



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) AMONG PARENTS OF 3-15-YEAR-OLD CHILDREN ON SOIL-TRANSMITTED HELMINTHIASIS (STH) AND ITS PREVENTION**

**KEY WORDS:** soil-transmitted helminthiasis, knowledge, attitude, practice

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**ABSTRACT**

**Introduction:** Soil-transmitted helminthiasis (STH) are known to have detrimental effects on child's growth causing anemia and under-nutrition. To control STH, the Government of India has launched national deworming day and bi-annual deworming through Anemia Mukta Bharat in children and adolescents. However, the awareness, attitude and practices are suboptimal in the community. **Objective:** To assess the KAP among parents of 3-15-year-old children using a questionnaire and to determine its association with socio-demographic factors of parents of 3-15-year-old children. **Methods:** A school-based study from May 2022 to August 2022 included 118 parents of 3-15-year-old children residing in the Kanyakumari district. A pre-structured validated questionnaire was used to assess the knowledge regarding helminthic infection, attitude, and practices to prevent STH among the parents and their socio-demographic factors. Knowledge considered adequate (>7/14), inadequate (<7/14); attitude - positive (>4/8), negative (<4/8) and practice - good (>5/6), poor (<5/6). Data was analysed and association was noted between parents socio-demographic characters and their knowledge, attitude & practice. **Result:** 74 (62.5%) parents of 3-15-year-old children had adequate knowledge and 109 (92.5%) had good practices whereas 102 (86.5%) had a negative attitude. Mother's age, education, occupation was statistically significant with the knowledge of STH and its prevention (p<0.05) and father's age, education, occupation and socio-economic status was statistically significant with the KAP of STH and its prevention among parents of 3-15-year-old children (p<0.05). **Conclusion:** Knowledge and practice domains were adequate/good among the parents but majority had a negative attitude regarding STH and its prevalence. Among the socio-demographic factors, mother's characteristics were associated mainly with knowledge and the father's with KAP. These observations are key factors in hindering the reduction of prevalence of STH, despite the existing national programmes. Hence, utilisation of more receptive social media and direct interaction with parents of target population by teachers and primary health care are recommended.

**INTRODUCTION:**

Soil-transmitted helminthiasis (STH) are known to have detrimental effects on children's physical growth and well-being and can cause anemia and under-nutrition. Despite various existing programmes to prevent STH, there are lacunae in the effective coverage of these programmes (1) and no substantial reduction in the STH (2). Also, there is an alarming increase in the prevalence of anemia in children in TamilNadu from 50.7%(NFHS-4) to 57.4%(NFHS-5) (3). To enable effective STH control measures, awareness to both the disease, and its prevention are critical. However, little is known of the awareness, attitude and practices of parents/caregivers of children on deworming for STH infections in our setting.

**METHODS:**

A descriptive cross-sectional study was conducted among the parents of 3-15-year-old children residing in the Kanyakumari district. Based on the index study (4), the sample size was calculated to be 118. A purposive sampling technique was applied. Inclusion criteria: Being a 3-15-year-old child's father or mother dwelling in the pre-determined area. Exclusion criteria: Parents of 3-15-year-old children who did not give consent. Data were collected from May 2022 to August 2022.

**DATA-COLLECTION TOOL:**

A pre-structured questionnaire containing preface, informed

consent and questions including multiple choice questions, semi-open and open-ended questions was designed in English, translated to local language (Tamil and Malayalam), validated by experts from other departments- paediatrics, community medicine and general medicine and piloted on 20 parents of SAC attending the OPD in the investigator's presence. Few fallacies were noticed, necessary changes made and the modified questionnaire was retested and ensured whether easy to comprehend until no further queries had to be addressed.

Section 1- Preface, Consent, Demographic details - including age, gender, educational qualifications, occupation of parents and monthly family income, housing conditions, sanitation & hygiene.

Section 2 - Questions aimed to assess the knowledge regarding helminthic infection, attitude and practices to prevent infection and its ill effects.

Data collection was by approaching parents at a private school in the locality during the school PTA meet. All information concerning the purpose and objective of the study explained and brief details on how to fill the questionnaire was given. Those who agreed to participate were requested to sign the informed consent form and fill the questionnaire at their leisure and return the filled forms to the teacher by the next working day. The contact number of the

principal investigator was enclosed in each questionnaire to address any queries.

**OPERATIONAL DEFINITIONS:**

**Knowledge:** Information/familiarity or comprehension that the target population has about STH and its preventive aspects

**Attitude:**

Attitude is the way of thinking or opinion on STH infections and its preventive measures.

**Practice:**

Ways in which people demonstrate their knowledge and attitudes through their actions like sanitation & hygiene practices Modified Kuppasamy Scale 2021 was used for assessing the socio-economic status. Section - Knowledge consisted of 14, attitude 8, and practice 6 questions. For each correct response, a score of "1" and "0" score for each wrong or don't know response. Knowledge score was arbitrarily classified as adequate (>7/14) and inadequate knowledge (<7/14), attitude into positive (>4/8) and negative attitude (<4/8) and practice as good (>5/6) and poor practices (<5/6) (4).

**Statistical Analysis:**

To ensure the quality of the data, completed questionnaires were manually checked before tabulation in Microsoft Excel 2019, analyzed using Statistical Software (SPSS) version 20.0. Descriptive statistics (frequencies, percentages, etc.) and cross-tabulations and chi-square tests were performed to determine significant relationships between categorical dependent and independent variables.

**Ethical Considerations:**

All procedures were performed in accordance with the Institutional Research Ethics and formal ethical approval was granted.

**RESULTS:**

Table 1 – Questionnaire to assess KAP among parents	n	%
<b>Knowledge</b>		
Are you familiar with STH?		
Yes	82	69.5
No	36	30.5
How did you know about STH?		
Hospital/Health Centre	43	36.5
Family and friends	5	4
TV/Radio	0	0
Classes/Lectures	16	13.5
Social Media (Facebook, Whatsapp, Youtube, Instagram...)	32	27
Others	0	0
How does this infection spread?		
Improper handwashing	104	88
Undercooked food	96	81.5
Unhygienic water	87	73.5
Contaminated food	101	85.5
Barefoot walking	89	75.5
Ingesting infected meat	80	68
Food contaminated by flies	90	76
Others	0	0
What are the clinical symptoms of STH?		
Abdominal pain	101	85.5
Loose stools	105	89
Perianal itching	75	63.5
Retarded growth	75	64
Anemia	64	54
Persistent cough	45	38
Eosinophilia	34	29

Do all need investigations before starting treatment?		
Yes	21	18
No	87	74
Don't know	10	8
Are you familiar with periodic deworming?		
Yes	88	74.5
No	30	25.5
How did you know about periodic deworming?		
Hospital/Health Centre	70	59
Family and friends	5	4
TV/Radio	0	0
Classes/Lectures	17	14
Social Media (Facebook, Whatsapp, Youtube, Instagram...)	37	31
Others	0	0
Is there a national programme for deworming?		
Yes	80	68
No	38	32
What are the drugs used for deworming?		
Albendazole	110	93
Mebendazole	5	4
Pyrantel pamoate	0	0
Others (tonics, antibiotics)	30	25
Don't know	8	6.8
What are the available preparations of deworming medicines?		
Syrup	34	29
Tablet	17	14.5
Both	67	56.5
<b>Attitude</b>		
Is STH a seasonal issue?		
Yes	40	34
No	78	66
What are the measures to prevent STH?		
Proper handwashing	114	96.5
Barefoot walking	110	93.2
Hand hygiene of the person who cooks meal	80	68
Habit of playing with soil	50	41
Unclean or untrimmed nails	52	44
Proper waste disposal	81	69
Why is periodic deworming of children difficult?		
Expensive	22	19
Difficulty in procuring the drug	21	18
Vomiting/loose stools	17	14.5
Difficulty in swallowing the tablet	58	49
How often should children be dewormed?		
Every 1-3 months	10	8.5
Every 1-6 months	25	21
Every year	66	56.5
Only when my child is symptomatic	9	7.5
I have no idea	8	6.5
Is there any seasonal variation in the effectiveness of deworming?		
Yes	16	13.5
No	102	86.5
Do drugs used for deworming have side-effects?		
Yes	8	6.5
No	110	93.5

Which is the best treatment medication?			
Drugs given from school	36	30	
Home remedies	32	27	
Doctor prescribed drug	65	55	
Indigenous medicine	4	3.5	
Agree		Strongly disagree	Disagree
		Strongly agree	Neither agree or disagree
Is STH a serious health infection in children?	5(4)	0(0)	34(30)
Worms are part of natural flora in the intestines	22(18.5)	16(13.5)	39(33)
Deworming might adversely affect the symbiosis of the natural intestinal flora	30(25)	12(10)	48(41)
Deworming is a good for the children	0(0)	0(0)	29(24)
Deworming makes children sick and should not be encouraged	38(32)	17(14)	24(20)
Deworming helps to prevent malnutrition in preschool children	5(4)	12(10)	30(25)
Deworming helps to prevent growth retardation in preschool children	5(4)	16(13.5)	30(25)
Deworming prevents anemia in preschool children	5(4)	31(26)	24(20)
Practice			
Does everyone at home practice?			
Follow proper handwashing	118	100	
Washing fruits and vegetables before cooking or consumption	110	93.2	
Covering food utensils using lids to protect from flies	114	96.6	
Prefer open air defecation	118	100	
Using chappal/slippers	114	96.6	
At what age did you start deworming your child?			
Less than 2 years	86	73	
More than 2 years	32	27	
When was your child dewormed last?			
<6 months back	27	23	
>6 months	73	62	
Not done	18	15	
Where did you obtain the last deworming treatment?			
Anganwadi/Balwadi/School GH/PHC	62	52.5	
During vaccination visits	4	3	
As per doctor's advice on OP basis/admission for other illness	0	0	
Over the counter from nearby pharmacy	25	21	
I have never dewormed my child	16	13.5	
Do adults in your home deworm simultaneously when kids are dewormed?			
Yes	41	34.5	
No	77	62.5	
Were any siblings diagnosed with helminthiasis and treated?			
Yes	4	3	
No	114	97	

Among 118 participants, M:F ratio was 1.18. The mean age of their children was 5.8 years. Mean age of fathers was 38 years and mean age of mothers was 33 years. Almost all parents had at least primary school education (Table 2).

17 (14.5%) belonged to upper-middle class, 43 (36.5%) lower-middle and 58 (49%) upper-lower class. The source of drinking water was well water in 65 (55%), corporation/municipal tap water in 48 (41%) and community well in 5 (4%). Sanitary latrine was available for 114 (96.6%). Solid waste disposal was mainly through municipal corporation scavengers 81 (68.5%), followed by burning 33 (28%) and composting 4 (3.5%).

43 (36.5%) knew about STH and 70 (59%) knew about periodic deworming through doctors at hospital/health centre, followed by 32 (27%) about STH and 37 (31%) about deworming through social media (facebook, whatsapp, youtube, instagram, etc) and TV/Radio was not a source for any of them. (Table 1).

38 (32%) did not know that a national programme for deworming existed. Only 25 (21%) rightly knew that children need to be dewormed every 6-monthly. 74 (62.5%) parents of 3-15-year-old children had adequate knowledge compared to 44 (37.5%) had inadequate knowledge.

40 (34%) had an attitude that STH is a seasonal issue and 16 (13.5%) felt it was a factor affecting the effectiveness of deworming. 41 (35%) thought worms are a normal part of flora and 29 (24%) thought that deworming will adversely affect the symbiosis of the natural intestinal flora. 65 (55%) thought that home remedies are the best treatment for worm infestation.

17 (14.5%) of them believed that deworming medications were only available in tablet formulation. The difficulty in following periodic deworming was majorly attributed to the difficulty in swallowing the tablet by 58 (49%), whereas 22 (19%) thought it was expensive. 16 (13.5%) parents had positive attitude and 102 (86.5%) had negative attitude.

109 (92.5%) had good practice whereas 9 (7.5%) had poor practices. 18 (15%) have never dewormed their children. Only 41 (34.5%) of families had the habit of all adults in the family deworming simultaneously along with their children.

Mother's age, education, occupation was statistically significant to the knowledge of STH and its prevention among parents of 3-15-year-old children (p<0.05). Father's age, education, occupation and socio-economic status was statistically significant to the KAP on STH and its prevention among parents of 3-15-year-old children (p<0.05) (Table 2).

**DISCUSSION:**

Though, many studies (5,6) correlate the high prevalence rate of the parasitic infection to poor knowledge on STH. In our study, attitude was the most affected compared to knowledge and practice.

Most knew about STH and deworming. Only 25 (21%) rightly knew that children need to be dewormed every 6-monthly. Notably none of them became aware through TV/radio. There is a changing trend in media use, most spend more time on social media. It is also noteworthy that most parents had at least primary education i.e., none were illiterate.

Hence, increasing awareness through social media by utilising the GOI health care apps – “Aarogya Setu” in smartphones and by increasing person-to-person interaction by involving anganwadi/school teachers and ASHA workers to reinforce parents about the STH and its prevention will be an effective way to intensify the awareness on STH.

Table 2 - Basic socio-demographic data of participants, their knowledge, attitude and practice of STH and its prevention and p value

	n	%	Knowledge		p	Attitude		p	Practice		p
			Adequate	Inadequate		Positive	Negative		Good	Poor	
Father's Age					0.029*			0.001*			0.007*
26-30	20	17	12	8		0	20		20	0	
31-35	27	23	22	5		4	23		22	5	
36-40	31	26	18	13		12	19		31	0	
41-45	19	16	14	5		0	19		19	0	
46-50	21	18	8	13		0	21		17	4	
Father's Education					0.009*			0.001*			0.021*
Primary school	28	24	24	4		0	28		28	0	
Middle school	18	15	9	9		4	14		18	0	
High school	34	29	21	13		4	30		29	5	
Diploma	21	18	8	13		8	13		17	4	
Graduate	17	14	12	5		0	17		17	0	
Profession	0	0	0	0		0	0		0	0	
Father's Occupation					0.011*			0.001*			0.001*
Unemployed	0	0	0	0		0	0		0	0	
Unskilled	76	64.5	45	31		4	72		72	4	
Semi-skilled	12	10	8	4		8	4		12	0	
Skilled	4	3.5	0	4		0	4		4	0	
Clerks	4	3.5	4	0		4	0		4	0	
Technicians	17	14.5	12	5		0	17		17	0	
Professionals	5	4	5	0		0	5		0	5	
Mother's Age					0.308			0.002*			0.002*
26-30	16	13.5	8	8		0	15		16	0	
31-35	20	17	16	4		8	12		20	0	
36-40	38	32	24	14		4	34		33	5	
41-45	28	24	18	10		4	24		28	0	
46-50	16	13.5	8	8		0	16		12	4	
Mother's Education					0.001*			0.396			0.048
Primary school	15	13	15	0		0	15		15	0	
Middle school	27	23	9	18		4	23		27	0	
High school	24	20	12	12		4	20		20	4	
Diploma	16	14	12	4		4	12		16	0	
Graduate	31	26	26	5		4	27		26	5	
Profession	5	4	0	5		0	5		5	0	
Mother's Occupation					0.001*			0.325			0.414
Unemployed	84	71	45	39		12	72		75	9	
Unskilled	0	0	0	0		0	0		0	0	
Semi-skilled	5	4	5	0		0	5		5	0	
Skilled	8	7	8	8		0	8		8	0	
Clerks	5	4	0	5		0	5		5	0	
Technicians	0	0	0	0		0	0		0	0	
Professionals	16	14	16	0		4	12		16	0	
Socio-economic class					0.001*			0.001*			0.001*
Upper (I)	0	0	0	0		0	0		0	0	
Upper-Middle (II)	17	14.5	17	0		0	17		12	5	
Lower-Middle (III)	43	36.5	16	27		12	31		39	4	
Upper-lower (IV)	58	49	41	17		4	54		58	0	
Lower (V)	0	0	0	0		0	0		0	0	

Despite good practice and knowledge, there is no substantial reduction in STH. Some usually correlate it with poverty, poor environmental and personal hygiene, and insufficient health services (7). In our study, majority had proper waste disposal methods, sanitary latrine facility and good personal hygiene. But most used was well water, which does not undergo any filtration, purification and disinfection which could be a factor for high prevalence (8,9,10).

Some misconceptions that home remedies are the best effective treatment, syrup formulations are not available and belief that worms are part of normal flora & deworming causes disruption of this flora were all factors hindering the reduction of STH prevalence and reflected the negative attitude of parents of 3-15-year-old children. This suggests the need to create awareness and refine the attitude of parents in order to break the vicious cycle.

But parents are less receptive during consultations for illness, since their primary concern would be ailment. Hence, emphasise about deworming at immunisation/wellness clinics in order to improve their attitude. In fact, the deworming drugs are available free of cost, easy-to-access.

In order to tackle STH, a major public health problem, the Government of India has taken up multiple initiatives - National deworming day (since 2015) and Anemia Mukh Bharat (since 2018) as part of the National Iron Plus Initiative (NIPI) Program, which mandates bi-annual deworming in children and adolescents. In fact, Ahamed et al (11) in 2020 analysed that none of 1150 participants were aware of National Deworming Day in India similar to our study which indicates the lack of reach among the parents of the target population. To ensure whether every child got the deworming dose and IFA tablets, proper documentation in the Mother and

Child Protection (MCP) Card - health card should be made mandatory.

**CONCLUSION:**

Among the socio-demographic factors, mother's characteristics were associated mainly with knowledge and the father's with knowledge, attitude and practice and the negative attitude of parents towards prevention of STH hinders the effectiveness of existing national programmes targeting to reduce the prevalence of STH. Utilisation of a more receptive media like social media - GOI's health care apps and direct interaction with the parents of the target population by anganwadi/school teachers and primary health care should be encouraged to create an attitude change.

**Limitations:**

- Sample size inadequate for generalisation
- Single centered study

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