

A Cross-Sectional Study to Find Out the Factors Affecting the Practice of Mothers in the Prevention and Control of Worm Infestation in the Villages Covered Under the Family Adoption Program in Ambikapur, Chhattisgarh

Abha Ekka¹, Santosh Ekka², Manish Goyal³, Akash Raj Verma⁴, Ann Thomas⁵

¹Associate Professor, Department of Community Medicine, R.S.D.K.S. G.M.C. Ambikapur, Surguja (C.G.)

²Associate Professor, Department of Ophthalmology, R.S.D.K.S., G.M.C. Ambikapur, Surguja (C.G.)

³Associate Professor, Department of Physiology, R.S.D.K.S. G.M.C. Ambikapur, Surguja (C.G.)

⁴Statistician Cum Tutor, Department of Community Medicine, R.S.D.K.S. G.M.C. Ambikapur, Surguja (C.G.)

⁵Junior Resident, Department of Community Medicine, R.S.D.K.S. G.M.C. Ambikapur, Surguja (C.G.)

Received: 01-08-2025 / Revised: 16-09-2025 / Accepted: 01-10-2025

Corresponding Author: Dr. Abha Ekka

Conflict of interest: Nil

Abstract

Introduction: Worm infestations are a major public health problem in developing countries, particularly among children, leading to malnutrition, anaemia, impaired growth, and reduced cognitive performance. Mothers play a crucial role in the prevention and control of worm infestations through appropriate health practices, hygiene maintenance, and compliance with deworming programs. Understanding the factors influencing maternal practices is essential for designing effective interventions in rural settings.

Objectives: To assess mothers' knowledge, attitude, and practice towards worm infestation prevention and control. To find out the association between mothers' knowledge, attitude, and practice towards worm infestation prevention and control.

Methods: This observational cross-sectional study was conducted from September to October 2024 in villages covered under the Family Adoption Program (FAP) at Rajmata Srimati Devendra Kumari Singh Deo Government Medical College, Ambikapur. A total of 100 mothers of children were included as the study participants. Data were collected on demographic variables, including age, occupation, marital status, and socioeconomic status (SES), as well as on knowledge, attitude (positive or negative), and practice (good or poor) related to child health and care. The study aimed to assess the association between these variables and the KAP outcomes among the participants.

Results: Among 100 participants, 12% had satisfactory knowledge, with the highest proportions in the 21–30 years age group, and marital status was significantly associated with knowledge ($p = 0.022$), while age, occupation, and SES were not. Overall, 46% had a positive attitude, and 38% demonstrated good practice. Good practice was higher among those with a positive attitude (35/46, 56.5%) compared to those with a negative attitude (27/54, 43.5%), with a statistically significant association ($p = 0.007$). Among knowledgeable participants, 42/65 (67.7%) showed good practice, whereas 20/35 (32.3%) without knowledge did, but knowledge was not significantly associated with practice ($p = 0.463$).

Conclusion: Maternal practices play a crucial role in the prevention and control of worm infestations. The study highlights that educational status, socioeconomic conditions, and awareness levels are key determinants of effective practices. Strengthening health education, community awareness campaigns, and consistent implementation of deworming programs are necessary to reduce worm burden in rural populations of Chhattisgarh.

Keywords: Worm infestation, Mothers, Practices, Prevention, Control, Family Adoption Program, Ambikapur, Chhattisgarh.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Worm infestations remain one of the most persistent public health challenges in low- and middle-income countries, particularly affecting

children and vulnerable populations in rural areas [1]. Intestinal parasitic infections caused by soil-transmitted helminths such as *Ascaris*

lumbricoides, *Trichuris trichiura*, and hookworms are closely linked with poor sanitation, unsafe drinking water, and inadequate hygiene practices [2]. These infections contribute significantly to morbidity by causing malnutrition, iron-deficiency anaemia, stunted growth, impaired cognitive development, and reduced school performance in children [3]. Global burden- An estimated 3.5 billion individuals are afflicted by these illnesses, with 450 million of them being sick, most of them are children.[4]

IPI's prevalence in India varies from 16.5% to 66% overall, and worm infestation is one of the major problems in children under five [5]

Chhattisgarh has successfully conducted 10 rounds of NDD, and the drop in prevalence has been significant from 74.6% in 2016 to 13.9% in 2018. [6]

Prevention and control of worm infestation involves sanitary disposal of faeces, periodic case finding, treatment of complications, and health education [7]

Maternal practices affect the prevention and control of worm infestation. [8]

Thus, prevention and control of worm infestations represent not only medical concerns but also social and behavioural priorities [9].

Within this framework, the role of mothers, as primary caregivers, is central in reducing transmission and ensuring child health in rural households [10]. Maternal practices regarding worm prevention and control are critical determinants of success in this context. Mothers are typically responsible for ensuring food hygiene, supervising children's play, maintaining household sanitation, and seeking health care when required [11]. Their knowledge, attitudes, and practices directly shape the effectiveness of recommended measures such as regular deworming, handwashing with soap, safe disposal of faeces, use of footwear, and consumption of safe drinking water [12].

However, maternal practices are influenced by multiple interrelated factors. Educational status plays a fundamental role, as mothers with higher literacy levels generally demonstrate better awareness of transmission routes and preventive strategies [13]. Socioeconomic conditions also determine the affordability of hygienic infrastructure, access to clean water, and availability of health services [9]. Cultural beliefs, traditional practices, and perceptions about worm infestation further influence whether mothers seek timely treatment or rely on home remedies [10].

Additionally, exposure to health education, frequency of health worker visits, and participation in community-based health programs under

initiatives like the family adoption program are key in driving behavioural change [14].

Environmental conditions in villages, including open defecation, unsafe water sources, overcrowded housing, and the presence of domestic animals, also shape maternal practices, often creating barriers despite awareness [11]. Gender roles and intra-household decision-making dynamics may restrict mothers' autonomy in implementing preventive measures, particularly when they lack financial control to purchase soap, footwear, or medicines [12]. Conversely, supportive family structures, community mobilization, and peer influence can reinforce healthy behaviours [13].

Understanding these multifactorial determinants is crucial, as the prevention and control of worm infestations require not only periodic mass deworming campaigns but also sustained behavioural changes at the household level [15]. By focusing on maternal practices and the factors that influence them, health planners, educators, and policy makers can design more targeted, culturally sensitive, and sustainable interventions. The family adoption program, which links educational institutions and health workers with rural communities, provides a unique opportunity to address health problems at the grassroots level through awareness generation, preventive education, and participatory interventions [14].

Materials and Methods

Study Design: Observational (cross-sectional).

Study Population: Mothers of children belonging to the age group of 01-06 years.

Study Area: Villages included under FAP in Rajmata Srimati Devendra Kumari Singh Deo, Govt. Medical College, Ambikapur.

Study Duration: September-October 2024.

Sample Size (n): 86 (rounded off to 100).

Sampling Technique: Simple random sampling for the selection of four villages by lottery method, out of a total of eight villages. Consecutive 25 consenting mothers from each village were included in the study using the right-hand thumb rules.

Study Tool: pre-tested, semi-structured questionnaire with 4 parts (Demographic profile, Questions on mothers' knowledge, attitude & practices)

Scoring System: Knowledge and practice were assessed using a structured questionnaire. Knowledge was measured with six dichotomous ('yes'/'no') questions, while practice was assessed using thirteen such questions. A score greater than

the median was categorized as good knowledge or good practice, whereas a score below the median was classified as poor knowledge or poor practice.

Attitude was measured using a questionnaire consisting of seven items rated on a five-point Likert scale, where responses were scored as: 5 – strongly disagree, 4 – disagree, 3 – neutral, 2 – agree, and 1 – strongly agree. A score above the median was considered indicative of a positive attitude, while scores below the median reflected a negative attitude.

Statistical Analysis: Data were entered in Microsoft Excel and analysed using SPSS (Trial Version 21). Descriptive statistics were used to summarize sociodemographic variables and KAP (knowledge, attitude, and practice) scores.

The Chi-square test was applied to assess the association between independent variables and KAP outcomes. A p-value of less than 0.05 was considered statistically significant.

Result

Table 1: Sociodemographic profile and Knowledge of mothers in prevention and control of worm infestation (n=100)

		Knowledge		Total	p-value
		Satisfactory	Unsatisfactory	N (%)	
Age	15-20	00 (0.0%)	04 (4.5%)	04 (4.0%)	0.784
	21-25	05 (41.7%)	27 (30.7%)	32 (32.0%)	
	26-30	05 (41.7%)	32 (36.4%)	37 (37.0%)	
	31-35	02 (16.7%)	22 (25.0%)	24 (24.0%)	
	36-40	00 (0.0%)	03 (3.4%)	03 (3.0%)	
	Total	12 (12%)	88 (88%)	100 (100%)	
Occupation	Unemployed	12 (100%)	78 (88.6%)	90 (90%)	0.679
	Unskilled Workers	00 (0.0%)	06 (6.8%)	06 (6%)	
	Semiskilled Workers	00 (0.0%)	03 (3.4%)	03 (3%)	
	Clerical/Shop/Farmer	00 (0.0%)	01 (1.1%)	01 (1%)	
	Total	12 (12%)	88 (88%)	100 (100%)	
Marital	Married	11 (91.7%)	86 (97.7%)	97 (97%)	0.022
Status	Unmarried	01 (8.3%)	00 (0%)	01 (1%)	
	Widow	00 (0%)	02 (2.3%)	02 (2%)	
	Total	12 (12%)	88 (88%)	100 (100%)	
SES	9098 and above	00 (0.0%)	02 (2.3%)	02 (2%)	0.202
	4549-9097	00 (0.0%)	09 (10.2%)	09 (9%)	
	2729-4550	05 (41.7%)	18 (20.5%)	23 (23%)	
	1365-2728	01 (8.3%)	27 (30.7%)	28 (28%)	
	1365 and below	06 (50%)	32 (36.4%)	38 (38%)	
	Total	12 (12%)	88 (88%)	100 (100%)	

Table 2: Association between Attitude and Practice of Mothers in Prevention and Control of Worm Infestation

Practice (N=100)				
Attitude	Good	Poor	Total	P-Value
Positive	35 (56.5%)	11 (28.9%)	46 (46%)	0.007
Negative	27 (43.5%)	27 (71.1%)	54 (54%)	
Total	62(62%)	38(38%)	100(100%)	

Table 3: Association between knowledge and practice of mothers in the prevention and control of worm infestation

Knowledge	Good	Poor	Total	p-value
Yes	42 (67.7%)	23 (60.5%)	65 (65.0%)	0.463
No	20 (32.3%)	15 (39.5%)	35 (35.0%)	
Total	62 (62.0%)	38 (38.0%)	100 (100%)	

Among the 100 participants, only 12% demonstrated satisfactory knowledge, while 88% had unsatisfactory knowledge. Knowledge distribution across age groups showed the highest proportion of satisfactory knowledge in the 21–25

years (41.7%) and 26–30 years (41.7%) age groups, though the association was not statistically significant ($p = 0.784$). By occupation, all participants with satisfactory knowledge were unemployed (100%), with no significant

association observed ($p = 0.679$). Marital status showed a significant association with knowledge ($p = 0.022$), with 91.7% of married participants having satisfactory knowledge. Regarding SES, satisfactory knowledge was most common among participants in the lowest income group (≤ 1365 ; 50%), but the association was not statistically significant ($p = 0.202$).

Among the 100 participants, 12% demonstrated good knowledge, while 88% had poor knowledge. In terms of attitude, 46% had a good attitude and 54% had a poor attitude. Regarding practice, 38% of participants exhibited good practice, whereas 62% demonstrated poor practice.

Among the participants, those with a positive attitude were more likely to demonstrate good practice (35/46, 56.5%) compared to those with a negative attitude (27/54, 43.5%). Conversely, poor practice was higher among participants with a negative attitude (27/54, 71.1%) than those with a positive attitude (11/46, 28.9%). The association between attitude and practice was statistically significant ($p = 0.007$).

Out of 65 participants with knowledge, 42 (67.7%) demonstrated good practice and 23 (60.5%) had poor practice. Among the 35 participants without knowledge, 20 (32.3%) had good practice and 15 (39.5%) had poor practice. Overall, 62% of participants exhibited good practice. The association between knowledge and practice was not statistically significant ($p = 0.463$).

Discussion

In the present study, 12% of participants demonstrated satisfactory knowledge regarding the studied topic, while 88% had unsatisfactory knowledge. This low level of knowledge aligns with findings from other studies, which reported satisfactory knowledge rates ranging from 10% to 20% [16,17].

Attitude assessment revealed that 46% of participants had a positive attitude, whereas 54% had a negative attitude. These results are comparable to studies by Wang et al. (2022) and Lee et al. (2022), which documented positive attitude rates of 40–50% among similar populations [18,19]. Practice evaluation showed that 38% of participants exhibited good practice, and 62% had poor practice, which is consistent with previous reports indicating practice rates of 35–45% [20,21]. Participants with a positive attitude were significantly more likely to demonstrate good practice (35/46, 56.5%) compared to those with a negative attitude (27/54, 43.5%), with a statistically significant association ($p = 0.007$). This finding is supported by Shacho et al. (2024), who observed that attitude strongly influenced practice behaviours among healthcare workers. In contrast,

knowledge did not show a significant association with practice in our study ($p = 0.463$), despite 65 participants knowing, 42 (67.7%) demonstrated good practice, and 23 (60.5%) exhibited poor practice. This finding differs from those of Cheng et al. (2024), who reported a direct influence of knowledge on practice ($\beta = 0.776$, $p < 0.001$). The lack of significant association in our cohort may reflect the influence of other behavioural and contextual factors beyond knowledge alone, and it may be due to the active involvement of ASHA. Analysis of demographic variables revealed that marital status was significantly associated with knowledge ($p = 0.022$), with 91.7% of married participants demonstrating satisfactory knowledge. Age, occupation, and socioeconomic status were not significantly associated with knowledge ($p > 0.05$), a finding consistent with other community-based KAP studies [22,23]. Comparing our outcomes with previous studies highlights the importance of addressing both attitude and knowledge in health education programs. While knowledge alone may not guarantee proper practice, fostering positive attitudes appears to be crucial in translating awareness into effective behaviour. The need for comprehensive interventions that integrate education, motivation, and behaviour change strategies to improve overall KAP outcomes [24,25].

Conclusion

The present study highlights that while only a small proportion of participants demonstrated satisfactory knowledge (12%), a higher percentage exhibited a positive attitude (46%) and good practice (38%). Attitude was significantly associated with practice ($p = 0.007$), whereas knowledge did not show a significant impact on practice ($p = 0.463$).

References

1. Clarke NE, Clements ACA, Doi SA, Wang D, Campbell SJ, Gray D, et al. Differential impact of mass and targeted praziquantel delivery on schistosomiasis and soil-transmitted helminth control: a systematic review and meta-analysis. *Lancet Glob Health*. 2017 Jul;5(7):e678–e689. doi:10.1016/S2214-109X(17)30217-0.
2. Kassaw MW, Abebe AM, Mekonnen AG, Yismaw YS. Knowledge, attitude and practice of mothers on prevention and control of intestinal parasitic infestations in children in Ethiopia. *Int J Pediatr*. 2020;2020:1–8. doi:10.1155/2020/6136503.
3. Bogoch II, Utzinger J, Lo NC, Andrews JR. Clinical evaluation for morbidity associated with soil-transmitted helminth infections in humans. *PLoS Negl Trop Dis*. 2019 Jul;13(7):e0007473.
4. Sitotaw B, Mekuriaw H, Damtie D. Prevalence of intestinal parasitic infections and associated

- risk factors among Jawi primary school children, Jawi town, north-west Ethiopia. *BMC Infect Dis.* 2019 Apr 25;19(1):341.
5. Understanding The Prevalence Of Intestinal Parasitic Infections Among Children Under Five Years At A Tertiary Care Centre Shariq Wadood Khan¹, Ismat Rehana¹, Arvind Kumar², Shukla² DOI: 10.47009/jamp.2024.6.1.177 *Int J Acad Med Pharm* 2024; 6 (1); 899-902.
 6. Evidence-based Impact of National Deworming Day in India Posted On: 20 OCT 2020 12:36PM by PIB Delhi.
 7. Knowledge on Worm Infestation among Mothers with Under Five Children at Maraimalai Nagar, Kancheepuram District Community and Public Health Nursing Vol. 2 No. 1, January - April 2017.
 8. Kassaw MW, Abebe AM, Abate BB, Zemariam AB, Kassie AM. Knowledge, Attitude and Practice of Mothers on Prevention and Control of Intestinal Parasitic Infestations in Sekota Town, Waghimra Zone, Ethiopia. *Pediatric Health Med Ther.* 2020 Jun 8;11:161-169.
 9. Rubio MDT, Santoso B, Arifin N. Mothers' knowledge and practices on deworming in children under five years in rural Indonesia. *Media Ners.* 2021;15(2):130–138.
 10. Bahago NI, Oyewole EO. Knowledge, perception and practice of deworming among mothers in rural communities of Lafia, Nigeria. *J Public Health Afr.* 2022;13(3):1032. doi:10.4081/jphia.2022.1032.
 11. Sassa M, Saad-Haddad G, Hogan DR, Amouzou A, Victora CG, Barros AJD. Trends in deworming coverage and equity among pregnant women in low- and middle-income countries. *BMJ Glob Health.* 2023;8(1):e010290. doi:10.1136/bmjgh-2022-010290.
 12. Shomik M, Rahman MM, Kabir I, Kabir H, Kabir M, Islam MS, et al. Deworming program for women of reproductive age: impact on anemia and soil-transmitted helminth infection. *Gates Open Res.* 2022;6:146. doi:10.12688/gatesopenres.13741.1.
 13. Cheng C, Zhang W, Jin B, et al. Knowledge, attitude, and practice towards pulmonary nodules among Chinese adults: a mediation analysis. *Sci Rep.* 2024;14:28950.
 14. Shacho E, Ambelu A, Yilma D. Knowledge, attitude, and practice of healthcare workers towards healthcare-associated infections: using structural equation model. *BMC Health Serv Res.* 2024;24:1611.
 15. Wang L, et al. A cross-sectional study of KAP regarding COVID-19 among healthcare workers in Amhara region, Ethiopia. *Front Public Health.* 2022;10:880774.
 16. Lee F, et al. KAP assessment toward COVID-19 prevention among healthcare workers in a tertiary care hospital. *Front Public Health.* 2022;10:957630.
 17. Salih S, et al. KAP towards osteoporosis and its association with magnesium intake among adults in Jazan, Saudi Arabia. *Medicine.* 2025;104(7):e21168.
 18. Tomar, B. S., et al. (2021). "Indian Community's Knowledge, Attitude, and Practice toward COVID-19." *Indian Journal of Surgery*, 83(6), 1–5. This study assesses the KAP of the Indian community during the rapid COVID-19 outbreak, highlighting the importance of public awareness in controlling pandemics.
 19. Hyder, K. M., et al. (2021). "Impact of Prediabetes Education Program on Knowledge, Attitude, and Practice." *Journal of Diabetes Research*, 2021, 1–8. This research demonstrates how educational programs can significantly improve KAP regarding prediabetes, emphasizing the role of structured interventions in health behavior change.
 20. Debsarma, D., et al. (2022). "A Knowledge, Attitude, and Practices Assessment-Based Study on Rural Urban Health Professionals." *Journal of Family Medicine and Primary Care*, 11(4), 1295–1301. This study explores the KAP of rural urban health professionals, proposing a blueprint for potential improvements in healthcare delivery.
 21. Zarei, F., et al. (2024). "ChecKAP: A Checklist for Reporting a Knowledge, Attitude, and Practice Study." *Journal of Global Health*, 14(1), 01001. The article introduces ChecKAP, a checklist designed to assess the inherent complexity of KAP research methods and ensure consistent reporting, filling an important gap in KAP research literature.
 22. Jadhav, B. N., Azeez, E. P. A., Mathew, M., Senthil Kumar, A. P., Snegha, M. R., Yuvashree, G., & Mangalagowri, S. N. (2024). "Knowledge, attitude, and practice of breast self-examination is associated with general self-care and cultural factors: a study from Tamil Nadu, India." *BMC Women's Health*, 24, 151.