A study to assess the knowledge regarding hand, foot and mouth diseases [HFMD] among mothers of under five children at selected urban slum area of Surat city with a view to develop an information booklet

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Abstract—**Background: Hand, foot and mouth disease (HFMD) is a common, highly contagious viral illness that mainly affects young children. Adequate parental knowledge is essential for early recognition, appropriate home care and prevention of transmission.**
Aim: To assess knowledge regarding HFMD among mothers of under-five children in a selected urban slum area of Surat city, and to examine its association with selected demographic variables.
Methods: A quantitative, non-experimental descriptive survey was conducted among 250 mothers of under-five children, selected by non-probability convenience sampling. Data were collected using a self-structured 26-item knowledge questionnaire. Descriptive statistics and the chi-square test were used for analysis.
Results: Out of the 250 mothers, 160 (64%) had poor knowledge, 90 (36%) had average knowledge and none (0%) had good knowledge. The mean knowledge score was 10.64 ± 5.56 out of 26. Knowledge was highest for transmission (57%) and lowest for complications (26%). Knowledge level was significantly associated with education, occupation, religion and number of children.
Conclusion: Most mothers had poor knowledge of HFMD, particularly regarding its complications. Targeted, community-based health education is needed to improve early recognition, prevention and management of HFMD in urban slum settings.

Index Terms—**Hand, Foot and Mouth Disease, knowledge, mothers, under-five children, urban slum, health education, information booklet**

I. Introduction

Children under five years of age are in a critical period of rapid physical, cognitive and socio-emotional development, and are highly vulnerable to communicable diseases such as respiratory infections, diarrhoea, measles and hand, foot and mouth disease (HFMD). HFMD was first described in an outbreak in Birmingham in 1959 [1] and is now recognised as a common and highly contagious viral infection that predominantly affects young children.

The disease is characterised by fever, oral ulcers and a vesicular rash on the hands, feet and sometimes other body sites. It is usually mild and self-limiting, but rarely it may cause serious complications such as meningitis, encephalomyelitis, myocarditis and acute flaccid paralysis. HFMD is caused mainly by enteroviruses of species A, particularly coxsackievirus A16 (CV-A16) and enterovirus A71 (EV-A71), with coxsackievirus A6 (CV-A6) increasingly implicated. Outbreaks have been reported from many regions,

including India [2], Korea and Finland [3,5], and CV-A6 infection has been associated with atypical cutaneous presentations, even in adults [4]. Enteroviral infections may also be severe in neonates [6].

Transmission occurs through the faeco-oral route, respiratory droplets, direct contact with infected persons or lesions, and contaminated objects. Cases often rise during warm, humid or rainy periods, particularly in tropical and subtropical regions. In India, HFMD was first reported from Kerala in 2003, followed by reports from Maharashtra, West Bengal, Odisha and Tamil Nadu.

Mothers are the primary caregivers of under-five children and play a central role in recognising early symptoms, maintaining hygiene, seeking timely care and limiting spread. Inadequate knowledge may delay recognition, encourage inappropriate home practices and sustain transmission, a risk that is greater in crowded urban slum communities where children are in close contact and exposure to infection is frequent. Identifying maternal knowledge gaps is therefore a prerequisite for planning structured health education. This study assessed knowledge of HFMD among mothers of under-five children in an urban slum of Surat city and explored its association with demographic characteristics.

Objectives

1.To assess knowledge regarding HFMD among mothers of under-five children in a selected urban slum area of Surat city.

2.To determine the association between knowledge and selected demographic variables.

II. Methods

Design and setting. A quantitative, non-experimental, descriptive survey design was used in a selected urban slum area of Surat city, Gujarat, India.

Population and sample. The target population was mothers of under-five children residing in the selected area. A total of 250 mothers were recruited by non-probability convenience sampling. Mothers were eligible if they lived in the study area, could read and speak English or Gujarati, were present at the time of data collection and were willing to participate.

Variables. The study variable was mothers' knowledge of HFMD. Demographic variables were age, education, occupation, religion, monthly income, previous knowledge of HFMD and number of children.

Data collection tool. The tool had two sections: (A) demographic profile and (B) a self-structured knowledge questionnaire of 26 items covering seven areas: introduction (2 items), risk groups and causes (2), transmission (4), signs and symptoms (4), management (6), complications (2) and prevention (6). Each correct answer scored one mark (total score 0–26). Scores were categorised as poor (<50%; 0–12), average (51–75%; 13–19) and good (>75%; 20–26). The tool was developed in consultation with experts in paediatrics and nursing and its content validity was established by expert review. A pilot study in another

urban slum area of Surat was used to test feasibility and clarity of the tool. [Insert reliability coefficient, e.g., Cronbach's alpha or split-half r.]

Data collection. Final data were collected from 4 to 9 May 2026. After building rapport and assuring confidentiality, the investigator assessed each mother's knowledge with the questionnaire. An information booklet on HFMD was then given to the participants.

Ethical considerations. Participation was voluntary, informed consent was obtained from all participants, and confidentiality of responses was assured.

Statistical analysis. Data were analysed using descriptive statistics (frequency, percentage, mean, standard deviation) and the chi-square test for association between knowledge level and demographic variables.

III. Results

3.1 Demographic characteristics. [Insert Table 1: frequency and percentage distribution of participants by age, education, occupation, religion, monthly income, previous knowledge and number of children.]

Sr. No.	Characteristics	Frequency	Percentage %
1	**Age**		
	A. 20-23 years	153	61.2
	B. 24-27 years	64	25.6
	C. 28-31 years	26	10.4
	D. 32-35 years	07	2.8
	E. Above 36 years	00	00
2	**Education**		
	A. Professional degree	00	00
	B. Graduate	00	00
	C. Diploma	00	00
	D. High school	00	00
	E. Middle school	101	40.4
	F. Primary school	126	50.4
	G. Illiterate	23	9.2
3	**Occupation**		
	1. Legislators, senior officials, managers	00 00	00 00
	2. Professional	00	00

Sr. No.	Characteristics	Frequency	Percentage %
	1. Technicians/associate professionals	00	00
	2. Clerk	50	20
	3. Skilled worker, shop and market sales worker	30	12
	4. Skilled Agricultural and fishery worker	71	28.4
	5. Craft and related trade worker	40	16
	6. Plant and machine operators and assemblers	50	20
	7. Elementary occupation	09	3.6
	8. Unemployed		
4	**Religion**		
	A. Hindu	216	86.4
	B. Muslim	18	7.2
	C. Christian	16	6.4
	D. Other	00	00
5	**Family income per month**		
	A. <7315	00	00
	B. 7316-21,913	178	71.2
	C. 21,914-36,526	65	26
	D. 36,527-45,588	07	2.8
	E. > 45,588	00	00
6	**Previous knowledge**		
	A. Yes	00	00
	B. No	250	100
7	**Number of children**		
	1. 1	174	69.6
	2. 2	62	24.8
	3. 3	14	5.6
	4. 4	0	00

3.2 Level of knowledge. Of the 250 mothers, 160 (64%) had poor knowledge, 90 (36%) had average knowledge and none had good knowledge (Table 2).

Table 2. Distribution of mothers by level of knowledge on HFMD (n = 250)

Level of Knowledge	Classification of score	Frequency	Percentage %
Poor	<50% (0-12)	160	64
Average	51% - 75% (13-19)	90	36
Good	>75% (20-26)	00	00
Total		**250**	**100**

3.3 Area-wise knowledge. The overall mean score was 10.64 ± 5.56 out of 26 (about 41%). Mothers scored highest in transmission (57%) and risk groups and causes (56%), and lowest in complications (26%), management (34.8%) and prevention (35%).

Table 3. Area-wise knowledge scores of mothers on HFMD (n = 250)

Sr. no.	Area of knowledge	No. of questions	Max. score	Mean score	Mean percentage %	SD
1.	**Introduction**	02	02	0.85	42.5	0.59
2.	**Risk group and causes**	02	02	1.12	56	0.44
3.	**Transmission**	04	04	2.28	57	1.11
4.	**Sign and symptoms**	04	04	1.68	42	0.96
5.	**Management**	06	06	2.09	34.83	0.89
6.	**Complication**	02	02	0.52	26	0.52
7.	**Prevention**	06	06	2.1	35	1.05
	TOTAL	**26**	**26**	**10.64**		**5.56**

3.4 Association with demographic variables. Knowledge level was significantly associated with education, occupation, religion and number of children. Age, monthly income and previous knowledge of

HFMD showed no significant association. [Insert Table 4 with χ^2 values, degrees of freedom and p-values for each variable.

IV. Discussion

This study assessed knowledge of HFMD among 250 mothers of under-five children in an urban slum of Surat. Nearly two-thirds (64%) had poor knowledge, the remainder (36%) had average knowledge and none reached the good category. The mean score of 10.64 out of 26 falls within the poor range, indicating a substantial knowledge deficit in a population whose children are at increased risk because of crowding and close contact.

Knowledge was relatively better for transmission and for risk groups and causes, which may reflect general familiarity with contagious childhood illnesses. By contrast, knowledge of management, prevention and especially complications was low. This pattern is important: although HFMD is usually mild, mothers who cannot recognise warning signs may delay care for the rare severe forms, and those who are unsure of preventive measures may unknowingly sustain transmission within households and neighbourhoods.

The significant associations with education, occupation, religion and number of children suggest that maternal knowledge differs across socio-demographic groups, and that educational programmes should be tailored accordingly, for example through simple, visual and local-language materials for mothers with lower education.

The findings indicate clear scope for improving mothers' awareness through community-based health education, with emphasis on early symptom recognition, home care, hygiene and warning signs requiring medical attention.

V. Implications

Nursing practice. Community health nurses can use the findings to identify knowledge gaps and the information booklet as a teaching aid during home visits, immunisation sessions and health talks, promoting handwashing, environmental sanitation, early recognition and timely care-seeking.

Nursing education. The findings and booklet can be incorporated into community health nursing teaching and help students develop effective materials for community health promotion.

Nursing administration. Administrators can plan HFMD awareness programmes, distribute the booklet through urban health centres, Anganwadi centres, schools and outreach activities, and train nursing staff and community health workers.

Nursing research. The study provides baseline data for urban slum mothers and supports future work evaluating the effectiveness of educational interventions on knowledge, practices and HFMD incidence.

VI. Limitations

The study was limited to 250 mothers from one urban slum area of Surat, selected by convenience sampling, which restricts generalisability. Only mothers who could read and speak English or Gujarati, were present at data collection and agreed to participate were included. Knowledge was assessed with a self-structured tool, and the study did not measure attitudes, practices or the effect of the booklet.

VII. Recommendations for Further Research

Future studies should use larger and more representative samples; assess attitude and practice alongside knowledge; employ quasi-experimental or experimental designs to evaluate the effectiveness of educational interventions, including audio-visual and game-based methods; include follow-up to test retention of knowledge; and compare different settings (rural and urban) and other caregivers such as teachers.

VIII. Conclusion

Most mothers of under-five children in the studied urban slum had poor knowledge of HFMD (64%), none had good knowledge, and the mean score was 10.64 ± 5.56 out of 26. Knowledge was highest for transmission (57%) and lowest for complications (26%), and was significantly associated with education, occupation, religion and number of children. Targeted health education programmes are needed to improve awareness, early identification, prevention and management of HFMD.

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