analyze demographic influences on outcome, and to assess the overall effectiveness of the physiotherapy intervention.

Data collected through questionnaires, VAS scores, and TUG test was first entered into Microsoft Excel or SPSS (Statistical Package for the Social Sciences) version 25 to obtain Frequencies and Percentages (for categorical variables such as age groups, type of cesarean section, parity, and presence of co-morbidities) and Means and Standard Deviations (SD): For continuous variables like, VAS pain scores (pre- and post-intervention), TUG test (pre- and post-intervention) and these helped provide a general picture of the participants' baseline characteristics and outcome measures. Data was cleaned by checking for completeness, outliers, and inconsistencies to ensure accuracy before analysis.

Data Analysis

Data was analyzed using SPSS software (IBM SPSS

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Statistics 29). Descriptive statistics (mean, standard deviation) summarized demographic data and baseline characteristics. Paired T-tests were used to compare pre-test and post-test scores for mobility and pain.

Ethical Considerations

Ethical clearance was obtained from the Mengo Hospital Research and Ethics Committee, number MH/REC/06/02-2025, and administrative clearance was obtained from Kiboga Hospital. Verbal and written consent were obtained from each study participant before conducting the study.

Results

Demographic characteristics

A total of sixty mothers participated in the study. Many (45%) were aged between 18 and 25 years and had 26.67% attained tertiary education. More than half of the mothers (51.67%) were housewives, and half had at least 2-3 children. These characteristics are further elaborated in Table 1 below.

Table 1

VARIABLE	NUMBER (60)	PERCENTAGE (%)
AGE		
18-27	27	45
28-36	24	40
37-45	7	11.67
Above 45	2	3.33
EDUCATION		
No formal education	7	11.67
Primary	20	33.33
Secondary	17	28.33
Tertiary	16	26.67
PARITY(NUMBER OF CHILDREN)		
1	16	26.67
2-3	30	50
4 and more	14	23.33

The effectiveness of physiotherapy-guided mobilization on pain reduction Post C-section.

Postnatal physiotherapy reduced pain among 96.67% of the mothers within a few hours, according to 43.33%and 26.67% reported immediate pain reduction, as in Table 2

Table 2

VARIABLE	NUMBER(60)	PERCENTAGE (%)
PAIN REDUCED		
Yes	58	96.67
No	2	3.33
HOW LONG DID IT TAKE		
Immediately	16	26.67
Few hours	26	43.33
24 hours	9	15
More than 24 hours	9	15

Using the T Test, the average pain score on the visual analogue (VAS) scale among pregnant mothers significantly decreased from 8.2 to 3.6 after intervention, as per Table 3

Table 3: T Test for pain among the patients

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Variable	Mean (+/- standard deviation)	mean value	95% difference	CI	P-value
Pain score on the VAS	8.2 (+/-1.2)	51.2	8.2	7.8-	<0.001
Pre-Physiotherapy	8.5				
Post-Physiotherapy	3.6(+/-3.6) 3.9	24.5	3.6	3.3-	

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The effectiveness of physiotherapy-guided mobilization in improving functional mobility among post-C-section mothers.

The majority, 58(96.67%) of the mothers were able to get out of bed independently, and 53.33% were able to walk 3 meters in less than 10 seconds after physiotherapy-guided mobilization, as demonstrated in Table 4 below.

TABLE 4

VARIABLE	PRE INTERVATION	POST INTERVATION
Ability to get out of bed	20(33.33%)	58(96.67%)
	40(66.67%)	2(3.33%)
Time taken to walk 3 meters	10(16.67%)	32(53.33%)
	20(33.33%)	24 (40%)
	30(50%)	46.67%)

Table 5: T Test for Mobility

The table below shows there was a significant (p-value <0.05) reduction in average time taken by mothers after physiotherapy, from 17.5s to 11.10s. This showed physiotherapy improved the motion of mothers who had undergone Caesarean section delivery

Variable value	Mean(+/- standard deviation)	t-	Mean	95%	P-value	Standard
Time taken to walk 3 meters (seconds)	17.5(+/-5.8)		23.7	17.7	16.3-19.2	<0.001
	11.10(+/-3.9)		21.8	11.1	10.1-12.1	

DISCUSSION

This study aimed to evaluate the effectiveness of physiotherapy-guided mobilization in improving mobility and reducing pain among post-caesarean section mothers at Kiboga Hospital. A significant reduction in pain was observed following physiotherapy-guided mobilization, with VAS scores showing lower post-test levels compared to pre-test. This improvement can be attributed to enhanced circulation, reduced inflammation, and endorphin release. The findings align with previous studies that advocate for controlled physical activity in reducing postoperative pain, emphasizing its importance in recovery (Kang et al., 2019; Odetayo & Roberts, 2022). The VAS pain scores significantly indicated lower pain scores in the post-test as compared to the pre-test scores due to the reduction of

inflammation, promotion of circulation, and minimized post-surgical stiffness. This is in line with another study by Patel et al. (2020), which found that mothers who engaged in physiotherapy-assisted mobilization reported significantly lower pain scores on the Visual Analog Scale (VAS). Therefore, mothers who have experienced CS should undertake physiotherapy-guided exercises to reduce the pain post-caesarean section. Similarly, mobility improved markedly, with mothers ambulating earlier and more independently after the intervention. This reinforces evidence highlighting the benefits of early ambulation in preventing post-surgical complications and promoting functional recovery by Huang, Y., Wang, X., & Liu, M. (2020). Postoperative mobilization and its impact on recovery. The observed improvements also

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correspond with global and regional studies linking early physiotherapy to reduced hospital stay, improved maternal confidence, and quicker resumption of daily activities (Ghaffari et al. 2017).

Study Limitations

This study had several limitations that should be considered when interpreting the findings. First, the study employed a pre-post intervention design without a control group, which limits the ability to attribute the observed improvements in pain and mobility solely to the physiotherapy-guided mobilization intervention. Other factors such as natural postoperative recovery, analgesic use, and nursing care may also have contributed to the improvements observed. Secondly, the relatively small sample size of 60 participants limits the statistical power of the study and may affect the precision and robustness of the findings. In addition, the study was conducted in a single hospital setting, which may limit contextual diversity in terms of healthcare infrastructure, staffing, and patient characteristics. Fourth, pain assessment relied on self-reported measures using the Visual Analog Scale (VAS), which are subjective and may be influenced by individual pain tolerance, emotional status, or social desirability bias. Similarly, short-term follow-up over seven days limited the ability to assess the long-term sustainability of the intervention effects on recovery and functional outcomes.

Generalizability of the Study Findings

The findings of this study provide important preliminary evidence on the effectiveness of physiotherapy-guided mobilization among post-caesarean mothers in a resource-limited hospital setting. However, the generalizability of the results should be interpreted with caution. Nevertheless, the study findings may be applicable to similar district-level and resource-constrained healthcare facilities in Uganda and other low- and middle-income countries where post-caesarean physiotherapy services are limited but feasible. The consistency of the findings with existing literature on early mobilization suggests that physiotherapy-guided mobilization may have broader relevance in improving postoperative recovery among post-

caesarean mothers. Further multicenter studies with larger and more diverse populations, including randomized controlled trials, are recommended to strengthen external validity and enhance generalizability.

CONCLUSION AND RECOMMENDATION

The study revealed that physiotherapy-guided mobilization is an effective intervention for enhancing mobility and reducing pain in post-caesarean mothers at Kiboga Hospital. The study highlights the importance of integrating physiotherapy into routine postoperative care to improve recovery outcomes and overall maternal well-being. By promoting early ambulation, healthcare providers can contribute to better postoperative outcomes, reduced hospital stays, and improved patient satisfaction. The positive outcomes from this study underscore the necessity of integrating structured physiotherapy-guided mobilization as a standard postoperative care component for mothers undergoing cesarean section, the use of visual aids in training, and educating them. Healthcare professionals at Kiboga Hospital should consider implementing formalized physiotherapy protocols to optimize patient recovery and improve maternal health outcomes. Despite the promising findings, this study had some limitations, including a relatively small sample size and the potential influence of individual pain tolerance levels on reported pain scores. Future research should explore larger cohorts and include long-term follow-ups to assess the sustained benefits of physiotherapy-guided mobilization. Additionally, qualitative assessments of maternal experiences with mobilization could provide deeper insights into patient perspectives and adherence challenges.

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List of Abbreviations

CS	Cesarian section
SPSS	Statistical Package for the Social Sciences
TUG	Timed Up and Go
VAS	Visual Analog Scale
WHO	World Health Organisation

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Author Biography

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Solomon Kevin Buwembo is a qualified physiotherapist and researcher working at Kiboga General Hospital. He holds a Diploma in Physiotherapy from the Uganda Institute of Allied Health and Management Sciences and a Bachelor's Degree in Physiotherapy from Ernest Cook University. He has experience in managing musculoskeletal, neurological, cardiopulmonary, and post-operative conditions, with research interests in physiotherapy-guided rehabilitation, pain management, women's health, and early mobilization, particularly post-caesarean recovery.

Donnah Driciru is a qualified physiotherapist and researcher working at The Gem Foundation. She holds a Bachelor's Degree in Physiotherapy from Ernest Cook University. She has clinical experience in managing musculoskeletal, neurological, cardiopulmonary, and post-operative conditions, and has been involved in research on cerebral palsy and post-caesarean physiotherapy interventions. She is committed to advancing physiotherapy practice through research, continuous professional development, and interdisciplinary collaboration to improve patient care and quality of life.

Alen Musisi is a Medical Physicist and lecturer in the Department of Physics at Ernest Cook University.

Richard Malumba is an epidemiologist working at the intersection of healthcare service delivery, access to care, and population health research. He holds a Master's degree in Health Services Research from Makerere University. His work applies quantitative methods to improve the delivery and accessibility of quality healthcare services and to strengthen health system performance. He is particularly focused on improving disease detection, monitoring, and timely public health decision-making in resource-limited settings. His research is driven by a commitment to strengthening health systems, improving equitable access to care, and addressing infectious disease challenges through data-driven approaches.

Victoria Nakalanzi Nakalanzi is a biostatistician, researcher, and lecturer with expertise in epidemiology, quantitative research methods, and health data analysis. She currently serves as a Research and Grants Officer at Ernest Cook University and also lectures part-time in Biostatistics and Epidemiology. She holds a Master of Biostatistics from Makerere University and a Bachelor of Science in Statistics from Kyambogo University. Her professional experience includes research coordination, grant writing, statistical analysis, academic supervision, and field research management. Her research interests focus on public health, prostate cancer research, maternal care research, and the application of machine learning and spatial analysis in healthcare research. She has contributed to several academic and community-based research projects aimed at strengthening evidence-based healthcare and improving public health outcomes in Uganda. Victoria is passionate about research capacity building, data-driven decision-making, and mentoring students in quantitative research and biostatistics.

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Rosta Asimwe is a Public Health Nutritionist serving as the Head of the Nutrition Department at Ernest Cook University, where she provides academic and technical leadership in nutrition training and programme development. Her work focuses on advancing maternal and child nutrition, the management of non-communicable diseases (NCDs), improving infant and young child feeding practices, nutrition informatics, and promoting evidence-based community nutrition interventions aimed at strengthening population health outcomes in Uganda.

Authors' Contributions

SKB & DD participated in designing the study, data collection, and drafting of the manuscript; RM, AM & VN provided statistical guidance and contributed to the interpretation of the findings. AR participated in the conceptualization, developed the methodology, and critically revised the manuscript.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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