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Maternal Perception of Medicinal Foods in Child Feeding Practices: A Study in Marsabit County, Kenya

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Abstract

Medicinal foods are important for enhancing children's health and preventing common illnesses. However, there is a lack of comprehensive understanding regarding how mothers perceive these foods and their effectiveness in child nutrition. Therefore, this study aimed to determine maternal perception of medicinal foods used in child feeding. This study adopted a cross-sectional study design. A three-stage sampling technique was used to randomly select 278 eligible households with children aged 6–24 months to assess their perception of child feeds with medicinal value. A questionnaire was used to gather quantitative data. Focus Group Discussion and Key Informant Interview guides were used to collect qualitative data. Univariate analysis was used to obtain the frequency distribution of maternal perception of medicinal foods. The results indicated that the common childhood illnesses in the community are diarrhea 63.9%, Pneumonia 55.2%, malnutrition 35.1%, malaria 35.7%, anemia 35.7%, and common cold 24.2%. Findings show that 56% of the respondents offered foods for medicinal purposes to their children during sickness and in good health. Most (75.5%) respondents indicated plants, fruits, and foods were used for medicinal

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purposes. The study concludes that maternal perceptions of medicinal foods significantly influence child-feeding practices in Marsabit County, Kenya. Based on the findings, the study recommends that the Marsabit County government conduct scientific research and clinical trials to assess the efficacy and safety of local plants, fruits, and foods used by mothers to treat childhood illnesses and integrate evidence-based findings into community health education. This study had potential limitations. It relied on maternal responses, which could have been affected by recall or social desirability bias; however, engaging communities in discussions on child nutrition can help bridge gaps between perception and scientific evidence, leading to informed decision-making. This initiative should involve collaboration between the local health authorities, research institutions, and traditional knowledge holders.

Keywords: Maternal Perception, Child Feeds, Medicinal foods, Medicinal Value

Introduction

In recent years, the importance of incorporating medicinal foods into children's diets has gained attention, particularly in regions with limited access to formal healthcare (Goldbohm *et al*., 2016). Some mothers view certain foods as preventive against childhood illnesses, such as diarrhea, respiratory infections, and malnutrition (IPC,2021). However, maternal knowledge and perceptions about the medicinal value of specific foods vary widely. It is mainly influenced by education, socio-economic status, and exposure to modern health information. This variance in perception can lead to varying feeding practices, some of which may benefit the child's health, while others may have limited or harmful effects (USAID,2018).

Complementary foods should be adequate, meaning, they should be given in consistent, amounts, frequency, and variety, to cover the nutritional needs while maintaining breastfeeding for two years and beyond (WHO, 2015). The WHO recommends that infants receive the minimum dietary diversity (MDD) of at least four food groups out of seven to maintain proper growth and development (WHO, 2008). An analysis of 80 national surveys in the LMICs indicated that only one in six children consumed the minimum acceptable diets while 1 in 4 consumed adequately diverse diets (Gatica et al., 2020). In Kenya, only 22% of breastfed children 6-24 months received a minimum acceptable diet (KNBS et al., 2015), while 59% do not consume a sufficiently diversified diet indicating restriction in access to quality diets. A study in Marsabit showed poor infant feeding practices in that less than a quarter of the children (23.9%) were fed on the required MDD (Mutuku et al., 2020).

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The period between 6-24 months is vulnerable. It is a time when undernutrition starts in many children, the underlying cause being poor complementary feeding (KNBS et al. 2015). According to the UNICEF conceptual framework (1992), Child feeding practices are considered one of the determinants of malnutrition in under-fives. Inadequate feeding practice is often a greater factor of malnutrition than lack of food (Emily, 2010). Essentially, food consists of nutrient components with one or more functions in the body including provision of nourishment, repair of worn-out cells, generation of new cells and tissues, growth and development, powering of metabolic processes, and protection against invasion by pathogens and illnesses (Chen et al., 2018). Food being portrayed as having the potential to promote health and well-being has brought the transition from the concept of adequate nutrition, that is, a diet that provides nutrients in quantities sufficient to meet body needs to optimal nutrition, that is, a diet that has the potential to improve general well-being and reduce the risk of certain diseases (Ramadan and Ghamdi, 2012).

In the developing world, medicinal plants are used widely in alleviating human suffering, mainly because they are thought to be very effective, readily available, and much cheaper than modern medicines (Popovic et al., 2016). The use of medicinal plants is more prevalent in Africa, where 80% of the population relies on traditional medicine for disease treatment, health improvement, and maintenance (WHO, 2018). Kenya is not an exception, especially among the rural population (Kigen et al., 2013). The Maasai and Samburu communities of Kenya, just like the Maasai of Eastern Serengeti in Tanzania, consume dietary additives obtained from medicinal plants in a variety of their beverages such as tea and soups (Bussmann et al., 2006, Parker et al., 2007). The intake of fermented milk helps reduce the incidence of gastrointestinal infections. In addition, it lowers the levels of milk allergens commonly found in fresh milk due to functional components such as probiotics (Ongeri and Mathara, 2014). Honey as a prebiotic, improves microflora and gut membrane barrier with a consequent decrease in diarrhea (Shariatpanahi, 2018). In addition, pectin and carotenoids in apples and carrots respectively have been proven to be successful in managing diarrhea (Mao et al., 2016, Youssef et al., 2020). Children with diarrhea are deficient in vitamin A. Beta-carotene present in carrots is a precursor of vitamin A, and is efficient in improving diarrhea (Youssef et al., 2020).

Ethno medicine and functional food (FF) contain procedures, knowledge, skills, and activities that are based on the culture and experience of natives and have been transmitted from parents to children over centuries (Esfahani, 2012, Ghannadi, 2011). Some locally available wild foods also have medicinal value to the human body and undergo processing through various methods such as boiling, fermentation, and sun drying by the local

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community (Kinyuru et al., 2012). Other studies have shown that some caregivers offer nutritious foods that have medicinal value and are locally available and cheaper than modern medicine to their children to boost or fasten recovery from ailments (Popovic et al., 2016; Merita et al., 2017). These medicinal foods are widely used to treat diseases and to improve and maintain good health (WHO, 2018). In India for instance, mothers offer their children turmeric milk mix daily, at bedtime because they know turmeric is anti-inflammatory and boosts immunity (Ritika et al., 2021). These knowledge and practices have the potential to help children from resource-limited settings grow healthily. It is important, therefore, to ensure mothers have the required knowledge on healthy child-feeding behavior which they can translate into practice to promote child health and nutrition. Hence, this study aimed to determine maternal perception of child feeds with medicinal value in Marsabit County, Kenya.

Methods

A cross-sectional study design was used to collect data. Both quantitative and qualitative approaches were employed. The study population consisted of mothers/ caregivers of children aged 6 to 24 months from a total population of 77,495 caregivers in Marsabit County.

The sample size was determined by the formula used by Fisher et al., 1998:

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where: n = Sample size

z = Level of confidence interval (usually 1.96 corresponding to 95%)

p = Estimated proportion of mothers on timely introduction of complementary foods (79.2% as reported in a study done in Marsabit County, Mutuku, 2020).

d = Relative desired precision (5.0%)

Therefore; $n = \frac{1.96^2 0.792(1-0.792)}{0.05^2}$

n=253

To cater to potential non-response subjects, a 10% allowance was added to the minimum sample size of 253 (Bujang, 2021).

Non-response rate = 10% of n

$= \frac{10}{100} * 253$

$= 25$

Therefore, n= nonresponse rate + n

=25+253

=278 participants

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Table 1: Sample Size Distribution Table

Sub-county/population	Wards	Villages	Sample size	Percentage
Saku	Sagante/Jaldesa	Lorora	1	0.4
		Manyatta Jillo	1	0.4
Moyale	Sololo	Makutano	16	5.8
		Gimbe	11	4.0
		Hadesa	21	7.6
	Butiye	Heilu	100	36.1
		Iladhu	20	7.2
		Kulapesa	12	4.3
	Obbu	Lemara/Manyatta	2	0.7
		Manyatta Lemora	4	1.4
		Manyatta Lomera	1	0.4
		Manyatta Lorara	1	0.4
North Horr	Dukana	Manyatta lorora	4	1.4
		Sidaimwita	3	1.1
		Thahaleyo	5	1.8
		Upane	8	2.9
	Maikona	Mayata	1	0.4
		Kalacha	19	6.9
		Boji	13	4.7
Laisamis	Loiyangalani,	Sambamba	13	4.7
		Sidaimuri	11	4.0
	Logologo	Soweto	11	4.0
Total	**8**	**22**	**278**	**100.0**

Table 1 presents the sample size distribution table indicating the sampled wards, villages and number of households proportionate to study participants.

Data collection tools were pretested in Archers Post which was not included in the study. A total of 10% (27) of data collection tools were used (Perneger et al., 2014). This was done to check on the consistency of the collected data with the expected results and help reframe the questions. Qualitative data from recorded FGDs was transcribed into text by a local translator and later translated into English. Two independent coders reviewed the text files and developed codes based on emerging patterns in the data. Any discrepancies in coding were discussed and resolved through consultation with experienced qualitative researchers. Data analysis was done using SPSS version 25 (IBM Corp, 2017). Descriptive analysis involved calculating means, standard deviations, frequencies, and percentages, while inferential statistics, including correlation and regression analysis, were used to examine the relationship between independent and dependent variables.

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Results

Maternal perception of child feeds with medicinal value

The study objective was to determine maternal perception of child feeds with medicinal value in Marsabit County, Kenya. The respondents were requested to indicate their agreement on child feeding with medicinal foods in Marsabit County, Kenya. The results are shown in the subsequent sections.

Common childhood illnesses in the community

Table 2 indicates the common childhood illnesses in the community as reported by the mothers. These include 63.9% diarrhea, 55.2% Pneumonia, 35.1% malnutrition, 35.7% malaria, 35.7% anemia, and 24.2% common cold. Diarrhea is the most common ailment and is the most serious illness recording 56.5% severity. Malnutrition affects 35.1% of children but most of the cases are moderate. Anemia on the other hand is rare among children and equally mild in its severity. A significant relationship (x^2=26.414, df=6, P=0.010, CI=95%) was established between common community childhood illness and child feeding practices.

Table 2: Common childhood illnesses in the community

Common community illness	Frequency/ percentage N=278	Known cause of the illness	Severity (frequency/percentage Most severe	Moderate	Mild
Diarrhea	177(63.9%)	Yes, 177(63.9%) No, 101(36.1%)	100(56.5%)	42(23.7%)	35(20%)
Malaria	100(35.7%)	Yes, 100(35.7%) No 178(64.3%)	38(38.3%)	12(12.2%)	49(49.5%)
Pneumonia	153(55.2%)	Yes, 153(55.2%) No, 125(44.8%)	37(24.1%)	43(28.2%)	73(47.7%)
Malnutrition	97(35.1%)	Yes, 97(35.1%) N0. 181(64.9%)	17(17.5%)	61(62.9%)	19(19.6%)
Anemia	99(35.7%)	Yes, 99(35.7%) No, 179(64.3%)	9(9.1%)	13(13.1%)	77(77.8%)
Common cold	67(24.2%)	Yes, 67(24.2%) No, 211(75.8%)	22(32.8%)	18(26.7%)	27(40.5%)

Traditional plants/ fruits /foods used to treat ailments in children

Table 3 shows that 75.5% of the respondents used plants/fruits/foods for medicinal purposes while 24.5% used none. Honey is used to treat the common cold and measles but is more effective (39.4%) for the common cold. Fito is used to ensure the healthy growth of children and treat wounds and infections. However, it's more effective in the healthy development of children (79.2%) and least effective in infection (28.1%) treatment. There was a significant relationship (x^2=7.001, df=1, P=0.000, CI=95%) between traditional plants/fruits/foods for treatment of sick children and child feeding practices.

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Table 3: Traditional plant/fruit/food used to treat ailments in children

Traditional plant/fruit/food used	Disease treated	Effectiveness		
		1-Very effective	2-Moderate	3-least effective
Honey	**Common cold**, 33(16.2%)	13(39.4%)	15(45.5%)	5(15.2%)
	Measles 22(10.7%)	5(22.7%)	10(45.5%)	7(31.8%)
Fito	**Wound healing** 76(37.3%)	60(78.9%)	10(13.2%)	6(7.9%)
	Healthy baby growth 48(23.5%)	38(79.2%)	5(10.4%)	5(10.4%)
	Weight gain for malnourished child 44(21.6%)	14(31.8%)	25(56.8%)	5(11.4%)
	Treats infections 39(19.2%)	9(23.1%)	10(25.6%)	20(51.3%)
Lemon	**Common cold** 29(14.2%)	3(10.3%)	10(34.5%)	16(55.2%)
Idepe	**Malaria** 9(4.4%)	1(11.1%)	3(33.3%)	5(55.6%)
	Pneumonia 5(2.5%)	4(80.0%)		1(20.0%)
learoni	**Malaria** 9(4.4%)	3(33.3%)	4(44.5%)	2(22.2%)
	Stomachache 1(0.5%)	1(100.0%)		
kiloriti	**Good health, diarrhea** 5(2.5%)	1(20.0%)	2(40.0%)	2(40.0%)
Seketet, Ndavuko	**Stomachache 3(1.5%)**		3(100.0%)	
mpopongi	**Headache and chest pain** 5(2.5%)	3(60.0%)	1(20.0%)	1(20.0%)
lordo	**Pregnancy, appetizer** 4(2.0%)		2(100.0%)	
ngornoo	**Malnutrition** 9(4.4%)	5(55.6%)	4(44.4%)	
ldedine	**Stomach bloating** 10(4.9%)	3(30.0%)	3(30.0%)	4(40.0%)
lkiviial	**Stomachache** 5(2.5%)	1(20.0%)	3(60.0%)	1(20.0%)
Wanga	**Mouth sores, 27**(3.4%)	13(48.1%)	7(25.9%)	7(25.9%)
	Infections, 35(17.2%)	20(57.2%)	5(14.3%)	10(28.6%)
Iddi crugga	**Infections** 8(3.9%)	2(25.0%)	4(50.0%)	2(25.0%)
Tangawizi	**Cough** 7(3.4%)	2(28.6%)	3(42.8%)	2(28.6%)
Ithigaga	**Infections** 3(1.5%)		1(33.3%)	2(66.7%)

Mothers are quite knowledgeable that the food they offer their children helps them stay healthy and strong apart from the satisfaction of hunger. Given the commonness of diarrhea,63.9%, (Table 2), mothers have come up with some local remedies for its treatment. These include: Moringa leaves, “Teinadhami”, fenugreek seeds, salt and water mixture, and pumpkin seeds.

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Table 4: Major/Common medicinal foods discussed during the nine FGDs

Type of food	Preparation method	Disease
Moringa leaves	Mixed with food	Relieves constipation and boosts immunity
Teinadhami'/ 'Qadhala'	Boiled with milk or leaves crushed and put in drinking water	Stomach discomfort, common cold, body pains (pain after child immunization or chicken pox)
Fenugreek seeds	Boiled with milk or water +Onions, or roasted and grounded	Relieves constipation, stomach discomfort, diarrhea, and common cold.
A mixture of lemon, ginger, garlic, honey, and fenugreek seeds	Boiled	Treat common cold
Salt and water	Boiled	Managing diarrhoea
Cerelac	Mixed with milk	Boosts appetite
Pumpkin seeds	Roasted	Deworming, bloating, stomach discomfort
Rice soup	Boiling rice to a thick paste	Stops vomiting, diarrhea and ease constipation

> *'Normally if a child is properly fed, the body will be able to fight diseases, for example, the difference between a child who is well fed and one who is not well fed is that the latter might even die because of the common cold while the other one will be able to recover easily after falling ill. The same applies even to adults, without food you will easily get ill compared to a well-fed person'*
>
> *FGD4.*

Maternal Perception of child foods for medicinal purposes

Figure 1 shows that 56% of the respondents offered food for medicinal purposes to their children during sickness and in good health whereas 44% offered food not for medicinal purposes but for satiety reasons. There was no significant relationship (x^2=6.429, df=1, P=0.073, CI=95%) between offering foods for medicinal purposes and child-feeding practices.

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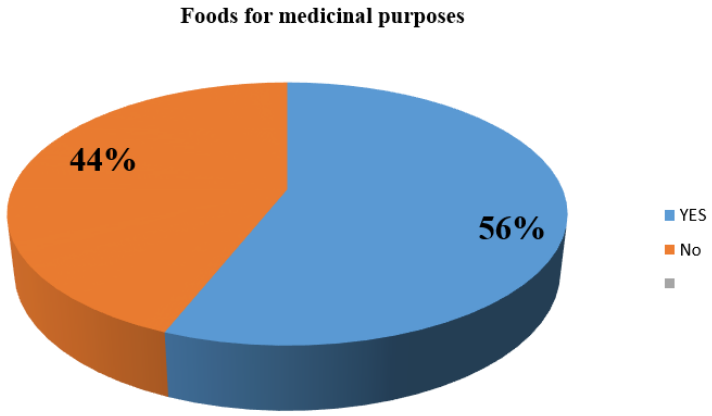

Figure 1: Foods for medicinal purposes

The use of medicinal plants is common here because of inaccessibility to good health services. They are very far away, in Marsabit town.

FGD 9

Some of these traditional plants are very effective in treating some of the illnesses for children, especially diarrhea

K.I. I 1

Correlation Analysis

This research adopted Pearson correlation analysis to determine how the dependent variable (child feeding practices in Marsabit County, Kenya) relates with the independent variable (maternal perception of medicinal foods), (Table 5).

Table 5: Correlation Coefficients

		Child Feeding Practices	Maternal Perception of Medicinal Foods
Child Feeding Practices	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	278	
Maternal Perception of Medicinal Foods	Pearson Correlation	.806**	1
	Sig. (2-tailed)	.002	
	N	278	278

The results also revealed a strong relationship between maternal perception of medicinal foods and child-feeding practices in Marsabit County, Kenya (r = 0.806, p-value =0.002). The relationship was significant since the p-value of 0.002 was less than 0.05 (significant level). The findings are in line

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with the findings of Shariat (2018) who indicated that there is a strong relationship between maternal perception of medicinal foods and child-feeding practices.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between the independent variable (maternal perception of medicinal foods) and the dependent variable (child feeding practices in Marsabit County, Kenya), (Table 6).

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877[a]	.769	.768	.10412

a. Predictors: (Constant), maternal perception of medicinal foods

The model summary explained the variation in the dependent variable based on the dependent variables. The r-squared for the relationship between the independent and the dependent variables was 0.769. This implied that 76.9% of the variation in the dependent variable (child feeding practices in Marsabit County, Kenya) could be explained by the independent variable (maternal perception of medicinal foods).

The ANOVA was used to determine whether the model was appropriate for the data. F calculated was 510.14 while the F critical was 2.405. The p-value was 0.002. Since the F-calculated was greater than the F-critical and the p-value 0.002 was less than 0.05, the model was considered a good fit for the data. Therefore, the model can be used to predict the influence of maternal perception of medicinal foods on child-feeding practices in Marsabit County, Kenya. (Table 7)

Table 7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102.028	1	25.507	510.14	.002[b]
	Residual	13.653	276	.0500		
	Total	115.681	277			

a. Dependent Variable: child feeding practices in Marsabit County, Kenya

b. Predictors: (Constant), maternal perception of medicinal foods

The regression model was as follows (Table 8):

$$\mathbf{Y = 0.335 + 0.328X_1 + \varepsilon}$$

Table 8: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.335	0.085		3.941	0.000
Maternal Perception of Medicinal Foods	0.328	0.087	0.329	3.770	0.002

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The results indicate that maternal perception of medicinal foods is of significance to child-feeding practices in Marsabit County, Kenya ($\beta 1 = 0.328$, $p = 0.002$). This relationship is considered significant, as the p-value (0.002) is below the threshold of 0.05. These findings align with those of Shariat (2018), who reported a strong correlation between maternal perception of medicinal foods and child-feeding practices.

Discussion

Maternal Perception of Child Feeds with Medicinal Value

Maternal perception of a child's feed with medicinal value has a potential impact on the identification, prevention, and treatment of childhood illnesses. This study identified common childhood illnesses, herbs, plants, fruits, and foods commonly used for their treatment and their perceived effectiveness. Findings indicate that some common childhood illnesses in the community included diarrhea, pneumonia, malnutrition, malaria, anemia, and the common cold. Most (75.5%) of the respondents indicated plants/fruits/foods were used for medicinal purposes to treat ailments in children 6 to 24 months. Respondents indicated the following plants/ fruits/foods as possessing medicinal value; Honey, fenugreek seeds (*Fito*), Lemon, ginger, garlic, moringa leaves, pumpkin seeds rice soup, and salt among other various herbs which include: *Idepe learoni, Kiloriti, Seketet, Ndavuko, Mpopongi, Lordo, Ngornoo, Idedine lkiviial, Wanga, Iddi crugga, Qadhala, and Ithigaga*. This is in line with another study where mothers employed home remedies such as the use of herbs and herbal products among other indigenous products such as honey, black soap onions, and pawpaw leaves to self-medicate their under-five children (Okunola et al., 2023). Findings show that mothers perceived honey to be moderately effective in the treatment of the common cold and measles. Honey as a prebiotic improves microflora and gut membrane barrier with a consequent decrease in viral and bacterial infections such as upper respiratory infections and gastroenteritis (Shariat, 2018, Abuelgasim et al 2021).

In this study, mothers used various home remedies and medicinal foods to manage diarrhea in their children. These included a mixture of salt and water, rice soup, roasted fenugreek seeds boiled in milk, and roasted pumpkin seeds. The salt and water mixture resembles an Oral Rehydration Solution, consisting of clean water, salt (potassium and sodium), and sugar (WHO, 2010). Pumpkin seeds are excellent sources of zinc and fiber. Notably, the mothers reported roasting the pumpkin seeds. Roasting is a process that improves zinc bioavailability (Andrej et al., 2011). Oral Rehydration Solution (ORS) and zinc are globally recognized as simple and effective home-based treatments for uncomplicated cases of acute diarrhea (Kianmehr et al., 2016; Abbas et al., 2018). Zinc is an essential micronutrient whose deficiency

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threatens children's health and growth (Kiran et al., 2015). A lack of zinc in children can lead to growth retardation and increased susceptibility to illnesses such as diarrhea, pneumonia, and malaria (Vivienne et al., 2012). Mothers also used rice water to manage diarrhea among their children at home. Similarly, another study found rice water highly effective in treating children with acute diarrhea (Kianmehr et al., 2016).

In the developing world, medicinal plants are used widely in alleviating human suffering, mainly because they are thought to be very effective, safe, readily available, and much cheaper than modern medicines (Popovic et al., 2016, Owumi et al., 2016, Okunola et al.,2023). This was discussed in the FGD.

> The u*se of medicinal plants is very common here because of inaccessibility to good health services. They are very far away, in Marsabit town.*
>
> FGD 9

> *Some of these traditional plants are very effective in treating some of the illnesses for children, especially diarrhea*
>
> K.I. I 1

Conclusion and Recommendation

The study concludes that maternal perception of medicinal foods in child-feeding practices in Marsabit County, Kenya is significant.

The study recommends that the Marsabit County government conduct scientific research and clinical trials to assess the efficacy and safety of local plants, fruits, and foods used to treat childhood illnesses and integrate evidence-based findings into community health education. This initiative should involve collaboration between health authorities, research institutions, and traditional knowledge holders. By validating the medicinal value of these natural remedies, the authorities can ensure that safe and effective treatments are recommended for childhood illnesses. Based on this a formal framework to integrate validated traditional remedies into primary healthcare services should be established and integrated into existing healthcare services.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

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Ethical Approval: Ethical approval for this study was obtained and all necessary permissions were acquired from the relevant authorities in Marsabit County, Kenya. Informed consent was obtained from all participants, and confidentiality was maintained throughout the study.

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