

Psychosocial Factors Associated With Malaria Care-seeking in Rural Ethiopia

Bolanle Olapeju (✉ bolanle.olapeju@jhu.edu)

Johns Hopkins University

Habtamu Tamene

Johns Hopkins Center for Communication Programs - Ethiopia

Minyahil Ayele

Johns Hopkins Center for Communication Programs - Ethiopia

Simon Heliso

Johns Hopkins Center for Communication Programs - Ethiopia

Tsega Berhanu

Johns Hopkins Center for Communication Programs - Ethiopia

Guda Alemayehu

U.S. President's Malaria Initiative, USAID

Nandita Kapadia-Kundu

Johns Hopkins University

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Abstract

Background

Ethiopia's National Malaria Control and Elimination Program aims to diagnose all suspected malaria cases within 24 hours of fever onset and provide prompt treatment for confirmed cases. This study explored psychosocial factors associated with no-, delayed- and prompt- care-seeking among female caregivers of children under five with fever in rural Ethiopia.

Methods

Household surveys were conducted from 2016–2019 among female caregivers (N = 2453) of children under five years old in Oromia; Amhara; Southern Nations, Nationalities, and Peoples Region (SNNPR); and Tigray. Prompt and delayed care-seeking were defined as seeking treatment within \leq 24 hours or $>$ 24 hours of symptom onset respectively. Contextual factors explored included sociodemographic factors, household supply of bed nets, exposure to health messages, and household vulnerability (a measure of financial access to food, shelter, schooling, and medical treatment). Ideational factors included psychosocial factors related to care-seeking (knowledge, self-efficacy, response efficacy, beliefs, involvement in decision-making, and household social support).

Results

The prevalence of fever among children under five was 18% (ranging from 9% in Tigray to 34% in SNNPR). Overall, 45% of caregivers of children with fever sought care promptly, while 23% delayed care-seeking and 32% sought no care. Prompt care-seeking rates were higher among caregivers with positive attitudes toward prompt care-seeking (48%), involved in decision-making (48%) or perceived equitable gender norms in the community (65%). Caregivers with a high care-seeking ideation had increased odds of prompt care-seeking (aOR: 2.65; 95% CI: 1.74–4.02). Significant contextual factors included residence in the Oromia region (aOR: 2.99; 95% CI: 1.40–6.41), caregivers age 35–49 years (aOR: 0.49; 95% CI: 0.26–0.95), residence in vulnerable households (aOR: 2.01; 95% CI: 1.28–3.18).

Conclusions

Among this rural Ethiopian population, prompt care-seeking was low but positively influenced by both ideational and contextual psychosocial factors occurring at the caregiver level. Multi-sectoral interventions at the individual, community, and health facility levels are needed to improve prompt care-seeking. These include social behavior change interventions to improve ideation, complemented by health facility interventions to ensure provision of high-quality services and structural interventions to increase educational attainment in these rural settings.

Background

In 2019, Ethiopia achieved the Global Technical Strategy for Malaria 2020 target of a 40% reduction in malaria case incidence and reduction in mortality rate[1]. While Ethiopia is characterized by an overall low malaria prevalence rate, over half of Ethiopians remain vulnerable to malaria with 27 million people living in high-transmission zones (more than one case per 1,000 population)[2] and over 250,000 confirmed cases of malaria in 2019[1].

Appropriate management of fever cases, insecticide-treated net (ITN) use, and intermittent presumptive treatment of malaria in pregnancy remain key to malaria control. The National Malaria Control and Elimination Program (NMCEP) has made great strides in reducing malaria burden and charting a path to elimination, including the roll-out of rapid diagnostic testing (RDT) and artemisinin-based combination therapy at the community level. Prompt care-seeking (defined as seeking care within the same day or next day of fever onset) is a key behavior to ensuring proper case management of suspected and confirmed malaria cases.

NMCEP aims to ensure all suspected malaria cases are diagnosed using either RDT or microscopy within 24 hours of fever onset and all households living in malaria-endemic areas have the knowledge, attitudes, and practices necessary for adopting appropriate health-seeking behavior for malaria prevention and control[2]. While the 2015 National Malaria Indicator Survey demonstrated that advice or treatment was sought for half of all children with fever, the number of children of fever for whom care was promptly sought is unknown[3].

Considering NMCEP's objectives and the critical role of prompt care-seeking in ensuring proper diagnosis and treatment of malaria, relevant stakeholders need to understand the factors influencing care-seeking behaviors for children with fever, particularly at the caregiver level. Specifically, to what extent Ethiopian caregivers who seek care promptly may differ from those who delay seeking care and from those who never seek care at all.

Of particular interest is the role of caregivers' psychosocial factors, defined as social, cultural, environmental phenomena, and other influences that may affect their behavior[4]. Psychosocial factors play an indubitable role in health and behavior change[5–7]. Recent studies in Ethiopia have explored the psychosocial factors associated with prompt care-seeking[8–11]. A facility-based study of a predominantly adult patient population in the Amhara region revealed that about half of febrile patient participants sought treatment within 24 hours of fever onset, and this was higher among patients who were knowledgeable about malaria prevention and transmission, close to a health center, or had a family size of less than five household members[11].

In Tigray, care-seeking was delayed among low-income patients and those without health insurance[9]. In Dera, northwest Ethiopia, income, community-based health insurance, previous history of malaria infection, decision-making and distance from the facility were determinants of delay in seeking treatment for malaria[10]. In addition, a community based study in Jimma found higher rates of prompt care-seeking among Muslim and uneducated respondents[8].

However, few studies have specifically explored factors influencing prompt care-seeking among caregivers of febrile children under five years of age. This warrants deeper research, as children under five remain more vulnerable to malaria complications. Community studies demonstrated low levels of caretakers' understanding of malaria in specific localities. Specifically, in the Mandura district of West Ethiopia, a considerable number of caregivers first consulted traditional healers and tried home treatment and thus, sought treatment late[12]. Caregivers' ages, malaria knowledge, perceived susceptibility to malaria, and perceived barrier to seek treatment, and if caregivers lived in rural villages, were important factors in seeking health care[12].

This study seeks to explore the spectrum of prompt care-seeking behavior and associated psychosocial factors among female caregivers of children under five with fever in rural Ethiopia: Oromia; Amhara; Southern Nations, Nationalities, and Peoples Region (SNNPR); and Tigray. Study findings can inform the design of evidence-based community engagement approaches that appropriately target caregivers in these regions and other similar settings.

Several conceptual frameworks have explored psychosocial factors influencing health behavior. As shown in Figure 1, the ideation framework developed by Kincaid serves as the underpinning for this manuscript[13, 14]. The concept of ideation has proven useful in understanding individual-level psychosocial factors affecting malaria-specific outcomes including ITN use[15, 16] and appropriate care-seeking[17]. The ideation framework is drawn from various behavioral theories and recognizes that most behavioral decisions are driven by psychosocial factors including cognitive, emotional, and social factors[14]. Cognitive factors include knowledge of disease symptoms; transmission and prevention; and beliefs, values, and attitudes related to proposed actions. Emotional factors include perceived severity and susceptibility to disease, perceived self-efficacy and belief in the efficacy of proposed actions. Social factors include social support, social influence, spousal/partner communication, and personal advocacy.

This study uses the ideation framework to understand the psychosocial factors associated with care-seeking among caregivers of febrile children under five. The study explores a limited number of ideational psychosocial factors related to care-seeking (malaria-related knowledge, self-efficacy, response-efficacy, beliefs, decision-making agency, and social support in the household) against the backdrop of overarching contextual psychosocial factors (demographics, physical environment, and access to resources) seen among caregivers in rural Ethiopia.

Methodology

Study Population

The data presented in this manuscript are drawn from survey data for the Communication for Health (C4H) project- a five-year (2015–2020) project in Ethiopia funded by the United States Agency for International Development focusing on integrated social and behavior change communication (SBCC) in multiple health areas including malaria [16]. The goal of the C4H project was to improve health practices

through standardized SBCC interventions in four major regions of Ethiopia: Amhara, Oromia, Tigray, and SNNPR. The project conducted formative studies, including a baseline survey in 2016 targeting all woredas in the four study regions and a follow-up survey in 2019 assessing the exposure and effectiveness of the interventions among 160 woredas where the interventions had been implemented. The C4H project study population was women of reproductive ages (15–49 years) who were the primary beneficiaries of the project's social and behavior change interventions. In addition to integrated social and behavior change activities, specific care-seeking interventions implemented by C4H included a radio drama series and the use of audio-mounted vans to disseminate messages in intervention areas.

Sample size

The study sample size for both the C4H baseline, and follow-up surveys were calculated assuming a 5% type I error and 80% power to detect a 5% change from baseline estimate on key project indicators (for example, increasing the proportion of under five children slept under an ITN from baseline values of 43.3–48.3%). This resulted in a required sample size of 1,555 women of reproductive age. An additional 20% of the baseline sample size was included for non-response in the follow-up survey.

Sampling strategy and data collection

This study applied a multi-stage cluster sampling to identify eligible households with women aged 15–49 years. First, 10% of the project woredas (24 of 240 woredas at baseline and 16 of 160 woredas at endline) were selected using Probability proportionate to size (PPS) sampling, with an equal number of woredas from each of the four regions (Oromia, Amhara, SNNPR, and Tigray). Then, three enumeration areas (EAs), a geographic area consisting of a manageable number of dwelling units (150–200 households) were randomly selected from each woreda using PPS sampling. The study created a list of households with women of reproductive age in each EA and then selected 35 households using a systematic random sampling technique from the list of each EA. The study data collectors interviewed all women aged 15–49 from the eligible households. See Supplemental Table 1 for more details.

Ethical considerations

The study received ethical approval from the Ethiopian Public Health Institute (EPHI) ethical review committee, Addis Ababa, Ethiopia, and the institutional review board (IRB) of the Johns Hopkins Bloomberg School of Public Health (JHSPH), Baltimore, Maryland, USA (JHSPH IRB # 00007138 and EPHI-IRB-173-2019). All study procedures were performed in accordance with the Declaration of Helsinki. Informed consent was obtained from all study participants. Participants less than 18 years provided a informed assent after parental consent was obtained.

Data collection

The study interviewed a total of 4,543 women aged 15–49 (94% response rate). Of these, 2,770 (92% response rate) were interviewed at baseline; because the intervention was implemented in fewer communities than the potential number determined at baseline, 1,773 (97% response rate) were interviewed at follow-up surveys. The questionnaires aimed to collect information on common themes,

including sociodemographic characteristics, malaria related behavior and psychosocial factors, gender equitable norms, and access to health education messages. The study administered questionnaires in the Amharic, Oromia, and Tigrigna languages. Of the 4,543 women in the dataset, this manuscript focuses on 2,453 women given both the baseline and follow-up surveys who were caregivers of children under five years old.

Data Analysis

The study measured participants' care-seeking behaviors and psychosocial factors accounting for contextual factors, including demographic characteristics, vulnerability, and gender equitable norms. The survey asked all caregivers, "Has [child's name] been ill with a fever at any time in the last two weeks?" Any care-seeking was defined using the question, "Did you seek advice or treatment for the fever from any source?" This study defined overall care-seeking as "prompt," "delayed," or "none," based on the time elapsed before seeking care.

The key outcome variable was prompt care-seeking for fever; explored by the survey question, "How long after the onset of fever did you seek treatment?" This study defined prompt care-seeking as seeking treatment within 24 hours or less and Delayed care-seeking as seeking treatment more than 24 hours after the onset of fever.

Psychosocial factors explored in this study included ideational factors relevant to care-seeking as well as overarching contextual factors. A limited number of ideational psychosocial factors related to care-seeking (knowledge, self-efficacy, response efficacy, beliefs, involvement in decision-making, and social support in the household) were explored as follows:

- Knowledge: The study assessed this by exploring participants' awareness of malaria, signs and symptoms, cause, and prevention measures. Specific questions included the following:
 - "Have you ever heard of an illness called malaria?"
 - "What signs or symptoms would lead you to think a person has malaria?"
 - "What do you think is the cause of malaria?"
 - "How can someone protect themselves against malaria?"
- Self-efficacy: This refers to an individual's belief in one's capacity to execute behaviors necessary to produce specific performance attainments[18]. This study assessed participants' self-efficacy for care-seeking and malaria prevention using the following statement: "I can take my child to treatment within 24 hours of onset fevers, and I am able to have children under five years sleep under an ITN each night."
- Response efficacy: This refers to a person's beliefs as to whether the recommended action step will avoid the threat. The study sought to understand if participants understood the benefits gained if they engaged in prompt care-seeking or malaria prevention behavior. This study proposed statements to participants like, "Having my children sleep under an ITN each night will prevent

malaria," and, "Seeking treatment for my under five children within 24 hours of onset fever improves chances of recovery and survival."

- Attitudes towards care-seeking: This study assessed this using the statement, "I should seek treatment for children under five years within 24 hours of onset of fever." Responses for self-efficacy, response efficacy, and attitudinal questions were recorded on a four-point Likert scale of "Strongly agree," "Agree," "Disagree," and "Strongly disagree."
- Involvement in decision-making: this study explored this using the question, "Who usually makes decisions about health care for yourself: you, your (husband/partner), or you and your husband/partner jointly?" Respondents who noted they made decisions by themselves or jointly with their partners were considered involved in decision making.
- Social support: This study assessed this by asking about the level of spousal support on household chores using the question, "Does your husband help you with household chores like looking after the children, cooking, cleaning the house, and doing other work around the house?" This question served as a proxy for actual spousal support on caregiving.
- Descriptive norms within the community: This study measured caregivers' perceptions regarding gender equitable norms using a 21-item Gender Equitable Men scale adapted for women. The adapted scale includes four sub scales related to physical violence, sexual relationships, reproductive health and disease prevention, and domestic chores and daily life. Responses to all 21 questions were condensed into a composite score and then subdivided into two categories of perceived gender equity: high perceptions of equitable gender norms (based on an inequality score \leq 46) and moderate or low perceptions of equitable gender norms (based on moderate/high inequality score > 46).

This study condensed all ideational psychosocial variables into a composite score, referred to as care-seeking ideation, ranging from 0–12 (Cronbach's alpha of 0.7). Caregivers with a care-seeking ideation score of 9 or more (greater than the median) were categorized as having a high care-seeking ideation, while those with a score of 8 or less were categorized as having low care-seeking ideation. Supplemental Table 2 summarizes the psychosocial variables used in generating the malaria care-seeking ideation.

The study also explored the following overarching contextual psychosocial variables: caregivers' region (Amhara, Oromia, SNNPR, Tigray), residence (urban versus rural), malaria transmission zone (high versus low/no), age (15–24, 25–34, and 35–49 years old), education (none versus primary or higher), religion (Christian versus non-Christian), marital status (married or cohabiting versus not), and wealth quintile based on ownership of household assets (richest, richer, middle, poorer, poorest).

Access to ITNs within the household was defined as the number of bed nets per household member. Given the assumption that a bed net can be used by up to two people, a value of ≥ 0.5 was defined as adequate ITN supply, while < 0.5 was classified as inadequate. Exposure to health communication messages was assessed by asking whether caregivers had the *Family Health Guide* (FHG), a national

health communication tool given to all families. FHG comprises more than 79 messages with cues to action and illustrations focusing on multiple health areas including malaria.

Additionally, a vulnerability index was assessed in the survey using four states the participant said they experienced in the last 12 months: (1) lacked adequate nutrition, (2) lacked shelter/house to stay in, (3) was unable to afford to send children to school, and (4) lacked sufficient money to buy medicines/medical treatment. Responses included never (coded as 1), rarely (coded as 2), sometimes (coded as 3), and often (coded as 4). We computed a composite score from the sum of the four responses. The vulnerability index was divided into two categories: non-vulnerable (score \leq 7) and vulnerable (8–16), with high scores indicating a greater level of poverty. Finally, the study included survey timing (baseline versus follow-up) as a contextual variable to account for temporal changes that might explain inter relationships between psychosocial factors and care-seeking.

Since we performed analysis on children under five with a fever in the two weeks preceding the survey, we explored any clustering effect that might occur with multiple children under five in the same household/caregiver. No evidence of clustering in the data (intraclass correlation = 0.015) appeared. The study used chi-square, t-tests, and Analyses of Variance for bivariable tests of association and exploratory analysis, comparing characteristics of caregivers of febrile children versus those without fever and to compare psychosocial factors across the spectrum of care-seeking. We employed multivariable logistic regressions to explore psychosocial factors associated with both care-seeking and prompt care-seeking. Data management and analysis was performed using Stata software, version 16 (Stata Corporation, College Station, TX, USA) and Excel 2016 (Microsoft Corp, Seattle, WA, USA). We weighted the data using the svyset command in Stata to ensure the data was representative of the study population.

Results

Description of study population

As shown in Table 1, on average, caregivers were aged 25–34 years old (53%), had formal education (70%), identified as Christian (64%), and were married (95%). While most caregivers resided in households not considered to be vulnerable (78%), most households had inadequate mosquito nets (87%). In addition, only few caregivers had the FHG (12%).

Table 1

Description of caregivers of children under five with and without fever in the study population (N = 2453)

Caregiver characteristics	Children with no Fever (N = 1974)		Children with Fever (N = 479)		Total (N = 2453)		P value
	No.	%	No.	%	No.	%	
Region							
Amhara	419	29	92	27	511	29	
Oromia	593	36	105	31	698	35	
SNNPR	496	28	140	34	636	29	
Tigray	466	6	142	9	608	7	
Malaria transmission zone							
Free/Low	810	43	139	35	949	41	
Moderate/High	1164	57	340	65	1504	59	
Age							
15–24	372	19	79	17	451	19	
25–34	1052	54	232	48	1284	53	
35–49	550	27	168	35	718	29	
Education							
None	1378	70	315	68	1693	70	
≥ Primary	596	30	164	32	760	30	
Religion							
Christian	1306	64	331	64	1637	64	
Non-Christian	668	36	148	36	816	36	
Marital status							
Not married	96	5	31	6	127	5	
Married	1877	95	448	94	2325	95	
Wealth Index							
Poorest	579	26	155	27	734	26	
Poorer	270	13	53	11	323	13	

Caregiver characteristics	Children with no Fever (N = 1974)		Children with Fever (N = 479)		Total (N = 2453)		P value
	No.	%	No.	%	No.	%	
Middle	380	20	105	24	485	20	
Richer	360	20	71	15	431	20	
Richest	385	21	95	23	480	21	
Household has enough nets							0.912
No	1686	87	408	87	2094	87	
Yes	286	13	71	13	357	13	
Vulnerability index							0.004
Not Vulnerable	1607	80	346	73	1953	78	
Vulnerable	367	20	133	27	500	22	
Household owns family health guide							0.776
No	1677	88	399	89	2076	88	
Yes	297	12	80	11	377	12	
Survey timing							0.767
Baseline (2016)	1250	64	311	65	1561	64	
Follow up (2019)	724	36	168	35	892	36	

Caregivers' reports indicated the prevalence of fever among children under five in the two weeks preceding the survey was highest in SNNPR (34%) and Oromia (31%) regions but lowest in Tigray (9%). Fever was much higher in the moderate and high malaria transmission zones (65%), though still present in free or low transmission zones (35%). Caregivers aged 15–24 years old (17%) were less likely to report fever compared to older caregivers, both aged 25–34 (48%) and 35-49 (35%) years old. The presence of fever was significantly higher among caregivers in vulnerable households (27%) compared to the overall population (22%).

The prevalence of fever was not associated with the following caregiver and household characteristics: education, religion, marital status, ownership of the FHG, household wealth, and ITN supply.

Spectrum of Care-seeking for Children with Fever

Table 2 highlights the spectrum of care-seeking for children with fever. Overall, 45% of caregivers of children with fever sought care promptly while 23% delayed care-seeking and 32% sought no care. Care-

seeking behavior differed significantly by some contextual psychosocial factors. Higher rates of prompt care-seeking were observed in Oromia (54%) and SNNPR (47%), compared with Amhara (33%) and Tigray (42%) regions. Caregivers' education significantly influenced care-seeking behavior. More than half (57%) of caregivers who had formal education sought care promptly (only 18% delayed care-seeking while 24% sought no care). Meanwhile, only 39% of caregivers with no formal education sought care promptly (26% delayed care-seeking while 35% sought no care).

Table 2
Spectrum of care-seeking and contextual psychosocial factors (N = 479)

Characteristics	No care		Delayed care		Prompt care		P value
	No.	%	No.	%	No.	%	
Total	181	32	95	23	203	45	n/a
Region							
Amhara	44	46	18	21	30	33	
Oromia	29	21	22	25	54	54	
SNNPR	35	26	40	27	65	47	
Tigray	73	46	15	11	54	42	
Malaria transmission zone							
Free/Low	53	33	23	20	63	47	
Moderate/High	128	31	72	25	140	44	
Age							
15–24	25	28	14	19	40	53	
25–34	87	31	41	21	104	48	
35–49	69	35	40	29	59	37	
Education							
None	133	35	65	26	117	39	
≥ Primary	48	24	30	18	86	57	
Religion							
Christian	134	35	64	25	133	41	
Non-Christian	47	27	31	21	70	51	
Marital status							
Not married	12	34	3	12	16	55	
Married	169	32	97	24	187	44	
Wealth Index							
Poorest	78	41	23	19	54	40	
Poorer	21	37	11	26	21	38	

Characteristics	No care		Delayed care		Prompt care		P value
	No.	%	No.	%	No.	%	
Middle	37	31	20	23	48	46	
Richer	19	27	15	23	37	50	
Richest	26	23	26	28	43	49	
Household has enough nets							0.273
No	158	33	81	24	169	43	
Yes	23	23	14	22	34	55	
Vulnerability index							0.103
Not Vulnerable	133	31	76	26	137	42	
Vulnerable	48	34	19	16	66	51	
Household owns family health guide							0.235
No	147	32	84	25	168	44	
Yes	34	32	11	14	35	53	
Survey timing							0.600
Baseline (2016)	116	33	57	22	138	45	
Follow up (2019)	65	30	38	26	65	44	

Prompt care-seeking was slightly higher than average among caregivers who were aged 15–24 (53%), unmarried (55%) or in households with sufficient bed nets (55%), but the differences were not significantly different.

Ideational psychosocial factors related to care-seeking

Ideational psychosocial factors explored included knowledge, self-efficacy, response efficacy, beliefs, decision making involvement and social support in the household. Table 3 shows the spectrum of care-seeking and associated ideational psychosocial factors. While the majority (95%) of caregivers were aware of malaria, only 52% knew malaria symptoms, 60% knew the cause of malaria and 24% knew measures to prevent malaria. Most caregivers had positive attitudes towards prompt care-seeking (90%). In addition, most caregivers had positive perceptions related to malaria including perceived response efficacy for prompt care-seeking (96%) and malaria prevention (88%), perceived self-efficacy to seek care promptly (87%) and prevent malaria (77%). Many (70%) caregivers reported involvement in decision-making, but few noted social support in the household from their partners (44%). Overall, less than half (44%) of caregivers possessed high care-seeking ideation.

Table 3
Spectrum of care-seeking and ideational psychosocial factors (N = 479)

Characteristics	Total (N = 479)		No care (N = 181)		Delayed care (N = 95)		Prompt care (n=203)		P value	
	No.	%	No.	%	No.	%	No.	%		
Care-seeking ideational factors										
Ever heard of malaria										
No	22	5	7	30	4	22	11	48	0.952	
Yes	457	95	174	32	91	23	192	45		
Knowledge of malaria symptoms										
Low	228	48	88	34	47	24	93	42	0.637	
High	251	52	93	30	48	23	110	47		
Knowledge of malaria cause										
No	188	40	78	35	38	25	72	40	0.327	
Yes	291	60	103	30	57	22	131	48		
Knowledge of malaria prevention measures										
Low	379	76	151	32	74	24	154	44	0.745	
High	100	24	30	31	21	21	49	48		
Perceived self-efficacy for prompt care-seeking										
No	65	13	39	51	19	35	7	14	< 0.001	
Yes	414	87	142	29	76	22	196	49		
Perceived self-efficacy for malaria prevention										
No	92	23	40	37	16	22	36	41	0.527	
Yes	387	77	141	30	79	24	167	46		
Perceived response efficacy of prompt care seeking										
No	15	4	7	37	5	33	3	29	0.514	
Yes	464	96	174	32	90	23	200	45		

Characteristics	Total (N = 479)		No care (N = 181)		Delayed care (N = 95)		Prompt care (n=203)		P value
	No.	%	No.	%	No.	%	No.	%	
Perceived response efficacy of malaria prevention									0.020
No	53	12	28	50	9	18	16	32	
Yes	426	88	153	29	86	24	187	46	
Positive attitudes toward prompt care-seeking									0.001
No	41	10	24	54	12	31	5	15	
Yes	438	90	157	29	83	23	198	48	
Involvement in decision making									0.016
No	135	30	46	29	37	33	52	38	
Yes	344	70	135	33	58	19	151	48	
Social support in household									0.797
No	262	56	100	31	55	25	107	44	
Yes	217	44	81	33	40	22	96	46	
Perceived equitable gender norms									0.010
No	404	86	163	34	81	24	160	42	
Yes	75	14	18	17	14	18	43	65	
Overall care-seeking Ideation									0.002
Low	261	56	115	37	57	27	89	36	
High	218	44	66	26	38	19	114	56	

Specific ideational psychosocial factors significantly associated with care-seeking included self-efficacy for prompt care-seeking, response efficacy of malaria prevention, positive attitudes toward prompt care-seeking, involvement in decision-making, and perceived equitable gender norms in the community. Specifically, caregivers with perceived self-efficacy for prompt care-seeking were more likely to seek care promptly (49%), compared to those without perceived self-efficacy (14%). Similarly, caregivers with perceived response efficacy of malaria prevention sought care promptly (46%) compared to those without (32%). Furthermore, 50% of those without perceived response efficacy did not seek any care. Caregivers with positive attitudes towards care-seeking also had higher rates of prompt care-seeking (48%) compared to those without. In addition, 54% of those without positive attitudes sought no care for their

children. Caregivers involved in household decision-making were more likely to seek care promptly (48%) than those uninvolved (38%), while caregivers who perceived equitable gender norms in their community had higher rates of prompt care-seeking (65%) compared to those without these perceptions (42%).

Overall, the study observed significantly higher rates of prompt care-seeking (56%) among caregivers with high ideation, compared to caregivers with lower levels of ideation (36%).

Inter-relationship between care-seeking ideational and contextual psychosocial factors with prompt care-seeking

Table 4 highlights the inter-relationships between ideational and contextual psychosocial factors with prompt care-seeking. Contextual psychosocial factors positively associated with high care-seeking ideation included malaria transmission zone, age, and marital status. Specifically, while caregivers in SNNPR had reduced odds of a high care-seeking ideation (adjusted odds ratio (aOR): 0.39; 95% confidence interval (CI): 0.19–0.77), caregivers in high transmission zones had increased odds of having high levels of care-seeking ideation (aOR: 1.85; 95% CI: 1.03–3.30). Older caregivers aged 25–34 years (aOR: 2.41; 95% CI: 1.32–4.38) and 35–49 years (aOR: 2.04 (1.05–3.93) old had increased odds of a high care-seeking ideation compared to caregivers aged 15–24 years. In addition, caregivers with a primary education (aOR: 2.24; 95% CI: 1.42–3.55) had increased odds of a high care-seeking ideation.

Table 4

Inter-relationship between prompt care-seeking, ideational and contextual psychosocial factors (N = 479)

	High care-seeking ideation (Prevalence = 44%)				Prompt care-seeking (Prevalence = 45%)			
	OR	95% CI	aOR	95% CI	OR	95% CI	aOR	95% CI
Ideational psychosocial factors								
Low care-seeking ideation (reference)					1.00	N/A	1.00	N/A
High care-seeking ideation					2.12	1.46–3.06	2.65	1.74–4.02
Contextual psychosocial factors								
Region								
Amhara (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Oromia	0.40	0.22–0.72	0.54	0.25–1.13	2.19	1.23–3.91	2.99	1.40–6.41
SNNPR	0.72	0.42–1.22	0.39	0.19–0.77	1.79	1.04–3.10	1.77	0.86–3.65
Tigray	1.24	0.73–2.09	0.95	0.52–1.75	1.27	0.73–2.20	1.17	0.61–2.25
Malaria transmission zone								
No/low (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
High	1.98	1.31–2.99	1.85	1.03–3.30	0.84	0.57–1.26	0.85	0.46–1.55
Age in years								
15-24 (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
25-34	1.58	0.94–2.66	2.41	1.32–4.38	0.79	0.48–1.32	0.64	0.36–1.15
35-49	1.29	0.74–2.22	2.04	1.05–3.93	0.53	0.31–0.91	0.49	0.26–0.95
Education								
None (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Primary or more	1.99	1.36–2.92	2.24	1.42–3.55	1.87	1.27–2.73	1.71	1.07–2.72

	High care-seeking ideation (Prevalence = 44%)				Prompt care-seeking (Prevalence = 45%)			
Religion								
Christian (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Non-Christian	0.47	0.32–0.71	0.79	0.45–1.37	1.34	0.90–1.97	0.93	0.53–1.65
Marital status								
Not married (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Married	1.56	0.73–3.34	1.54	0.68–3.49	0.67	0.32–1.39	0.60	0.27–1.33
Wealth index								
Poorest (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Poorer	0.68	0.36–1.29	0.78	0.39–1.54	1.23	0.65–2.33	1.29	0.65–2.57
Middle	0.81	0.49–1.34	1.00	0.57–1.76	1.58	0.95–2.61	1.41	0.79–2.51
Richer	1.16	0.66–2.03	1.42	0.74–2.72	2.04	1.15–3.60	2.08	1.07–4.02
Richest	1.01	0.61–1.69	1.44	0.74–2.81	1.55	0.92–2.61	1.29	0.65–2.54
Household has enough bed nets								
No (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Yes	1.46	0.88–2.42	1.05	0.60–1.83	1.30	0.78–2.15	1.43	0.80–2.54
Vulnerability index								
Not vulnerable	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Vulnerable	0.73	0.48–1.09	0.86	0.55–1.35	1.50	1.00–2.25	2.01	1.28–3.18
Household owns family health guide								
No (reference)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A
Yes	1.04	0.64–1.68	0.75	0.44–1.27	1.07	0.66–1.74	1.47	0.85–2.53
Survey timing								

	High care-seeking ideation (Prevalence = 44%)					Prompt care-seeking (Prevalence = 45%)			
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Baseline (2016)	1.00	N/A	1.00	N/A	1.00	N/A	1.00	N/A	
Follow up (2019)	1.06	0.73–1.54	0.86	0.56–1.31	0.79	0.54–1.16	0.75	0.49–1.15	

Caregivers with a high care-seeking ideation had increased odds of prompt care-seeking (aOR: 2.65; 95% CI: 1.74–4.02) compared to their counterparts with low care-seeking ideation. Contextual factors associated with prompt care-seeking include residence in Oromia region (aOR: 2.99; 95% CI: 1.40–6.41), being educated (aOR: 1.71; 95% CI: 1.07–2.72), and residence in a vulnerable household (aOR: 2.01; 95% CI: 1.28–3.18). On the other hand, older caregivers aged 35–49 years old had lower odds of prompt care-seeking (aOR: 0.49; 95% CI: 0.26–0.95).

Discussion

Principal findings

Among this rural Ethiopian population, prompt care-seeking rates were low but positively associated with both ideational and contextual psychosocial factors occurring at the caregiver level. The study found an association between high care-seeking ideation and higher rates of prompt care-seeking. Specific ideational factors of note in this setting included perceived self-efficacy, response efficacy, attitudes toward prompt care-seeking, and involvement in household decision-making. Contextual psychosocial factors associated with influencing prompt care-seeking in rural Ethiopia included region of residence, education, and household vulnerability. This study reported similar rates of care-seeking ideation and behavior across the baseline and follow-up surveys. However, analysis of the follow-up survey data by exposure to the C4H program interventions demonstrated significantly higher rates of prompt care-seeking, knowledge, and perceived efficacy among caregivers exposed to the program interventions.

Comparison with other studies

This study is of significance as it is one of few studies exploring factors associated with prompt care-seeking for children under five with fever in rural Ethiopia. The few existing previous studies have focused on the sole effect of psychosocial factors such as knowledge and perceptions [19] or contextual factors such as residence[20]. This study employs a larger perspective and elucidates the complementarity of both psychosocial and structural factors associated with malaria related behavior.

Study implications

Disparities in access to health services have been well documented using frameworks incorporating quality, geographic accessibility, availability, financial accessibility, and acceptability of services[21]. Study findings can inform relevant behavior change, structural and research interventions to reverse this trend in rural Ethiopia. This study demonstrated the overall role of psychosocial ideational factors. A key

premise behind the ideation model is that people do not ordinarily take action, especially new action, until they have gained sufficient knowledge about it and its consequences, until they have a positive attitude toward it, and until they have talked to others about it and feel right about it[13].

Communication can directly influence such cognitive, emotional, and social factors of ideation separately, as well as jointly as these ideational factors often are interdependent and often occur simultaneously. Considering this, social and behavior change interventions should employ messaging that not only improves communities' knowledge about prompt care-seeking and its benefits but also promotes a positive attitude about prompt care-seeking, generates conversation and decision-making regarding prompt care-seeking, and enables communities to feel right about seeking care promptly. Behavior change approaches should aim to promote supportive norms within the community and remove barriers to caregivers' self-efficacy and response efficacy regarding prompt care-seeking and other malaria related behavior.

To sustain behavior change related to health care utilization within communities, complementary approaches are needed at the health provider level. In Ethiopia, challenges in access to health care have been mitigated using community health workers. To ensure interventions that bring about positive change, community workers in the study regions need to be empowered with relevant technical and interpersonal communication skills to continue to deliver high quality malaria testing and treatment services.

Intended interventions should leverage existing knowledge of factors that influence health worker performance. In particular, limited supervision and support, lack of recognition and appreciation of accomplishments, limited opportunities for professional advancement, few professional support networks, and lack of financial incentives have negatively impacted health workers' performance[13]. Non-material factors like health workers' self-image and acceptance by the community and their supervisors were found to positively impact health worker performance and retention[22, 23].

The role of contextual and ideational factors suggests interventions should employ a holistic approach to health and quality of life, not just focus on malaria. This is of critical importance, as educational achievement and gender equality norms remain key factors in rural Ethiopia. Holistic approaches should employ a multi-sectoral lens and combine health, education, and gender empowerment interventions to improve the lives of community members. Investing in women, and, more specifically, girl's education, has several positive effects on children, women, and communities at large, combating poverty and fostering economic growth[24, 25]. At the heart of achieving gender equality is the education of girls and women and the removal of barriers to education and opportunities for their advancement.

Strengths and limitations

A key strength of the study is the use of a theory-driven, comprehensive exploration of psychosocial factors specific to a high-risk population. We expect that our study findings might be generalizable to similar rural contexts in sub-Saharan Africa. However, some study limitations include its cross-sectional

design, which limits the ability to make causal inferences. The use of self-reported data from multiple survey rounds may be limited by recall or social desirability bias. While the study employed the ideation model as part of its theoretical underpinnings, some aspects of this theory such as social influence, spousal/partner communication, and personal advocacy were not explored in this study. In addition, the study did not ask about health provider- or facility-level factors that could influence care-seeking, such as either perceived quality of care or stock out of commodities. Future research should seek to use prospective studies to validate findings with more complete measures of the ideational constructs.

Conclusion

This study identified psychosocial factors among female caregivers of children under five with fever in rural Ethiopia. Structural factors included caregivers' level of education while ideational factors included caregivers' self-efficacy and response efficacy, attitudes related to prompt care-seeking, involvement in decision-making, and perceptions of gender equitable norms in the community. Such factors should be accounted for when designing and implementing multi-sectoral interventions at community level.

Abbreviations

aOR: Adjusted odds ratio

C4H: Communication for Health

CI: Confidence interval

EA: Enumeration area

FHG: Family Health Guide

ITN: Insecticide-treated net

NMCEP: Ethiopia's National Malaria Control and Elimination Program

PPS: Probability proportionate to size

RDT: Rapid diagnostic testing

SBCC: Social and behavior change communication

SNNP: Southern Nations, Nationalities, and Peoples Region

USAID: United States Agency for International Development

Declarations

Ethical approval and consent to participate

The study received ethical approval from the Ethiopian Public Health Institute ethical review committee, Addis Ababa, Ethiopia, and the ethical review board of the Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA. (JHSPH IRB # 00007138 and EPHI-IRB-173-2019). All respondents provided written informed consent prior to participating in the survey. All methods were performed in accordance with the relevant guidelines and regulations in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

BO, HT, and NK conceptualized the study, analyzed the data, and drafted the manuscript. All co-authors assisted with interpretation of the results and critically edited and reviewed this manuscript. All authors read and approved the final manuscript.

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