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Hand Foot and Mouth Disease: A Community Prospective

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Abstract:

Hand, Foot and Mouth Disease (HFMD) as a viral disease mostly affected children under the age of five years. HFMD is clinically characterized by a brief febrile illness followed by pharyngitis and rashes on skin. HFMD was a mild illness reported from developed countries, and most of the patients recovered within seven days. In view of the several controversial results of various studies, the study on Hand Foot and Mouth Disease: A Community Prospective was carried out.

A cross-sectional survey was conducted using pretested structured questionnaire in Aralikatti village, Hirebagewadi Community Health Centre. Study involved 114 mothers of under five children attending Anganwadi schools from Aralikatti village, Belagavi, from them 100 mothers were found eligible and consented for the study. Data were statistically analyzed using Statistical Package for the Social Sciences (SPSS) software Version 26 with a significance value of $p < 0.01$ and 99% confidence intervals reported when applicable.

The statistical significance (***$p<0.05$) for daily floor cleaning reflects stronger preventive attitudes in this group. The highest compliance with hygiene practices is observed in respondents who know the incubation period is six weeks, with 65.3% washing hands after defecation.

Study suggests strengthening of health education for prevention of communicable disease in general and HFMD in particular.

Keywords: Hand Foot and Mouth Disease, Knowledge, Attitude, Practices, mothers, under five children

Introduction:

First case of Hand, Foot, and Mouth Disease (HFMD) was reported in 2004 in Calicut, India, thereafter, disease was declared endemic[1, 2]. Hand, Foot and Mouth Disease (HFMD) as a viral

disease mostly affected children under the age of five years[3]. HFMD is clinically characterized by a brief febrile illness followed by pharyngitis and rashes on skin. HFMD was a mild illness reported from developed countries, and most of the patients recovered within seven days[4].

HFMD occurred globally in humid warm climate. HFMD is contagious, spreads by direct contacts with nose and throat discharges, saliva, fluid from blisters, or the stool of infected. Poor hygienic conditions are associated with the development of HFMD and disease is contagious during the first week of the illness[5]. Many outbreaks have been reported in India, visibly from Bangalore, Karnataka, in October 2015 two young boys of age 3 and 10 years had vesicular lesions on tongue, hands and leg referred for laboratory diagnosis of the disease, yielded positivity for Coxsackievirus-A16[4].

Human enteroviruse (HEVs) is of the family of Picornaviridae, belongs to HEV-A, reported to be associated with HFMD. Among EVs, CV-A16 and EV-A71 were the major etiological agents causing HFMD outbreaks. Outbreaks of HFMD disease have been reported from many parts of the world including Japan[6], USA[7], Australia[8], England[9] and Singapore[10], CV-A16 was associated as the main etiological agent. Apart from CV-A16, other coxsackieviruses have also been implicated in various outbreaks including Coxsackievirus A4–A7, A9–A10, B1– B3, B5, and E9 {A4–A7, A10 (HEV-A); A9, B1–B3, B5, E9 (HEV-B)[11,12]}. Etiological relation of HEV-A71 and HFMD was identified for the first time in 1973 in Sweden and Japan[13].

In Asia, the temperate region HFMD is common during late spring and early summer. In tropical and subtropical regions of Asia, outbreak occurred in late spring. Whereas, other regions like Singapore, Thailand, Malaysia, and Vietnam, the association with humidity and temperature could not be collated, and therefore the outbreaks were reported throughout the year[14].

The present study was undertaken in the rural area of Aralikatti village, Belagavi district during

August to September 2023, using pretested structured questionnaire to understand knowledge, attitude and practice by mothers of children under five years of HFMD disease spread, control and prevention.

Material and Methods:

A cross-sectional survey was conducted using pretested structured questionnaire in Aralikatti village, Hirebagewadi Community Health Centre during August to September 2023. Questionnaire to study Hand Foot and Mouth Disease (HFMD) was prepared using review of literature[15-17] furthermore, to study feasibility questionnaire was used to collect data from eight mothers and as required some of the questions were modified. The pretesting phase was also used to train Anganwadi workers for data collection.

Study involved 114 mothers of under five children attending Anganwadi schools from Aralikatti village, Belagavi, from them 100 mothers were found eligible and consented for the study. Study was approved by the Institutional Review Board on 7th June 2023 prior to data collection.

Data was cleaned and entered for the analysis within week of data collection, questionnaires found with any inconsistency or errors were referred back to the community at the same time.

Data cleaning and analysis was subsequently performed by a researcher independent of team involved in data collection. Each record was managed as a unique response and checked for completeness, accuracy, and clarity by the independent researcher before inclusion for analysis.

Questions regarding demographic characteristics, general knowledge of HFMD, signs and symptoms, complications, mode of transmission and prevention of HFMD were sequenced in the questionnaire. Questions on attitude towards HFMD were in 5- point Likert Scale (REF). Questions on attitude were collated with knowledge of the mothers and for the practice of the same.

Data were statistically analyzed using Statistical Package for the Social Sciences (SPSS) software Version 26 with a significance value of $p < 0.01$ and 99% confidence intervals reported when applicable.

Results:

One hundred mothers of children under five years of age, need to be protected from Hand, Foot and Mouth Disease (HFMD) were subjected to survey at Anganwadi, Aralikatti village, Belagavi, Karnataka, out of which fifty-two reported correct cause of disease 'virus.

Knowledge, Attitude and Practice of preventive aspects of HFMD along with its determinants were as under.

Table 1: Causative organism of HFMD disease by socio-demographic status

Organism/ Causative factors	Causative organism for HFMD						
	Bacteria		Fungus		Virus		Total
	No	%	No	%	No	%	
a: Religion: $\aleph_2^2$= 1.51; p> 0.05; NS							
Hindu	10	12.20	27	32.93	45	54.88	82
Others (Christian (2) + Muslim (16)	3	16.67	8	44.44	7	38.89	18
b: Type of family: $\aleph_2^2$= 1.80; p> 0.05; NS							
Nuclear	6	19.35	11	35.48	14	45.16	31
Joint	7	10.14	24	34.78	38	55.07	69
c: Age of the mother: **$\aleph_4^2$= 3.50; p> 0.05; NS**							
15-20 years	3	17.65	8	47.06	6	35.29	17
21-25 years	7	10.77	23	35.38	35	53.85	65
26+ years	3	16.67	4	22.22	11	61.11	18
d: Educational status: $\aleph_6^2$= 39.32; p> 0.05; NS							
Illiterate	4	33.33	7	58.33	1	8.33	12
Primary	5	17.86	17	60.71	6	21.43	28
SSLC and above	4	6.67	11	18.33	45	75.00	60
e: Occupational status: $\aleph_6^2$= 3.41; p> 0.05; NS							
House maker	12	13.79	30	34.48	45	51.72	87
Govt employee	0	0.00	3	50.00	3	50.00	6
Pvt employee	0	0.00	1	25.00	3	75.00	4
Own business	1	33.33	1	33.33	1	33.33	3
f: Family income: $\aleph_6^2$= 16.66; p> 0.05; NS							
Less than 10000	3	11.11	12	44.44	12	44.44	27
10001- 10999	7	21.88	14	43.75	11	34.38	32
20001-20999	3	21.43	4	28.57	7	50.00	14
Above 30000	0	0.00	5	18.52	22	81.48	27
Total	**13**	**13.00**	**35**	**35.00**	**52**	**52.00**	**100**

Table 1 Causative organism of HFMD disease by socio-demographic status reveals out of total 100, bacteria was stated by 13%, Fungus 35% and Virus 52%. However, Table 1a, Causative organism of Hand Foot and Mouth disease by Religion reveals Virus 54.9 % as the highest cause

of causative organism for HFMD followed by Fungus 32.9% and bacteria 12.2%, similar respective figures for Christians were 50% each for Virus and Fungus, whereas, for Muslims figures were 52, 35 and 13 % respectively. Furthermore, table 1b, by type of family reveals for joint family Virus were 55.1% followed by fungus 34.8 % and Bacteria 10.1%. Table 1c, by age reveals Fungus 47.1% as the highest cause of causative organism for HFMD followed by virus 35.3% and bacteria 17.7%, similar respective figures for 21-25 years of age of mothers were 35.4, 53.9 and 10.8%, whereas, for age 26 and above years the respective figures were 35, 52 and 13 % respectively. Furthermore, table 1d, causative organism by educational status reveals knowledge of illiterate woman Fungus 58.3% followed by bacteria 33.3% and virus 8.3%, similar respective figures for primary education for Fungus were 60.7% followed by Virus 21.4% and bacteria 17.9%, and in education group SSLC and above were 18.3, 75 and 6.7% respectively. Table 1e, Causative organism of Hand Foot and Mouth disease by occupation of mothers reveals that Virus was highest 51.7% as the causative organism for HFMD followed by Fungus 34.5% and bacteria 13.8% by house maker. For government employees Fungus and Virus were revealed each 50%, whereas, by private employees Virus was 75% and Fungus 25%. However, woman in own business revealed 33.3% each. Table 1f, causative organism by Family income reveals knowledge about causative organism in income group less than 10,000; Virus and Fungus each 44.4% followed by 11.1% as bacteria.

Table 2: Knowledge about preventive measures of Hand Foot and Mouth Disease

Knowledge/Transmission of HFMD virus		
a: Mode of transmission	n	percent
Direct contact	6	11.54
Indirect through sputum etc	15	28.85
Droplet	13	25.00
Common source of infection	18	34.62
b. Knowledge of HFMD presentation		
Fever, weakness & Lethargy	4	7.69
Lesions on palm, sole and oral mucosa	48	92.31
c: Maximum incubation period		
1 week	12	23.08
2 weeks	11	21.15
6 weeks	26	50.00
8 weeks	3	5.77
d: Maximum duration of clinical symptoms		
3-7 days	4	7.69
8-14 days	17	32.69
15-21 days	20	38.46
22-28 days	11	21.15
Total	52	100

Table 2, Knowledge about preventive measures of Hand Foot and Mouth Disease reveals a) mode of transmission, maximum 18 (34.62%) of mothers responded common source of infection, followed by indirect through sputum etc. 28.9% and droplet 25%. However, differences in source of infection were not statistically significant. Table 2, b) Knowledge of HFMD presentation as maximum lesions on palm, sole and oral mucosa 92.3% and only 7percent Fever, weakness & Lethargy. Table 2, c) maximum incubation period reveals maximum incubation period as 6 weeks 50 percent followed by less than 6 weeks 44 percent, and Table 2,d) maximum duration of clinical symptoms was reported 15-21 days 38.5percent maximum followed by 8-14 days , 32.7 percent and 22-28 days 21.2%.

Table 3: Attitude of Hand Foot and Mouth Disease by its knowledge attributes

Knowledge attributes of HFMD		Attitude of HFMD						
		Hand wash can prevent HFMD	**Disinfection of toy**	**Hot water consumption in case of oral ulcer**	**Avoid contact with HFMD infected person**	**Disease control by withdrawal from school**	**Transmits through infected faeces**	**Immunisation can prevent HFMD**
a: Mode of transmission								
Direct Contact (6)	Mean	3.67	1.33	2.83	2.83	3.50	3.00	3.17
	SD	0.81	0.51	0.98	0.98	0.83	0.89	0.98
Indirect through sputum etc (13)	Mean	1.54	1.85	1.46	2.23	2.77	2.38	2.54
	SD	0.66	1.14	0.77	0.83	1.09	0.65	0.77
Droplet (15)	Mean	2.07	1.67	1.13	1.73	2.07	2.27	2.47
	SD	0.45	0.48	0.51	0.88	0.25	0.88	0.91
Common source of infection (18)	Mean	2.56	2.72	2.83	3.11	3.06	2.56	2.56
	SD	0.78	0.66	1.04	0.83	0.63	0.78	0.70
b: Knowledge of HFMD presentation								
Fever, weakness & Lethargy (4)	Mean	2.25	3.00	3.00	3.00	3.00	3.75	3.50
	SD	0.50	0.81	1.41	0.81	0.81	0.50	0.57
Lesions on palm, sole and oral mucosa (48)	Mean	2.30	1.96	1.68	2.43	2.72	2.38	2.53
	SD	0.95	0.88	1.02	1.03	0.87	0.73	0.80
c: Maximum incubation period								
1 Week (12)	Mean	2.75	1.92	1.75	2.58	3.00	2.58	2.67
	SD	1.05	0.66	1.05	1.16	1.04	0.90	0.77
2 Weeks (11)	Mean	2.73	1.91	1.82	2.64	3.00	2.45	2.64
	SD	1.10	1.04	1.16	1.02	0.77	0.68	0.92
6 Weeks (26)	Mean	1.92	2.23	1.88	2.38	2.62	2.54	2.58
	SD	0.62	0.95	1.14	0.98	0.80	0.81	0.85
8 Weeks (3)	Mean	2.67	1.33	3.00	2.00	3.33	1.67	2.33
	SD	1.52	0.57	1.00	1.00	0.57	0.57	0.57
d: Maximum duration of mild clinical symptoms								
3 - 7 days (4)	Mean	2.75	2.00	1.00	1.50	2.00	2.25	2.75
	SD	0.95	0.00	0.00	0.57	0.00	1.25	0.95
8- 14 days (17)	Mean	2.29	1.88	1.53	2.59	2.65	2.47	2.71
	SD	0.92	0.85	1.06	0.87	0.78	0.80	0.84
15-21days (20)	Mean	2.15	2.10	1.50	2.35	2.95	2.65	2.65
	SD	0.93	1.02	0.82	1.04	1.05	0.74	0.87
22-28days (11)	Mean	2.36	2.18	3.00	2.82	2.82	2.27	2.27
	SD	0.92	0.98	0.89	1.16	0.60	0.78	0.64

Table 3, attitude of Hand Foot and Mouth Disease by its knowledge attributes, a) mode of transmission by hand wash revealed maximum mothers answered mode of transmission through direct contacts with mean 3.67 and SD 0.8, followed by droplet with mean 2.1 and SD 0.5. Disinfection of the toys did not show differences in the mode of transmission as the mean varied from 2.7 to 1.1. In case of hot water consumption, the highest mode of transmission was revealed as common source of infection and direct contact with mean 2.8 each. Transmission through infected persons was highest through with common source with mean 3.1 followed by direct contact with mean 2.8. The reason for withdrawal from school was reported maximum through direct contact with mean 3.5 and SD 0.8 followed by common source of infection with mean 3.1 and SD 0.6. Mode of transmission through infected faeces was through direct contact with mean 3.0and SD 0.9 followed by due to common source of infection with mean 2.6 and SD 0.8. Immunization was said to play important role to prevent transmission through direct contact with mean 3.2 and SD 1.0, followed by through sputum with mean 2.6 and SD 0.7. b) Knowledge of HFMD presentation. b) Attitude of hand wash for HFMD presentation did not have differences with mean 2.3. Disinfection of toy was said to prevent Fever, weakness & Lethargy with mean 3 and SD 0.8, whereas, the mean in case of Lesions on palm, sole and oral mucosa was 2.0 with SD 0.9, hot water consumption had the similar figures as disinfection of toys. In case of avoiding contact with HFMD person, the mean with Fever, weakness & Lethargy was 3 with SD 0.8. the similar figures for Lesions on palm, sole and oral mucosa was 2.4. Disease control by withdrawal from school, transmits through infected faeces and prevention of HFMD by immunization had the same figures as avoiding of contacts. c) Maximum duration of mild clinical symptoms reveals hand wash could reduce maximum duration of symptoms within 7days with mean 2.8 and SD 1.0 followed by other groups of duration in their sequence. Furthermore, immunization had maximum score 2.8 with SD 1.0and decreased with increasing duration of clinical symptoms. The mean of other groups was in between 1 to 2.5 only.

Table 4: Attitude to prevent infection of Hand Foot and Mouth disease by practice attributes

Attributes of practices (n)		Attitude of HFMD							
		Hand washing can prevent HFMD	Disinfection of toy not mandatory	Hot water consumption in case of ulcer	Avoid contact with HFMD infected person	Disease control by withdrawal from school	Transmits through infected faeces	Washing vessels can prevent	Immunisation can prevent HFMD
a: Hand washing practice with soap before meals									
Sometimes (28)	**Mean**	2.3	2.1	2.1	2.3	2.7	2.3	2.2	2.4
	SD	0.8	1.0	1.2	1.0	0.8	0.6	1.0	0.7
Always (24)	**Mean**	2.3	1.9	2.0	2.5	2.9	2.6	2.3	2.7
	SD	0.9	0.7	1.0	0.9	0.9	0.9	0.9	0.8
b: Washing hands with soap after defecation									
Sometimes (23)	**Mean**	2.3	1.9	2.1	2.4	2.9	2.2	2.2	2.4
	SD	1.0	0.9	1.2	0.9	0.9	0.7	1.0	0.7
Always (29)	**Mean**	2.3	2.1	2.0	2.4	2.7	2.6	2.3	2.6
	SD	0.8	0.9	1.1	1.0	0.7	0.8	0.9	0.8
c: Washing toys with disinfectant									
Sometimes (39)	**Mean**	2.3	1.9	2.0	2.4	2.8	2.5	2.2	2.5
	SD	0.9	0.8	1.2	1.0	0.8	0.8	1.0	0.8
Always (13)	**Mean**	2.3	2.3	2.3	2.3	2.6	2.3	2.3	2.6
	SD	0.9	1.1	0.9	1.0	0.8	0.6	0.9	0.8
d: Isolate child from infected sources									
Sometimes (39)	**Mean**	2.2	2.1	2.0	2.5	2.7	2.5	2.4***	2.6
	SD	0.7	0.8	0.7	1.0	0.7	0.8	1.0	0.8
Always (13)	**Mean**	2.5	1.8	3.0	2.3	3.0	2.3	1.6***	2.5
	SD	1.3	1.1	1.1	0.7	1.1	0.6	0.6	0.7
e: Use of floor cleaning disinfectant									
Sometimes (46)	**Mean**	2.3	2.0	2.1	2.5	2.8	2.5	2.3	2.6
	SD	1.0	1.0	1.2	1.0	0.9	0.8	1.0	0.8
Always (6)	**Mean**	2.7	2.2	1.8	2.0	2.8	2.7	2.3	2.7
	SD	0.8	0.4	1.0	1.1	1.0	0.8	0.8	1.0
f: Provide adequate rest and sleep to sick child									
Sometimes (45)	**Mean**	2.3	2.0	2.0	2.3	2.4	2.8	2.4	2.2
	SD	1.0	0.9	1.1	0.7	1.0	0.9	0.8	1.0
Always (7)	**Mean**	2.4	2.0	2.9	2.7	2.6	3.1	3.0	2.4
	SD	0.8	1.0	1.1	0.8	1.3	0.9	0.8	1.3
g: Cleaning floor every day									
Sometimes (47)	**Mean**	2.3	1.8***	1.5***	2.3***	2.8	2.4	2.1***	2.6
	SD	0.9	0.7	0.9	0.9	0.8	0.8	1.0	0.8
Always (5)	**Mean**	2.0	3.6***	3.0***	3.8***	3.0	2.6	3.0***	2.6
	SD	0.7	0.8	0.7	0.4	0.7	0.8	0.7	0.8

Note: ***; p<0.001, *; p<0.05, comparison is in between means of two groups of practice for each attitude

Table 4, attitude to prevent infection of Hand Foot and Mouth disease by practice attributes a) hand washing practice with soap before meals groups did not have any statistically significant variation for all attitudes, b) washing hands with soap after defecation, c) washing toys with disinfectant also did not show significant differences. d) Isolation of child from infected sources exhibited statistically significant differences for using washed vessels at $p<0.001$, however, other practices exhibited some differences that was not statistically significant. Use of floor cleaning disinfectant (e) and f) providing adequate rest and sleep to sick child did not show any statistically significant differences. Cleaning floor every day (g) exhibited best practice with significant differences ($p<0.001$) to prevent Hand Foot and Mouth disease.

Table 5: Hand, Foot, and Mouth Disease Practices by knowledge

Knowledge	Practices of HFMD														
	Washing hands with soap before meals		Washing hands with soap after defecation		Clean the floor of the house every day		Use of floor cleaning disinfectant		Washing toys with disinfectant		Isolate child from infected sources		Provides adequate rest and sleep to the sick child		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
a. Transmission of HFMD virus															
Direct contact	5	83.3	4	66.6	0	0.0	1	16.6	3	50.0	4	66.6	1	16.6	6
Indirect through sputum etc	5	38.4	6	46.1	1	7.6	1	7.6	2	15.3	5	38.4	1	7.6	13
Droplet	7	46.6	9	60.0	0	0.00	2	13.3	3	20.0	1	6.6	1	6.6	15
Common source of infection	7	38.8	10	55.5	4	22.2	2	11.1	5	27.7	3	16.6	4	22.2	18
b. Knowledge of HFMD presentation															
Rash on the torso	2	50.0	2	50.0	1	25.0	1	25.0	2	50.0	1	25.0	1	25.0	4
Swollen lymph nodes	1	100.0	1	100.0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1
Lesions on palm, sole and oral mucosa	21	44.6	26	55.3	4	8.5	5	10.6	11	23.4	12	25.5	6	12.7	47
c. Maximum incubation period															
1 week	5	41.6	5	41.6	1	8.3	2	16.6	2	16.6	2	16.6	0	0.0	12
2 weeks	6	54.5	6	54.5	1	9.0	2	18.1	3	27.2	5	45.4	3	27.2	11
6 weeks	12	46.1	17	65.3	3	11.5	2	7.6	8	30.7	6	23.0	4	15.3	26
8 weeks	1	33.3	1	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3
d. Maximum duration of clinical symptoms															
3-7 days	3	75.0	2	50.0	0	0.0	1	25.0	1	25.0	1	25.0	0	0.0	4
8-14 days	10	58.8	10	58.8	1	5.8	1	5.8	5	29.4	4	23.5	1	5.8	17
15-21 days	8	40.0	12	60.0	3	15.0	4	20.0	5	25.0	6	30.0	3	15.0	20
22- 28 days	3	27.2	5	45.4	1	9.0	0	0.0	2	18.1	2	18.1	3	27.2	11

Table 5: Hand, Foot, and Mouth Disease Practices by knowledge (HFMD) reveals, a) transmission of HFMD virus, mothers' awareness of direct contact transmission is more likely to practice hand hygiene, such as washing hands before meals (83.3%) and after defecation (66.6 %), likely (66.6 %) to isolate their children from infected sources. Mothers answering HFMD through indirect transmission were practicing washing hands with soap after defecation (46.1 %) and toys with disinfectant (15.3%). Mothers answering HFMD transmission through droplet were not attentive to using floor cleaning disinfectant only 7.6%, but still pressed washing hands with soap after defecation (60%). Mothers with answers of common sources of infection

practiced cleanliness like washing hands with soap after defecation (55.5 %) and isolating sick child (16.6 %). b) Knowledge of HFMD Presentation, as rash on the torso and Swollen lymph nodes were very less 1 and 4 respectively to draw any conclusion regarding practice of hygiene etc. Lesions on palm, sole, and oral mucosa were acknowledged by maximum mothers 47(90.38%), among these 44.6% practiced hand wash before meals and 55% after defecation.

c) Maximum incubation period revealed as 2 weeks had highest 54.5% washing of hands before meals followed by at 6 weeks 46.1%, similar figures of washing hands after defecation were 54.5 and 65.3 % respectively. Practice of washing toys with disinfectant (30.7%) and isolating the child from infected sources (23.0%) were very poor. They also show moderate percentages in cleaning the floor of the house every day (9.0%) and using floor cleaning disinfectant (18.1%). Mothers aware of 1 week and 8 weeks incubation periods show varying percentages across different practices, with no clear trend.

d) Practice of washing hands before meals decreased consistently from 75 to 27% with increasing duration of clinical symptoms from 3-7 days to 22-28 days, however, similar figures for washing hands after defecation did not follow any trend. With other knowledge as washing toys with disinfectant practices were very poor.

Discussion:

Knowledge Attitude and Practice for prevention of Hand Foot and Mouth Disease (HFMD), 100 mothers of under five years children were subjected to pre structured and pre tested questionnaire by trained Anganwadi workers under supervision of faculty of college of nursing. Out of total 82 % were Hindu and remaining 18% belonged to Muslim, Christians and other communities. Fifty two percent of mothers answered causative organism as ‘Virus’ correctly. The present study was conducted in the rural community of the North Karnataka with 82% less than 26 years of age and 88% with education primary and above. Whereas study conducted at Pune Maharashtra, 80% of mothers were in the age group of 26 and above[18] and when literacy rate is compared with Karnataka state and national figures, the female literacy is much higher in our study (Karnataka 68.08 % and India 70.3%) [19, 20].

Out of total, fifty-two mothers responded correctly about causative organism of HFMD, thirty five percent (35%) responded mode of transmission as a common source of infection, followed

by 29% indirect through sputum etc. and 25% through droplets. Whereas, a study conducted by Y. Rajamoorthy et al, maximum 89% responded for indirect spread of infection through sputum, 84% for droplet and only 6.6% direct source of infection for HFMD[21]. Knowledge about presentation of HFMD as lesions on palm, sole and oral mucosa were 92.3% and only 7 percent were aware of typical symptoms such as Fever, weakness & Lethargy. Similar observation was made by study conducted by Siti Aida Shaqirah Mahadzar et al, with 94 (92.2 %) responded correctly about the symptoms of HFMD [22]. Knowledge about incubation period of HFMD disease was reported 50% and clinical symptoms 39%. The variation in the knowledge of HFMD causation may be due to socio-cultural and ethnicity of the communities.

Attitude about hand wash for mode of transmission of HFMD was revealed as maximum by mothers with mean 3.67 through direct contacts followed by droplet with mean 2.1. Attitude about disinfection of toys did not exhibit significant differences in mode of transmission of HFMD with mean varied from 1.1 to 2.7. Similar results were observed in a study conducted by Nurul Azmawati Mohamed et al [23]. In case of hot water consumption highest mode of transmission was common source of infection and direct contact with mean 2.8 each.

Attitude about transmission through infected persons was highest through common source with mean 3.1 followed by direct contacts with mean 2.8. Reason for withdrawal from school was reported maximum through direct contact with mean 3.5 followed by common source of infection with mean 3.1. Whereas, study conducted at Hong Kong has reported, respondent's answer as of keeping infected children away from school[24].

Attitude about mode of transmission through infected faeces as through direct contact was reported with mean 3 followed by common source of infection with mean 2.6. Similar study conducted at Malaysia observed less than half of them were aware that HFMD spreads via feaces[23], and study from China suggested that faeco-oral route might be the primary cause of transmission of HFMD among children[25].

Attitude about immunization in the present study revealed important role to prevent transmission through direct contact with mean 3.2 followed by through sputum with mean 2.6. Similar study conducted at Singapore has shown positive vaccine acceptance, with a strong concern for vaccine safety and efficacy amongst those with neutral attitudes[27].

Practices about hand washing with soap before and after meals groups did not have any statistically significant variation in study variables of attitude; however study conducted at Bankok, Thailand had shown direct association between a proportion of respondents complying with proper hand washing [26], suggesting strengthening of proper hand wash practice through proper education.

Practice of washing toys with disinfectant did not show significant differences with any variate. Reviewed study reported that parents who cleaned their children's toys were more likely to be high adopters of prevention measures[27]. This is especially important as frequency of cleaning may be insufficiently protective against HFMD [28].

Isolation of child from infected sources exhibited statistically significant differences for using washed vessels at $p<0.001$. Other practices exhibited some differences that were not statistically significant. Use of floor cleaning disinfectant and providing adequate rest and sleep to sick child did not show any statistically significant differences. Cleaning floor every day exhibited best practice with significant differences ($p<0.001$) to prevent Hand Foot and Mouth disease.

However, reviewed studies have shown only a small proportion of practiced prevention measures for isolation of children, floor cleaning with disinfectant and provision of rest and sleep of HFMD Children[26,27].

Conclusion:

Study was conducted amongst mothers of Anganwadi children; hence, results may not be applicable for general community. However, study suggests strengthening of health education for prevention of communicable disease in general and HFMD in particular.

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Conflict of interests

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References:

1. Sasidhran CK, Sugathan P, Agarwal R, Khare S, Lal S, Jayaram Paniker CK. Hand-foot and mouth disease in Calicot. Indian J Pediatr. 2005; 72:17–21. [PubMed] [Google Scholar]

2. Sarma N, Sarkar A, Mukherjee A, Ghosh A, Dhar S, Malakar R. Epidemic of hand, foot and mouth disease in West Bengal, India in August 2007: A multicentric study. Indian J Dermatol. 2009; 54:26–30. [PMC free article] [PubMed] [Google Scholar]

3. Wong SSY, Yip CCY, Lau SKP, Yuen KY. Human enterovirus 71 and hand, foot and mouth disease. Epidemiol Infect 2010; 138(8):1071-89

4. Ruan F, Yang T, Ma K, Jin Y, Song S, Fontaine RE. Risk factors of hand, foot and mouth disease and herpangia and the preventive effect of hand-washing. Pediatrics. 2011;127: e898–904. [PubMed] [Google Scholar]

5. Sanjaykumar Tikute , Mallika Lavania. Hand, Foot, and Mouth Disease (HFMD) in India: A Review on Clinical Manifestations, Molecular Epidemiology, Pathogenesis, and Prevention. Indian Dermatol Online J. 2023 Jul-Aug; 14(4): 475–481.

6. Goto K, Sanefuji M, Kusuhara K, Nishimura Y, Shimizu H, Kira R, et al. Rhombencephalitis and coxsackievirus A16. Emerg Infect Dis 2009; 15:1689-91.

7. Wright HT Jr, Langing BH, Lennette EH, McAllister RM. Fatal infection in an infant associated with Coxsackie virus group A, type 16. N Engl J Med 1963; 268:1041-4.

8. Ferson MJ, Bell SM. Outbreak of Coxsackievirus A16 hand, foot, and mouth disease in a child day-care center. Am J Public Health 1991; 81:1675-6.

9. Bendig JW, Fleming DM. Epidemiological, virological, and clinical features of an epidemic of hand, foot, and mouth disease in England and Wales. Commun Dis Rep CDR Rev 1996; 6:R81-86.

10. Ang LW, Koh BK, Chan KP, Chua LT, James L, Goh KT. Epidemiology and control of hand, foot and mouth disease in Singapore, 2001-2007. Ann Acad Med Singap 2009; 38:106-12.

11. Russo DH, Luchs A, Machado BC, de Cássia Carmona R, do Carmo Sampaio Timenetsky M. Echovirus 4 associated to hand, foot and mouth disease. Rev Inst Med Trop Sao Paulo 2006; 48:197-9.

12. Zhu Z, Xu WB, Xu AQ, Wang HY, Zhang Y, Song LZ, et al. Molecular epidemiological analysis of echovirus 19 isolated from an outbreak associated with Hand, foot and mouth disease (HFMD) in Shandong Province of china. Biomed Environ Sci 2007; 20:321-8.

13. Ishimaru Y, Nakano S, Yamaoka K, Takami S. Outbreaks of hand, foot, and mouth disease by enterovirus 71. High incidence of complication disorders of central nervous system. Arch Dis Child 1980; 55:583-8.

14. Chang LY. Enterovirus 71 in Taiwan. Pediatr Neonatol. 2008; 49:103–12. [PubMed] [Google Scholar]

15. Lou, M., Lin, D. 2006. Exploration of the Healthy Behaviors Against Enterovirus and Its Related Factors in the Caregivers of Preschool-age Children. J Hung Kuang, 49:145–162.

16. Charoenchok panit, T. P. R. Knowledge Attitude and Preventive Behaviors towards Hand Foot and Mouth Disease among Caregivers of Children Under Five Years Old in Bangkok, Thailand. Journal of Health Research. 27(5):281–286.

17. Suliman, Q., Said, S. M., Zulke□li, N. A. M. 2017. Predictors of preventive practices towards HFMD among mothers of pre-school children in Klang District.Malaysian Journal of Medicine and Health Sciences, 2013;13(3):21–32.

18. Meghana M. Kamble et al."A study to assess knowledge on Hand-foot-and-mouth disease (HFMD) among mothers of under 5 children in selected urban area of Pune City."

Journal of Survey in Fisheries Sciences. 2023;10(2S): 1382-1386

19. India Guide Population of India Karnataka's Population in 2021.

Available at: https://www.indiaonlinepages.com/population/karnataka-population.html

20. National Family Health Survey (NFHS-5) and National Statistical Office: NSO (2021 and 2022). Available at : https://main.mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf

21. Y. Rajamoorthy et al. Parents' knowledge and awareness towards hand foot mouth disease in Malaysia: A survey in Selangor. Clinical Epidemiology and Global Health. 2022; 15:101027

Available at: https://doi.org/10.1016/j.cegh.2022.101027

22. Siti Aida Shaqirah Mahadzar, Haliza Abdul Rahman. Knowledge, Attitude and Practice towards Hand, Foot and Mouth Disease (HFMD) Among Nursery Governesses in Klang Valley, Selangor. Mal J Med Health Sci. Dec 2019; 15(SP4): 40-47,

23. Nurul A zmawati Mohamed, Habibah Faroque et al. Hand Foot and Mouth Disease (HFMD) Educational Workshop for Preschool Teachers: International journal of research in pharmaceutical science An Interventional Study. 2020; Vol. 11 (SPL 4)

24. Q. Liao, W. W. T. Lam, B. J. Cowling, R. Fielding. Parental perspectives on hand, foot, and mouth disease among children in Hong Kong: a longitudinal study. Epidemiol Infect. 2018 Feb; 146(3): 324–332. doi: 10.1017/S0950268818000018

25. Sun, L., Lin, H., Lin, J., He, J., Deng, A., Kang, M., Zeng,H., Ma, W., Zhang, Y. 2016. Evaluating the trans-mission routes of hand, foot, and mouth disease inGuangdong, China. American Journal of Infection Control. 44(2): e13–e14

26. Ruttiya Charoenchokpanit, Tepanata Pumpaiboo. Knowledge attitude and preventive behaviors towards hand foot and mouth disease among caregivers of children under five years old in Bangkok, Thailand. J Health Res. October 2013: vol.27 (5)

Available at http://www.jhr.cphs.chula.ac.th

27. Min Xian Wan, Junxiong Pang. The knowledge, attitudes and practices of hand, foot, and mouth disease prevention strategies amongst parents and educators of children under 5 years amidst COVID-19 pandemic: A cross-sectional study. 17 October 2022

DOI 10.3389/fpubh.2022.908004

28. Kua JA, Pang J. The epidemiological risk factors of hand, foot, mouth disease

among children in Singapore: a retrospective case-control study. 2020; 15:e0236711.

doi: 10.1371/journal.pone.0236711