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“A child may be tall but stunted.” Meanings attached to childhood height in Tanzania

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Abstract

Stunting affects large numbers of under-fives in Tanzania. But do caretakers of under-fives recognize height as a marker of child growth? What meanings do they attach to linear growth? An ethnographic study using cultural schemas theory was conducted in a rural community in Southeastern Tanzania to investigate caregivers' conceptualizations of child height in relation to growth and the meanings attached to short stature. Data for the study were collected through 19 focus group discussions, 30 in-depth interviews, and five key informant interviews with caregivers of under-fives, including mothers, fathers, elderly women, and community health workers. Principles of grounded theory guided the data management and analysis. Although caregivers could recognize height increments in children and were pleased to see improvements, many held that height is not related to nutrition, health, or overall growth. They referred to short stature as a normal condition that caregivers cannot influence; that is, as a function of God's will and/or heredity. While acknowledging short stature as an indicator of stunting, most participants said it is not reliable. Other signs of childhood stunting cited by caregivers include a mature-looking face, wrinkled skin, weak or copper-coloured hair, abnormal shortness and thinness, delayed ability to crawl/stand/walk, stunted IQ, and frequent illness. Culturally, a child could be tall but also stunted. Traditional rather than biomedical care was used to remedy growth problems in children. Public health programmers should seek to understand the local knowledge and schemas of child stature employed by people in their own context before designing and implementing interventions.

KEYWORDS

child growth, height, malnutrition, short stature, stunting, Tanzania

1 | INTRODUCTION

Childhood stunting (low height-for-age) is a growing public health problem, particularly in Sub-Saharan Africa (SSA). It is estimated that 36% of all stunted children worldwide live in this region (UNICEF,

2016). Due to population growth, trend analyses for the SSA in general and East Africa in particular show the number of stunted children increasing through 2020 (Afan-Holmes et al., 2015; de Onis & Branca, 2016; Nordang, Shoo, Holmboe-Ottesen, Kinabo, & Wandel, 2015).

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Tanzania is ranked third among the SSA countries in childhood stunting (Semali, Tengia-Kessy, Mmbaga, & Leyna, 2015; UNICEF, 2016), despite a reduction from 48% (1996) to 42% in 2010 (Tanzania Demographic and Health Survey [TDHS], [National Bureau of Statistics, ICF Macro, 2011]). Nationally, chronic malnutrition or stunting affects 34.7% of children under the age of five (TDHS-MIS, 2015–2016). Within the country, there is considerable variation in stunting between rural and urban settings, between zones, and between regions (ibid). The evidence indicates that stunting prevalence is higher in rural communities (39%) than urban communities (30%; TDHS, 2010; TFNC, 2014; UNICEF, 2016) and is very high in the Southern Highlands (45%) and the South West Highlands (43%) (TDHS-MIS, 2015–2016). In three regions, more than half of children are chronically malnourished: Rukwa (56%), Njombe (49%), and Ruvuma (44%; ibid). Overall, more than 2.7 million children under age five in Tanzania are stunted, and one in six children aged 24–35 months is severely stunted (ibid).

Stunting begins in utero and continues through early childhood (de Onis & Branca, 2016; Victora et al., 2008). Stunted children are known to become short adults (de Onis & Branca, 2016; Dewey & Begum, 2011). Stunting is associated with increased child morbidity and mortality (Semali et al., 2015), poor cognition and educational performance, low adult wages and lost productivity (de Onis & Branca, 2016; Kar, Rao, & Chandramouli, 2008), impaired behavioural development in early life (Hoddinott, Alderman, Behrman, Haddad, & Horton, 2013), delayed development of motor skills (Brown & Pollitt, 1996), and chronic disease risk in adulthood (Adair et al., 2013; Dewey & Begum, 2011; Smith & Haddad, 2015; Victora et al., 2008). Stunted girls are more likely to give birth to low birth weight children (Bisai, 2010; Britto et al., 2013). Recent evidence suggests that stunting in childhood is not associated with metabolic syndrome components in young adults (Grillo, Gigante, Horta, & de Barros, 2016).

Linear growth (an increase in the length/height of a child) is considered as the best overall indicator of child well-being, providing an accurate marker of inequalities in human development (de Onis & Branca, 2016). The objective of routine growth monitoring is the early detection of growth failure to allow for timely interventions and the prevention of further growth failure (Hasegawa, Ito, & Yamauchi, 2017; Hossain et al., 2018). The evidence suggests that the early detection of future stunting (i.e., the identification of high-risk children at an early stage) is crucial step for preventing malnutrition (Hasegawa et al., 2017). Yet the health care systems in most countries with a high prevalence of stunting, including Tanzania, have been focusing on the routine monitoring of weight, rather than linear growth (de Onis & Branca, 2016; Ruel, Rivera, & Habicht, 1995). This practice may contribute to the lack of awareness among families, health workers, and policymakers of the magnitude and the consequences of stunting as a public health issue (Dewey & Begum, 2011).

In Tanzania, several studies on determinants of undernutrition have been conducted (Chirande et al., 2015; Hadley, 2005; Howard, 1994; Nordang et al., 2015; Sellen, 1999; Semali et al., 2015). These studies however, do not explain how community members conceptualize height or the relationship between short stature and child growth. Similarly, although the first step in preventing and treating stunting is to identify it as a problem (de Onis & Branca, 2016), the

Key messages

- To develop effective interventions targeting linear growth, it is important to understand “local” definitions of child stature, as well as what “stunting” as a concept means to the community and how it is used.
- The use of the term *kudumaa* in counselling mothers about stunting may not send a clear message that will motivate mothers to invest in taking action to encourage the linear growth of their children. Health professionals would have a greater impact if they used the specific term *ufupi* (short stature) when referring to stunting.
- It is crucial to find ways to inform caregivers that short stature is a nutrition-related problem and that linear growth is associated with adequate care.
- A comprehensive educational approach that combines the knowledge and cultural frameworks of both caregivers and health care providers is needed to overcome growth deficits among under-five children.
- Engaging local resources, such as religious leaders and traditional healers, is crucial to the utilization and sustainability of stunting reduction interventions.

extent to which caregivers understand linear growth and are able to identify stunting remains unclear. Parents' levels of concern about their children's growth and their willingness to take action greatly depend on their interpretations of growth indicators. Therefore, understanding the caregivers' perceptions of child height—particularly short stature—in relation to growth is an important step towards addressing childhood stunting.

This study employed a cognitive anthropological perspective on cultural meaning systems (cultural schema theory) to investigate caregivers' perceptions of child height in relation to growth and the meanings they attach to short stature. Cultural schema theory was developed by cognitive anthropologists (D'Andrade, 1884; D'Andrade & Strauss, 1992; Strauss, Quinn, & Meeting, 1997). D'Andrade (1884) argued that a community's cultural meaning systems are composed of shared cultural schemas, including mental constructs, which form the reality-defining system of the human and provide information about what states of the world can be and should be pursued. Schemas may include beliefs, perceptions, emotions, goals, values, and discourses (D'Andrade & Strauss, 1992; Hill & Cole, 1995). These schemas are therefore context-specific interpretive devices (D'Andrade, 1884) that facilitate the creation of knowledge and the attribution of meaning to objects (Metta et al., 2015). Thus, how a certain health condition is conceptualized (e.g., short stature) depends on each community's cultural meaning systems (ibid). Strauss et al. (1997) stated that schemas exist for all kinds of phenomena (including child growth) and are embedded in broader systems of cultural meaning. By applying a cognitive anthropological perspective on cultural meaning systems in different contexts, such as diabetes (Metta et al.,

2015), HIV/AIDS (Bailey & Hutter, 2006), and complementary feeding (Monterrosa, Pelto, Frongillo, & Rasmussen, 2012), scholars have been able to understand the meanings given to symptoms of a particular health condition/child feeding practice and how these meanings inform people's behaviour and care practices.

In the context of the current study, the wider community's cultural meaning systems or schemas inform caregivers' beliefs, perceptions, and behaviour, including those related to linear growth in their children. Consequently, we assume that whether caregivers seek help in treating the linear growth deficits of their children depends in part, on how their communities interpret and ascribe meaning to short stature in children. Thus, understanding the schemas and meanings caregivers attach to height and short stature in children is essential to developing effective interventions.

2 | METHODS

2.1 | Study setting

The fieldwork was conducted in Kilosa, the largest of the six districts of the Morogoro region located in Southern Tanzania, with an area of 14,918 km² and a population of 438,175 (218,378 males and 219,797 females), according to the 2012 National Census (National Bureau of Statistics, 2012). In collaboration with the Kilosa district administration, one village (Malangali village) in the district was chosen for the study based on its rural location, which typifies the general context of the Kilosa district. As in the majority of villages in Kilosa and in the Morogoro region in general, subsistence farming, including crop cultivation (mainly rice and maize) and livestock keeping, is the main economic activity of the study population. With its fertile land and weather conditions conducive to agriculture, the study village, like other parts of Kilosa, attracts many internal migrants. There are two main ethnic groups in the study village. The first is the native Bantu group, to which the majority of the population belong. The Luguru, Sagara, Kaguru, and Pogoro people are in this group. Other minority Bantu ethnic subgroups that have migrated to and settled in this area include, inter alia, the Sukuma, Nyamwezi, Zaramo, Gogo, and Hehe people. The second is the Maasai group, which is a Nilotic minority group of people who migrated to this area in the past two decades in search of pasture for their livestock. The majority of people in the village live in small traditional houses with mud walls, earth floors, and grass roofs. The majority use firewood as the main source of energy to prepare their meals. As the village has no electricity, most use paraffin as a source of light. Many village residents have primary education only.

2.2 | Health services

The study village is poorly served in terms of health infrastructure. Because there is no local health facility, the people in the village depend on health services from other villages outside of the ward, which are approximately 3–6 km away. The village has a limited transport infrastructure. The roads are poor and are passable only during the dry season. Moreover, there is no public transport connecting

the village with Kilosa town and neighbouring villages. Thus, accessing health services can be challenging for the residents. Within the village, there are two small privately owned drug shops (*maduka ya dawa*), both of which are operated by unqualified attendants who offer a variety of medications, including antibiotics and antimalarials, mostly without prescription. Due to the lack of health facilities in the village, child growth monitoring services (mainly weighing) are offered monthly in a meeting room of the village office (*ofisi ya kijiji*) by two trained community health workers (CHWs), who are both standard seven leavers. Generally, the CHWs are trained according to government standards to provide an integrated and comprehensive package of interventions, including health promotion and education, disease prevention, referrals, basic curative services, rehabilitative services, and surveillance. The CHWs in the study village are paid a small monthly allowance of 40,000 Tanzanian shillings (equivalent to 18 USD per month) by the village government. In general, the meeting room of *ofisi ya kijiji* is not conducive to providing growth monitoring services, as the room is too small to accommodate mothers and their children and has no facilities for them to sit while waiting to receive services. Thus, during GM visits, mothers and their babies sit outside of the building waiting to receive services, which can expose their babies to the elements, including the sun, wind, and rain. Moreover, because the office is used for both GM and village government activities, the schedule of the GM clinics can sometimes be disrupted by village government meetings, causing mothers and babies to wait for several hours to be served.

2.3 | Study design

Our ethnographic study was conducted to explore community members' perceptions of the relationship between child height and growth and the meanings they attach to short stature in children. Focus group discussions (FGDs), in-depth interviews (IDIs), and key informant interviews (KIIs) were used to collect data for the study. The design of the questions in the FGD and interview guides reflected the concepts that are embedded in the research questions and the cultural schemas theory. The guides were then pilot tested in a community outside of the study village, and the questions that did not seem to be clear or relevant to the interviewees were rephrased. During actual data collection, the guides were moderately rephrased to include more probes and to adapt the concepts/words to the context of the participants. Data for this study were collected in two separate rounds. The first round (July to September 2015) involved FGDs. The information gathered from the FGDs was used to contextualize the IDI and the KII question guides, which were then used in the second round of data collection (August to September 2016). The IDI guides were also adapted to address the gaps identified in the information obtained through the FGDs. In addition to providing detailed information on the caregivers' personal views about height and short stature in children, the IDIs helped researchers validate the information generated through the FGDs and address the gaps identified in the data collected during the first round of fieldwork. FGDs facilitated researchers access to the community and enabled them to gather data on participants' perceptions of short stature in relation to child growth. The IDIs and

KIIs allowed the researchers to explore in detail the caregivers' views on child height in relation to child growth and the meanings they attach to short stature.

2.4 | Data collection and participants recruitment

Data were collected through 19 FGDs, 30 IDIs, and five KIIs (see Table 1 for participants' information). Two researchers were involved in the data collection process: the principal researcher (first author) and a trained Tanzanian female research assistant with a postgraduate background in sociology. The researchers had advanced training in qualitative methods and extensive experience in qualitative data collection procedures. To enhance the research assistant's efficiency, she participated in the process of defining the research topic, the fieldwork logistic, the pilot study. The research assistant supported the principal researcher in taking field notes during the FGDs. All of the FGDs and interviews were conducted in Swahili, which is the local language spoken by the participants and the researchers. The moderator and the note taker held debrief sessions after every FGD. Although a majority of the IDIs took place at participants' homes, the FGDs were conducted in different venues in the village, such as school classrooms and the principal researcher's and the participants' home compounds.

Data collection was ended when no new information related to the interview questions was emerging. All of the interviews and FGDs were audio recorded using a digital recorder and were transcribed verbatim. Throughout the fieldwork, the principal researcher and her assistant took field notes of what they observed and heard, and they later expanded the notes into detailed descriptions. To initiate the discussion, the FGD participants were asked about community opinions on ideal child growth and were probed on a number of markers (including height) used in assessing healthy growth. Thereafter, they were asked about community perceptions regarding height in relation to the health/growth of a child and their interpretations of short stature in children and the determinants of a child's height. During in-depth interviews, the study participants were asked about their personal views and experiences regarding what a healthy/unhealthy child looks like and how they can tell that a child is growing well. Specifically, the parents of under-five children were asked to provide their views on the health and growth of their individual under-five child.

The parents who reported that their child was growing well were asked to justify their judgement. To solicit detailed information regarding their perceptions of linear growth, the participants were further probed on their personal views regarding height in relation to the health/growth of a child, their interpretations of short stature in a child, their views about the determinants of height in a child, and the difference between short stature and *kudumaa* (Please see Annex I, supplemental materials). Question guides with open-ended questions and probes (see Annex I, supplemental materials) were used to capture individual caregivers' conceptualizations of height in relation to growth and their personal views on short stature in children. When conceptualizing child growth and stature in particular, the FGD participants routinely mentioned *kudumaa* (local term for stunting). This prompted the researchers to probe their knowledge of the markers and causes of childhood stunting.

The participants in the FGDs and the IDIs were (a) mothers and fathers who had under-five children, regardless of their nutritional status and (b) elderly women aged 45 years and older. Community health workers (CHWs) and traditional birth attendants were interviewed as key informants. Purposive sampling was used to recruit different types of participants. The mothers and fathers who participated in the FGDs were identified with the guidance of village leaders and other relevant gatekeepers. A majority of the IDI participants were identified with the help of community health workers and through researchers' social networks. Key informants were approached based on their experience and knowledge of issues relevant for this research. The recruitment of participants continued up to the point of data saturation, when no new information in relation to the study interest was obtained from the interviews.

2.5 | Data analysis

All transcripts were analysed in Swahili, the original language and the mother tongue of the principal investigator (first author) and the research assistant, in order to preserve linguistic authenticity (Richards & Morse, 2007). Principles of grounded theory, as described by A. Strauss, Corbin, and Corbin (1998), guided the data management and analysis. While in the field, the principal researcher wrote brief notes about the analytical concepts that emerged from day-to-day encounters. This allowed for the validation of concepts as they were being

TABLE 1 Characteristics of focus group discussion, in-depth interview, and key informant interview participants

Activity	Number of the activity	Age range	Date of interview	Gender		Level of education	Inclusion criteria	Total
				Males	Females			
FGDs	19	18–74	July–September 2015	39	98	0–Form IV	Mothers and fathers who had under-five children, regardless of their nutritional status Elderly women aged 45 years and older	137
IDIs	30	17–71	August–September 2016	11	19	0–Form IV	Mothers and fathers who had under-five children, regardless of their nutritional status Elderly women aged 45 years and older	30
KIIs	5	39–50	August–September 2016	1	4	0–Standard 7	Community health workers and traditional birth attendants	5

Note. FGDs: focus group discussions; IDIs: in-depth interviews; KIIs: key informant interviews.

developed (ibid). The data transcription was done by the researchers and one hired transcriber. After the data transcription was completed, the principal researcher read the transcripts to identify the initial categories and to crosscheck the analytical concepts that emerged during the fieldwork. The words/phrases/paragraphs that captured the emerging issues were coded. The categories that arose from the transcribed data and the concepts that emerged during data collection formed the initial coding scheme. The patterns and the relationships between the categories were identified, and main themes were synthesized, which reflected the local conceptualizations and meanings attached to childhood height and short stature. Five categories emerged from the data: (a) height in relation to child growth, (b) the classification of short stature, (c) stature as a normal condition given at birth, (d) the cultural markers of stunting, and (e) cultural explanations for the aetiology of stunting (See Table 2, a summary of themes with illustrative quotes). Thereafter, a codebook with a description of what each code entails was developed. The codebook was then discussed among the PI and her two supervisors (third and fourth authors) and was refined after a unanimous consensus was reached. The codebook is attached as supplemental materials. The principal researcher then imported the transcripts to NVivo 11 software (QSR International Pty Ltd, Australia), which was used to facilitate the data analysis. She coded the data and then wrote a descriptive report. Additional data from field notes were used to clarify and expand the meanings cited by the caregivers.

2.6 | Ethical approval

The study obtained ethical approval from both the Groningen University Research Ethics Committee and the Tanzania Ministry of Health, Community Development, Gender, Elderly and Children through the Medical Research Coordinating Committee of the National Institute for Medical Research. The researchers also contacted local leadership for permission to conduct this study in their administrative areas. Verbal or written/thumbprint informed consent was obtained from all participants prior to their participation. The participants' anonymity was assured through the use of pseudonyms during the fieldwork. All identifiers were removed from the transcripts during the data-cleaning process.

3 | RESULTS

3.1 | Height in relation to child growth

In this study, some of the caregivers and particularly the older parents of under-fives and the community health workers, mentioned height as one of the markers they use to track healthy child growth (findings presented in another manuscript), but some did not see any link between stature and growth:

Height is not related to growth (ukuaji). Height is height and growth is growth. Somebody may be tall, but his/her growth have plenty of [health] problems. Tallness or shortness does not relate to growth at all. They are two different things. (Father, 43 years, IDI, farmer).

Similarly, although the community members indicated that they are aware of their children's height and are pleased to see them grow taller, most of the participants and particularly the women and the fathers of under-fives, said they believe that—in contrast to weight—height is not related to health and cannot be improved by nutrition, as height is mainly determined by hereditary and/or God's design. Thus, they observed, a child can be tall and yet still have health problems.

There is no relationship between height and a child's health. I may be born short, but when they measure my weight, they may find that I am even heavier than the tall one. (Mother, FGD-#01).

I: Does a child's height have any relationship to her health?

P: Not at all! A child can inherit shortness from her clan members, but s/he is healthy if s/he does not have diseases. That is how I see it. Being tall does not mean having good health. Not at all! You can be tall but not have good health [...] (Father, FGD-#03).

It therefore appears that in the participants' cultural model, aspects such as “being free of illness” and having a healthy weight are more important markers than height in defining what “being healthy” means. Additionally, the absence of a concept of height in the model of health and growth used by the participants is based on a shared schema that “height” is not an aspect of growth over which caregivers have control.

Although some caregivers incorporated height increment into their conceptualization of healthy growth, the general understanding of the ideal height for a child was vague:

I: “What can you say about height in relation to the growth of a child?”

R: “A child is supposed to have good growth. S/he should not be too short. S/he should have an average height. S/he should not be extremely short.” (KII, CHW, 40 years).

I: “What can you say about the height of your child (name) in relation to her growth?”

R: “She is growing well. She has an average stature. She is not tall. She has a normal height.” (Father, 54 years, IDI, farmer).

3.2 | Classification of short stature (ufupi)

Regardless of their age, religion, or ethnicity, the participants frequently pointed out that short stature (*ufupi*) does not always indicate poor child health/growth. They provided two specific classifications of short stature in children that reflect their cultural constructs (See Table 3). In their view, there is “normal short stature” (*ufupi wa kawaida*) and “stunted stature” (*ufupi wa kudumaa*). Unlike *ufupi wa kudumaa*, which is linked to ill health, normal shortness is referred as natural (*ufupi wa asili/ufupi wa kuzaliwa*). “*Ufupi* and *kudumaa* differ, as *ufupi* is natural while stunting is an illness.” (Father, FGD-#02).

TABLE 2 Result themes according to codes, description, and illustrative quotes from caregivers from rural South-Eastern Tanzania

Theme	Description	Codes	Illustrative quotes
Height in relation to child growth/health	Caregivers' knowledge and opinions on the relationship between height vs. health and child growth.	Height in relation to growth/nutrition	<p>"Shortness does not mean that a child is not growing well. Not at all! It is just how God creates them (children). Some are tall and some are short. Some are fat and some are thin. So, I do not see any reason to say that a short child lacks good care or is not growing well." (mother, FGD-#04).</p> <p>"Similar to what my fellows earlier said, height does not have any relationship with growth. It is just God's will. Look at me, I am short, does it mean that I am not eating rice (<i>ubwabwa</i>) [laughter]. If God says, 'let this one be short, tall, or extremely short,' you will be so. It is just his will. It does not mean you lack good nutrition. If the child had not been eating, s/he would have been dead. There is no relationship between height and <i>lishe</i> (nutrition). No matter how much you feed her/him (child), s/he will not grow tall." (mother, FGD-#02).</p> <p>"You find that both the child's father and mother are short. The child cannot grow tall no matter how they feed him/her." (elderly woman, FGD-#04).</p>
		Height in relation to health	<p>"With regard to health, height (<i>kimo</i>) is not about health. You can be short but have good health, which makes you totally different from a tall person. Being short does not mean you lack good health, and being tall does not mean you have good health." (father, 48 years, IDI, farmer).</p>
Classification of short stature (<i>ufupi</i>)	Cultural construction of the types of short stature: differences between <i>kudumaa</i> (stunting) and normal short stature	<i>Ufupi</i> and <i>kudumaa</i> differ	<p>"The child who is stunted is too short and her face looks too mature (<i>sura yake imekoma</i>). But the child who is short but not stunted has a baby face, her/his skin is soft (<i>ngozi teketeke</i>)." (mother, 42 years, IDI, farmer)</p> <p>"Looking at her/his hair, it looks too soft and light [thin]. It spreads randomly. And when it is too windy, it [hair] may start to fall out. But the child who is short but normal seems to have healthy hair." (KII, community health worker, 50 years).</p> <p>"Short stature is not an illness (<i>sio ugonjwa</i>). A child can be short yet very active, and play football very well. Another child's shortness may indicate an illness (stunting), as s/he does not have the ability to run here and there. So, we see that one as stunted and ill." (father, FGD-#01).</p> <p>"The child who is stunted differs from the one who is not. His intelligence becomes stunted. It has some deficiencies." (mother, FGD-#02).</p> <p>"Not all short children are stunted. There are those who inherited the shortness from their parents. But there are those who are short but the parents are tall. That could be due to a lack of good nutrition (<i>lishe bora</i>). A child with that particular kind of shortness (stunting) is usually weak (<i>dhaifu dhaifu</i>). A child whose shortness is hereditary does not grow tall, but s/he is active and her/his body is big (<i>amejazia vizuri</i>). S/he is chubby (<i>amenenepa</i>)." (KII, community health worker, 50 years)</p>
Stature as a normal condition given at birth	Local perceptions about the aetiology of a child's stature	Heredity	<p>"That (stature) depends on what your parents are like. To my knowledge, if the parents are short, a child will also be short. If a child turns out to be tall while the parents are short, you are shocked, wondering why this child is tall!" (father, FGD-#03).</p>
		<i>Mpango wa Mungu</i> (God's will)	<p>"You are not the one who makes a child grow. A child grows by the power of God. You only assist in providing care, such as food. But the one who makes a child grow is God. No matter how hard you try to care for her/him (child), if God refuses, do you think s/he will grow? S/he will never grow." (elderly woman, FGD-#05).</p> <p>"The way we understand it is that whether a person is short or tall is God's will (<i>Mpango wa Mungu</i>). That is how God planned them to be [...]" (father, FGD).</p>
		Stature is ascertained at birth	<p>"In most cases, a child or people who are destined to be short can be recognized at the time of birth. If his <i>vipingili</i> (the body parts between joints of arms and limbs) are short, you can be certain that this child will never be tall in his/her entire life. But if you see that the <i>vipingili</i> of</p>

(Continues)

TABLE 2 (Continued)

Theme	Description	Codes	Illustrative quotes
			her/his arms and legs are long, you know that the child will be tall later in his/her life." (father, FGD-#01).
Local knowledge about markers of <i>kudumaa</i>	Knowledge and perceptions about the signs of stunting	Physical appearance	<p>"Firstly, s/he usually has hair of an infant (<i>nywele za uchanga</i>). Her/his hair is not good. S/he is growing but still has the hair of an infant; hair that is too thin. Secondly, when you look at her/his face, s/he looks mature (<i>amekoma uso</i>), her face looks like that of an adult person, but her/his body looks small. That is a symptom of <i>kudumaa</i>. Thirdly, unlike a normal baby, her/his skin looks like that of an elderly person (<i>ngozi yake kama ya mzee</i>). Those three symptoms are the ones that indicate that a child is stunted, not the height." (father, FGD-#01).</p> <p>"S/he usually does not grow tall. S/he normally has a low height. That is when you realize that this child is stunted." (elderly woman, 45 years, farmer).</p> <p>"Another child may be tall, but his/her face looks mature. That is when we say that this little one is stunted." (mother, FGD-#04).</p> <p>"S/he is short and has a tiny dry body [<i>mwili mkavu</i>]. His/her body does not expand (does not become fat)." (father, 54 years, IDI, farmer).</p>
		Motor milestones	"A stunted child does not grow like other children. You find that when his/her age mates can walk but s/he cannot walk. S/he is still sitting down. Then you know that this child is stunted." (KII, traditional birth attendant, 48 years).
		Frequent illness	<p>"The child who is stunted usually has intermittent illnesses. S/he becomes sick easily, and is regularly hospitalized. Her/his growth (<i>makuzi</i>) is totally different from that of other children." (KII, community health worker, 40 years).</p> <p>"S/he is frequently sick. S/he may be hospitalized for a time, but as soon as s/he is discharged, s/he falls sick again. His/her health does not stabilize." (mother, unknown age, IDI).</p>
		Intelligence (<i>akili</i>)	"S/he can be tall but his/her <i>akili</i> (intelligence) is not similar to that of his/her peers. S/he cannot understand things as quickly as others. You then know that the <i>akili</i> of this one is stunted." (KII, traditional birth attendant, 48 years).
		Play and physical activity	<p>"His/her health is not good. S/he wants to stay with his/her mother all the time. S/he does not like to play with the Other children." (mother, 18 years, IDI, farmer)</p> <p>"S/he is extremely short, not active, and not as cheerful as her peers. Even when s/he plays, s/he segregates her/himself from others and plays alone." (KII, community health worker, 40 years).</p>
		Poor weight	"When you go to the clinic (growth monitoring clinic) they tell you that your child has some nutritional problems. When they assess his/her weight they find that s/he has lost some points in her weight." (elderly woman, FGD-#04).
Cultural explanations for the cause of stunting	Knowledge, beliefs, and perceptions about the aetiology of stunting	<i>Kubemenda</i> (causing poor growth through non-adherence to postpartum sex taboos)	"Another cause of stunting is ' <i>kukatikiza</i> '. A child can be born in good health, but her/his health can be stunted by her/his parents' sexual behavior [...]. If you have sex during the nursing period, the breast milk will become contaminated [by semen/sperms], and your baby will suck dirty milk. S/he will then experience sudden and frequent diarrhoea. S/he will become so weak and will eventually be stunted." (father, 43 years, IDI, farmer).
		Evil spirits/witchcraft	"In our community, people commonly throw <i>wadudu wabaya</i> (the evil spirits) everywhere. The evil spirit attacks you when you are breastfeeding your baby. After attacking you, some cause the child to be stunted, and some may even kill. If you are attacked by the spirit that makes a child stunted, you need to be treated by <i>dawa</i> (traditional medicine). When you go to traditional healers (<i>waganga</i>), they treat both you and the child.

(Continues)

TABLE 2 (Continued)

Theme	Description	Codes	Illustrative quotes
			Eventually, the child starts to walk again." (elderly woman, FGD-#05). "On top of illnesses, others (children) become stunted because of the evil spirits (<i>upepo mbaya</i>). When a child is attacked by the evil spirits, her/his growth is at risk (<i>bahati nasibu</i>)." (mother, FGD-#05)
		Heavy works	" <i>Kudumaa</i> in a child is caused by heavy work. A child may not have reached the proper age for doing some tasks, but you tell him/her: 'Go and carry a 10-litre bucket of water and bring it here.' The child carries the bucket on his/her head (<i>anajitwisha</i>). S/he then lacks the time and freedom to grow tall (<i>kupanda</i>). In that context, s/he must become stunted." (mother, FGD-#03)
		Infections	" <i>Kudumaa</i> (stunting) is caused by a child being given a heavy load (<i>mzigo mzito</i>) to carry; a load that is too big for her age. That's why s/he never grows tall." (father, 42, IDI, farmer) "Others become stunted due to diseases. For instance, there is a particular disease called sickle cell. This disease is very bad for children. In most cases, if a child with sickle cell does not attend the (growth monitoring) clinic, the disease makes him/her stunted. Firstly, s/he never grows tall. Secondly, the disease causes his/her intelligence (<i>akili</i>) to be stunted." (elderly woman, FGD-#02). "A child becomes stunted because s/he is frequently ill. When an illness attacks him/her, his/her growth is at risk (<i>bahati nasibu</i>). This means that although the years are passing, his/her body is still down (does not grow tall)." (mother, FGD-#05).
		Poor care	"The main thing that contributes to our children being stunted, particularly in rural areas, is inadequate nutrition. In most cases, our children do not get the foods that a young child is supposed to get. This greatly contributes to their being stunted." (elderly woman, FGD-#04). "A child may become sick today, but you have to wait for several days to take her/him to the hospital because you don't have money. In that case, even if a child had a good weight, s/he will lose some weight because you have delayed getting her/his medication." (father, FGD-#04).

Note. FGD: focus group discussion; IDI: in-depth interview; KII: key informant interview.

Normal shortness was also commonly referred as God's shortness (*ufupi wa Mwenyezi Mungu*). According to their cultural template, a seemingly short child is considered to be of normal height provided she/he is chubby (*ana mwili*), is smart, is active (*amechangamka*), is playful, has a baby face, and is not frequently ill (*haumwiumwi*). Other markers that a short child is healthy cited by the participants are that the child is cheerful, weighs enough (*ana kilo*), crawl/stand/walk on time, and has good skin. Distinguishing between normal shortness and stunting, participants explained:

There is a big difference between natural or normal shortness and kudumaa (stunted stature). A child with biological shortness usually looks fat; her/his health is good. You can clearly see that this one is short but is in good health. But the shortness of a child who is stunted is different. (Father, FGD-#02)

The one with God's shortness is active (kachangamka), but the other one (with kudumaa) is not active. (Elderly woman, IDI, age unknown)

The use of a short child's body image, heaviness, ability to crawl/stand/walk on schedule, and immune system as indicators of his/her health is influenced by shared schemas about healthy child growth (more details presented in another manuscript). According to these schemas, fatness, heaviness, freedom from illness, good eating habits, and the timely acquisition of motor skills are key markers of healthy child growth.

3.3 | Stature as a normal condition given at birth

In this study, caregivers commonly referred to short stature in a child as a "normal condition" (*hali ya kawaida*) that should not worry the parents. While conceptualizing short stature in relation to growth, the participants often stated that "shortness is not a disease" (*ufupi sio ugonjwa*) or "shortness does not matter" (*ufupi sio hoja*). They commonly depicted short stature as a condition caused by heredity (*kurithi*) or God's will (*Mpango wa Mungu*).

Shortness is natural. A child may inherit it from his/her father, grandfather, or mother. If his/her mother is

TABLE 3 Difference between *Kudumaa* (stunting) and normal short stature: the study participants' point of view

	Normal short stature (<i>ufupi wa kawaida</i>)	Stunted stature (<i>ufupi wa kudumaa</i>)
Interpretation	Natural (<i>wa asili/wa kuzaliwa</i>) Hereditary (<i>wa kurithi</i>) God's shortness (<i>ufupi wa Mwenyezi Mungu</i>). Not an illness (<i>sio ugonjwa</i>)	An illness (<i>ugonjwa/ufupi wa matatizo</i>) Poor health Poor growth
Physical markers	Having a baby face Is having healthy skin (i.e., soft/babyish skin (<i>ngozi tekeke/ya kitoto</i>) Being chubby/big body size (<i>ananepa, amejazia, ana mwili, ana alya</i>)	Small body (<i>mwili mdogo</i>) Too short (<i>Kafupi sana</i>) Mature face comparable with that of an adult (<i>amekomaa uso kama mtu mzima</i>) Wrinkled skin that looks like that of an elderly person (<i>ngozi imesinyaa kama ya mzee</i>) Stiff skin (<i>ngozi ngumu</i>) like that of a mature person Immature skin for the child's age Skinny and dry body (<i>Amekomaa mwili/mwili mkavu/mkakamavu/mgumu</i>) Thin arms and legs and tight calf muscles (<i>vigimbi</i>) Body does not expand (does not become fat) Swollen belly or cheeks
Weight	Weights enough (<i>uzito wake mzuri</i>) Weight marker in green area of growth chart	Light body (<i>mwili mwepesi</i>) Weight marker in grey and red colours in the green area of the growth chart Weight loss
Play and physical activity	Active (<i>Kachangamka</i>) Playful (interacts with peers) Robust	Not active (<i>hachangamki</i>) Not playful Does not like to play with peers Always wants to stay with her/his mother Does not have physical strength (<i>hana nguvu</i>) Has a weak body (<i>mwili dhaifu/kanyongea</i>)
Immunity	The child is free of illness/not intermittently sick (<i>haumwiumwi</i>)	The child is intermittently sick (<i>anaumwiumwa</i>) Illnesses do not pass away from him (<i>magonjwa hayampitii mbali</i>) The child is vulnerable to disease and is regularly hospitalized
Motor milestones	The child crawls/stands/walks on time. The child is able to run	Unsteady limbs/arms The child fails to crawl/stand/walk on schedule. The child's peers can walk/run but s/he cannot.
Intelligence	Is intelligent (<i>ana akili</i>) Is clever (<i>mjanja</i>) Has good memory Quickly understands parents' instructions	The child has stunted cognitive abilities (<i>akili imedumaa</i> ; i.e., is not smart, not clever, is forgetful/struggles to understand parents' instructions).
Child's mood	Is cheerful/looks happy	The child is not cheerful (<i>hana furaha</i>).
Hair condition	Healthy hair	The child has stunted hair (dull, too weak, too soft for his/her age [infant's hair], or copper/brown in colour [<i>nywele za shaba</i>]).

short, s/he will later be short; a normal level of shortness. So shortness certainly comes from the person's clan. S/he grows well, but s/he can't grow tall. (Elderly woman, FGD-#03).

Some of children are short but others are tall. I find it to be normal. That is how Almighty God created them, nothing more. (Mother, 42 years, IDI, farmer).

They believed a child's stature is a condition given at birth with no voluntary control. In their views, similar to child's skin colour or sex, the child's stature is formed by God during conception, and whether a child will be tall or short in the future is usually ascertained at the time of her/his birth:

Child's height is created since the time of conception (tangu mimba inaingia). During conception, God clearly knows that this child will be tall or short, a girl or a boy. That is why the child's height can be known as soon as s/he is born. (Elderly woman, FGD-#04).

On the basis of the shared schemas that God is responsible for a child's height, they believed that differences in height are not a problem, as these differences exist because God created people in different colours, shapes, and sizes:

Shortness is God's creation. God made us differently so that some people are short and some are tall. Having a child who is short should not cause the parent to worry. Shortness is a sign of God's creativity and blessings. God brought us into the world to live, and not to be similar. God innovates: this one will be white, this one black, and that one brown; this one will be short and that one tall. (Father, 43 years, IDI, farmer).

To explain their schemas in which height differences between children are seen as God given, some participants drew examples from the differences between people's fingers.

Some are tall, some are short. That is the shape that God created. That is why even in our hands, He [God] created five fingers, starting from a short one, to a relatively long one, to the longest one. (Father, 45 years, IDI, farmer).

God is the one who creates children. Some are short while some are tall. It is God who creates his people. Look at the fingers, they are not the same. They are also created by God. That is the reality. (Mother, 18 years, IDI, farmer).

Caregivers' shared schemas, in which heredity or God is seen as the cause of differences in human height, appear to inform the actions they take in response to a child's linear growth. Participants believe that caregivers have no control over the height of their children and that, unlike weight, a child's height cannot be improved through adequate nutrition and medical care:

There is nothing that I can do to make a child tall. Even if you feed her/him good food, vegetables, s/he cannot be tall. As educated people, you must explain it based on

your science, but in a real sense, there has never been something like human-influenced tallness. I disagree! A human being cannot make a child tall. (Elderly woman, age unknown).

Religious teachings emerged as important sources of cultural schemas about the aetiology of child's stature and seem to have informed the lack of willingness among caregivers to question short stature in children:

The height of a child is God's will. I cannot question it. I attended 'chuo' [Islamic religious education]. We were taught to never question God's decision to make some people short and others tall. Because the one who created them is God Almighty. (Elderly woman, 76 years, IDI).

3.4 | A child can be tall but also stunted: Local knowledge about markers of *kudumaa*

Given the widespread distinctions between normal short stature and shortness that indicate *kudumaa*, the researchers therefore asked participants how they can tell that a child is stunted. The local model of *kudumaa* (see Figure 1) includes some elements derived from the bio-medical model, although the two models differ. Although short stature (*ufupi*) is seen as an important indicator that a child is stunted, the caregivers said they do not view shortness as an independent marker of stunting. They also expressed the belief that a child can be tall but stunted. As one mother put it, "Another child may be tall but also stunted. Looking at the way s/he grows, you can just tell that this one is tall but her growth (referring to general growth) is stunted." (Mother, FGD-#06).

The participants' view that *ufupi* is just one of many important markers of stunting appears to be embedded in the cultural meanings they assign to the word *kudumaa*. Although standard Swahili dictionary refers to the word *kudumaa* as having short stature (Taasisi ya Uchunguzi wa Kiswahili [TUKI], 2013), participants used it to refer to any sign of poor growth and development in a child. Accordingly, in their description of a stunted child, they often used concepts such as "stunted hair," "stunted face," "stunted body," "stunted skin," or "stunted *akili*" (intelligence).

Generally, the participants appear to believe that *kudumaa* goes beyond short stature to indicate faltering growth in a very broad sense. A wide range of cultural signs was cited as indicators of *kudumaa*; if these signs are not present, a child cannot be labelled as stunted based on *ufupi* alone. Physical signs are among the common markers of stunting mentioned by the participants. These markers include the appearance of the face, body, skin, belly, and hair. For example, a child may be considered stunted if she/he has a face and skin comparable with that of a mature person (*amekomaa uso/ngozi kama mtu mzima*), looks short and is so skinny (*mwili mkavu*) that his/her muscles are visible through the skin, has mature and wrinkled skin like that of an elderly person, or has immature skin for his/her age. Additionally, mothers participating in one FGD added that a stunted child looks too short and has thin arms, legs, and tight calf muscles (*vigimbi*):

S/he looks short and her face looks like that of an adult. Others may be tall but her face is too old. Therefore,

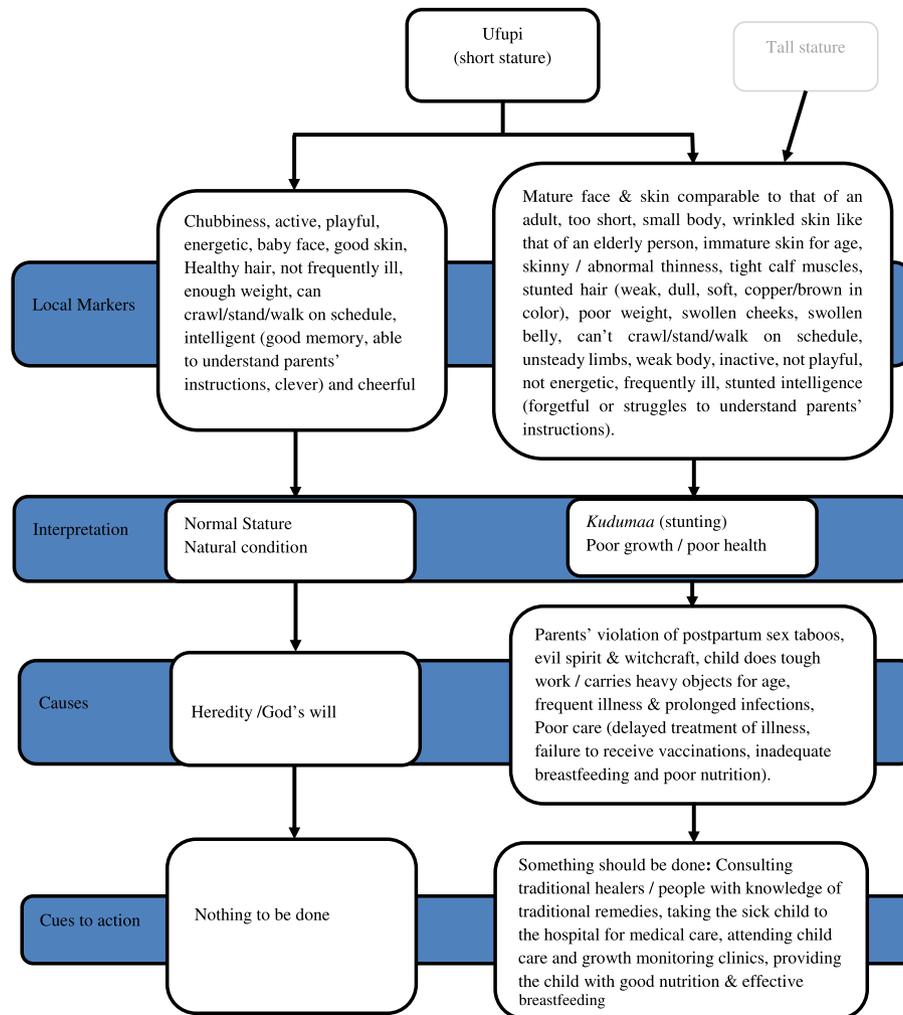


FIGURE 1 Diagnostic flow gram of linear growth: a cultural lens

when people look at her/him they say, "This one has been stunted. Look at her/his face, it is too old." (Mother, FGD-#04).

When s/he sits down, her/his back muscles are visible through the skin. So we say that this one is stunted. (Father, FGD-#02).

Her/his body usually looks too mature (amekomaa). Even her/his arms (vikono vyake) become too mature. S/he is just a little child but her/his legs have tight calf muscles. (Mother, FGD-#03).

A few of the participants, particularly the older women and the fathers of under-fives, added that a child can also be perceived as stunted if has a swollen belly or cheeks. Some of the participants, including the community health workers, described a child as stunted when his/her hair is dull, too weak, too soft for his/her age, or is copper/brown in colour (*nywele za shaba*). These are, in fact, symptoms of kwashiorkor or protein-energy malnutrition:

Her/his hair becomes reddish like copper. It doesn't look healthy. That's when you know that this one is not growing (stunted). (Father, 50 years, IDI, farmer).

The use of appearance as a heuristic for determining whether a child is stunted seems to be influenced by shared schemas about how a healthy baby should look.

In addition to noting these physical markers, the caregivers commonly described a stunted child as one who is frequently ill, is not active (*hachangamki*), is not playful, and has a weak body:

S/he is different (from the one with normal shortness). As I told you earlier, s/he is not as active as her/his peers. S/he is a bit weak. Her/his calmness is extreme; you could mistake her/him for a child with "utapiamlo" (malnutrition). (Elderly woman, FGD-#04).

S/he may be growing well (in height). But s/he appears to have stunting (*udumavu*). Her/his body appears to have (health) problems. S/he is not as active as her/his peers who are growing well. (KII, Community health worker, 40 years).

According to the community health workers and a few women, poor weight is an important dimension that defines a stunted child:

One may not grow tall. Another child may be tall but is light (not heavy). (Elderly woman, FGD-#01).

You can also tell from her/his weight. When you look at her/him, s/he appears too small; but when you check her/his clinic card (growth chart), you realize that s/he is older than her appearance. When you put her/him on the scale, her weight falls on red and grey colour (of the growth chart). (KII, Community health worker, 50 years).

Some of the older women and the fathers of under-fives explained that a stunted child has unsteady upper and lower limbs and fails to achieve expected motor milestones on schedule. Culturally, a child is expected to be able to sit at 4–5 months old, crawl at 6–7 months old, stand at 8–9 months old, and walk at 10–12 months old.

In the present study, the caregivers used other children and particularly those of similar ages, to benchmark the growth of their own children. When asked how they would know if a child was stunted, the caregivers frequently said they would compare a child's stature and motor skills with those of other children of similar ages:

You will clearly recognize if your child is stunted. You find that the children of other women who gave birth at same time as you are growing rapidly, but yours is becoming stunted. S/he is not growing. While her peers grow, s/he becomes smaller than them. That is when you realize that that the child is stunted. (Mother, FGD-#06).

I say that a child is stunted because ... let's assume that a child is one year old. His/her fellow child of one year old can walk, but s/he is still sitting or crawling. You must say that this one is stunted. Same date, same month [of birth], others can walk but s/he cannot. You must consider her as stunted (Father, FGD-#04).

The mothers in a few of the FGDs referred to “stunted cognitive ability” (*kudumaa kwa akili*) as one of the markers they use to identify *kudumaa* in a child. Through probes, the fathers and the elderly women also confirmed that intelligence is an important indicator that parents use to ascertain *kudumaa* in their children. Culturally, a child is seen as stunted if she/he is forgetful or struggles to understand her parents' instructions:

The intelligence of a stunted child has deficiencies. If you send her somewhere to get something, s/he has no sense of direction (looks confused). If you send her to the shop, s/he does not bring back the things you sent her for. Sometimes s/he goes there and forgets, and comes back to ask, “What did you send me for?” (Mother, FGD-#04).

3.5 | Cultural explanations for the cause of “stunting”

The cultural construction of stunting (*kudumaa*) reflects faltering growth that goes beyond height deficits. Participants cited aetiology of childhood stunting that deviates from those cited in the biomedical model. Their perceptions of the aetiology of childhood stunting appear to be a blend of ideas derived from both the biomedical model and

their cultural meaning systems. Here, we present the participants' perceptions of the aetiology of stunting, starting with those that are based on cultural meanings, followed by those that are in line with the biomedical model.

When asked about the aetiology of stunting, the participants spontaneously mentioned *kubemenda*; that is, the belief that poor child growth and development and ill health are caused by the parents' violation of postpartum sexual abstinence norms. Culturally, it is believed that a child's growth can be impaired when (a) the parents have sexual intercourse while a baby is still breastfeeding (b) or during a new pregnancy while the mother is still lactating (*kukatikiza/kumruka mtoto*). According to the participants, when a nursing woman engages in sexual intercourse, her vaginal excretion and a man's semen/sperm (*manii/mbegu*) run toward the woman's breasts and pollute the milk. Thus, when the baby sucks the milk blended with genital fluids, she/he eventually contracts diarrhoea and her growth falters. Additionally, it is believed that when sucked by the baby, the genital fluids flow towards the baby's legs, which weaken the joints and cause the baby to lack the strength to stand/walk on schedule (one of the cultural markers of *kudumaa*). It is also believed that a new pregnancy alters the mother's body temperature, which eventually spoils her breast milk by making it hot, turning it into colostrum of a yellowish or brownish colour. Thus, when a baby sucks the spoiled milk, she/he experiences diarrhoea and vomiting. Similarly is believed that both the body heat (*joto*) and the sweat (*jasho*) generated by the sexual act and a new pregnancy inflict ill health and general body weakness on the child, particularly when a parent touches/carries the baby. (More details are presented in another manuscript).

Although the belief about the violation of postnatal sexual taboos and its impact on child growth also exists among the Masai community, it was rarely mentioned by the Masai participants, particularly the mothers of under-fives, when discussing the aetiology of stunting. Whereas the majority of the participants in the study setting linked *kubemenda* to general signs of growth faltering, a few of them linked it to short stature in children:

A child can be stunted because of the (behavior of) a father and a mother. When you engage in sexual intercourse (tendo la ndoa) carelessly, without any plan to protect the child, s/he will be stunted even if s/he was healthy and tall. When a child sucks her/his father's dirties (“uchafu”) i.e. semen/sperm, which contaminate the mother's breast milk, that child must be stunted. That is a fact that cannot be refuted. There are two sorts of shortness (ufupi), God's shortness (ufupi wa Mungu) and the one that we parents create [...] (Fathers, FGD-#05).

A few of the mothers and the elderly women in the FGDs, all of whom belong to the Bantu ethnic groups, ascribed *kudumaa* to witchcraft or invasion by capricious, malevolent spirits (*mdudu* or *upepo mbaya*):

As we said, there are some wadudu wabaya (evil spirits), which get into a child's body and make her/him stunted. So that child will never move; s/he only sits and may not

even be able to crawl. There are those who are stunted due to diseases, but there are those who are stunted due to evil insects. (Elderly woman, FGD-#05).

Beliefs in witchcraft (*uchawi*) or the infliction of evil spirits is widespread in the study setting and particularly among the Bantu ethnic groups and are mentioned in everyday conversations. Participants said they believe there are evil spirits roaming in the air that can attack children and cause them to become ill. Similarly, they also believe that some people have bad eyes, and the power to keep and control *majini* (evil spirits) that they intentionally send to harm children (*kurushiwa jini*) out of jealousy or hatred. The evil spirits are said to have the ability to cause children to develop symptoms of seemingly normal conditions, such as severe malaria (*degedege*), or to become too weak to walk. It is also believed that these spirits can stop a fetus from growing. In most of these cases, traditional healers (*waganga*) are consulted to detect the presence of evil spirits and to provide treatment. This is particularly when a caregiver believes that the condition is supernatural or when biomedical treatments have failed or are taking too long. The healers are also asked to protect children and unborn babies by preparing charms and amulets (*kamwa* or *azama*).

Another prominent cultural explanation for stunting in the study setting is that height deficit in particular is caused by forcing children to carry objects that are too heavy for their age or to perform tough chores while still young. Participants explained that mothers who are overwhelmed by their gendered tasks may seek support from their young children in performing domestic chores, such as fetching water and collecting firewood, that can limit a child's height and cause his/her skin to age prematurely:

When you make a young child to carry a bucket full of water that weighs 20 kg, do you think s/he will grow? Do you expect her to be tall? ... Children grow up doing hard work. We parents are the cause of that; we expose children to hard work. Sometimes you find that even the flesh of a child's buttocks ages. So others are stunted due to hard work. (Elderly women, FGD-#2)

Finally, in line with the biomedical model, almost all of the participants ascribed *kudumaa* to frequent and prolonged infections, poor care, including delays in the treatment of illness, the failure to get recommended vaccinations, inadequate breastfeeding, and poor nutrition. However, when discussing the impact of these factors, they often referred to cultural markers of *kudumaa* that go beyond short stature:

If you are not providing good food to children, they can be stunted. You find that if a child has been starving for a long time, his intelligence (akili) becomes stunted. (KII, Traditional Birth attendant, 48 years)

A child can be stunted for two reasons. First, a child may be stunted due to living in a difficult and unfavourable home environment. Stunting may also be caused by prolonged diseases in a child that delay his ability to crawl or walk. (Father, 43 years, IDI, farmer).

Thus, it appears that the cultural schemas of the participants regarding child stature and stunting include both biomedical explanations and locally held supernatural beliefs.

4 | DISCUSSION

In this ethnographic study, we aimed to explore caregivers' perspectives on child height in relation to child growth and the schemas that influence their interpretations of and the meanings they attach to short stature and stunting. Although we found that the participants integrated some biomedical concepts into their local models and practices, the constructs and the meanings they attach to height, short stature, and stunting in children are primarily embedded in their cultural template. Participants believed that child height is unrelated to nutrition, health, or growth. Short stature is generally perceived as a normal condition that is a function of God's will or of heredity and that cannot be influenced by caregivers. The caregivers acknowledged that short stature is one of the crucial indicators of stunting but said they do not see it as an independent marker, arguing that a child can be tall while also being stunted. Cultural and religious beliefs thus appear to shape the participants' interpretations of and the meanings they attach to short stature in children and to inform their actions.

4.1 | Short stature as a normal condition

Although short stature (low height-for-age) is considered to be a marker of growth deficiency and poor health (de Onis & Branca, 2016; Dewey & Begum, 2011; Reifsnider, Allan, & Percy, 2000; Ruel et al., 1995), the participants indicated that they perceive it as a normal condition that should not worry parents. Hence, a child's short stature may not motivate his/her caregivers to seek medical help if it is not accompanied by cultural signs. It has also been shown that "stunting goes unrecognized in communities where short-stature is so common that it is considered normal" (de Onis & Branca, 2016; Dewey & Begum, 2011). Although this may be a good explanation for the normalization of short stature in children, it does not appear to apply to our study population. Unlike in a biomedical context, the term "normal" (*kawaida*) used by our participants refers not to the high prevalence of short stature in the community but to the assumption that height is a natural condition determined by heredity or God's will (*Mpango wa Mungu*) and thus lies beyond the influence of caregivers. Furthermore, whereas the normalization of short stature appears to be shaped by shared schemas that linear growth in children is beyond caregivers' influence (God's plan), it may also reflect the relative poverty of the community members and the inability of the community's cultural meaning system to help individuals interpret symptoms of poor health, including short stature. The tendency of caregivers to ascribe certain health conditions to natural causes is also evident in other studies conducted in the same region as that of the current study. For instance, a study by Muela, Ribera, and Tanner (1998) about lay perspectives and health-seeking behaviour regarding malaria among children in South-Eastern Tanzania reported that "people habitually speak of *malaria* as a 'normal illness' (*ugonjwa wa kawaida*) or an 'illness of God' (*ugonjwa wa Mungu*)." They further clarified

that in the study context, the term normal (*kawaida*) does not refer to the high prevalence or the severity of the illness but instead expresses the belief that such an illness is part of the natural order created by God.

Chubbiness and heavy weight emerged as one of the important markers that a short child is nonetheless healthy. This view may be influenced by the participants' cultural constructs regarding healthy growth: That is, that heaviness and chubbiness alone are sufficient to show that a child is in good health and has been receiving good care (more details are presented in another manuscript). The schema that a short child with a fat/heavy body has "normal shortness" can cause caregivers to fail to recognize the risk of double malnutrition (i.e., stunting and obesity) and thus to fail to seek help.

In this study, the caregivers habitually relied on peer comparisons to judge whether a child was stunted using a number of criteria, notably the child's motor development skills and height increment. Notwithstanding, their general understanding of the ideal height for a child was vague. The lack of proper biomedical knowledge regarding linear growth trajectories in children has also been reported in studies conducted in Bangladesh (Hossain et al., 2018) and in Guatemala (Reifsnider et al., 2000).

These findings have implications for programs directed at reducing levels of stunting, as defined by WHO. The promotion of strategies to address the information gaps in the recognition of linear growth faltering among caregivers (Roberfroid, Pelto, & Kolsteren, 2007) and the integration of the concept of stunted (linear) growth into the awareness messages to mothers (Turnbull, Martínez-Andrade, Huérfano, Ryan, & Martínez, 2009), may help to improve linear growth outcomes. Although we agree with this suggestion, we would caution that it may take a long time for an emphasis on awareness messages to positively impact caregivers' mindsets, as the cultural schemas and meanings are shared, created, and performed within the wider community and are thus difficult to change (Bailey & Hutter, 2006). On the basis of our findings, we would argue along with Hossain et al. (2018) that in order to be effective, programs targeting childhood stunting need to be aligned with local interpretations of the condition. As Helman (2007) states, a person is unlikely to seek care and treatment for an illness unless its symptoms and signs are aligned with society's view of what constitutes an illness.

4.2 | The gap between cultural and biomedical framework of stunting

Although caregivers in this study seemed to integrate biomedical concepts into their understanding of stunting, their conceptualization of child height and their locally based knowledge of the markers of stunting diverged sharply from those of the biomedical model. Culturally, stunting is broadly conceptualized beyond height. Thus, in some cases, a short child can be considered healthy if he or she is chubby, active, and not frequently sick, and a tall child can be regarded as stunted if she or he portrays typical symptoms of *kudumaa*, including face and skin comparable with that of a mature person, abnormal thinness, inability to crawl/stand/walk on time, and unhealthy hair. This indicates that height and short stature in particular, is not the only

criterion in the cultural schema of growth, which suggests differences in the biomedical and the cultural perspectives on stunting.

The participants in the present study appear to believe that *kudumaa* (also referred to as *udumavu*) goes beyond short stature (*ufupi*) to indicate faltering growth in a very broad sense. This conception diverges greatly from the linguistic and the biomedical conceptualizations of stunting. Commensurate with the biomedical conceptualization of stunting, the word *kudumaa* is referred to in the standard Swahili dictionary as having short stature or height deficits (*ufupi*) owing to inadequate care, nutrition, and/or illness, and it can be used to refer to the growth of living things, including human beings, animals, and plants (TUKI, 2013). Despite this fact, people commonly use it generically to refer to any kind of poor growth and development, including that of children (*kudumaa kwa mtoto*), plants (*kudumaa kwa mimea*), or the economy (*kudumaa kwa uchumi*). In this study, for example, the use of the word extended to include poor condition of specific aspects of growth and development in a child such as "stunted hair", "stunted face", or "stunted intelligence." Participants' construction of the word stunting as a general term for "growth faltering" may be attributed to the contextual versatility of the word *kudumaa*, as highlighted in the foregoing paragraph.

The aforementioned findings highlight a need for revisiting the educational and promotional messages targeting child linear growth. This is because, if the language and conceptual framework understood by caregivers are in disharmony with those used by health professionals in nutrition programs, then chances of miscommunication may be high (Launer & Habicht, 1989), and the advice may not have the intended effect. Nutrition education is an important component of programs designed to improve child nutritional status, including linear growth. In Tanzania, however, its effectiveness can be impaired by the existing differences in the conceptual framework. The concerns on difference in concept meaning between local people and the biomedical model are also detailed in previous research in rural Mexico (Turnbull et al., 2009), in Guatemala (Reifsnider et al., 2000), and in Indonesia (Launer & Habicht, 1989). In the study setting, for example, the use of the term *kudumaa* in counselling mothers on poor linear growth of their children may not send a clear message that will motivate mothers to invest in promoting height of their children. Instead, health professionals and practitioners would make a great impact if they would directly refer to specific term "short-stature" (*ufupi*) when referring to stunting.

4.3 | The use of traditional care

These cultural schemas are relevant not only for conceptualizations of child height and markers of stunting but also for the aetiology of stunting and health-seeking behaviour. In the participants' cultural model, symptoms indicative of malnutrition—such as sudden weight loss, poor motor skills development, a swollen stomach, swollen cheeks, copper-coloured hair, pale skin, and cognitive retardation—can be ascribed to various factors, including the parents' violation of postpartum sex taboos and the invasion of evil spirits. These beliefs may prompt caregivers to seek care from traditional healers rather than from health professionals. Similar findings have been reported

elsewhere in Tanzania (Makundi, Malebo, Mhame, Kitua, & Warsame, 2006; Muela et al., 1998). It has for example, been shown that mothers' linking of severe malaria in children to supernatural causes them to rely on traditional healers for treatment of convulsions. While raising community awareness of the symptoms and aetiology of stunting is important, the engagement of traditional healers is central to the successful implementation of interventions against malnutrition. Studies conducted in Tanzania (Makundi et al., 2006) and elsewhere in SSA (Aubel & Samba-Ndure, 1996; Eliason, 1999) have shown the importance of using local resources, such as religious leaders and traditional healers, in ensuring the utilization and sustainability of health interventions.

For example, in a study done in Kilosa (the district in which this study was conducted), traditional healers were involved in the implementation of community-based rectal artesunate. The results showed that this approach improved the management of severe malaria in children by encouraging parents to seek biomedical treatment early (Makundi et al., 2006). It is therefore clear that traditional healers can provide valuable forms of assistance to caregivers concerned about the growth of their children because they are able to provide solutions and remedies that make sense to the community members. In line with Muela et al. (1998) and Makundi et al. (2006), we recommend the forging of alliances between medical health personnel and healers that focus on improving the capacity of healers to refer patients to medical clinics and on decreasing the likelihood that harmful traditional practices will be employed. However, more operational research is needed to determine how traditional healers can be successfully incorporated into interventions targeting poor growth in children.

5 | STRENGTHS AND LIMITATIONS

The current study has several strengths. Even though malnutrition, particularly stunting (short height-for-age), is one of the most serious health problems affecting under-five children and is the single greatest cause of child mortality in Tanzania, this is the first study in Africa to explore how caregivers of under-five children conceptualize child height and short stature in relation to child growth using qualitative methodology. Additionally, conducting FGDs and IDIs by applying cultural schema theory and using Swahili (the local language spoken by the majority in the study setting) and analysing the data in the original language resulted in rich data. Our study is also unique in that, unlike in previous studies, it included a sample of caregivers of under-five children from the general population, regardless of the growth status of their children. Because maternal and child nutrition are public health problems, we believe that by engaging various caregivers across generations in generating data for this study, our research sheds light on issues relevant to the development of policy and interventions. It is possible that the results would differ if the study sample included only caregivers whose children are confirmed as being stunted. Additionally, because the study was conducted in a rural part of the country, and the number of participants was small, the generalizability of the findings may be limited. However, we believe the study's findings are highly relevant to the wider Tanzanian

context, as a large share of the country's population lives in rural areas where the prevalence of childhood malnutrition is especially high (TDHS, 2010; Tanzania Food and Nutrition Centre, 2014; United Nations Children's Fund, 2016).

6 | IMPLICATIONS

In Tanzania, where approximately half of under-fives in rural communities are stunted, understanding caregivers' conceptualizations of child height in relation to growth and the meanings they attach to short stature is an important step in developing effective interventions to reduce or prevent stunting.

Stunting is currently identified as a major global health priority (de Onis & Branca, 2016), and global efforts to eliminate stunting are being scaled up, with an emphasis on multisectoral initiatives to address the underlying drivers of stunting (de Onis & Branca, 2016; Hossain et al., 2018). As part of a renewed commitment to address the problem of child undernutrition, the Tanzanian government has recently launched a five-year National Multi-Sectoral Nutrition Action Plan (NMNAP 2016–2021). The NMNAP is regarded as a “double duty” multisectoral action plan, as it intends to address both undernutrition (acute malnutrition and stunting) and the emerging double burden of malnutrition (NMNAP 2016–2021). Additionally, the government of Tanzania, together with various partners, have been implementing recommended preventive and curative interventions, including the early diagnosis and treatment of malaria in children and the increasing coverage of essential vaccination and deworming services and of micronutrient supplementation programs, such as vitamin A supplementation. On the basis of the study's findings, the authors argue that although the current programs are very valuable, they may fail to tackle childhood malnutrition if they do not use a bottom-up approach in designing interventions. To reduce childhood stunting among the rural population in the study area and similar settings in the country, public health programmers should:

- Try to understand the local perspectives and schemas of child height and short stature employed by people in their own context and use this knowledge in designing and implementing any intervention.
- Develop a more comprehensive educational strategy that merges the knowledge, conceptual frameworks, and terminologies of caregivers and health providers (including traditional healers). Behavioural change can only be successful if the new knowledge is contextualized and adapted to the frameworks of the participants. Thus, to draw people's attention to stunting, we need to explain the problem through their cultural frameworks, rather than negating these frameworks.
- Include routine screening of child height during growth-monitoring services. As stated by de Onis and Branca (2016), the visual challenges in identifying stunted children and the failure of primary health care services to routinely assessing linear growth, contribute to the lack of awareness of the magnitude of stunting. The inclusion of height assessment in routine growth-monitoring practices in Tanzania will facilitate the early

identification of children at risk of stunting and will thus allow practitioners to offer timely interventions and advice to mothers.

- Implement multifaceted and trans-disciplinary approaches that tackle childhood stunting by addressing inequalities within the community.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

CONTRIBUTIONS

Conceived and designed the experiments: ZM, HH, AB, SD.

Performed the fieldwork: ZM.

Analysed the data: ZM, HH, SD.

Wrote the paper: ZM, HH, AB, SD.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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