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Research Article

Knowledge and Practices Regarding Worm Infestation and Deworming Among Mothers of Under-Five Children Attending an Immunization Clinic in Srinagar: A Cross-Sectional Study

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ABSTRACT
Background: Soil-transmitted helminth infections affect a large number of children and continue to remain a public health concern. Mothers have an important role in identifying possible symptoms, adopting preventive measures and ensuring that their children receive deworming at the appropriate time. The present study assessed the knowledge of mothers regarding worm infestation and their deworming practices among under-five children.
Methods: This hospital-based cross-sectional study was conducted among 150 mothers of children aged 12–59 months attending the Immunization Clinic of department of Community Medicine SKIMS Soura, Srinagar, Jammu and Kashmir. Data were collected using a pre-designed questionnaire covering socio-demographic characteristics, knowledge and practices related to worm infestation and deworming. Data were analysed using SPSS version 23.
Results: Of the 150 mothers, 70.7% were literate and 71.3% resided in rural areas. Most mothers recognized that worm infestation could cause illness (79.3%) and produce signs and symptoms (86.0%). However, knowledge regarding sources and prevention was less comprehensive: 31.3% were unaware of the source of infestation. Overall, 78.7% reported having dewormed their children, but regular deworming was reported by only 42.7% and 21.3% had never dewormed their children. Rural residence was significantly associated with lower odds of recognizing unhygienic practices as a cause of illness (AOR=0.350, p=0.020).
Conclusion: Mothers demonstrated relatively good recognition of the clinical manifestations of worm infestation, but important gaps remained in knowledge regarding its sources and prevention. Targeted health education focusing on transmission and prevention, along with reinforcement of periodic deworming through existing school and community-based programmes, may help improve deworming practices.

Keywords: Soil-transmitted helminths, Deworming, Mothers, Under-five children, Knowledge, Practices.

INTRODUCTION

Helminthic infections are commonly encountered among children of preschool and school-going age and may also affect adolescents. (1)
Intestinal parasites can be acquired through several routes, including contact with fecally contaminated material, consumption of inadequately cooked meat, and exposure to contaminated food, water or soil. In children, infection is particularly related to exposure to contaminated soil and habits such as nail biting. (1,2)
Globally, a substantial number of children living in areas where these infections are common remain at risk of soil-transmitted helminth infection, with the WHO estimating this number at about 870 million. (3)
In children, intestinal helminth infections may have consequences ranging from impaired nutrient absorption and malnutrition to poor growth and development. Severe infection may also result in anaemia, intestinal obstruction, diarrhoea, fever, dehydration and vomiting, including iron-deficiency anaemia. (1)
These infections are particularly prevalent in tropical and subtropical settings, especially in

communities where poverty, inadequate sanitation and poor hygiene remain common. (4)

In addition to their health effects, intestinal helminth infections continue to impose a considerable public health and socioeconomic burden worldwide.

The burden of intestinal helminth infections is substantial, with approximately 300 million people experiencing severe morbidity and an estimated 10,000–135,000 deaths reported annually. (6) Around one-fourth of the world's population is estimated to be affected, and children constitute a major proportion of those experiencing illness. (7) More than 267 million preschool-aged and 568 million school-aged children live in areas where soil-transmitted helminth infections are prevalent. (8)

Children are especially vulnerable to these infections and may become infected again even after successful treatment. (9,10)

Periodic deworming forms an important component of the Anemia Mukt Bharat strategy. Through the National Deworming Day programme, children and adolescents between 1 and 19 years are targeted for deworming at six-monthly intervals. (11) Health education through channels such as social media, together with direct communication with parents, can also be used to improve awareness and encourage positive changes in health-related practices.

Considering the importance of preventing worm infestation during early childhood, this study was undertaken to assess mothers' knowledge and deworming practices and to examine whether these were associated with selected socio-demographic characteristics.

MATERIALS AND METHODS

Study design: A hospital-based cross-sectional study was conducted among mothers of children aged 12–59 months attending the Immunization Clinic of department of Community Medicine SKIMS Soura, Srinagar, Jammu and Kashmir, India.

Study period: Data collection was carried out for two months, from 1 April to 31 May 2024.

Study population: The study included mothers who accompanied children aged 12–59 months to the immunization clinic.

Inclusion criteria: Mothers of children aged 12–59 months attending the immunization clinic who provided written informed consent.

Exclusion criteria: Other attendants accompanying the children and mothers who did not consent to participate were not included in the study.

Sampling: Data collection was undertaken on two days each week, with the selected days changed from week to week. For example, data were collected on Monday and Tuesday during the first week and Wednesday and Thursday during the following week. Convenience sampling was adopted. All eligible mothers attending during the study period were approached. A total of 150 mothers participated.

Study tool: Information was obtained through an interviewer-administered questionnaire developed for the study. It included questions on socio-demographic characteristics and mothers' knowledge, attitudes and practices related to worm infestation and deworming.

Data analysis: The collected data were first entered in Microsoft Excel and subsequently analysed using SPSS version 23. Categorical data were presented as frequencies and percentages. Associations were examined using the chi-square test, while logistic regression was used for adjusted analysis. ORs, AORs and 95% CIs were reported. Statistical significance was considered at $p<0.05$.

Written informed consent was obtained from all participants before enrolment.

RESULTS

Among the 150 participating mothers, 60.7% were aged 30 years or above, while nearly three-fourths (71.3%) belonged to rural areas. Most mothers (70.7%) were literate and 80.0% were homemakers. Among the children, 71.3% were aged 36–60 months and the sex distribution was nearly equal (49.3% males and 50.7% females).

Table 1: Sociodemographic Characteristics of Study Participants

Characteristic / category	Frequency (n=150)	Percentage (%)
Mother's age		
<30	59	39.3
>=30	91	60.7
Residence		
Rural	107	71.3
Urban	43	28.7

Mother's education		
Illiterate	44	29.3
Literate	106	70.7
Mother's occupation		
Housewife	120	80.0
Working	30	20.0
Age of the child in months		
12–35	43	28.7
36–60	107	71.3
Gender of the child		
Male	74	49.3
Female	76	50.7

Table 2 Shows the Knowledge of Mothers Regarding Worm Infestation.

Knowledge item	Frequency (N)	Percent (%)
Worm causes illness		
Yes	119	79.3
No	31	20.7
Worm infestation causes signs and symptoms		
Yes	129	86.0
No	21	14.0
Signs and symptoms		
Vomiting	139	92.7
Low appetite	106	70.7
Pain abdomen	67	44.7
Anaemia	32	21.3
Pot belly	21	14.0
Pica	19	12.7
Worm in stool	16	10.7
Unhygienic feeding causes worm infestation		
Yes	99	66.0
No	51	34.0
Sources of worm infestation		
Food and water	76	50.7
Eating mud	18	12.0
Eating junk	9	6.0
Don't know	47	31.3

Knowledge regarding worm infestation was generally satisfactory. Nearly four-fifths (79.3%) of mothers were aware that worm infestation could cause illness, while 86.0% knew that it could produce signs and symptoms. Vomiting (92.7%) and decreased appetite (70.7%) were the most frequently recognized manifestations.

Regarding prevention, 66.0% identified unhygienic feeding practices as a cause of worm infestation while food and contaminated water were reported as sources of infestation by 50.7% of mothers. However, 31.3% were unaware of the source of infestation, highlighting persisting knowledge gaps.

Overall, 78.7% of mothers had dewormed their children. Regular deworming was reported by 42.7%, whereas 36.0% dewormed only after symptoms or occasionally and 21.3% had never dewormed their children.

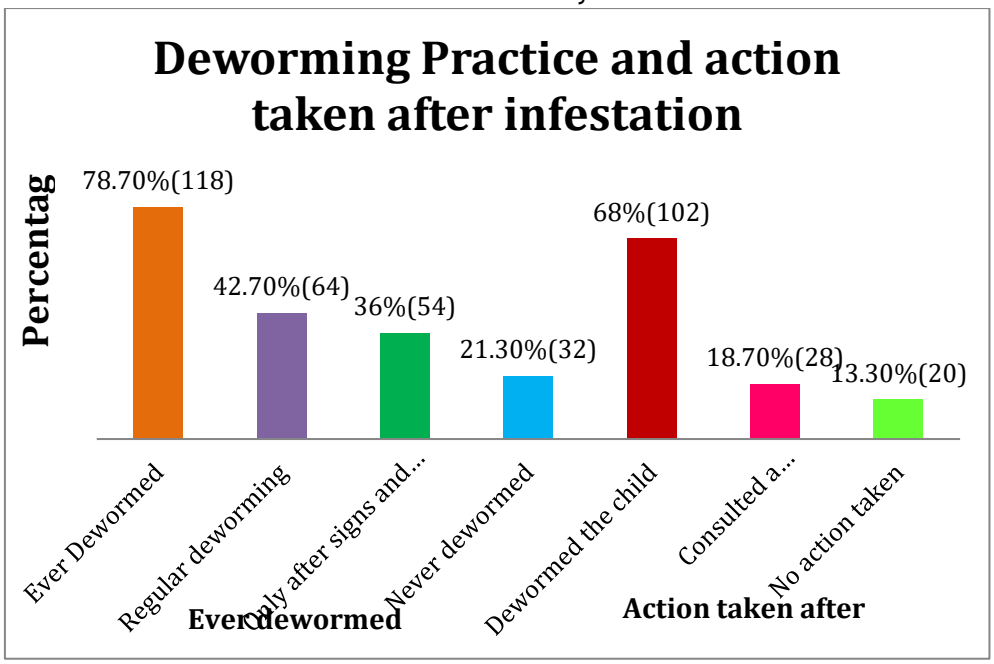

Figure 3. Deworming Practice and Action Taken After Suspected/Confirmed Infestation Among Children (N=150).

Table 3. Relationship of General Characteristics with Knowledge Regarding Unhygienic Practices and Worms Causing Illness

Variable	Category	Unhygienic practice causes illness n (%)	AOR (p value)	Worms n (%)	AOR (p value)
Mother's education	Illiterate	29 (65.9)	1.038 (0.925)	32 (72.7)	0.423 (0.067)
	Literate	70 (66.0)	Reference	87 (82.1)	Reference
Sex of child	Female	46 (60.5)	0.667 (0.267)	57 (75.0)	0.503 (0.119)
	Male	53 (71.6)	Reference	62 (83.8)	Reference
Residence	Rural	64 (59.8)	0.350 (0.020)	82 (76.6)	0.577 (0.293)
	Urban	35 (81.4)	Reference	37 (86.0)	Reference
Birth order	1	56 (65.9)	Reference	63 (74.1)	Reference
	2	33 (67.3)	1.045 (0.942)	43 (87.8)	0.472 (0.301)
	3	10 (62.5)	1.314 (0.663)	13 (81.3)	1.935 (0.408)
Mother age	<30 years	39 (66.1)	0.889 (0.753)	47 (79.7)	1.243 (0.633)
	>=30 years	60 (65.9)	Reference	72 (79.1)	Reference

Table 3 shows the association between selected socio-demographic variables and mothers' knowledge regarding deworming.

After adjustment for the other variables, residence was the only socio-demographic characteristic that showed a significant relationship with mothers' perception of unhygienic practices as a cause of illness. Compared with mothers from urban areas, those living in rural areas were less likely to report that unhygienic practices could cause illness (AOR = 0.350, p = 0.020).

The adjusted analysis did not demonstrate a significant relationship between this perception and maternal education, child's sex, birth order or maternal age.

On adjusted analysis, awareness regarding worms was not significantly related to any of the socio-demographic characteristics examined. Awareness was lower among children of illiterate mothers in comparison with those of literate mothers; however, the observed difference was not statistically significant (AOR = 0.423, p = 0.067). Similarly, sex (AOR = 0.503, p = 0.119), residence (AOR = 0.577, p = 0.293), birth order (second birth order: AOR = 0.472, p = 0.301; third birth order: AOR = 1.935, p = 0.408), and mother's age (AOR = 1.243, p = 0.633) were not significantly associated with awareness regarding worms.

Table 4. Relationship of General Characteristics with Practice of Deworming

Variable	Category	No n (%)	Yes n (%)	Total	AOR (p-value)
Mother's age group	<30 years	12 (20.3)	47 (79.7)	59	0.965 (0.935)
	>=30 years	20 (22.0)	71 (78.0)	91	Reference
Sex of child	Female	20 (26.3)	56 (73.7)	76	0.504 (0.113)
	Male	12 (16.2)	62 (83.8)	74	Reference
Residence	Rural	22 (20.6)	85 (79.4)	107	1.328 (0.534)
	Urban	10 (23.3)	33 (76.7)	43	Reference
Birth order	1	17 (20.0)	68 (80.0)	85	Reference
	2	9 (18.4)	40 (81.6)	49	2.469 (0.143)
	3	6 (37.5)	10 (62.5)	16	2.758 (0.120)
Mother's education	Illiterate	7 (15.9)	37 (84.1)	44	1.636 (0.319)
	Literate	25 (23.6)	81 (76.4)	106	Reference

Multivariable logistic regression analysis showed that maternal education, child's sex, residence, birth order, and maternal age group were not independently associated with deworming practice, as all p-values were greater than 0.05.

Children of illiterate mothers had higher adjusted odds of deworming than children of literate mothers (AOR = 1.776), but this association was not statistically significant (p = 0.236).

Similarly, sex, residence, birth order, and maternal age group were not significant predictors of deworming practice.

DISCUSSION

This study explored what mothers of under-five children knew about worm infestation and examined the deworming practices followed for their children. The findings showed that mothers were relatively familiar with the clinical features of worm infestation, but their understanding of how infection is acquired and prevented was less complete. Regular preventive deworming, however, was followed by considerably fewer mothers.

In our study, 70.7% of mothers were literate, while four-fifths were homemakers. Literacy may facilitate access to health information and may also influence the way mothers seek healthcare for their children. (12,13) However, this expected association was not evident in our findings.

Mothers in our study appeared to have a better understanding of the signs and symptoms of worm infestation than of its possible sources and routes of transmission. Similar findings were reported by Gurkiran Kaur et al., who observed adequate knowledge of worm infestation among most of the mothers studied. (14) In contrast, Afshana Bashir et al. reported adequate knowledge in only 18% of the mothers included in their study. (15)

This gap in understanding may make prevention more difficult. Nearly half of the mothers did not recognize contaminated food or water as possible sources of infection, which could affect their adoption of appropriate food and water safety practices for their children.

Although deworming had been given to approximately four out of every five children at least once, only about 43% were reported to receive it regularly as a preventive measure. This difference between having received deworming at least once and following it regularly indicates a need for stronger health education and continued implementation of deworming activities through schools and community settings. In a study conducted in Tamil Nadu, Dhanuraja V. et al. reported regular deworming among approximately 65% of mothers. (16) The higher proportion compared with our study suggests that there is still scope for improving the consistency of preventive deworming in our setting.

Mothers living in rural areas were less likely than their urban counterparts to identify unhygienic practices as a cause of illness. This difference may partly be related to greater exposure to health information and public health messages among mothers living in urban areas. A study from Puducherry by Kalaivani E et al. also reported poorer knowledge among rural mothers than among mothers residing in urban areas, which is in keeping with our finding. (17)

CONCLUSION

Mothers demonstrated relatively good recognition of the clinical manifestations of worm infestation, but important gaps remained in knowledge regarding its sources and

prevention. Although most children had been dewormed at least once, regular preventive deworming was considerably less common. Targeted health education focusing on transmission and prevention, along with reinforcement of periodic deworming through existing school, preschool and community-based programmes, may help improve deworming practices among young children.

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