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Ease-of-Use, Acceptability, and Perceptions of a Photographic Figure Rating Scale for Child Wasting Assessment by Low-Literate Mothers in Buyende District, Uganda

Hedwig Acham[1*], Richard Kajura[2], Ronald Tenywa[2], Esther Babirekere[3], Mathew Mwenyi[4]

[1]Department of Food Technology and Nutrition, Makerere University, Kampala, Uganda
[2]School of Public Health, Makerere University, Kampala, Uganda
[3]Ministry of Health, Kampala, Uganda
[4]School of Biomedical Sciences, Makerere University, Kampala, Uganda
Email: *hedwig.acham@mak.ac.ug

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Abstract

Child malnutrition remains a significant health concern in Uganda, particularly in rural areas such as Buyende District. This study explored the attitudes, perceptions, and acceptability of low-literate mothers towards using a photographic figure rating scale to assess wasting in children under 5 years old. A mixed-methods approach was used, including focus group discussions and key informant interviews with mothers of infants 9 - 12 months old in six subcounties of Buyende district. Qualitative data were analyzed using content analysis. Most mothers were dissatisfied with their children's body sizes, with 67.6% perceiving their children to be underweight, having moderate acute malnutrition, or having severe acute malnutrition. Over 74% desired their children to be overweight or obese. Key factors influencing infant feeding included limited paternal support, household poverty, and mothers' heavy workloads. Mothers generally found the photographic figure rating scale to be acceptable and easy to use. Low-literate mothers in this rural Ugandan setting demonstrated the ability to use a photographic figure rating scale to assess their children's nutritional status. However, cultural preferences for larger infant body sizes and socio-economic constraints present challenges in addressing child malnutrition. Culturally sensitive interventions that engage fathers and address underlying poverty are needed alongside innovative assessment tools.

Keywords

Attitudes, Perception, Low-Literate, Acute Malnutrition, Figure Rating Scale

1. Introduction

Despite progress in recent years, malnutrition remains a significant contributor to child morbidity and mortality, with wasting being a particular concern because of its acute nature and potential long-term consequences. The 2022 Uganda Demographic and Health Survey (UDHS) reported a wasting prevalence of 3.4% among children under five years old, indicating a persistent challenge despite ongoing interventions [1]. In the Busoga sub-region, where Buyende district is situated, the prevalence of wasting in this age group remains alarmingly high (27.3%), and is identified as a cold spot [2], which necessitates innovative approaches for its timely detection and management.

An accurate assessment of wasting in children is crucial for timely intervention and prevention of further health complications. Traditional methods for assessing wasting often rely on anthropometric measurements, such as weight-for-height indices, which may be challenging to implement in resource-constrained settings or among populations with low literacy levels. Recognizing these challenges, alternative approaches, including photographic figure rating scales, have gained attention for their potential to facilitate more accessible and user-friendly assessments, particularly among low-literate populations (**Figure 1**).

Our previous research [3] developed and examined the accuracy of using a photographic figure rating scale as a culturally acceptable and user-friendly tool for mothers with low-literacy levels. For reasons beyond control and being a community-based study, the scale developed (**Figure 2** and **Figure 3**) comprised 5 photographic images, depicting varying degrees of wasting to allow mothers/caregivers to assess their children's nutritional status based on visual cues rather than numerical data or written instructions.

Other studies [4]-[10] have explored the use of photographic or silhouette tools among caregivers of young children across various cultural contexts. Mwangome *et al.* [4] piloted a pictorial scale in rural Kenya, pairing tool development with validation against anthropometric measures such as Mid-Upper Arm Circumference Z-score (MUACZ) and Weight-for-Age Z-score (WAZ). Similarly, studies in Guatemala [5], Mexico [6], Malawi [7], Türkiye [9], and U.S. low-income populations [8] [10] have implemented analogs of silhouette or photographic scales to assess maternal perceptions of the child's nutritional status, often comparing the accuracy of these visual methods against verbal or categorical assessments.

Across these different settings, photographic scales and visual methods yielded higher accuracy in caregiver identification of undernourished or overweight children than traditional verbal descriptions, with some studies reporting quantitative measures of validity, such as sensitivity, specificity, and likelihood ratios [4] [6] [8]. Notably, the work by [4] provided evidence for the successful local adaptation and psychometric validation of a pictorial tool specifically intended for low-literate rural Kenyan mothers. Other studies, such as those in Mexico and the United States, often utilize silhouette scales validated in external settings or with minimal adaptation to local cultural contexts [6] [8]. A recent approach known as Family-Led

MUAC (FL-MUAC), promoted by UNICEF and its partners, trained caregivers in Uganda and Kenya [11] [12] to use MUAC tapes themselves. This strategy has been implemented in several African countries and is recognized as a cost-effective and scalable method for improving the early detection of child malnutrition. With basic training and the use of color-coded MUAC tapes, families can routinely screen their children at home, enabling earlier treatment and reducing the risk of mortality.

Importance of low-literate mothers' perspectives

Accurate identification of child wasting by caregivers is essential for the timely management and mitigation of malnutrition, particularly in low-resource settings where healthcare access is limited. Traditional anthropometric tools, while considered gold standards, often require specialized training and may be inaccessible or difficult to interpret by low-literate mothers and caregivers. In rural areas such as Buyende District, where adult literacy rates are generally low (34%) [13], engaging mothers as primary caregivers and key decision-makers regarding child health is essential. Understanding the attitudes, perceptions, and acceptability of novel assessment methods, such as photographic and visual scales, among low-literate mothers is critical for their successful implementation and sustainability. Despite the demonstrated potential of these tools to improve caregiver recognition of wasting and malnutrition, there has been limited systematic qualitative investigation into caregiver comprehension, cultural acceptability, and emotional responses, which this research intends to address. Most studies cited in this paper only report brief survey-based or open-ended questions related to perceptions or preferences, with few employing formal qualitative methods such as focus groups or in-depth interviews, and none performing thematic analysis to rigorously assess acceptability.

Therefore, while cross-sectional studies indicate that locally adapted or context-specific visual scales can enhance the recognition of wasting among caregivers in diverse global settings, particularly among low-literacy populations, formal qualitative research into the acceptability and contextual fit of these tools is lacking. There is a clear need for studies that combine robust psychometric validation with in-depth qualitative analysis to guide the cultural adaptation and broader implementation of figure rating scales for assessing wasting in children under five. This study presents the attitudes, perceptions, and acceptability of low-literate mothers towards the use of a validated photographic figure rating scale in assessing wasting in children aged 9 - 12 months in Buyende District, Uganda.

2. Theoretical Framework

This study builds upon the theoretical underpinnings of the Health Belief Model (HBM) [14] [15] and Social Cognitive Theory (SCT) [16]. Applied to the context of wasting assessment in children, the HBM can clarify the factors shaping low-literate mothers' attitudes towards and acceptance of the photographic figure rating scale as a tool for identifying and addressing malnutrition. In contrast, within

the SCT framework, observational learning, social modeling, and self-efficacy play key roles in shaping individuals' attitudes, beliefs, and actions. By considering the socio-cultural context in which low-literate mothers navigate child health decisions, this theory provides insights into how social norms, cultural beliefs, and interpersonal relationships influence their perceptions of and engagement with novel assessment methods.

The studies cited in this paper have not incorporated rigorous qualitative methodologies, such as focus groups or in-depth interviews with formal coding and saturation, specifically aimed at explaining the experiences, attitudes, emotional responses, or potential stigma faced by mothers or caregivers when using photographic or silhouette rating scales for wasting. This deficiency constrains our understanding of how caregivers interpret these images, the acceptability of the scales across diverse cultural contexts, and their practical applicability. It is imperative to conduct qualitative studies specifically designed to explore users' experiences, emotional reactions, and barriers. This study explored caregivers' attitudes and perceptions towards the use of the photographic figure rating scale for assessing wasting among children and examined the acceptability of the scale in terms of ease-of-use, understanding, and cultural appropriateness. Thus, it contributes valuable insights into the feasibility and effectiveness of employing innovative assessment tools within resource-constrained settings to combat child malnutrition, ultimately informing evidence-based interventions and policy recommendations at local and national levels.

3. Methodology

This was a cross-sectional mixed-methods study conducted in six subcounties of Buyende District: Kidera, Nkondo, Buyende Town Council, Buyende, Bugaya, and Kagulu, from April to June 2023.

The participants included a sub-sample of mothers and caregivers of infants 9 - 12 months, who participated in a survey that led to the development of a photographic figure rating scale [2]. In the development of the FRS, numerous measurements of weight and height/length were taken, of which only those with exact measures fitting into the WHO scale (−3.0, −2.0, −1.0, 0, + 1.0, + 2.0, +3.0 z-scores) depicting the varying degrees of wasting, were selected to represent others in the development of the photographic FRS, and had their photographs taken. However, for lack of children fitting on the −3 z score (who may presumably had been on hospital admission), the −3 and +3 points of the scale were dropped from the study, leaving us with five points on each scale (−2 to +2), hence making the number for both males and females, n = 10 as represented on the actual FRS (**Figure 2** and **Figure 3**). This sample size (n = 10) of mother-infant pairs can also be justified for this formative tool assessment based on established usability testing guidelines and saturation principles [17], which suggest that 5 - 15 participants are typically sufficient to uncover the majority of usability issues.

The study was conducted in a phased manner (**Figure 1**). Of the 210 mother-in-

fant pairs who participated in the survey (phase 1), subsamples of 10 mothers/caregivers (whose children's photographs were used for the development of the FRS, acted as key informants—phase 2) participated in the ease-of-use assessment,105 participated in the validation of the photographic FRS (phase 3), while 84 participated in FGDs (phase 4), whose data are reported in this study.

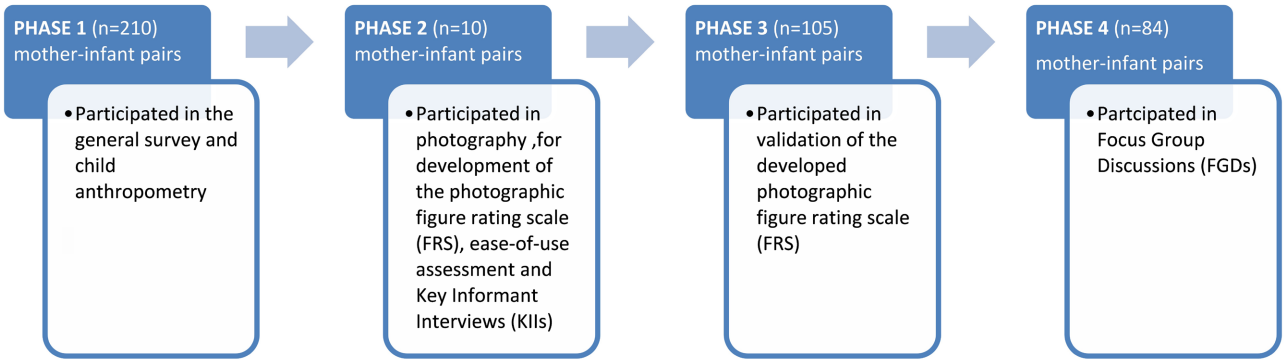

Figure 1. Schematic representation of the phases of the study.

3.1. Determination of "Ease-of-Use" and Acceptability of the FRS

The ease-of-use and acceptability of the photographic figure rating scale (**Figure 2** and **Figure 3**) were measured using both quantitative indicators (Likert scale) and key informant interviews. A sample of 10 mothers/caretakers, whose children's photographs were used in the development of the FRS, participated in the "ease-of-use" assessment and were further interviewed in the form of key informant interviews. A 5-point Likert scale (very easy-5, to very difficult-1 and 1-not

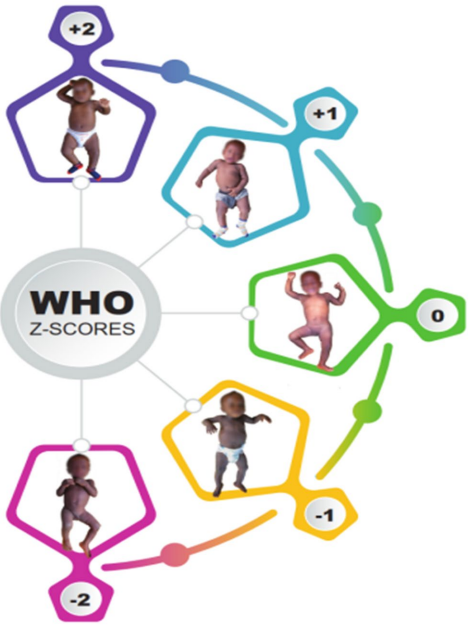

Figure 2. A photographic figure rating scale for male children. Source: Adapted from Acham *et al.* (2025) [3].

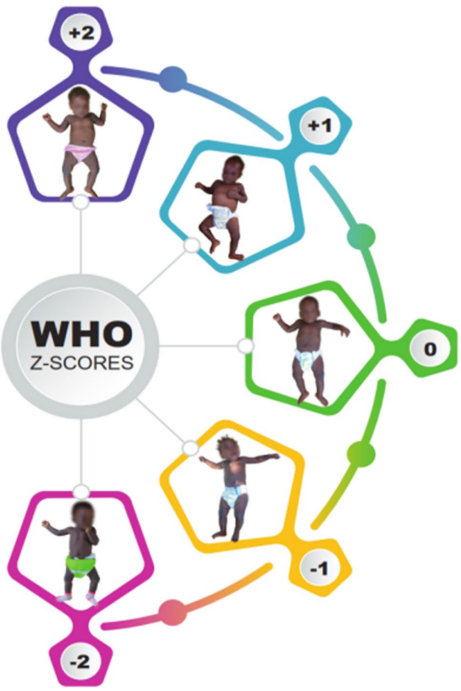

Figure 3. A photographic figure rating scale for female children. Source: Adapted from Acham *et al.* (2025) [3].

acceptable, 5-highly acceptable) was used to score the responses from the mothers/caretakers and analyzed to identify patterns of responses. The mothers were further subjected to cognitive interviews, allowing them to think aloud as they responded to the interview while capturing their responses, hesitations, and emotional reactions.

3.2. Determination of Acceptability and Perceptions on Use of the Photographic FRS

Acceptability and perceptions were assessed using qualitative indicators (perceived relevance, comfort, and preference) [18] [19]. To determine acceptability and the perceived ideal infant body size, seven Focus Group Discussions (FGDs) of about 1.00 - 1.30 hours long were conducted, one for each health facility in the respective counties (n = 6), and one for the key informants (10 mothers).

The FGDs were conducted in the native language, "*Lusoga*", prioritizing confidentiality, and were conducted by independent interviewers focusing on specific issues relevant to the study objective.

The mothers were enlightened on the meaning of the figure rating scales, which served as a point of discussion to obtain information regarding the acceptability of the use of the scale, general opinions about infant growth, factors influencing infant feeding decisions in the locality, difficulties being faced in infant feeding, and the effect of infant body size perception on complementary feeding practices. The information generated was recorded, audio-taped, and stored for further analysis. The focus group discussions continued until data saturation was reached and

no new information was generated.

3.3. Data Management and Analysis

Data from the Likert scale were analyzed using descriptive statistics, while qualitative data generated by KII and FGDs were audio-recorded and stored. The audio-recorded KII and FGD interviews were transcribed verbatim. The data were then back-translated from "*Lusoga*" to English, followed by the generation of codes before entry into Atlas.ti software for the subsequent content analysis using an inductive approach. A qualitative content analysis process for Focus Group Discussions (FGDs) was performed, where transcription was followed by dividing text into "sense units", condensing and labeling with codes, comparing and sorting codes into categories, and incorporating observation notes to explore mothers' perceptions regarding the size of the child diagnosed with malnutrition. The thematic analysis that guided the FGDs yielded the following themes: ease and acceptability of use of the FRS, factors influencing infant feeding decisions in the locality, difficulties faced in infant feeding, and the effect of infant body size perception on complementary feeding practices.

3.4. Ethical Consideration

Ethical approval was obtained from the Makerere University School of Social Sciences Research and Ethics Committee (MakSSREC, REC003219.01) and from the Uganda National Council for Science and Technology (UNCST, HS2137ES). In the study area (Buyende District), additional permission was obtained from the offices in charge of health (nutrition and community health), as well as CAO, DHO, and DPO, who were notified. In addition, participants in the study were first consulted, and their consent was obtained before they were enrolled and registered. Consent and assent forms are included in the appendices of this report. All information from individuals was treated with the utmost confidentiality. An INFORMED CONSENT form was provided along with contextualized information about the project, emphasizing privacy and confidentiality.

4. Results

4.1. The "Ease-of-Use" and Acceptability of the FRS

Summary statistics indicated a median score of 4.2, a median of 4.5, a mode of 5, SD 0.79, and a range of 3-5. The majority of mothers rated the photographic figure rating scale as being easy to use. Specifically, 60% (n = 6) rated it as very easy (score = 5), 30% (n = 3) rated it as easy (score = 4), and 10% (n = 1) rated it as neutral (score = 3). No mother rated the scale as difficult or very difficult. The results for acceptability indicated a mean of 4.3, median of 4.5, mode of 5, SD of 0.78, and a range of 3-5. Half of the mothers (n = 5) rated the scale as highly acceptable (score = 5), 30% (n = 3) rated it acceptable (score = 4), 20% (n = 2) rated it neutral (score = 3), and no participants rated it as unacceptable. The narrow score range (3 - 5) suggests a general consensus towards positive reception. These results indicate that the photo-

graphic figure rating scale was perceived as both easy to use and highly acceptable by the majority of mothers, which consistently suggests that the perceived simplicity of the tool may contribute to its acceptability for use in the population (Table 1).

Table 1. Ease-of-use ratings by mothers.

Participant ID (n = 10)	Ease-of-use (1 = Very difficult, 5 = Very easy)	Acceptability (1 = Not acceptable, 5 = Highly acceptable)
M01	5	5
M02	4	4
M03	5	5
M04	3	3
M05	4	4
M06	5	5
M07	4	5
M08	5	5
M09	3	3
M10	4	4

4.2. Mothers' Perceptions of the Body Size of Infants

Generally, two-thirds (60.7%) of the mothers were not satisfied with their children's body size (Table 2). Almost a quarter (23.8%) of the mothers perceived their children's body size as underweight, 21.4% perceived them as having MAM, and 21.4% perceived them as having SAM. In contrast, 11.9%, 10.7%, and 7.2% of the mothers perceived their children's body sizes to be normal, overweight, and obese, respectively. More than three-quarters (74.3%) of the mothers desired their children to be overweight/obese, whereas 76.2% of the mothers mentioned that they preferred their children's body sizes because they looked good. A few (11.9%) mothers perceived their children to be normal, and 13.1% reported a desire to have a normal body size for their children, while 13.1% wished their babies could gain more weight.

Table 2. Maternal perceptions of infant body size (n = 84).

	Frequency (n)	Percentage (%)
Mother's satisfaction with body size		
Yes	33	39.3
No	51	60.7
Perceived body size		
No choice	3	3.6
Normal	10	11.9
Overweight	9	10.7
Obese	6	7.2

Continued

Underweight	20	23.8
MAM	18	21.4
SAM	18	21.4
Desired body size		
No choice	6	7.1
Normal	11	13.1
Overweight	24	28.6
Obese	39	46.4
Underweight	4	4.8
Why do you prefer this body		
Baby looks good	64	76.2
Baby light to carry	9	10.7
Wish the baby gains more weight	11	13.1

Mothers' perception of a healthy infant weight

Analysis of interviews with mothers revealed that most mothers were pleased that their children were small. They contended that the weight of their infants is reasonably good despite the size, however, other mothers felt the weight of their child was not good and this was attributed to frequent illnesses and loss of appetite among their children.

"*The body size for my child is small but I feel my child's weight is heavy, the physical look, the child's body size is small but when you lift him you feel his weight.*" (*FGD, PHOTO STUDY-NKONDO*)

"*My child doesn't look well the way I want her to be, she is small and her skin is not looking good.*" (*FGD, PHOTO STUDY-KIDERA*)

Reasons for the choice of the perceived body sizes

Most mothers indicated that their children were not as small initially, but their growth kept reducing, which was attributed to poor feeding and frequent illness of the infants.

"*My child was fat and healthy at birth, but she kept reducing as she grew, and I feel that my child's weight is light now. I think this is attributed to the frequent illnesses and loss of appetite for my child.*" (*FGD, PHOTO STUDY-BUGAYA*)

Mothers' satisfaction about the infant's body size

Mothers reported that they were unhappy with their infants' size. According to the mothers, this routine sickness of their infants provided a platform for weight loss. Mothers argued that the hair color of their infants changed, indicating that their infants were sick.

"*For me I am not happy with the body size of my child, the colour of his hair has changed it is now pale and at times his stomach swells I believe he has some sickness that is preventing him to gain weight.*" (*FGD, PHOTO STUDY-BUYENDE T/C*)

Ideologies about infant body weight

Interviews with mothers revealed that, although their infants' body size is small, they feel it is okay because their children are not sick. However, some mothers had mixed reactions about the care provided to the infants in the community, indicating that some mothers tend to pay little attention to their infants in the community, as shown in the quote below:

"*Care of the infants in our community is good, because, everyone cares for her child as required, this has helped our children to grow well in our community.*" (*FGD, PHOTO STUDY-KIDERA*)

"*Some mothers go to the garden when they have not provided food to their infants, while others give their children cold food that was left for supper. Some women will tell the neighbors to give the child sweet potatoes when they have gone to the garden.*" (*FGD, PHOTO STUDY-KIDERA*)

Opinions about infant growth

Interviews with mothers revealed that infants were not growing well due to poor feeding.

"*I am not happy with the body size of my child because my child is very small and I see that the colour of his hair is turning yellow I think my child is sick that prevents him from gaining weight.*" (*FGD, PHOTO STUDY-BUYENDE S/C*)

4.3. Factors Influencing Infant Feeding Decisions

During the focus group discussions, mothers demonstrated a greater likelihood of fathers of the infants to be the facilitator of malnutrition among infants as compared to their counterparts (the mothers). The illustration underscores how fathers' limited support in the family has impacted the feeding of infants in the family.

"*In our homes, when we tell our husbands to buy sugar for us to cook for the child tea or porridge, they just start a quarrel, as a mother you are forced to let go and wait until the time when you will have lunch for the whole family. Remember when your child is not well, you are also stressed as a mother.*" (*FGD, PHOTO STUDY-NKONDO*)

"*The challenge we face while caring for our children, fathers of these children don't support us to enable us feed these children well, when you tell them the child is sick, they will not mind, they will not give you money to take the child to the health facility.*" (*FGD, PHOTO STUDY-KIDERA*)

The research participants further explained that, unlike regular household meals, infants are left with no option but to eat what adults feed them, even when they need additional support. In addition, drinking among men was reported to have a significant impact on infant feeding outcomes. Mothers mentioned that fathers preferred drinking alcohol over buying sugar at home. It was further revealed that mothers are not allowed by their husbands to work, which is reported to have impacted their income, hence making them unable to look after their children.

"*Our husbands don't support us in our homes, when you ask for sugar, he will*

tell you he is going to use the money for drinking, you end up not giving the child anything because when you give the child porridge without sugar he will not take it, in most case our children feed with us when we are having general meal, and that is why our children are not gaining weight." (*FGD, PHOTO STUDY-BUGAYA*)

"*The challenge we have is that our husbands do not allow us to work to make money and look after our children. When we tell our husbands that there is no soap at home, they tell us that there is no money and that we should just plan to buy it. Men always say that if a woman works in a home, she will not respect the man; that is the challenge we are facing.*" (*FGD, PHOTO STUDY-KAGULU*)

"*Those are the challenges we face. When we tell our husbands that the child is sick, we want to take the child to the facility, but they will not give you money to take the child to the health facility or buy milk for the child. They will tell you that they do not have money, so the child will not feed well, and since the child is sick, he/she will not breastfeed well. And for us women we don't have jobs, you will be there without a single coin, so, your child will end up fading, he will not craw or walk.*" (*FGD, PHOTO STUDY-KIDERA*)

Unemployment among men was raised by participants as a contributing factor for malnutrition among infants; men are left with no option but to hang around nearby trading centers playing Ludo.

"*These men don't allow us to work but they don't support us, some of our men also unemployed, they just wake up in the morning to go in the trading centres to play Ludo, when you go to the health facility and they prescribe for you medicine to buy, the man will not have money to give you to treat your child but you will find him playing Ludo and drinking, but he will not have money to treat his child.*" (*FGD, PHOTO STUD Y-KAGULU*)

"*The problem is all with our husbands, you may want to buy something to feed the child but when you ask the man to give you money and buy something for the child to eat, he will tell you there is no money, there is no even five hundred to buy the child milk, you will tell him we should grind food that will help the child the man will tell you that I don't have money because he is not working.*" *FGD, PHOTO STUDY-KIDERA*)

Mothers revealed that around the months of June and July, during the harvesting season, men abandon their families after selling all that has been harvested and spend all the money with other women.

"*Around June and July during harvesting period, men tend to sell all the food at home, when they get the money, they spend all the money on drinking and they will eat the money with other women, you will dig together but when time for harvesting comes, it is the man having total ownership of the food.*" (*FGD, PHOTO STUDY-BUYENDE S/C*)

"*Let's say this is January, drought is a lot and the money is scars, you may want to buy food but the money is not there, so, that is a very big challenge for us.*" (*FGD, PHOTO STUDY-KIDERA*)

"*April is also a difficult period, the money is scarce, the children want to go to*

school, and you also want to care for the child, but you do not have money." (*FGD, PHOTO STUDY-KIDERA*)

Furthermore, household chores are reported to have had a great impact on the feeding of infants at home; mothers are reported to be occupied by household chores all day and left with no time to look after the child.

"*In most cases when you are at home, you are occupied with a lot of work and you may not have enough time to look after your child, because we go to the garden very early in the morning, from the garden you will come back home, wash utensils, the child wants to eat, you also want to eat, the man wants to eat, the man is bucking at you, he wants the food for him to eat and go, the child is also crying, there is no sugar that you will prepare some tea for the child as you do other things, it is until you cook for the man, that is the food the child is also going to eat, the man is asking for water for him to bath, he wants you to wash his clothes, he will demand for food and you will wonder how you will do all these things and be able to look after your child.*" (*FGD, PHOTO STUDY-KAGULU*)

"*The challenge we face with household chores, you leave the garden very tired, everything will be waiting for you, you are alone at home and everything will be on you as a mother at home, even when the man is around and you tell him to help you carry the child as you do other work at home, he will tell you that that is not my work, you are a woman, surfer with your problems, so you will be left alone with a lot of work and caring for your children becomes a challenge, and because you are not feeding well as a mother, the breastmilk will not be enough for the child.*" (*FGD, PHOTO STUDY-KIDERA*)

4.4. Effect of Infant Body Size Perception on Complementary Feeding Practices

It is noted that infants are fed millet porridge, posho, and sweet potatoes as complementary foods. Some mothers revealed that they grind maize flour mixed with soya bean and mukene (*Rastrineobola argentea*). In addition, mothers mentioned that they breastfed their children as a method of family planning, as indicated in the quotes below:

"*For me, I normally breastfeed for one year and eight months, and if I want to stop breastfeeding the child at one year, the man always asks me why I am stopping breastfeeding. I also went for family planning for me to avoid conceiving when my child is still young.*" (*FGD, PHOTO STUDY-BUGAYA*)

"*Me I even breastfeed for two years, I do this because I avoid quick conception, I have noticed that the moment I stop breastfeeding, I conceive immediately, so, this is what keeps me continue breastfeeding my child longer, I use breast feeding as a method of family planning.*" (*FGD, PHOTO STUDY-KAGULU*)

While most mothers thought providing complementary feeding was the best option, the focus group discussion members revealed mixed feelings about its effectiveness in the growth of an infant. Although some mothers supported complementary feeding, others were unconvinced that it helped infants grow well. Those who

supported the complementary feeding approach, primarily using maize floor mixed with soya bean and mukene, believed that it helped the growth of infants, whereas some mothers mentioned that households did not have these food items.

"*I give my child maize porridge, or during harvesting season, I grind millet, mix it with soya bean and give to my child to drink, sometimes I also prepare mukene and give to my child. what I do, I get some crops and I hide them because if I leave it the man will sell everything and will leave the child to feed on potatoes only.*" (*FGD, PHOTO STUDY-BUYENDE S/C*)

"*I believe complementary feeding would be the best but the problem is, most of us don't have food to feed our children, it is not that we don't grow food in our homes, but men sell all the food at home and leave us with nothing to feed our children.*" (*FGD, PHOTO STUDY-BUYENDE S/C*)

"*For me, I grind maize, mix it with soya and milk, and prepare porridge for myself; this is what gives me breastmilk to breastfeed my child well. Let's say with sauce, I take some dodo, beans, I also eat fish, because my child also feeds on what I feed, this health my child grow well.*" (*FGD, PHOTO STUDY-KIDERA*)

Most participants weighed feeding practices through the lens of the limited availability of a variety of food items in people's homes, including convenience in navigating access to a variety of food items, as shown in the quotes below:

In one FGD, mothers noted that most homes have a large family size, which was reported to have caused a lot of harm to feeding practices among infants, as elucidated in the quote below:

"*The situation our children are living is not good, you find that you have eight children at home but you don't have enough support to look after these children, you will find one child is moving necked, another child is sick, but you don't have any single coin to buy medicine for that child. You will find another child wants to go to school but you don't even have a single coin to buy a book, you will not have enough food to feed all these children so, you will just leave everything to God.*" (*FGD, PHOTO STUDY-KAGULU*)

"*We are producing many children but we have failed to look after them, you cannot feed all those children for lunch and supper, they end up feeding on jackfruit and papaya alone that is when they will change their diet, apart from that, there is no any other food we are changing, we are eating if it is millet, it is millet every day, if it is sweet potatoes, it is sweet potatoes every day.*" (*FGD, PHOTO STUDY-KAGULU*)

In the FGDs, mothers mentioned some of the aspects they regard as important in the growth of a child, and the following aspects were mentioned:

"*If my child is eating well, sleeping well, learning well, then my child will grow well, but in most cases, we get one sheet and cover five children, we do not make them sleep under mosquito nets, the children are ever sick, but if the child is sleeping well, you make the child sleep under a mosquito net, bed sheets are there, the child is feeding well, that child will grow well.*" (*FGD, PHOTO STUDY-BUYENDE T/C*)

"*For me I think my child to grow well I have to make sure that I bring my child for immunization, and my child must complete all dozes of immunization, I have to make my child clean all the time, I have to feed my child well and give everything that my child requires.*" (*FGD, PHOTO STUDY-BUYENDE T/C*)

"*Even myself as a mother, I prepare dodo, porridge and these gives me enough milk to breastfeed my child for a long time.*" (*FGD, PHOTO STUDY-KIDERA*)

"*I make sure my child sleeps under a mosquito net, and when my child falls sick, I take him to the facility for treatment. I also make sure my child completes immunization as required.*" (*FGD, PHOTO STUDY-KIDERA*)

Unintended pregnancies among breastfeeding mothers were mentioned as a facilitator of malnutrition among infants. It was noted that mothers conceive while breastfeeding and are forced to stop breastfeeding, as indicated in the quote below:

"*You may want to breastfeed your child for a longer time, and at the same time, you will get an intended pregnancy, and that child will breastfeed for a sufficient period of time. The pregnancy has come, will you be able to breastfeed a child. so, me I use family planning, immediately after delivery, right now I haven't resumed it but I am just waiting for my periods then I resume family planning.*" (*FGD, PHOTO STUDY-KIDERA*)

5. Discussion and Conclusion

5.1. Discussion

The findings of this study demonstrate a markedly positive reception of the photographic figure rating scale among mothers, particularly concerning its perceived ease-of-use and overall acceptability. This consistent positive feedback, coupled with the tightly clustered data, indicates a strong consensus among the participants regarding the tool's effectiveness and utility.

Perceived ease-of-use

The summary statistics for ease-of-use decisively indicated that the photographic figure rating scale was perceived as highly user-friendly. A substantial majority (90%) of mothers rated the scale as "very easy" (**Table 1**), with no participants reporting any difficulty. This strong endorsement aligns with established technology acceptance models, such as the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology, which posit that perceived ease-of-use is a critical determinant of user acceptance and behavioral intention to use a given technology or tool [20] [21]. The absence of negative ratings strongly suggests that the scale's design minimized cognitive load and operational complexity, thus facilitating a straightforward user experience. Furthermore, the use of pictorial illustrations, as integral to a photographic figure rating scale, is recognized as particularly beneficial for enhancing comprehension and reducing potential response errors in diverse populations [22]. Such visual aids are crucial for ensuring the accurate capture of subjective characteristics and attitudes in psychometric response scales [23] [24].

Acceptability

The results for acceptability further underscore the high degree of participant

satisfaction. Eighty percent of mothers found the scale either "highly acceptable" or "acceptable" (30%), with only a small proportion rating it as "neutral" and critically, no participants deeming it "unacceptable". Acceptability is a multifaceted construct that is increasingly acknowledged as a crucial consideration when designing, evaluating, and implementing healthcare interventions [25]. The robust positive ratings observed in this study affirm the scale's suitability for the maternal demographic. Understanding and ensuring the acceptability of health interventions and assessment tools is paramount for their successful implementation and sustained use in real-world settings. The high acceptability reported suggests that the scale resonates well with the users' needs and preferences, and high ease-of-use can directly contribute to patient acceptability [25] [26].

Interrelationship of perceived ease-of-use and acceptability

The consistent positive reception across both ease-of-use and acceptability metrics highlights a significant and well-documented interrelationship between these two constructs. Theoretical frameworks, such as the Fit between Individuals, Task, and Technology model, emphasize the importance of optimal alignment between user, task, and technology for successful implementation and adoption [27]. The data presented herein, characterized by narrow score ranges and high central tendencies for both measures, suggest that the intuitive design and user-friendliness (ease-of-use) of the photographic figure rating scale directly contributed to its high perceived acceptability among mothers. This consistency implies that a user-centered design prioritizing ease of interaction is a key factor in promoting the successful adoption and integration of health-related tools within specific populations [28].

Mothers' perceptions

Maternal perceptions and desired body sizes for children

The results reveal a significant prevalence of maternal dissatisfaction with their children's body sizes, alongside notable discrepancies between perceived and desired weight statuses. These findings are critical, given the profound influence of maternal perceptions on child feeding practices and nutritional outcomes.

Maternal perception of child nutritional status

The data indicate that a substantial majority (60.7%) of mothers expressed dissatisfaction with their children's body size. A considerable proportion perceived their children to be underweight (23.8%), with similar figures for Moderate Acute Malnutrition (21.4%) and Severe Acute Malnutrition (21.4%). Conversely, a smaller percentage of mothers perceived their children as having normal weight (11.9%), overweight (10.7%), or obese (7.2%). This observation is consistent with the existing literature that highlights common maternal misperceptions regarding child nutritional status, particularly an underestimation of overweight/obesity and an overestimation of thinness [29]. Studies have shown that mothers may mistakenly perceive normal-weight children as underweight [29] [30], which can significantly influence feeding styles and the quantity and type of food provided, ultimately impacting a child's growth and nutritional status [31] [32]. Inappropriate maternal perceptions can pose a significant threat to child nutrition [33].

Desired body size and cultural influences

The findings further indicate that more than three-quarters (74.3%) of mothers desired their children to be overweight or obese, with a substantial majority (76.2%) preferring these body sizes because they were considered "good-looking". Only a small fraction desired a normal body size (13.1%) or wished for their babies to gain weight (13.1%). This strong preference for larger body sizes, often associated with perceptions of health and prosperity in various cultural contexts, is well documented [7] [34]. Such cultural beliefs can lead to a disconnect between medical definitions of healthy weight and lay perceptions, contributing to the challenge of addressing both undernutrition and overnutrition [35]. For instance, qualitative research has identified a cultural preference for larger children in some communities, where "healthy weight" for a child might be defined by factors other than clinical Body Mass Index, such as the child's activity level or a pediatrician's opinion [30]. This cultural ideal can inadvertently contribute to the rise of overweight and obesity in children, even as rates of malnutrition persist [35]. Maternal visual perception of children's nutritional status directly influences feeding practices, and cultural norms play a significant role in shaping these perceptions and preferences [31]. Familial and ethnic effects on body image and preferences underscore the importance of considering socio-cultural factors when designing interventions related to child nutrition [36].

In Uganda, cultural beliefs strongly shape child-feeding practices, with larger body size widely perceived as a marker of health, prosperity, and competent caregiving. Fatness is socially valued and normalized, while thinness is often feared as a sign of illness, weakness, or deprivation, creating pressure on caregivers to maintain visibly "big" babies [37] [38]. Infant body size also becomes a measure of maternal competence, especially among young mothers under community scrutiny [39]. These beliefs drive practices such as early supplementation with cow's milk, tea, glucose water, and porridges—partly because milk expression is culturally incongruent—as well as the widespread use of cereal porridges enriched with sugar or oil to "fatten" children [40] [41]. Maternal diets during pregnancy and lactation are likewise shaped by cultural taboos and prescriptions aimed at producing a "bigger, stronger" baby, though some restrictions may undermine nutrition [42]. Together, these norms equating size with health sustain feeding practices that prioritize visible weight gain over balanced growth and development, highlighting the need for interventions that reframe "healthy growth" as appropriate weight-for-age, length-for-age, and developmental progress, while providing culturally acceptable feeding alternatives.

Implications for child health and interventions

The observed maternal dissatisfaction with current body sizes and the strong desire for larger children, coupled with the misperception of the actual nutritional status, have critical implications for public health. A significant proportion of mothers perceived their children as underweight, MAM, or SAM, combined with a desire for larger body sizes, suggesting a need for targeted education and interventions.

These interventions should aim to align maternal perceptions with clinically defined healthy weight ranges and address the underlying cultural preferences that may promote overfeeding or hinder appropriate nutritional management. Given that maternal perceptions can directly influence feeding behaviors [31], addressing these misalignments is crucial for preventing undernutrition and the growing challenge of childhood overweight and obesity. Educational programs should consider the socio-economic factors influencing attitudes towards children's nutritional status [43] and be designed to gently challenge deeply ingrained cultural beliefs while promoting evidence-based healthy eating practices.

Implications of maternal perceptions of child body size

The observed maternal perceptions regarding their children's body sizes, characterized by widespread dissatisfaction, misperception of the actual nutritional status, and a prevalent desire for larger children, have significant implications for child health and public health interventions. These implications extend beyond individual family units to shape broader nutritional landscapes and intervention strategies.

Impact on child feeding practices and nutritional outcomes

The finding that a substantial majority (60.7%) of mothers were dissatisfied with their children's body sizes, coupled with significant proportions perceiving their children as underweight (23.8%), MAM (21.4%), or SAM (21.4%), highlights a critical area of concern. Maternal perceptions of a child's nutritional status, even if inaccurate, directly influence feeding styles and practices, including the type and quantity of food offered [31]. Studies have confirmed that mothers may misinterpret normal-weight children as underweight [21], leading to feeding behaviors aimed at increasing weight, which can inadvertently contribute to unhealthy weight gain [31]. Such inappropriate maternal perceptions pose a considerable threat to child nutrition, potentially exacerbating issues of undernutrition and overnutrition [33]. The desire for larger portions can drive food choices and feeding strategies, potentially overriding clinical recommendations or healthy eating guidelines [7].

Challenges for public health interventions

The strong preference for larger body sizes, with more than three-quarters (74.3%) of mothers desiring their children to be overweight or obese because they are considered "good-looking" (76.2%), presents a significant public health challenge in the Philippines. This cultural ideal can lead to a disconnect between medical definitions of healthy weight and lay perceptions, complicating efforts to address both undernutrition and the rising prevalence of overweight and obesity in childhood [34]. In some cultural contexts, a larger child is equated with health and prosperity, even if this contradicts clinical assessments of a healthy weight [35]. This cultural preference can inadvertently contribute to the global double burden of malnutrition, where undernutrition coexists with overweight/obesity within the same population or even household [44]. Therefore, programs designed to combat malnutrition must contend not only with food insecurity or access issues but also with ingrained cultural beliefs that may promote overfeeding or hinder appropriate

nutritional management. The misperception of size among families, where tolerance of overweight status is common, is critical for the future design of obesity prevention programs.

Necessity of culturally sensitive interventions

These discrepancies underscore the urgent need for culturally sensitive, context-specific public health interventions. Educational programs must go beyond simply providing nutritional information; they must actively address and reshape underlying cultural preferences and misperceptions of child body size [30]. Interventions must consider the various factors that influence maternal feeding practices, including family dynamics, media influence, and maternal knowledge [31]. Given that mothers are often the primary caregivers and most influential in modeling dietary behavior for their children [34], empowering them with accurate knowledge and culturally appropriate strategies is crucial. Community-based nutrition interventions must acknowledge these complex realities and gendered roles within households that influence treatment actions and engagement with nutrition programs [45]. Ultimately, effective interventions should aim to align maternal perceptions with clinically defined healthy weight ranges, gently challenging deeply ingrained cultural beliefs while promoting evidence-based healthy eating practices and optimal growth trajectories [33].

Limitations

The study relies on maternal perceptions without comparing these to traditional measures of child nutritional status, such as the use of MUAC, which could provide important context for interpreting the results. Additionally, the photographic scale was developed for a specific cultural context. Its applicability and effectiveness in other cultural settings may be limited, requiring additional studies in other regions of the country and lastly, the relatively small sample size limits the generalizability of the findings to other regions or populations. Also, the cross-sectional nature of the study doesn't allow for tracking changes in perceptions or practices over time, which could provide valuable insights into the effectiveness of interventions. These potential weaknesses suggest areas for future research and improvement in studying maternal perceptions of child nutritional status and the use of visual assessment tools in low-literacy settings.

5.2. Conclusion

The findings of this study offer a nuanced understanding of both the efficacy of the photographic figure rating scale and the complexities associated with mothers' perceptions of their children's body size. The consistently high ratings for the ease-of-use and acceptability of the photographic figure rating scale underscore its potential as a valuable and user-friendly tool for assessing child body image and related perceptions. The overwhelmingly positive reception, characterized by narrow score ranges and low variability, suggests that the scale effectively minimizes cognitive burden and maximizes user comfort, which are critical factors for the successful adoption of health assessment instruments in diverse populations. This positive evaluation aligns with research advocating for user-centered design in health tech-

nologies, where intuitive interfaces and high perceived utility contribute significantly to implementation success and sustained engagement. However, the study also revealed significant challenges related to maternal perceptions of a child's body size. The prevalent dissatisfaction among mothers with their children's current body sizes, coupled with a notable misperception of the actual nutritional status—manifesting as an overestimation of thinness and a strong desire for larger, often overweight or obese, children—highlights a critical disconnect between lay beliefs and clinical health parameters. These deeply ingrained perceptions, often influenced by cultural ideals where larger body sizes are considered attractive or a sign of prosperity, can inadvertently perpetuate unhealthy feeding practices and contribute to complex nutritional challenges in the affected population. Such misperceptions underscore the complexity of nutritional interventions, which must navigate not only biological and socio-economic factors, but also powerful cultural narratives and individual beliefs. In conclusion, while the photographic figure rating scale demonstrates exemplary user-friendliness and acceptability, its application must be contextualized within the broader framework of maternal perception. The successful deployment of this tool, or any similar assessment instrument, in public health initiatives necessitates strategies that address and realign maternal perceptions with evidence-based nutritional guidelines. By fostering accurate maternal perceptions and empowering mothers with appropriate knowledge, these efforts can collectively contribute to healthier child nutritional outcomes and more effective public health programs.

Authors' Contributions

HA: Conceptualized and designed the study, implemented and analyzed the data, prepared the manuscript; RK: Conceptualized and designed the study, implemented and analyzed the data, reviewed the manuscript; EB: Conceptualized and designed the study, implemented and analyzed the data, reviewed the manuscript; MM: Implemented the study, analyzed the data, and reviewed the manuscript; RT: Implemented the study, analyzed the data, reviewed the manuscript.

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Conflicts of Interest

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

References

[1] Uganda Bureau of Statistics (2022) Uganda Demographic and Health Survey, 2022. UBOS.

[2] Maniragaba, V.N., Atuhaire, L.K. and Rutayisire, P.C. (2023) Undernutrition among the Children Below Five Years of Age in Uganda: A Spatial Analysis Approach. *BMC Pub-*

lic Health, **23**, Article No. 390. https://doi.org/10.1186/s12889-023-15214-9

[3] Acham, H., Kajura, R., Bukenya, R., Babirekere, E. and Mwenyi, M. (2025) Development of a Photographic Figure-Rating Scale for Detection of Wasting among Infants 9 - 12 Months in Buyende, Uganda. *Mathews Journal of Nutrition & Dietetics*, **8**, Article 42.

[4] Mwangome, M.K. and Berkley, J.A. (2014) The Reliability of Weight-for-Length/Height z Scores in Children. *Maternal & Child Nutrition*, **10**, 474-480. https://doi.org/10.1111/mcn.12124

[5] Palacios, A. and Freeland-Graves, J. (2020) Maternal Perceptions of Child's Nutritional Status in Rural, Indigenous Ixil Women from Guatemala. *Current Developments in Nutrition*, **4**, nzaa053_084. https://doi.org/10.1093/cdn/nzaa053_084

[6] Garcia, M.L., Crespo, N.C., Behar, A.I., Talavera, G.A., Campbell, N., Shadron, L.M., *et al.* (2020) Examining Mexican-Heritage Mothers' Perceptions of Their Children's Weight: Comparison of Silhouette and Categorical Survey Methods. *Childhood Obesity*, **16**, 44-52. https://doi.org/10.1089/chi.2019.0015

[7] Flax, V.L., Thakwalakwa, C., Phuka, J.C. and Jaacks, L.M. (2020) Body Size Preferences and Food Choice among Mothers and Children in Malawi. *Maternal & Child Nutrition*, **16**, e13024. https://doi.org/10.1111/mcn.13024

[8] Hager, E.R., Candelaria, M., Latta, L.W., Hurley, K.M., Wang, Y., Caulfield, L.E., *et al.* (2012) Maternal Perceptions of Toddler Body Size: Accuracy and Satisfaction Differ by Toddler Weight Status. *Archives of Pediatrics & Adolescent Medicine*, **166**, 417-422. https://doi.org/10.1001/archpediatrics.2011.1900

[9] Erkan, M. and Velipaşaoğlu, S. (2024) Opinions of Mothers about the Weights of Their Preschool Children and Its Relationship with Their Own Body Perceptions. *Turkish Journal of Pediatric Disease*, **18**, 329-337. https://doi.org/10.12956/tchd.1455850

[10] Messiah, S.E., Weerakoon, S., Atem, F., Schulte, M., Lebron, C., Kambali, S., *et al.* (2020) Determinants of Accurate Visual Perception of Child Anthropometric Phenotype among Ethnically Diverse Preschool Parents in the United States. *Health & Social Care in the Community*, **28**, 2095-2104. https://doi.org/10.1111/hsc.13020

[11] UNICEF Uganda (2021) Moving the Diagnosis of Malnutrition to the Family. https://www.unicef.org/uganda/press-releases/moving-diagnosis-malnutrition-family

[12] Tickell, K.D., Achieng, C., Masheti, M., Anyango, M., Ndirangu, A., Diakhate, M.M., *et al.* (2023) Family MUAC Supported by a Two-Way SMS Platform for Identifying Children with Wasting: The Mama Aweza Randomised Controlled Trial. *eClinicalMedicine*, **64**, Article ID: 102218. https://doi.org/10.1016/j.eclinm.2023.102218

[13] (2025) Buyende District Statistical Abstract for 2020. https://www.buyende.go.ug/sites/default/files/Buyende%20District%20Stastical%20Abstract%202020.pdf

[14] Rosenstock, I.M. (1974) Historical Origins of the Health Belief Model. *Health Education Monographs*, **2**, 328-335. https://doi.org/10.1177/109019817400200403

[15] Glanz, K., Rimer, B.K. and Viswanath, K. (2015) Health Behavior: Theory, Research, and Practice. 5th Edition, Jossey-Bass.

[16] Bandura, A. (2001) Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, **52**, 1-26. https://doi.org/10.1146/annurev.psych.52.1.1

[17] Nielsen, J. and Landauer, T.K. (1993). A Mathematical Model of the Finding of Usability Problems. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems—CHI'*93, Amsterdam, 24-29 April 1993, 206-213. https://doi.org/10.1145/169059.169166

[18] Alexandre, B., Reynaud, E., Osiurak, F. and Navarro, J. (2018) Acceptance and Acceptability Criteria: A Literature Review. *Cognition, Technology & Work*, **20**, 165-177. https://doi.org/10.1007/s10111-018-0459-1

[19] Pulvers, K.M., Lee, R.E., Kaur, H., Mayo, M.S., Fitzgibbon, M.L., Jeffries, S.K., *et al.* (2004) Development of a Culturally Relevant Body Image Instrument among Urban African Americans. *Obesity Research*, **12**, 1641-1651. https://doi.org/10.1038/oby.2004.204

[20] Alsyouf, A., Lutfi, A., Alsubahi, N., Alhazmi, F.N., Al-Mugheed, K., Anshasi, R.J., *et al.* (2023) The Use of a Technology Acceptance Model (TAM) to Predict Patients' Usage of a Personal Health Record System: The Role of Security, Privacy, and Usability. *International Journal of Environmental Research and Public Health*, **20**, Article 1347. https://doi.org/10.3390/ijerph20021347

[21] Duarte, L.S., Fujimori, E., Toriyama, Á.T.M., Palombo, C.N.T., Miranda, P.P.L. and Borges, A.L.V. (2016) Maternal Perception of Their Child's Nutritional Status at Less than Three Years Old. *Revista da Escola de Enfermagem da USP*, **50**, 771-778. https://doi.org/10.1590/s0080-623420160000600009

[22] Ramos, S.R., Paintsil, E., Ofori-Atta, A., Kusah, J.T., Amissah, K.A., Alhassan, A., *et al.* (2019) Prototype Development, Usability, and Preference of a Culturally-Relevant Pictorial Aid to Facilitate Comprehension of Likert-Type Levels of Agreement in Caregivers of Children Living with HIV in Ghana. *CIN*: *Computers, Informatics, Nursing*, **38**, 45-52. https://doi.org/10.1097/cin.0000000000000584

[23] Åström, E., Sundström, A.E. and Lyrén, P. (2022) Examining the Psychometric Properties of the Swedish Version of Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM) in a Clinical Sample Using Classical Test Theory and Item Response Theory. *Clinical Psychology & Psychotherapy*, **30**, 398-409. https://doi.org/10.1002/cpp.2808

[24] Klimek, L., Bergmann, K., Biedermann, T., Bousquet, J., Hellings, P., Jung, K., *et al.* (2017) Visual Analogue Scales (VAS): Measuring Instruments for the Documentation of Symptoms and Therapy Monitoring in Cases of Allergic Rhinitis in Everyday Health Care: Position Paper of the German Society of Allergology (AeDA) and the German Society of Allergy and Clinical Immunology (DGAKI), ENT Section. *Allergo Journal International*, **26**, 16-24. https://doi.org/10.1007/s40629-016-0006-7

[25] Sekhon, M., Cartwright, M. and Francis, J.J. (2022) Development of a Theory-Informed Questionnaire to Assess the Acceptability of Healthcare Interventions. *BMC Health Services Research*, **22**, Article No. 279. https://doi.org/10.1186/s12913-022-07577-3

[26] Pascoe, G.C., Williams, J.E. and Reddy, P. (2018) Acceptability and Feasibility of Visual Aids for Child Nutrition Assessment in Low-Resource Settings. *Public Health Nutrition*, **21**, 2215-2223.

[27] Blaise Bucyibaruta, J., Peu, D., Bamford, L. and Van der Wath, A. (2022) Closing the Gaps in Defining and Conceptualising Acceptability of Healthcare: A Qualitative Thematic Content Analysis. *African Health Sciences*, **22**, 703-709. https://doi.org/10.4314/ahs.v22i3.75

[28] Bertolazzi, A., Quaglia, V. and Bongelli, R. (2024) Barriers and Facilitators to Health Technology Adoption by Older Adults with Chronic Diseases: An Integrative Systematic Review. *BMC Public Health*, **24**, Article No. 506. https://doi.org/10.1186/s12889-024-18036-5

[29] Lizama-González, D.V., Ramos-Ramírez, M.J., Lozano-Contreras, C.L., Bricio-Barrios, J.A. and Sanchez-Ramirez, C.A. (2018) Maternal Perception Regarding Nutritional Sta-

tus and Physical Appearance in Preschoolers. *Early Child Development and Care*, **190**, 277-283. https://doi.org/10.1080/03004430.2018.1465942

[30] Duarte, L.S., Fujimori, E., Minagawa Toriyama, A.T., Palombo, C.N.T., Borges, A.L.V. and Kurihayashi, A.Y. (2016) Brazilian Maternal Weight Perception and Satisfaction with Toddler Body Size: A Study in Primary Health Care. *Journal of Pediatric Nursing*, **31**, 490-497. https://doi.org/10.1016/j.pedn.2016.03.022

[31] Dalimunthe, I., Sembiring, T. and Evalina, R. (2021) Maternal Visual Perception of Children's Nutritional Status and Feeding Style. *Paediatrica Indonesiana*, **61**, 34-8. https://doi.org/10.14238/pi61.1.2021.34-8

[32] Wulandari, E., Wiboworini, B. and Widyaningsih, V. (2023) Maternal Dissatisfaction about Toddler's Body Size and Its Relationship to Children's Eating Behaviours. *International Journal of Human and Health Sciences* (*IJHHS*), **7**, 157-161. https://doi.org/10.31344/ijhhs.v7i2.545

[33] Dalal, P., Thaddanee, R., Parikh, A., Chauhan, H. and Morbiwala, S. (2019) Inappropriate Maternal Perception of Child's Weight Status: A Potential Threat to Nutrition. *International Journal of Contemporary Pediatrics*, **6**, 2091-2097. https://doi.org/10.18203/2349-3291.ijcp20193731

[34] Kim, L.P. and Mallo, N. (2019) Maternal Perceptions of Self-Weight and Child Weight May Influence Milk Choice of Participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). *Journal of Obesity*, **2019**, Article ID: 3654728. https://doi.org/10.1155/2019/3654728

[35] Nguyen, T., Trat, T., Tieu, N.T., Vu, L. and Sokal-Gutierrez, K. (2022) Key Informants' Perspectives on Childhood Obesity in Vietnam: A Qualitative Study. *Maternal and Child Health Journal*, **26**, 1811-1819. https://doi.org/10.1007/s10995-022-03502-6

[36] Mchiza, Z.J., Goedecke, J.H. and Lambert, E.V. (2011) Intra-Familial and Ethnic Effects on Attitudinal and Perceptual Body Image: A Cohort of South African Mother-Daughter Dyads. *BMC Public Health*, **11**, Article No. 433. https://doi.org/10.1186/1471-2458-11-433

[37] Alhassan, Y., Twimukye, A., Malaba, T., Myer, L., Waitt, C., Lamorde, M., *et al.* (2022) "It's Only Fatness, It Doesn't Kill": A Qualitative Study on Perceptions of Weight Gain from Use of Dolutegravir-Based Regimens in Women Living with HIV in Uganda. *BMC Women's Health*, **22**, Article No. 246. https://doi.org/10.1186/s12905-022-01814-x

[38] Sewannonda, A., Medel-Herrero, A., Nankabirwa, V. and Flaherman, V.J. (2022) Experiences and Attitudes Related to Newborn Feeding in Central Uganda: A Qualitative Study. *PLOS ONE*, **17**, e0274010. https://doi.org/10.1371/journal.pone.0274010

[39] Ickes, S.B., Heymsfield, G.A., Wright, T.W. and Baguma, C. (2016) "Generally the Young Mom Suffers Much:" Socio-Cultural Influences of Maternal Capabilities and Nutrition Care in Uganda. *Maternal & Child Nutrition*, **13**, e12365. https://doi.org/10.1111/mcn.12365

[40] Sewannonda, A., Medel-Herrero, A., Nankabirwa, V. and Flaherman, V.J. (2022) Experiences and Attitudes Related to Newborn Feeding in Central Uganda: A Qualitative Study. *PLOS ONE*, **17**, e0274010. https://doi.org/10.1371/journal.pone.0274010

[41] Abaasa, C.N., Rukundo, G.Z., Ayesiga, S., Atukunda, S.P., Campisi, S., O'Hearn, S., *et al.* (2021) Healthcare Providers and Caregivers' Perspectives on Factors Responsible for Persistent Malnutrition of under 5 Children in Buhweju District, South Western Uganda; a Phenomenological Qualitative Study. *BMC Public Health*, **21**, Article No. 1495. https://doi.org/10.1186/s12889-021-11432-1

[42] Tugume, P., Mustafa, A.S., Walusansa, A., Ojelel, S., Nyachwo, E.B., Muhumuza, E., *et al.* (2024) Unravelling Taboos and Cultural Beliefs Associated with Hidden Hunger

among Pregnant and Breast-Feeding Women in Buyende District Eastern Uganda. *Journal of Ethnobiology and Ethnomedicine*, **20**, Article No. 46. https://doi.org/10.1186/s13002-024-00682-z

[43] Saeed, N., Khan, S.K., Raheed, H.M. and Hussain, M.Z. (2018) Empirical Analysis of Socio-Economic Factors Effecting Nutritional Status of Children (1 - 5) of Age. *International Journal of Civic Engagement and Social Change*, **5**, 1-18. https://doi.org/10.4018/ijcesc.2018100101

[44] Singh, S., Shri, N. and Singh, A. (2023) Inequalities in the Prevalence of Double Burden of Malnutrition among Mother-Child Dyads in India. *Scientific Reports*, **13**, Article No. 16923. https://doi.org/10.1038/s41598-023-43993-z

[45] Muraya, K.W., Jones, C., Berkley, J.A. and Molyneux, S. (2016) Perceptions of Childhood Undernutrition among Rural Households on the Kenyan Coast—A Qualitative Study. *BMC Public Health*, **16**, Article No. 693. https://doi.org/10.1186/s12889-016-3157-z

Abbreviations

CAO	Chief Administrative Officer
DHO	District Health Officer
DPO	District Production Officer
FGDs	Focus Group Discussions
FRS	Figure Rating Scale
HBM	Health Belief Model
KIIs	Key Informant Interviews
NDP	National Development Plan
SCT	Social Cognitive Theory
UDHS	Uganda Demographic Health Survey