

RESEARCH

Open Access



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

permission was obtained from Amhara Regional Health Office, Central Gondar Zonal Health Office, Gondar Zuria District Health Office, Central Gondar Educational Office and Maksegnit Number Two Primary School Director Office. Written informed consent was obtained

Table 2 Knowledge of parents of school age children towards Helminthiasis, Maksegnit, northwestern Ethiopia, June 2022

Variable (Respondents)	Response Category	Frequency(percent)
Ever heard about parasites (n = 394)	Yes	323 (82)
	No	71 (18)
Source of information about helminthic parasites (n = 340)	Community	12 (3.5)
	Public Media	200 (58.8)
	Health personnel	128 (37.6)
Know helminthic parasite (n = 370)	Yes	262 (70.8)
	No	108 (29.2)
Name of helminthic parasite (n = 84)	Ascaris	46 (54.8)
	Tapeworm	33 (39.3)
	Other	5 (5.9)
Source of helminthic parasites infection (n = 382)	Through body skin	98 (25.7)
	Contaminated food, water or hand	284 (74.3)
Was your child infected with any helminthic parasite? (n = 388)	Yes	264 (68)
	No	124 (32)
Treatment to helminthic parasite infected child (n = 313)	Traditional health care	44 (14.1)
	Modern Health care	269 (85.9)
Are helminthic parasites treatable? (n = 373)	Yes	325 (87.1)
	no	48 (12.9)
How are helminthic parasites treated? (n = 385)	Traditional health care	68 (17.7)
	Modern Health care	317 (82.3)
Are helminthic parasites preventable? (n = 389)	Yes	356 (91.5)
	No	33 (8.5)
How are helminthic parasites prevented? (n = 359)	Anthelmintic treatment	92 (25.6)
	Health education, hygiene	267 (74.4)
Ever heard about deworming (n = 358)	Yes	212 (59.2)
	No	146 (40.8)

hand as source of helminthic parasite infection. Close to 68% (264/388) reported that their children were infected with at least one helminthic parasite and 85.9% (269/313) sought modern healthcare for their infected children.

A great majority (91.5%; 356/389) perceived that helminthic parasites are preventable. Health education and hygiene were the preferred prevention strategies by the parents (74.4%; 267/359) compared to the treatments (25.6%; 92/359). Over 59% (n = 212) heard about deworming program.

Household practices and risk of child infection with Helminthiasis

Only 31.9% (106/332) of parents reported that their children participated in deworming program (Table 3). About 81% (317/392) of households used latrine and 19% (75/392) open-field. About 45.7% (148/324) used cement floor latrine, 33.3% (108/324) wooden floor and 21% (68/324) mud floor. A child who used latrine with wooden floor was at greater risk of infection with Helminthiasis (OR = 7.2; CI = 2.16–23.95). About 98% of respondents cited that their children wear shoes daily.

The majority (91.7%; 321/350) had metal-roofed houses. Close to 71% (278/393) reported that their children practiced hand washing using soap after toilet, 85.3% (336/394) after touching dirt and 93.4% (367/393) before eating. About 45.6% (180/395) ate washed cabbage and fruit, 16.8% (65/388) ever ate uncooked meat and 52.4% (199/380) reported that their children bathed/washed in streams and rivers. Close to 74% (286/387) had child/children who contacted cats most frequently, 21.2% (82/387) cattle and 4.9% (19/387) chicken. Washing with soap after toilet (OR = 0.09; CI = 0.03–0.34) and eating washed cabbage and fruit (OR = 0.26; 0.15–0.44) were associated with significantly low odds of child infection with helminths.

Knowledge of parents about malaria

Over 94% (372/394) of the parents had information about malaria (Table 4). Health workers informed 46.3% (174/376) of the parents, public media 46.5% (175/376), and community 7.2% (27/376). About 68.7% (259/377) reported that their children were infected with malaria and 88.8% (269/303) sought modern healthcare for their

sick children. About 89.6% (337/376) perceived that malaria is treatable with drugs of which 61.5% (118/192) cited Coartem as the drug of choice and 15.6% (30/192) chloroquine. According to 66.8% (257/385), malaria is transmissible and 77.9% (272/349) perceived that malaria is transmitted by mosquito bites, 11.5% (40/349) by respiratory tract and 10.6% (37/349) by physical contact with a sick person. A very high proportion (86.6%; 220/254) responded that mosquitoes breed in water habitats. The choice of control method depended on effectiveness (39.7%; 151/380), low cost (23.4%; 89/380), availability (22.9%; 87/380) and safety (13.9%; 53/380). "Do not have" was the most frequently cited (94.1%; 206/219) reason for not using mosquito nets.

to control malaria (Table 5). Parents who participated

Parental practices and risk of child infection with malaria

Close to 56.2% (204/363) of the parents involved in environmental management based vector control, 35.5% (129/363) used tablets and 8.3% (30/363) used IRS/LLINs

Table 4 Knowledge of parents of school age children towards malaria, Maksegnit, northwestern Ethiopia, June 2022

Variable (respondents)	Category	N (%)
Ever heard about malaria (<i>n</i> = 394)	Yes	372(94.4)
	No	22(5.6)
Source of information about malaria (<i>n</i> = 376)	Community	27(7.2)
	Public media	175(46.5)
	Health worker	174(46.3)
Was any child sick with malaria? (<i>n</i> = 377)	Yes	259 (68.7)
	No	118(31.3)
Treatment made for malaria infected child/children (<i>n</i> = 303)	Traditional healthcare	34(11.2)
	Modern Healthcare	269(88.8)
Is malaria treatable with drugs? (<i>n</i> = 376)	Yes	337(89.6)
	No	39(10.4)
Drug to treat malaria (<i>n</i> = 192)	Chloroquine	30(15.6)
	Fansidar	20(10.4)
	Quinine	24(12.5)
	Coartem	118(61.5)
Is malaria transmissible? (<i>n</i> = 385)	Yes	257 (66.8)
	No	128 (33.2)
How is malaria transmitted? (<i>n</i> = 349)	Body contact with infected person	37(10.6)
	Through respiratory tract	40(11.5)
	Through mosquito bite	272(77.9)
Mosquito breeding habitat (<i>n</i> = 254)	Water	220(86.6)
	Other	11(4.3)
	Living area	23(9.1)
Is malaria preventable? (<i>n</i> = 382)	Yes	349(91.4)
	No	33(8.6)
How is malaria prevented? (<i>n</i> = 382)	IRS/LLINs	35(10.2)
	Tablet	126(36.8)

respondents lived in Maksegnit town where the urban setting makes media and public health services easily accessible. The high level of parents' knowledge strengthens helminthiasis control by improving hygienic practices, modern healthcare seeking behaviours, and participation in deworming programs. A female parent and a parent with a monthly household income of ≥ 2001 birr were less likely to report a helminth infected school child. This could result from better maternal hygiene practices and urban living conditions [13]. Helminthiasis has been associated with poverty all over the world

including the United States of America, Latin America, Africa and mainland China [14–17].

A child living with married parent was associated with a higher odds of Helminthiasis. Married parent could increase the number of household members relative to the unmarried, thereby increasing the possibility of overcrowding and hence increased feco-oral transmission of Helminthiasis. Large family size was reported to be a predisposing factor for soil-transmitted helminths (STH) infection in Ambo town of western Ethiopia [18], in Ecuadorian birth cohort study

implement core malaria vector control tools, namely long

