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"Knowledge and Attitude regarding Human metapneumovirus (HMPV) infection among Mothers of Under-Five Children with a view to develop an Information Booklet in Selected Health Centres of Kamrup, Assam: An Exploratory Study."

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Abstract: Human Metapneumovirus (HMPV) is a significant global respiratory pathogen, contributing to acute lower respiratory infections (ALRIs) and hospitalizations in children under five years. Despite its severity, awareness remains low, particularly among primary caregivers in low- and middle-income settings like India. An exploratory quantitative study was conducted among 200 mothers of under-five children using a non-probability convenience sampling technique. Data were collected through face-to-face interviews using a structured knowledge questionnaire and a 5-point Likert scale. The finding of the study showed that the mean score of knowledge was 8.72±3.15 and the mean score of attitudes was 32.62±5.02. There was a moderate positive correlation between knowledge and level of attitude (r = 0.411, p=0.0001). The level of knowledge showed a statistically significant association with educational status of the mother (p=0.017), occupation of the mother (p=0.021), and having prior information about HMPV (p=0.003). Demographic variables did not show statistically significant association with level of Attitude regarding Humen metapneumovirus infection among Mothers of under-five children. The study concludes that there is a significant knowledge gap regarding HMPV among mothers, influenced by lower educational and occupational status.

Index Terms - Knowledge, Attitude, HMPV, Mothers of Under-Five Children and Information Booklet

INTRODUCTION:

Human Metapneumovirus (HMPV), a member of the Paramyxoviridae family is a major viral pathogen responsible for respiratory illness among infants and children worldwide. Discovered in 2001 in the Netherlands. HMPV is closely related to respiratory syncytial virus (RSV) and primarily affects children under-five years, elderly individuals, and those with underlying health conditions including asthma, cancer and chronic obstructive pulmonary diseases (COPD).

The burden of disease caused by HMPV is highest among pediatrics population, particularly infants and toddlers under the age of two, who are more vulnerable to severe infections. Seasonal outbreaks of HMPV typically occur during late winter and early spring. Studies have shown that nearly 100% of children are seropositive for HMPV by the age of five, highlighting its widespread and often underestimated presence.[1] The virus is transmitted through close contact and respiratory droplets, similar to other common respiratory viruses.

In India, HMPV as a cause of Acute Respiratory Infection (ARI) is underestimated due to limited data. Acute lower respiratory infections (ALRIs) are one of the leading causes of morbidity and mortality in children globally, accounting for 1.9 million deaths in children younger than 5 years.[2] Previous evidence indicates that most children are infected with human metapneumovirus by age 5 years, with most severe infections occurring in infants, including symptomatic and asymptomatic infections. Studies have shown that human metapneumovirus is associated with 6·1-6·4% of hospital admissions due to ALRI among patients younger than 20 years worldwide.

According to the World Health Organization (WHO), respiratory infections are responsible for approximately 1.0 million deaths annually in children under the age of five and HMPV contributes significantly to this global burden. In 2018, an estimated 14.2 million cases of HMPV acute lower respiratory infection occurred in children <5 years worldwide, including 6,43,000 hospitalizations and 7700 in-hospital deaths. Children aged <12 months accounted for 71% of deaths and 64% of deaths were amongst children <6 months, of which 96% occurred in settings with high child mortality.

METHODS

Study design:

An exploratory research design was used to assess the Knowledge and Attitude regarding HMPV among of Mothers of under five children.

Setting and participants:

The present study was conducted among total of 200 mothers of under five children presented in the selected health centres of Kamrup, Assam. Samples were selected using convenience sampling technique and the inclusion criteria were Mothers who are available at the time of data collection and willing to participate in the study.

The data collected using a self-structured knowledge questionnaire and 5-point Likert scale using interview method was started in August-September 2025.

Sample size was estimated by considering the study Kumar P et al. (2022) and based on the sample size formula, taking into account p=20/100, q=1-0.2 and 95% confidence level, it was estimated to be 185 people. In order to increase the accuracy, according to the recommendation of the statistical advisor, 200 people were considered.[6]

This study was carried out after obtaining ethical consideration from the Ethical Committee, EC/INS/2025-26/037 INS Trust, GNRC Dispur. A formal written permission was taken from the Joint Director of Health Services, Kamrup Assam to conduct the research study. After that an official permission letter was issued from the Jt. DHS office to the concerned block authority i.e. SDM&HO. Then permission was obtained from the SDM&HO for granting approval for the conducting the research. The data was collected after obtaining informed written consent of the sample. The participants were assured anonymity & confidentiality of information provided by them.

Statistical Analysis:

Data were coded and entered into a master spreadsheet for analysis. Subject characteristics, knowledge, and attitude scores were summarized using frequency, percentage, mean, and standard deviation. To determine associations between demographic variables and baseline scores, Chi-square and Fisher's exact tests were employed. The relationship between pre-intervention knowledge and attitude was assessed using the Karl Pearson correlation coefficient.

RESULTS

In this study, total of 200 samples was collected from the selected four health centers in Kamrup, Assam. The demographic characteristics of mothers of under-five children are shown in table 1.

Findings related to demographic variables of mothers of under-five children:

Table 1: Frequency and percentage distribution of demographic variables of mothers of under-five children.

Demographic Variables	Frequency (f)	Percentage (%)
Age of the mother		
≤20 years	19	9.5
21 – 25 years	60	30.0
26 – 30 years	87	43.5
31 – 35 years	30	15.0
36 years and above	4	2.0
No. of under-five children in the family		
1	168	84.0
2	25	12.5
3	5	2.5
More than 3	2	1.0
Educational status of the mother		
No formal education	2	1.0
Primary school	6	3.0
ME school	29	14.5
HSLC	72	36.0
Higher secondary	67	33.5
Graduate and above	24	12.0
Occupation of the mother		
Homemaker	146	73.0
Farming	11	5.5
Daily wages	9	4.5
Self employed	12	6.0
Private job	15	7.5
Govt. job	7	3.5
Type of family		
Nuclear	108	54.0
Joint	92	46.0
Extended	-	-

Demographic Variables	Frequency (f)	Percentage (%)
Type of house		
Temporary	80	40.0
Permanent	120	60.0
Have you heard of Human metapneumovirus infection?		
Yes	56	28.0
No	144	72.0
If yes, specific source of information		
Health professional	30	53.6
Mass media	15	26.8
Family members and friends	9	16.1
Others	2	3.6

The table 1 portrays that most of the mothers of under-five children, 87(43.5%) were aged between 26 – 30 years, 168(84%) had only one child, 72(36%) of mothers had HSLC education, 146(73%) were homemakers, 108(54%) were from nuclear family, 120(60%) were staying in permanent house, 144(72%) had not heard of human metapneumovirus infection and 30(53.6%) had health professional as source of information.

Findings related to knowledge and attitude score regarding HMPV infection:

This result shows that 124(62%) possessed moderately desirable knowledge, 63(31.5%) possessed inadequate knowledge and 13(6.5%) possessed adequate knowledge regarding HMPV infection among mothers of under-five children. It also depicts that 101(50.5%) possessed moderately desirable attitude, 97(48.5%) possessed desirable attitude and 2(1.0%) possessed undesirable attitude regarding HMPV infection among mothers of under-five children.

Findings related to correlation between the level of knowledge and attitude regarding HMPV infection:

Table 2: Correlation between knowledge and attitude regarding HMPV infection among mothers of under-five children

Variables	Mean	SD	Karl Pearson's Correlation "r" & p-value
Knowledge	8.72	3.15	**r = 0.411** **p=0.0001, S***
Attitude	32.62	5.02	

The mean score of knowledge was 8.72±3.15 and the mean score of attitudes was 32.62±5.02 The calculated Karl Pearson's Correlation value of r = 0.411 shows a moderate positive correlation between knowledge and attitude statistically significant at $p<0.05$ level which clearly establishes that when knowledge regarding HMPV infection among mothers of under-five children improves or increases then their attitude towards it also improves desirably.

Findings related to Association of level of knowledge and attitude regarding HMPV infection among mothers of under-five children with their selected demographic variables

In association, the result showed that the demographic variables such as educational status of the mother **(p=0.017)**, occupation of mother **(p=0.021)** and have you heard of human metapneumovirus infection **(χ^2=11.807, p=0.003)** had statistically significant association with level of knowledge regarding HMPV infection among mothers of under-five children at p<0.05 level and the other demographic variables did not show statistically significant association with knowledge regarding HMPV infection among mothers of under-five children at p<0.05 level. And other tested variables such age, no of under-five child, type of family, type of house are statistically not significant with knowledge regarding HMPV infection among mothers of under-five children.

It was also observed that none of the demographic variables showed a statistically significant association with attitude regarding HMPV infection among mothers of under-five children at p<0.05 level.

DISCUSSION

The present study was conducted to assess the knowledge and attitude regarding Human Metapneumovirus (HMPV) infection among mothers of under-five children and the results revealed that the majority of mothers, 124 (62%), possessed moderately adequate knowledge regarding HMPV infection. The mean knowledge score was 8.72 ± 3.15. These findings indicate that although mothers had some awareness regarding HMPV infection, comprehensive knowledge was lacking among a considerable proportion of participants.

The findings of the present study are consistent with the study conducted by Patil S.S et al. (2020) in Karnataka, India, regarding mothers' knowledge of acute respiratory viral infections among under-five children. Their study reported that 58% of mothers had moderate knowledge, 29% had inadequate knowledge, and 13% had adequate knowledge.

With regard to attitude, the present study showed that 101 (50.5%) mothers possessed a moderately desirable attitude toward HMPV infection, 97 (48.5%) had a desirable attitude, and only 2 (1.0%) demonstrated an undesirable attitude. The mean attitude score was 32.62 ± 5.02. This finding suggests that most mothers had a positive perception and favorable attitude toward the prevention and management of HMPV infection among under-five children.

The present study also identified a moderate positive correlation between knowledge and attitude regarding HMPV infection among mothers of under-five children. The calculated Karl Pearson's correlation coefficient value (r = 0.411) was statistically significant at $p < 0.05$, indicating that improved knowledge regarding HMPV infection is associated with a more desirable attitude toward its prevention and management. This finding emphasizes that increasing maternal awareness through educational programs may positively influence attitudes and promote better health practices.

The study further revealed that educational status of the mother ($p = 0.017$), occupation of the mother ($p = 0.021$), and previous awareness regarding HMPV infection ($\chi^2 = 11.807$, $p = 0.003$) had statistically significant associations with the level of knowledge regarding HMPV infection among mothers of under-five children. However, other demographic variables such as age, number of under-five children, type of family, and type of house did not show any statistically significant association with knowledge at $p < 0.05$ level.

Regarding attitude, the present study found that none of the selected demographic variables showed a statistically significant association with attitude toward HMPV infection among mothers of under-five children at $p < 0.05$ level. This finding indicates that favorable attitudes toward HMPV infection prevention may be present across different demographic groups irrespective of age, education, occupation, or family characteristics.

Overall, the findings of the present study emphasize the need for structured health education programs, awareness campaigns, and community-based interventions to improve knowledge regarding HMPV infection among mothers of under-five children. Enhanced maternal awareness can contribute to early identification, prevention, timely healthcare-seeking behavior, and reduction of respiratory infections among children.

Conclusion

Based on the analysis of the findings of the study, the investigator concluded that improving awareness among mothers of under five children will significantly help in early identification, timely care-seeking and prevention of HMPV infection among children. So, the study has importance implications for managing health of under five children.

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