Research Article

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Fathers' Involvement in Child Care Practices to Improve Stunting among Under-five Children in Sumbawanga Rural District, Rukwa Tanzania

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Abstract

Introduction

Male involvement in childcare practices is crucial in shaping a child's health outcomes. Recognising that aspect of father's involvement can be applied as a method against stunting since it has been a public health concern for years. This study intends to describe how paternal involvement can serve as a prevention strategy to address stunting among under-five children in the Rukwa region.

Methods

A cross-sectional study design was conducted in Sumbawanga Rural District. This study used A multistage clustering sampling to obtain 359 father-child pairs. A questionnaire was used to collect data. Height and age measurements were standardised to WHO height for age Z-scores to determine stunting status among under-five children. Data were analysed by using STATA software, and descriptive statistics and bivariate and multivariate analyses were conducted.

Results

The magnitude of fathers' involvement in childcare practices was 43.8%. According to this study, fathers had moderate knowledge about children stunting, and the proportion of stunting among under-five children was 55%. Factors associated with stunting were male involvement and fathers' knowledge, while fathers with moderate knowledge and those who were highly involved in childcare were 46% and 52% less likely to have children with stunting compared to those with low knowledge of stunting (Adjusted OR=0.54; 95% CI [0.22- 0.87]; p-value= 0.046) and those who were less involved (Adjusted OR=0.48; 95% CI [0.26 - 0.92)]; p-value= 0.048) respectively.

Conclusion

This study suggests that increasing fathers' involvement in childcare practices may help address under-five stunting. The study underscores the significance of encouraging fathers to be engaged in childcare activities and educating them about stunting, which could potentially contribute to reducing the prevalence of stunting among under-five children.

Keywords: *Fathers' involvement, stunting, under-five children, Rukwa, Tanzania*

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INTRODUCTION

Linear growth is a strong indicator of healthy growth in early childhood. It is associated with different aspects of child development, including language, cognitive and sensory-motor abilities. The child is considered stunted if his/her height for age is more than two standard deviations below the median of the WHO child growth standard (Mchome et al., 2019). Stunting is often caused by adverse malnutrition, illnesses, food instabilities, insufficient dietary intake, and limited access to medical treatment (Makori et al., 2018). It affects children and families in short and long terms, with short-term consequences including decreased energy expenditure, poor physical and cognitive development, and distortion of the family's economy (Bogale et al., 2022, Jeong et al., 2023). Long-term consequences include higher diabetes risk, fat buildup, obesity, and poor maternal reproductive outcomes (Bogale et al., 2022, Jeong et al., 2023).

Stunting prevalence among under-five children is estimated at 22.3% globally, 43% in Africa, 31.5 % in sub-Saharan Africa and 30.6% in Tanzania. Stunting prevalence is higher in rural areas (33%) than in urban areas (21%) (TDHS, 2022, Kansiime et al., 2017). Interventions toward stunting have been implemented to address the situation in Tanzania. Programs like exclusive breastfeeding education, ASTUTE program which aimed to address child stunting in Tanzania by implementing activities in all districts of five regions in the Lake Zone by training more than 3,600 nutritionists, community health workers and health care providers where more than 8 million people were engaged through a comprehensive communication strategy, the five-year National Multi-Sectorial Nutrition Action Plan (NMNAP, 2016–2021) and macronutrient supply (Dearden et al., 2023). Fathers are crucial in promoting a child's health and development, and their involvement in child development activities can reduce stunting probabilities (Januarti & Hidayathillah, 2020). A father's involvement in child development is crucial for the growth and health of the child; children whose fathers are not involved in their child's healthcare practices have a high risk of becoming stunted (Bogale et al., 2022).

Father's involvement is crucial in stunting prevention; promoting positive fatherhood in parenting can be useful in improving child diets and child development (Jeong et al., 2023). Father's socioeconomic status, knowledge about stunting, society's cultural norms and illiteracy have been limiting fathers from participating in childcare practices, which are associated with malnutrition as far as stunting is concerned, according to literature (Kansiime et al., 2017). Little is known regarding fathers' involvement in childcare practices in stunting among under-five children in the Rukwa region because the majority of studies conducted targeted maternal care (Pessa & Mweya, 2021, Nordang et al., 2015). However, these studies have been conducted and are limited to fathers' involvement in childcare practices and stunting despite the high stunting prevalence (50%) in the Rukwa region, Tanzania (TDHS, 2022/2023). Because of the high frequency of stunting in Tanzania's Rukwa region, research suggests that rural regions have a 33% higher prevalence of stunting than urban areas (21%). Therefore, this study aimed to determine the magnitude of fathers' involvement in childcare practices and its association with stunting status among under-five children in the Sumbawanga rural district, Rukwa, Tanzania.

METHODS

Study Area

This study was conducted in Sumbawanga Rural District, the largest of Rukwa Region's four districts. Sumbawanga rural district spans 5,150 km² and has a population of 494,330 (male 238,600 and female 255,730) (Commissioner, 2021). Agriculture and, to a lesser extent, animal husbandry are the principal sources of income for a large percentage of the population.

Study design

A cross-sectional study design was used in this research, and a quantitative method was applied to collect and analyse data. The cross-sectional design was chosen for this study because it can provide a snapshot of the characteristics of a population at a specific moment in time to get a picture of the population and examine correlations between variables, such as paternal involvement and child stunting status (Kesmodel & Ulrik, 2018). Compared to other study designs, the cross-sectional study design was favoured because there was the intention to seek immediate insights into population characteristics without needing to establish causation or observe changes over time.

Sampling technique

Multistage cluster sampling was used to obtain representative sample of fathers and their under-five children for this research. Samples were obtained through 3 stages of cluster random sampling. First, twenty-seven wards of the Sumbawanga rural district were listed then followed by a random selection of 3 representative wards. The criteria for

the selection of wards, such as size, diversity, or accessibility, were not considered; it was just a random selection of wards that focused on achieving unbiased representation by giving all areas an equal opportunity for inclusion in this study. Using random number generators, the lottery approach was applied to simple random sampling. Second, from 3 wards, the random selection of two villages from each corresponding ward was done, which made the selection of 6 villages. Third, a random selection of households was conducted to obtain sixty (60) pairs of fathers with under-five children from each selected village by using a village registrar book with the help of each village chairperson. Consequently, from 6 villages, we were able to get the calculated sample of 347 fathers with under-five children since each village provided us with sixty (60) fathers with under-five children except one village which gave us forty-seven (47) fathers with under-five children to get a calculated sample of 347 fathers with under-five children.

Sample Size

Estimated sample size N was computed using Kish and Leslie formula (1965) (Naing et al., 2006). Below,

$$n = \frac{Z^2 P (100-P)}{\varepsilon 2}$$

n= estimated sample size

Z= percentage point of the normal distribution corresponding to the level of significance <5%,

Z= 1.96

ε= margin of error, which is approximately 5%

P= Proportion of fathers' involvement (65.5) was adapted in calculations (Kansiime et al., 2017).

$$n = \frac{(1.96)2 \times P \times (100-P)}{5^2}$$

$$n = \frac{(1.96)2 \times 65.5 \times (100-65.5)}{5^2}$$

$$n = 347$$

Therefore, the minimum sample for this study was 347 participants. All participants participated in this study with zero non-responses.

Data collection

An interviewer-administered questionnaire with pre-determined questions was used to collect data. Anthropometric measurement methods were conducted to obtain the height and age of the child to determine the stunting status of under-five children using a Recumbent Length Board. The child's information was written on the questionnaire. Questions were designed to capture relevant information for the research to ensure validity and reliability. Also, the questionnaire was pre-tested for 20 fathers in Sumbawanga municipal to see how questionnaires fit to answer the developed objectives. In this study, three research assistants whose qualifications were graduates of advanced secondary school level were specifically trained by the principal investigator on how to administer the questionnaire consistently and accurately conduction of anthropometric measurements. By the end of each working day, the principal investigator thoroughly reviewed the quality of the data collected from each questionnaire to ensure the questionnaires were accurate and complete. After data consistency and completeness checks, variables were manually entered into the Excel 3.1 version.

Before taking measurements, the length board was calibrated to ensure level and free of damage or obstructions. This ensured that the board was set to a standard reference point. The board was also cleaned after every usage to avoid contamination and deterioration. Standardised procedures were closely followed throughout the measurement process to guarantee accurate readings. For example, the child needed to lie supine (on their back), relaxed and fully extended to measure their recumbent length. The head was positioned against a fixed headboard while the feet were held flat against a movable footboard. Care was taken to avoid any bending of the knees or lifting the feet during measurement, as this could have led to inaccuracies. Additionally, measures were taken twice and take an average of these measurements to enhance reliability.

Data analysis

Data was analyzed using STATA version 17 software and WHO Anthro Plus software; WHO Anthro Plus software was used to analyse the height measurements with corresponding child age by comparing them to established reference values provided by the World Health Organization (WHO) to determine whether a child is stunted. In STATA version 17 software, Logistic regression analysis was done to determine the degree to which multiple variables were associated with a child's stunting status. Probability values (p values) were calculated at the 0.05 significance level. Factors with a P-value < 0.25 in the bivariate analysis were entered into a multivariate logistic regression analysis to avoid the effect of confounders.

Study variables and measurements

The dependent variable for this research is the stunting situation among under-five children. Height and age measurements were standardised to WHO height for age Z-scores using WHO Anthro plus software to determine stunting status among under-five children. The primary independent variable (Father Involvement) is assigned binary responses, "1" (yes) representing the fact that the father plays a role and "0" (no) representing the fact that the father does not play a role). The level of father involvement will be measured using the individual male involvement index, with all variables equally scored with 1 (yes) and 0

(no). The overall score is 16, where the father scores of 0–8 equal low male involvement and scores of 9–16 equal a high level of male involvement.

Ethical considerations issues

Ethical clearance was requested from the Institutional Review Board (IRB) of Muhimbili University of Health and Allied Sciences (MUHAS) with Ref. (No.DA.282/298/01.C/2340). Further permission to conduct the study was sought from the Sumbawanga Rural Council, and written consent will be obtained from participants, whereby voluntary participation was highly encouraged in this study. Fathers provided informed consent for themselves and their children to participate in the study by filling out the consent form provided after clearly explaining the objectives and procedures of the study. Numbers were assigned to participants to ensure confidentiality, and only the researcher and research team could access the respondent's questionnaires.

RESULTS

Socio-demographic and characteristics of participants

A total of 347 respondents participated in the study, with a mean age of 35 ± 6.91 years. Many respondents were aged between 33-47 years (n=213; 61.4%), with only a small proportion aged ≥48 years (n=18; 5.2%). Most respondents were married (n=343; 98.9%) and had completed primary school (n=180; 51.9%). Among the children, the majority were in the 3-4 age group (n=206; 62.4%), with a slight predominance of females (n=177; 51.0%).

Regarding occupation, most respondents were farmers (n=251; 72.6%), followed by entrepreneurs (n=72; 20.8%). Most households had low economic status (n =258; 74.4%), with only (n=39; 11.2%) being highly economically. Household sizes were predominantly large, with most having five or more people (n=286; 82.4%), while only a small number had three people (n=19; 5.5%). Regarding the number of children per household, the majority had three or more children (n=225; 64.8%), followed by those with three children (n=61; 17.6%), two children (n=41; 11.8%), and one child (n=20; 5.8%) (Table 1).

Table 1: Socio-demographic and economic characteristics of respondents (N=347)

Variables	Frequency	Percentage
Father age Category		
18 -32	116	33.4
33 -47	213	61.4
≥ 48	18	5.2
Child Age Category		
1 - 2 years	69	20.9
3- 4 years	206	62.4
< 1 year	11	3.3
> 4years	44	13.3
Child Sex		
Female	177	51.0
Male	170	49.0
Education Level		
Never been to school	40	11.5
Primary school level	180	51.9
Secondary school	104	30.0
College or University	23	6.6
Marital Status		
Married	343	98.9
Widowed	4	1.2
Occupation		
Employed	23	6.6
Entrepreneur	72	20.8
Farmer	252	72.6
Household Economic status		
Low	258	74.4
Middle	50	14.4
High	39	11.2
Household No. of People		
3 people	19	5.5
4 people	42	12.1
≥ 5 people	285	82.1
Household No. of Children		
1 child	20	5.8
2 children	41	11.8
3 children	61	17.6
≥ 3 children	225	64.8

Prevalence of stunting in children under five years of age

According to this study, the prevalence of stunting among under-fives in Sumbawanga rural district is 55%. Among the 347 children, more than half were stunted (n=191; 55.0%), while the remaining children had a normal growth status (n=156; 45.0%). Further analysis of stunting severity was done, and 131 children had moderate stunting (37.8%), and a notable fraction were severely stunted (n=60; 17.3%) (Figure 1).

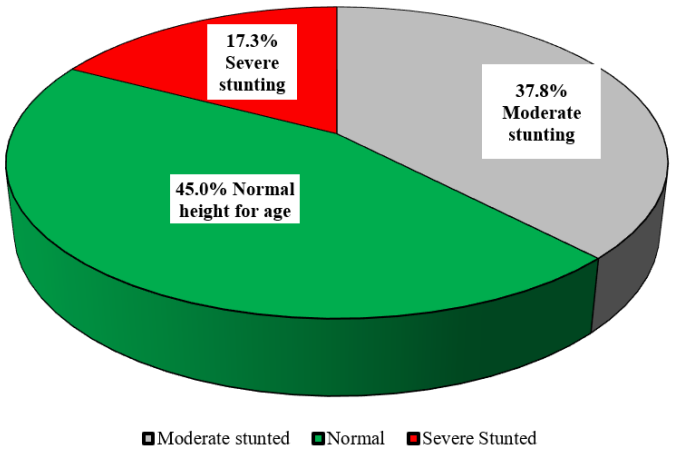

Figure 1: Prevalence of stunting in Sumbawanga Rural District, Rukwa Region, Tanzania (N=347)

Fathers' involvement in childcare practices

Overall, among the 347 respondents, most respondents had low involvement in childcare practices (n=195; 56.20%), while only (n=152; 43.80%) were highly involved. Regarding decision-making in infant and young child feeding, most fathers were not involved in the final decision on exclusive breastfeeding (n=217; 62.5%) and the time to start complementary foods (n=205; 59.1%). In terms of providing physical support, most fathers accompanied mothers to child health clinics (n=316; 91.1%), but those attending the first appointment, only a few attended at least four appointments (n=20; 6.3%). However, providing appropriate information to their wives about breastfeeding was less common, with only (n=141; 40.6%) doing so. Financially, most fathers supported buying food for lactating mothers (n=334; 96.3). About promoting optimal child feeding practices, (n=146; 42.1%) provided appropriate information, and (n=140; 40.3%) shared and acted on this information with their partners (Table 2).

Table 1: Male involvement activities in Childcare Practices in the Sumbawanga rural district (n=347)

Variables	Yes n (%)	No n (%)
Decision-making in infant and young child feeding		
The final decision on exclusive breastfeeding	130 (37.5)	217 (62.5)
Final decision on time to start complementary foods	142 (40.9)	205 (59.1)
Type of food for start of complementary feeding	139 (40.1)	208 (59.9)
Order of serving food	120 (34.6)	227 (65.4)
Providing physical support		
Accompanying mother-to-child health clinics	316 (91.1)	31 (8.9)
Accompanying mother-to-child health clinics each month	20 (6.3)	296 (937)
Allows help after delivery	340 (98.0)	7 (2.0)
Participate in child-feeding	202 (58.2)	145 (41.8)
Assist in farming	273 (78.7)	74 (21.3)
Assist in household chores	130 (39.3)	210 (60.7)
Support and guidance for Breastfeeding		
Provide appropriate information about breastfeeding	141 (40.6)	206 (59.4)
Financial support		
To buy food for the child	344 (99.1)	3 (0.86)
To buy food for lactating mother	334 (96.3)	13 (3.8)
Transport money to the child health clinic	80 (23.0)	267 (77.0)
Promoting optimal child feeding practices		
Provide appropriate information about young child feeding	146 (42.1)	201 (57.9)
Sharing appropriate child-feeding information with partners	140 (40.3)	207 (59.7)

Fathers Knowledge about stunting among under-five children

The findings reveal that most fathers possessed adequate knowledge about child stunting (n=194; 55.9%), whereas only (n=153; 44.1%) had inadequate knowledge. Further, the assessed knowledge aspect found that close to half (n= 162; 46.7%) of the father's knowledge knew the stunting meaning. Regarding the causes, only (n=188; 54.18%) were aware of the causes. Additionally, most fathers (n=316; 91.59%) were aware of the correct duration of exclusive breastfeeding. Regarding the initiation of complementary feeding and the appropriate types of food, at least half (n=187; 53.89%) were aware of this (Figure 2).

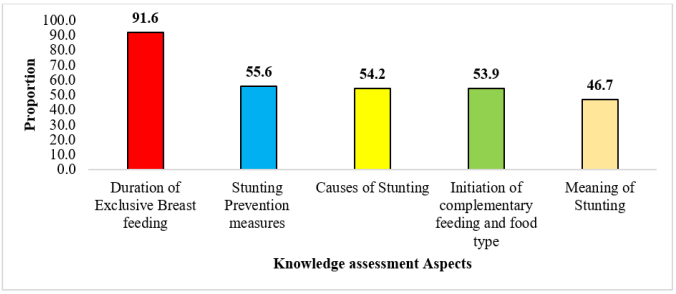

Figure 2: Proportion of fathers who had knowledge of stunting aspects

Factors associated with stunting among children in Sumbawanga rural district

Several variables were analysed to assess factors associated with stunting. These included demographic characteristics, the father's knowledge, and involvement in childcare

practices. In the bivariate analysis, only the father's knowledge of stunting (p-value = 0.042) and male involvement (p-value = 0.040) showed a statistical association. To adjust for potential confounding, multivariable regression was done, which included factors that showed statistical significance and those with a p-value <0.2.

Fathers' involvement and knowledge of stunting remained significantly associated with stunting. Specifically, fathers with adequate knowledge and those who were highly involved in childcare were 46% and 52% less likely to have children with stunting compared to those with inadequate knowledge on stunting (adjusted OR = 0.54; 95% CI = 0.22–0.87; p-value = 0.046) and those who were highly involved (adjusted OR = 0.48; 95% CI = 0.26–0.92; p-value = 0.048), respectively (Table 3).

Table 3: Factors associated with stunting among children in Sumbawanga rural district

Variable	Frequency	Stunting status	COR, 95% CI	P-Value	AOR, 95% CI	P-Value
Father age						
33 -47	213	114 (53.5)	0.76 (0.47 - 1.19)	0.234	0.85 (0.52 - 1.39)	0.523
≥ 48	18*	7 (38.9)	0.41 (0.15 - 1.15)	0.09	0.53 (0.18 - 1.58)	0.26
18 -32	116	70 (60.34)	Reference		*Reference*	
Child age						
> 4years	44	26 (59.1)	1.73 (0.46 - 6.56)	0.418		
3- 4 years	206	109 (52.9)	1.35 (0.39 - 4.56)	0.63		
1 - 2 years	69	41 (52.9)	1.76 (0.49 - 6.32)	0.388		
< 1 year	11	5 (45.5)	Reference			
Child Sex						
Female	177	102 (57.6)	1.24 (0.81 - 1.89)	0.324		
Male	170	89 (52.3	Reference			
Education Level						
Primary school level	180	94 (52.2)	1.09 (0.55 - 2.17)	0.799		
Secondary school	104	64 (61.5)	1.6 (0.77 - 3.34)	0.21		
College or University	23	13 (56.5)	1.3 (0.46 - 3.65)	0.618		
Never been to school	40	20 (50.0)	Reference			
Marital Status						
Married	343	189 (55.1)	1.22 (0.17 - 8.81)	0.839		
Widowed	4	2 (50.0)	Reference			
Occupation						
Farmer	252	138 (54.8)	0.93 (0.39 - 2.20)	0.871		
Entrepreneur	72	40 (55.6)	0.96 (0.37 - 2.47)	0.935		
Employed	23	13 (56.5)	Reference			
Household Economic status						
High	39	24 (61.5)	1.39 (.69 - 2.77)	0.348		
Middle	50	29 (58.0)	1.20 (0.65 - 2.22)	0.558		
Low	258	138 (53.5)	Reference			
No. of People in Household						
≥ 5 people	285	154 (54.0)	1.05 (0.42 - 2.68)	0.905		
4 people	42	26 (61.9)	1.46 (0.49 - 4.37)	0.496		
3 people	19	10 (52.6)	Reference			
No. of Children in Household						
≥ 3 children	225	191 (55.0)	0.72 (0.28 - 1.83)	0.494		
3 children	61	36 (59.0)	0.96 (0.34 - 2.68)	0.938		
2 children	41	26 (63.4)	1.15 (0.39 - 3.46)	0.796		
1 child	20	12 (60.0)	Reference			
Male involvement						
Highly Involved	152	77 (49.2)	0.28 (0.13 - 0.82)	**0.040***	0.48 (0.26 - 0.92)	**0.048***
Less Involved	195	114 (58.6)	Reference		*Reference*	
Knowledge on Stunting						
Adequate knowledge	194	75 (38.7)	0.39 (0.12 - 0.92)	**0.042***	0.54 (0.22- 0.87)	**0.046***
Inadequate Knowledge	153	116 (75.8)	Reference		*Reference*	

DISCUSSION

This study aimed to determine the magnitude of fathers' involvement in childcare practices and its association with stunting among under-five children in the Sumbawanga rural district. The study revealed that 55% of under-five children in the Sumbawanga rural district are stunted. The percentage is higher than the Rukwa region's general stunting prevalence of 50% (TDHS, 2022). Additionally, our study findings corroborate findings from a study conducted in Tanzania that examined the differences in stunting prevalence between urban and rural areas over the previous three decades and revealed a higher prevalence of stunting in rural than urban areas. The study revealed that the prevalence of rural to urban stunting according to years was 50.48% to 46.80% in 1992, 52.12% to 40.79% in 1996, 52.66% to 29.09% in 1996, 46.71% to 35.44% in 2005, 44.62% to 32.11% in 2010 and 38.26% and 25.65% in 2016 (Sunguya *et al.*, 2019). Similarly, the same trends were observed in a study conducted in Afghanistan (Li et al., 2020).

Furthermore, our study findings identified a lower magnitude of fathers' involvement in childcare practices (56.20%), while 43.80% were highly involved. This is different from a similar study conducted in Uganda on fathers' involvement in childcare practices, where the magnitude of fathers' involvement in childcare practices was 65.5% (Kansiimee et al., 2027). The reason for lower father involvement might be caused by misconceptions on gender roles and perceptions that childcare practices are female roles in households (Kansiimee et al., 2027), which is similar to the study conducted in Madagascar, which highlighted different societal gender roles, including childcare roles, as the reason for lower fathers' involvement in childcare practices, which have been established for years that the mother's role is to take care of the child while the father's role is to provide for the family (Id et al., 2021).

In our study the level of male involvement was high in two aspects, which were providing financial support and physical support. This study findings correlate with the study findings conducted in Kenya on the role of fathers in child feeding, which were the provision of food and resources to provide food for the family (Martin et al., 2020). This might be caused by the fact that culturally, men are considered as providers and control resources in most households. Our study findings revealed that most fathers only attend the first health clinic, which is compulsory, and then disappear completely for the rest of the child health clinic, which is important because they receive education pertaining to breastfeeding and child feeding. This finding aligns with the study findings conducted in Zimbabwe, where males who participated in and received encouragement in breastfeeding decisions were more likely to complete exclusive breastfeeding, which increased the odds of a child having protection against malnutrition (Maphosa, 2021).

Furthermore, our study findings revealed that most of the fathers had adequate knowledge about child stunting (n = 194; 55.9%), whereas only 153 (44.1%) had inadequate knowledge. This may be influenced by most respondents attending health clinics in the second objective, although some are not completing at least four appointments, which somehow may have influenced their knowledge. Upon examining its association with the stunting status of the

children, there was an association (P-value <0.05). Fathers with adequate knowledge about stunting were less likely to have stunted children by 61%. These findings are the same as the study findings conducted in Indonesia on the analysis of causes of stunting in toddlers, which found that lack of parental knowledge about stunting was among the causes because not knowing it may not facilitate proper conduct to combat stunting (Marsaoly, 2021). Similarly, it corroborates the study findings conducted in Rwanda on engaging fathers in stunting prevention, which found a lack of knowledge about stunting as one of the reasons limiting fathers' participation in childcare activities (Bergstrom & Hogling, 2017).

Furthermore, our study findings indicate that fathers who were highly involved in childcare were 61% less likely to have stunted children compared to those who were less involved, and fathers who were highly involved were less likely to have stunted children by 72%. This finding is in the same line with another study finding in Indonesia (Bukit et al., 2021). Likewise, our study findings align with similar study findings conducted in Tanzania, which revealed that households led by females were associated with stunting. This indicates the importance of fathers in childcare practices in overcoming stunting (Sunguya et al., 2019).

STRENGTHS AND LIMITATIONS

This study has some potential limitations that could have affected the findings. This study was quantitative with no further explanation of the observed relationships. With that, a corresponding study using a qualitative methodology for a more narrative overview of the findings might be useful to explore the research question in greater depth. Two, the study was cross-sectional, so it was impossible to establish the causal relationship between variables. Furthermore, findings from this study may be limited to self-reported bias. Self-reported data had several potential sources of bias, including recall bias and social desirability bias. However, bias was controlled through a comprehensive description of the study's aim before enrolling the participants into this study.

CONCLUSION

This study revealed that a father's knowledge of stunting and involvement in childcare practices was associated with stunting among under-five children. The study highlights the concerning trend of low paternal involvement in childcare practices. This low level of engagement is particularly troubling given the established link between parental involvement and improved child health outcomes. Fathers play a crucial role not only in providing physical support but also in making informed decisions regarding infant and young child feeding practices. The data suggests that many fathers are not actively participating in these critical decisions, which may contribute to the high rates of stunting observed. Statistical analyses reveal a significant association between fathers' knowledge about stunting and their involvement in childcare practices with stunting. However, further qualitative research is needed to confirm these findings and explore potential mechanisms underlying these relationships. Also health care workers should organize community-based education programs that focus on the importance of paternal involvement in childcare practices so as to elevate the magnitude of their involvement in childcare practices.

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Conflict of Interests

I declare that there is no conflict of interest in this study.

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