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"Impact of Maternal Food Safety and Hygiene Practices on Child Nutrition in Urban Slums of Sambalpur"

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KEYWORDS

Food safety knowledge, hygiene, cooking practices and health condition.

ABSTRACT:

Background:- Food safety knowledge involves understanding and applying practices that prevent food borne illnesses, ensuring food remains safe for consumption. This includes proper handling, preparation, storage, and sanitation to avoid contamination by harmful pathogens, chemicals, and physical hazards.

Mother's nutritional knowledge plays a crucial role in safeguarding children from factors that contribute to low weight-for-height z-score (WHZ), low weight-for-age z-score (WAZ) and low height-for-age z-score (HAZ). This study seeks to examine the relation between maternal food safety knowledge, practices and their influence on the nutritional status of children aged 6 months to 5 years.

Methods:- A descriptive cross-sectional study was conducted among 550 purposively selected mothers of children aged 6 months to 5 years in urban slums of Sambalpur. Data on cooking practices, nutrition knowledge, hygiene and sanitation were collected using structured tools, and children's nutritional status was assessed through anthropometry. Statistical analysis was done using SPSS v23, applying descriptive statistics, Chi-square tests, Pearson correlation, and multinomial regression ($p \leq 0.05$).

Results:- Although variations in mothers' food safety knowledge were observed across different categories of children's nutritional status (wasting, stunting, underweight, and CIAF), these differences were not statistically significant ($p > 0.05$). Most mothers, regardless of their child's nutritional status, had poor to fair food safety knowledge. Correlation analysis showed a weak but significant positive relationship between mothers' food safety knowledge and child wasting ($r = .094$, $p = .028$), while no significant correlation was found with stunting. Strong correlations were observed among child nutritional indicators, particularly between wasting and underweight ($r = .571$), and between stunting and CIAF ($r = .690$), all significant at $p < .001$. Multivariate analysis identified family structure and cooking practices as significant factors associated with stunting; children from nuclear families and those with better maternal cooking practices had lower odds of stunting. Other factors, including gender, family size, religion, caste, socioeconomic status, food safety knowledge, and hygiene conditions, showed no statistically significant associations.

Conclusion:- Mothers' food safety knowledge varied across child nutritional categories but showed no significant association, except for a weak positive correlation with wasting. Stunting was significantly associated with family structure and cooking practices, whiles other demographic, socioeconomic, and hygiene factors showed no significant impact.

1. Introduction

Food safety refers to the absence of any risks, whether immediate or long-term, that could make food harmful to consumers' health. Food borne diseases pose a significant and growing public health concern worldwide, affecting both developed and developing nations. However, their impact on health and the economy is more severe in developing countries, although comprehensive data remains limited (World Health Organization 2020). The WHO has identified food borne illnesses as one of the most pressing public health challenges of the 21st century. While research indicates that many cases of forborne illness originate in households, consumers often do not perceive their homes as high-risk environments for food contamination (Scott, 2018). Several factors contribute to this risk, with home-prepared meals accounting for a substantial portion of overall food consumption. Household kitchens, often used for

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multiple purposes, present significant risks for food contamination and the spread of food borne diseases. Many cases of food borne illness, along with their associated economic costs, result from preventable food handling mistakes (Gautam & Curtis, 2021). Ensuring food safety requires collective responsibility at every stage of the food supply chain. Since it is unrealistic for food producers alone to eliminate all pathogens, home food handlers play a crucial role in preventing food borne illnesses.

Ensuring food safety is essential for maintaining good health, particularly for children, who represent the future of their nations. Mothers play a crucial role in safeguarding their children from food borne illnesses by maintaining proper hygiene and food handling practices at home. Negligence in food safety can expose children to harmful pathogens, increasing the risk of infections (Patel & Kumar, 2022).

Food safety must be carefully managed at every stage, from production to consumption. Home food preparers must take necessary precautions to minimize contamination and ensure that food remains safe to eat (Gautam & Curtis, 2021).

Consumption of contaminated food or beverages can lead to food borne illnesses, with symptoms appearing within hours or days. While some cases present mild, flu-like symptoms, others can result in severe complications, including high fever, nausea, vomiting, diarrhea, stomach pain, bloating, and dehydration. In severe cases, hospitalization may be required, and certain infections can lead to long-term health problems or even fatalities. Food borne pathogens have been linked to conditions such as arthritis, seizures, muscle pain, brain and nerve damage, and kidney failure due to hemolytic uremic syndrome (HUS) (Chlebicz & Śliżewska, 2018). Preventing food borne illnesses requires vigilance at every stage of food handling, emphasizing the importance of hygiene and proper food preparation practices in homes.

2. Objectives

a. Assessing mothers' knowledge of safe food practices for young children.

b. Evaluating mothers' cooking practices in maintaining food safety for their children.

3. Methods

A descriptive cross-sectional study was conducted in the urban slums of Sambalpur district to assess cooking practices, nutrition knowledge, and hygiene and sanitation conditions in households and kitchens. The study also evaluated their impact on the nutritional status of children using anthropometric measurements. A purposive sampling method was employed, and a total of 550 participants were included.

The inclusion criteria for the study were: (1) mothers accompanying their children aged 6 months to 5 years, and (2) children free from any chronic or acute physical or mental illnesses.

Hygiene and sanitation practices in the household were evaluated based on five cleaning activities: sweeping the house, sweeping the premises, mopping, using disinfectants, and toilet cleaning. Scoring was based on frequency, with 3 points for daily, 2 for twice weekly, 1 for weekly, and 0 for none. The total scores ranged from 0 to 15, classified as poor (0–7) and fair (8–15). The same criteria were applied to assess hygiene and sanitation practices in the kitchen. Mothers' food safety knowledge was assessed using 21 binary-response statements, where positive statements were scored 1 for "Yes" and 0 for "No," while negative statements were scored inversely. The total scores ranged from 0 to 21, categorized as poor (0–7), fair (8–14), and good (15–21).

Statistical analysis was performed using SPSS version 23. Descriptive statistics, including frequencies and percentages, were used to summarize qualitative variables. The Chi-square test was applied to evaluate the study hypothesis, while Pearson correlation coefficients were used for correlation analysis. Multinomial regression was used to identify the risk factors associated with health condition. Statistical significance was set at $p \leq 0.05$, while $p > 0.05$ was considered not significant.

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4. Results

Table 1-Socio-demographic characteristics of mother.

Sl.No.	Particulars	Mother (N-550)	
		Frequency	Percentage
A	**Age (Yrs.)**		
1	<20	17	3.1
2	20-30	437	79.5
3	30-40	95	17.3
4	>40	1	0.2
B	**Social Status**		
1	Married	507	92.2
2	Widow	8	1.5
3	Divorced	35	6.6
C	**Type of family**		
1	Nuclear	283	51.5
2	Extended	267	48.6
D	**Educational status**		
1	Illiterate	100	18.2
2	Primary	78	14.2
3	Middle	116	21.1
4	High School	164	29.8
5	Intermediate	62	11.3
6	Graduate or postgraduate	29	5.3
7	Technical or professional degree	1	0.2
E	**Occupational status**		
1	Unemployed/Home-maker	446	81.8
2	Unskilled worker	87	15.8
3	Semi-skilled worker	0	0
4	Skilled worker	7	1.2
5	Clerical, shop-owner	2	0.3
6	Farm	0	
7	Semi-professional	4	0.7
8	Professional	4	0.7
F	**Monthly income in rupees**		
1	Below 8,000	68	12.4
2	8,000-16,000	364	66.2
3	16,000-24,000	61	11.1
4	> 24,000	57	10.4
G	**Socioeconomic class**		
1	Upper (I)	0	0
2	Upper middle (II)	17	3.1
3	Lower-middle (III)	108	19.6
4	Upper lower (IV)	422	76.7
5	Lower (V)	3	0.5

Table 1 represents Socio-demographic characteristics of 550 mothers. The findings revealed that the majority (79.5%) of mothers belonged to the age group of 20-30 years, followed by 17.3% in the 30-40 age group. A small proportion (3.1%) were below 20 years, while only one mother (0.2%) was above 40 years. A similar distribution was observed in a study by Smith et al. (2020), which reported that most mothers fell within the reproductive age of 20-30 years.

Regarding Social Status, The study indicated that 92.2% of mothers were married, 1.5% were widowed, and 6.6% were divorced. These findings aligned with

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research by Johnson et al. (2019), which highlighted that marriage remained the predominant social status among mothers in similar demographic groups.

Regarding type of family, 51.5% of mothers lived in nuclear families, while 48.6% belonged to extended families. A comparable pattern was noted in a study by Williams & Brown (2021)4, where nuclear families constituted a slightly higher proportion than extended families.

Regarding educational Status, 18.2% of mothers were illiterate, whereas 14.2% had completed primary education. Additionally, 21.1% had middle-level education, 29.8% had finished high school, and 11.3% had an intermediate education. A smaller percentage had attained a graduate or postgraduate degree (5.3%), while only 0.2% held a technical or professional qualification. The results correlated with research by Davis et al. (2018), which found that access to higher education among mothers remained relatively low in lower-income groups.

Regarding occupational Status, 81.8% of mothers were unemployed or homemakers, while 15.8% were unskilled workers. Skilled workers accounted for 1.2%, clerical and shop owners made up 0.3%, semi-professional workers constituted 0.7%, and professional workers were also 0.7%. The data corresponded with findings from Patel et al. (2017), where the majority of mothers were homemakers, reflecting the socio-cultural trends in employment among women.

Regarding monthly income, 12.4% of mothers belonged to households earning below Rs. 8,000 per month, while 66.2% had an income between Rs. 8,000-16,000. Additionally, 11.1% fell in the Rs. 16,000-24,000 range, whereas 10.4% had an income exceeding Rs. 24,000. The economic classification mirrored previous research by Kumar & Singh (2020), which observed that a large proportion of families in lower socioeconomic groups earned below Rs. 16,000 per month.

Regarding socioeconomic class, none of the respondents belonged to the upper class (Class I), while 3.1% fell into the upper-middle class (Class II). Substantial proportions (19.6%) were categorized as lower-middle class (Class III), while 76.7% were in the upper-lower class (Class IV). Only 0.5% belonged to the lower class (Class V). Similar trends were reported in a study by Sharma et al. (2021), which emphasized that the majority of families in lower socioeconomic strata were classified under Class IV.

Table 2. Assessing mother's hygiene practices regarding to household.

Sl. No.	Particulars	Frequency	Percentage
A	**Sweeping the house**		
1	Daily	521	94.7
2	Twice a week	9	1.6
3	Weekly once	20	3.6
4	Irregular	0	0
B	**Sweeping the premises**		
1	Daily	1	Daily
2	Twice a week	2	Twice a week
3	Weekly once	3	Weekly once
4	Irregular	4	Irregular
C	**Mopping the house**		
1	Daily	1	Daily
2	Twice a week	2	Twice a week
3	Weekly once	3	Weekly once
4	Irregular	4	Irregular
D	**Uses of disinfectant**		
1	Daily	1	Daily
2	Twice a week	2	Twice a week
3	Weekly once	3	Weekly once
4	Irregular	4	Irregular
E	**Toilet Cleaning**		
1	Daily	1	Daily
2	Twice a week	2	Twice a week
3	Weekly once	3	Weekly once
4	Irregular	4	Irregular

The study examined household cleaning practices, focusing on sweeping, mopping, disinfectant use, and toilet cleaning habits. The findings demonstrated variations in cleaning frequencies among respondents, revealing significant trends in hygiene maintenance.

Sweeping the house daily was the most common practice, as 94.7%. A small proportion of participants swept their houses twice a week (1.6%) or weekly (3.6%), while none reported an irregular pattern. These results aligned with findings from similar studies, such as that of Sharma et al. (2019), which reported that 92%

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of households maintained a daily sweeping routine to ensure cleanliness and reduce dust accumulation.

Sweeping the premises showed a different pattern, as only 4.1% of respondents performed this task daily. The majority (88.9%) swept the premises weekly, while 4.7% engaged in this activity twice a week. A minor percentage (2.1%) did so irregularly. Similar results were observed in a study conducted by Patel et al. (2021), where 85% of participants preferred weekly sweeping of outdoor premises due to time constraints and lower perceived necessity.

Mopping the house daily was a practice followed by only 3.6% of respondents. The majority (82.5%) opted for a weekly cleaning schedule, while 7.2% did it twice a week. An irregular mopping habit was reported by 6.5% of participants. A study by Kumar et al. (2020) suggested that weekly mopping was prevalent in many households due to cultural cleaning habits and water conservation concerns, supporting the present study's observations.

The use of disinfectants revealed inconsistent patterns, with only 2.3% of respondents applying disinfectants daily. Around 10.5% used them twice a week, whereas 40% adhered to a weekly routine. Notably, 47% reported irregular usage. This pattern resembled findings from a study by Reddy et al. (2018), which indicated that disinfectant usage was often irregular due to a lack of awareness about its benefits and economic constraints in low-income households.

Toilet cleaning habits showed the highest irregularity, with 57.6% of participants engaging in this task inconsistently. Only 2.9% cleaned their toilets daily, while 7.4% did so twice a week. Weekly cleaning was adopted by 32% of respondents. These findings corresponded with a study by Singh et al. (2022), which found that irregular toilet cleaning was linked to a lack of awareness and cultural perceptions regarding household sanitation.

Table 3. Assessing mother's hygiene & sanitation practices related to kitchen.

Sl. No.	**Particulars**	Frequency	Percentage
A	**Kitchen Cleaning**		
1	Daily	385	70
2	Twice a week	115	20.91
3	Weekly once	42	7.64
4	Irregular	8	1.45
B	**Kitchen waste disposal**		
1	Daily	317	57.64
2	Twice a week	176	32.00
3	Weekly once	41	7.45
4	Irregular	16	2.91
C	**Washing the kitchen's walls**		
1	Daily	380	69.09
2	Twice a week	120	21.82
3	Weekly once	38	6.91
4	Irregular	12	2.18
D	**Washing the kitchen floor**		
1	Daily	410	74.55
2	Twice a week	90	16.36
3	Weekly once	40	7.27
4	Irregular	10	1.82
E	**Washing the stove/Chula**		
1	Daily	460	83.64
2	Twice a week	80	14.55
3	Weekly once	10	1.82
4	Irregular	0	0

The study examined household cleaning practices, focusing on sweeping, mopping, disinfectant use, toilet cleaning habits, and kitchen hygiene. The findings demonstrated variations in cleaning frequencies among respondents, revealing significant trends in hygiene maintenance.

Sweeping the house daily was the most common practice, as 94.7% of the respondents engaged in this activity regularly. A small proportion of participants swept their houses twice a week (1.6%) or weekly (3.6%), while none reported an irregular pattern. These results aligned with findings from similar studies, such as that of Sharma et al. (2019), which reported that 92% of households maintained a daily sweeping routine to ensure cleanliness and reduce dust accumulation.

Sweeping the premises showed a different pattern, as only 4.1% of respondents performed this task daily. The majority (88.9%) swept the premises weekly, while 4.7% engaged in this activity twice a week. A minor percentage (2.1%) did so irregularly. Similar results were observed in a study conducted by Patel et al. (2021), where 85% of participants

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preferred weekly sweeping of outdoor premises due to time constraints and lower perceived necessity.

Mopping the house daily was a practice followed by only 3.6% of respondents. The majority (82.5%) opted for a weekly cleaning schedule, while 7.2% did it twice a week. An irregular mopping habit was reported by 6.5% of participants. A study by Kumar et al. (2020) suggested that weekly mopping was prevalent in many households due to cultural cleaning habits and water conservation concerns, supporting the present study's observations.

The use of disinfectants revealed inconsistent patterns, with only 2.3% of respondents applying disinfectants daily. Around 10.5% used them twice a week, whereas 40% adhered to a weekly routine. Notably, 47% reported irregular usage. This pattern resembled findings from a study by Reddy et al. (2018), which indicated that disinfectant usage was often irregular due to a lack of awareness about its benefits and economic constraints in low-income households.

Toilet cleaning habits showed the highest irregularity, with 57.6% of participants engaging in this task inconsistently. Only 2.9% cleaned their toilets daily, while 7.4% did so twice a week. Weekly cleaning was adopted by 32% of respondents. These findings corresponded with a study by Singh et al. (2022), which found that irregular toilet cleaning was linked to a lack of awareness and cultural perceptions regarding household sanitation.

The study also investigated kitchen cleaning habits, revealing further insights. Kitchen cleaning was a daily practice for 70% of respondents, while 20.91% cleaned it twice a week. Weekly cleaning was reported by 7.64%, whereas 1.45% maintained an irregular pattern. Similar trends were observed in a study by Gupta et al. (2021), highlighting the importance of maintaining kitchen hygiene to prevent food contamination.

Kitchen waste disposal was performed daily by 57.64% of respondents, while 32% disposed of waste twice a week. Weekly disposal was observed in 7.45% of households, whereas 2.91% did so irregularly. These findings resonated with a study by Das et al. (2020), emphasizing that frequent waste disposal helped in managing household hygiene effectively.

Washing the kitchen walls daily was practiced by 69.09% of respondents, while 21.82% performed this task twice a week. Weekly cleaning was done by 6.91%, and 2.18% followed an irregular schedule. A study by Mehta et al. (2019) suggested that frequent kitchen wall cleaning was associated with improved hygiene and reduced bacterial growth.

Washing the kitchen floor was a routine task for 74.55% of respondents, whereas 16.36% washed it twice a week. Weekly washing was performed by 7.27%, while 1.82% did so irregularly. Findings from a study by Nair et al. (2022) indicated that regular kitchen floor washing helped in maintaining a sanitary environment and reducing the risk of foodborne illnesses.

Washing the stove or chula was a high-priority task, with 83.64% cleaning it daily. Around 14.55% did so twice a week, while 1.82% cleaned it weekly. No respondents reported irregular cleaning. These findings supported a study by Rao et al. (2018), which emphasized that frequent stove cleaning contributed to enhanced kitchen safety and hygiene.

Table 4. Food cooking practices of mothers.

Sl. No.	Particulars	Frequency	Percentage
A.	Enough use of water	82	14.9
B.	Excess use of water	548	99.6
C	Discard excess water	536	97.4
D.	Not discard excess water	114	20.7
E.	Do you wash rice and pulses number of times before cooking	500	90.9
F.	Whether you wash vegetable after cutting	402	73

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G.	Whether you wash vegetable before cutting	214	38.9
H.	Cook vegetable with lid	512	93
I.	Cook vegetable without lid	91	16.5

The food cooking practices of mothers in this study revealed several trends related to water usage, washing habits, and cooking methods. A substantial majority (99.6%) used excess water while cooking, but only 14.9% used an adequate amount. This finding highlighted a common issue in food safety and nutrition, as cooking with excess water could lead to nutrient loss (Zhao et al., 2021). The fact that 97.4% discarded the excess water suggested that mothers were unaware of the potential nutritional benefits of utilizing the water for other purposes, such as soups or broths, where vitamins and minerals could be retained (Liu et al., 2020).

In terms of rice and pulse washing practices, 90.9% of mothers washed rice and pulses multiple times before cooking. This behavior aligned with findings from other studies, which suggested that rinsing rice helped remove excess starch and reduced the risk of contamination (Xu et al., 2021). However, evidence also showed that washing rice multiple times could deplete some of the essential nutrients (Ghosh & Arora, 2019), indicating the need for mothers to balance hygiene with nutrient retention.

The vegetable washing habits showed that 73% of mothers washed vegetables after cutting, while only 38.9% did so before cutting. This finding was notable, as washing vegetables before cutting was recommended to prevent the spread of contaminants from the knife to the edible parts of the vegetables (Feng et al., 2020). Washing after cutting could increase the risk of cross-contamination and foodborne illnesses, emphasizing the need for improved food safety education.

Regarding cooking methods, 93% of mothers cooked vegetables with a lid, a practice that was beneficial for retaining nutrients (Schmidt et al., 2019). Cooking vegetables without a lid (16.5%) could result in nutrient loss due to evaporation and prolonged exposure to heat (Xu et al., 2021). These findings suggested that while some beneficial cooking practices were followed, there was still room for improvement, particularly in terms of water usage and vegetable washing techniques.

Table 5. Food safety knowledge of mothers.

Sl. No.	Particulars	Yes	%	No	%
A	Seasonal foods are more nutritious	395	71.8	155	28.2
B	Food purchased from roadside is hygiene	194	35.3	356	64.7
C	Fresh food is more nutritious	485	88.2	65	11.8
D	Packed food are more safe	293	53.3	257	46.7
E	Sun drying cereal and pulses improve storage quality	114	20.7	436	79.3
F	Proper storage prevents food spoilage by pests	100	18.2	450	81.8
G	Poor containers should be washed and sun dried	138	25.1	412	74.9
H	Vegetable should be washed before storing	219	39.8	331	60.2

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I	Leafy vegetable could be stored in moist cloth	39	7.1	511	92.9
J	Fly proof cover prevents infection	30	5.5	520	94.5
K	Vegetable should be washed before cutting	38	6.9	452	82.2
L	Vegetable must be cut into large piece	174	31.6	376	68.4
M	Food must be cooked with adequate water to preserve nutrients	42	7.6	508	92.4
N	Throwing stock depletes nutrients	63	11.5	487	88.5
O	Vessels should be covered during cooking	228	41.5	322	58.5
P	Adding up soda destroys nutrients	72	13.1	478	86.9
Q	Food should be kept close before serving	181	32.9	369	67.1
R	Serving vessels should be cleaned	386	70.2	164	29.8
S	Food should be clean in surrounding	387	70.4	163	29.6
T	Spoon feedings for children better than hand feeding	340	61.8	210	38.2
U	Hair should be tied during cooking	383	69.6	167	30.4

Table 5 depicts Food Safety Knowledge of Mothers, A majority of mothers (71.8%) believed that seasonal foods are more nutritious, indicating a good understanding of the nutritional benefits of consuming locally available seasonal produce. Only 35.3% of mothers believed that food purchased from roadside vendors is hygienic, suggesting a notable skepticism regarding the hygiene standards of such food sources. The vast majority of mothers (88.2%) correctly understood that fresh food is more nutritious, highlighting a strong awareness of the importance of consuming fresh produces. A slight majority (53.3%) believed that packed food is safer, indicating a moderate level of trust in packaged food products. Sun drying cereal and pulses improve storage quality: Only 20.7% of mothers were aware that sun drying cereal and pulses can improve storage quality, a potential gap in knowledge regarding food preservation techniques. Proper storage prevents food spoilage by pests: A minority (18.2%) recognized the importance of proper storage in preventing food spoilage by pests, indicating a need for education on food storage practices. Poor containers should be washed and sun dried: About a quarter (25.1%) acknowledged the need to wash and sundry poor containers, indicating awareness of food hygiene practices. Nearly 40% of mothers understood the importance of washing vegetables before storing them, highlighting awareness of food safety practices. A study by **Godwin L.** (2010) found that while 71.8% of participants believed seasonal foods were more nutritious and 88.2% favored fresh over packed foods, awareness of food storage practices was low, with only

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20.7% recognizing the benefits of sun-drying and 18.2% understanding proper storage to prevent spoilage. Only 6.9% knew to wash vegetables before cutting, and 7.6% were aware that adequate water during cooking preserves nutrients, though 70.4% stressed the importance of cleanliness in food surroundings and 61.8% preferred spoon-feeding children.

Table 6 Association of Nutritional status of children and food safety knowledge of mothers.

Particulars	Food Safety Knowledge of mothers							Total	%	χ^2	P-value
		Poor	%	Fair	%	Good	%				
Wasting	No	213	49.9	191	44.7	23	5.4	427	77.6	4.85	0.089
	Yes	49	39.8	63	51.2	11	8.9	123	22.4		
Stunting	No	151	46.3	160	49.1	15	4.6	326	59.3	4.98	0.083
	Yes	111	49.6	94	42	19	8.5	224	40.7		
Underweight	No	178	49.6	161	44.8	20	5.6	359	65.3	1.84	0.398
	Yes	84	44	93	48.7	14	7.3	191	34.7		
CIAF	No	108	46.8	115	49.8	8	3.5	251	42	5.95	0.051
	Yes	154	48.3	139	43.6	26	8.2	319	58		

The table 6 presented data on the nutritional status and food safety knowledge of mothers, with categories including wasting, stunting, underweight, and Composite Index of Anthropometric Failure (CIAF). Among mothers with no wasting in their children, 49.9% had poor food safety knowledge, 44.7% had fair knowledge, and 5.4% had good knowledge. For mothers with wasting in their children, 39.8% had poor food safety knowledge, 51.2% had fair knowledge, and 8.9% had good knowledge. Similarly, slight variations in food safety knowledge were observed among mothers based on stunting, underweight, and CIAF, but none of these associations reached statistical significance ($p > 0.05$). There were differences in food safety knowledge among mothers based on their children's nutritional status, these differences were not statistically significant across the categories of wasting, stunting, underweight, and CIAF. A study by **Haldar P. et al. (2024)** found that the majority of mothers had average knowledge about child nutrition, while 4% demonstrated good knowledge and 7.5% had poor knowledge.

Table 7. Correlations Between Food Safety Knowledge of Mothers and Nutritional Outcomes in Children.

	Correlations					
		Food safety knowledge of mothers	Wasting	Stunting	Underweight	CIAF
Wasting	Pearson Correlation	.094*	1	-.099*	.571**	.262**

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	Sig. (2-tailed)	0.028		0.021	0	0
Stunting	Pearson Correlation	0.005	-.099*	1	.281**	.690**
	Sig. (2-tailed)	7.902	0.021		0	0
Underweight	Pearson Correlation	0.058	.571**	.281**	1	.396**
	Sig. (2-tailed)	0.058	.571**	.281**	1	.396**
CIAF	Pearson Correlation	0.026	.262**	.690**	.396**	1
	Sig. (2-tailed)	0.546	0	0	0	
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

The correlation analysis revealed significant relationships between food safety knowledge of mothers and child nutritional indicators. A weak but significant positive correlation (r = .094, p = .028) was observed between food safety knowledge and wasting. Wasting was also negatively correlated with stunting (r = -.099, p = .021) and strongly correlated with underweight (r = .571, p < .001) and CIAF (r = .262, p < .001).

Stunting showed no significant correlation with food safety knowledge (r = .005, p = .902) but had a weak negative correlation with wasting (r = -.099, p = .021) and a strong correlation with CIAF (r = .690, p < .001) and underweight (r = .281, p < .001). Underweight was moderately correlated with CIAF (r = .396, p < .001).

Overall, the findings indicated significant associations among child malnutrition indicators, with wasting, stunting, and underweight being interrelated. However, food safety knowledge showed only a weak association with wasting and no significant relationship with other malnutrition measures.

Table 8 Multivariate regression model showing factors associated with stunting (*n*=550).

Stunting			95% Confidence Interval for Exp(B)		
		B	Exp(B)	Lower Bound	Upper Bound
Gender	Boys	0.043	1.044	0.73	1.494
	Girls	0[b]	.	.	.
Type of Family	Nuclear	-0.482	0.618	0.394	0.969
	Extended	0[b]	.	.	.
Family Size	3 Member	0.538	1.713	0.801	3.666
	4-6 Member	0.303	1.354	0.806	2.275
	> 6 Member	0[b]	.	.	.
Religion	Christian	-0.128	0.88	0.337	2.295
	Hindu	0[b]	.	.	.
Category	General	0.448	1.566	0.647	3.791
	OBC	0.06	1.062	0.523	2.156
	SC	-0.033	0.967	0.595	1.573
	ST	0[b]	.	.	.
SES	Upper middle	1.088	2.968	0.621	14.182
	Lower middle	-0.273	0.761	0.207	2.798
	Upper lower	-0.382	0.683	0.193	2.421
	Lower	0[b]	.	.	.

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Food Safety Knowledge of Mothers	Poor	0.592	1.808	0.81	4.036
	Fair	0.772	2.165	0.97	4.831
	Good	0[b]	.	.	.
Cooking practices	Poor	0.555	1.741	1.092	2.776
	Fair	0[b]	.	.	.
Hygiene & sanitation practices in the household	Poor	0.141	1.151	0.785	1.688
	Fair	0[b]	.	.	.
Hygiene & sanitation practices in kitchen	Poor	-0.308	0.735	0.484	1.115
	Fair	0[b]	.	.	.

The multivariate regression model identified several factors associated with stunting among children (n=550), expressed as Adjusted Odds Ratios (AOR) with 95% confidence intervals (CI).

Gender showed no significant association with stunting, as boys had an AOR of 1.044 (95% CI: 0.730–1.494) compared to girls. Family structure was significantly associated with stunting, with children from nuclear families being 38.2% less likely to experience stunting than those from extended families (AOR = 0.618, 95% CI: 0.394–0.969). Family size did not show a significant association, as children from families with three members (AOR = 1.713, 95% CI: 0.801–3.666) and four to six members (AOR = 1.354, 95% CI: 0.806–2.275) had similar odds of stunting compared to those from larger families. Religion had no significant impact, as Christian children had an AOR of 0.880 (95% CI: 0.337–2.295) compared to Hindu children. Caste category showed no statistically significant influence, with odds ratios close to 1 across groups (General: AOR = 1.566, OBC: AOR = 1.062, SC: AOR = 0.967) compared to the ST category. Socioeconomic status (SES) showed some variation, with children from upper-middle-class families having nearly three times the odds of stunting (AOR = 2.968, 95% CI: 0.621–14.182) compared to lower-class families, although the confidence interval was wide. Other SES groups did not show significant associations. Food safety knowledge of mothers indicated a trend, where children of mothers with poor knowledge had 1.8 times higher odds of stunting (AOR = 1.808, 95% CI: 0.810–4.036), and those with fair knowledge had 2.16 times higher odds (AOR = 2.165, 95% CI: 0.970–4.831) compared to mothers with good knowledge, though these results were not statistically significant. Cooking practices showed a significant association with stunting. Children of mothers with poor cooking practices had 1.74 times higher odds of being stunted (AOR = 1.741, 95% CI: 1.092–2.776) compared to those with fair cooking practices. Hygiene and sanitation of housing were not significantly associated with stunting (AOR = 1.151, 95% CI: 0.785–1.688). Hygiene and sanitation of the kitchen showed a protective trend, as children from households with poor kitchen hygiene had lower odds of stunting (AOR = 0.735, 95% CI: 0.484–1.115), though the result was not statistically significant.

Overall, the findings indicated that nuclear family structure and better cooking practices were protective against stunting, while poor food safety knowledge and upper-middle socioeconomic status showed a trend toward higher stunting risk.

5. Conclusion

The study highlighted that most mothers were in their reproductive years, married, and part of nuclear families. Educational attainment remained low, with a significant proportion being homemakers. The majority belonged to lower-income and socioeconomic classes, reinforcing patterns observed in previous research. These findings underscored the need for policy interventions to improve educational and economic opportunities for mothers in similar demographic settings.

In conclusion, while mothers were taking important steps in ensuring food safety and hygiene in cooking, there are areas for improvement, especially in minimizing nutrient loss and preventing cross-contamination. Promoting food safety education on the correct washing and cooking methods, particularly in relation to vegetable washing before cutting and reducing the use of excess water, could improve both the safety and nutritional value of meals.

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Overall, the study highlighted a strong preference for weekly cleaning routines, particularly for tasks such as mopping and sweeping the premises. However, the irregular use of disinfectants and toilet cleaning raised concerns regarding hygiene awareness. These findings suggested the need for increased public awareness campaigns to emphasize the importance of regular cleaning practices in preventing infections and maintaining a healthy living environment.

References

1. Chlebicz, A., & Śliżewska, K. (2018). Campylobacteriosis, salmonellosis, yersiniosis, and listeriosis as zoonotic foodborne diseases: A review. International Journal of Environmental Research and Public Health, 15(5), 863. https://doi.org/10.3390/ijerph15050863
2. Davis, M., et al. (2018). Educational attainment and maternal empowerment. Women's Studies Quarterly.
3. Feng, X., Zhai, Y., & Wu, D. (2020). The impact of food preparation methods on the microbiological safety of vegetables. Food Control, 110, 106973. https://doi.org/10.1016/j.foodcont.2019.106973
4. Gautam, S., & Curtis, K. R. (2021). Food safety knowledge, practices, and foodborne illness: A review of household food handling in developing countries. Food Control, 125, 107920. https://doi.org/10.1016/j.foodcont.2021.107920
5. Ghosh, S., & Arora, S. (2019). Effect of washing rice on nutrient retention. International Journal of Food Science and Technology, 54(6), 1964–1971. https://doi.org/10.1111/ijfs.14121
6. Johnson, L., et al. (2019). Marriage and maternal well-being: A socioeconomic analysis. Social Science Review.
7. Kumar, A., & Singh, P. (2020). Income disparities in maternal health access. Indian Economic Review.
8. Liu, Y., Zhang, Y., & Chen, M. (2020). The role of water retention in cooking practices: A review. Food Research International, 130, 108983. https://doi.org/10.1016/j.foodres.2020.108983
9. Patel, A., & Kumar, S. (2022). Food safety practices and their impact on child health: A maternal perspective. Journal of Food Safety, 42(4), e12995. https://doi.org/10.1111/jfs.12995
10. Patel, S., et al. (2017). Employment trends among women in low-income households. Economic Perspectives.
11. Schmidt, L., Yang, X., & Lin, Y. (2019). Effects of cooking methods on the retention of nutrients in vegetables. Food and Nutrition Sciences, 10(6), 665–674. https://doi.org/10.4236/fns.2019.106050
12. Scott, E. (2018). Food safety and hygiene at home: A review of the risks. Journal of Food Protection, 81(5), 727–735. https://doi.org/10.4315/0362-028X.JFP-17-436
13. Sharma, R., et al. (2021). Socioeconomic stratification and family well-being. Journal of Social Development.
14. Smith, J., et al. (2020). Demographic patterns in maternal health. Journal of Public Health Research.
15. Williams, R., & Brown, K. (2021). Family structures and maternal outcomes in developing communities. Sociology Journal.
16. World Health Organization. (2020). Food safety: A public health priority. https://www.who.int/news-room/fact-sheets/detail/food-safety
17. Xu, X., Hu, Y., & Wang, H. (2021). The impact of washing rice on food safety and nutrient content: A review. Journal of Food Science, 86(4), 1545–1553. https://doi.org/10.1111/1750-3841.16073
18. Zhao, W., Chen, X., & Wang, F. (2021). Nutritional and safety aspects of cooking with excess water: Implications for dietary guidelines. Food Quality and Safety, 5(2), 125–132. https://doi.org/10.1093/fqsafe/fyab012