

Caregivers' knowledge about childhood malaria in Gilgel Gibe field research center, southwest Ethiopia

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Abstract

Background: Malaria morbidity and mortality reduction in children greatly depends on caregivers' knowledge about childhood malaria.

Objective: The objective of the study was to assess caregivers' knowledge about malaria in Gilgel Gibe Field Research Center, Southwest Ethiopia.

Methods: A cross-sectional study was conducted from November to December 2005. A Sample of 588 households having children between the ages of 2-59 months were randomly selected from urban, semi-urban and rural strata proportional to their size. Caregivers of the children were interviewed using a structured questionnaire.

Findings: Of 572 interviewed caregivers, most of them (70.1%) spontaneously mentioned mosquitoes as the cause of malaria in children while half of them (51.9%) had non-biomedical perceptions as causes of the disease. Among the symptoms of malaria in children, fever was mentioned spontaneously by most (86.2%) of the caregivers. The three most commonly perceived preventive measures of malaria for children were cleaning the surrounding (43.7%), keeping personal hygiene (35.7%), and mosquito net usage (35%). Urban or semi-urban residence, lower income and having formal education were found to be associated with good knowledge about childhood malaria.

Conclusion: This study identified misperceptions regarding the cause and low level of awareness about childhood malaria among caregivers. These issues need to be addressed through tailored health promotion activities to prevent and control childhood malaria. [*Ethiop.J.Health Dev.* 2008;22(1):49-54]

Introduction

An estimated 350–500 million clinical malaria episodes and 1.1-2.7 million deaths from malaria occur annually (1, 2). About 60% of the cases of malaria worldwide and more than 80% of malaria deaths occur in Africa south of the Sahara (1). Lacking acquired immunity to the disease, young children bear the brunt of malaria mortality (2). In Ethiopia, over 5 million episodes of malaria are estimated to occur annually and it is the top leading cause of outpatient visit and inpatient mortality (3, 4).

Malaria can progress from mild illness to severe disease and death over a short period of time. Especially in young children, malaria can progress from a mild to severe case within 24 hours after the onset of symptoms (5, 6). Studies have shown that mothers or caregivers are the first to recognize fever, decision to seek care is made at and communities can be trained to recognize malaria and respond appropriately (7). Therefore, in order for malaria to be treated in a timely manner, caregivers must be able to recognize the symptoms of malaria and they must do so at the at the time the symptoms occur (5).

However, information concerning caregivers' knowledge about childhood malaria is scarce in Ethiopia. Therefore, this study could contribute in understanding of the subject matter in local context which is essential for malaria control in children. And the fact that the study area is located surrounding a dam which is expected to

result in increased rate of malaria transmission raises the significance of the study.

Methods

The study area is found in Jimma University's field research project site. It encompasses 9 Kebeles (the smallest administrative and development unit in the country) which are located within 10km radius of the periphery of the Gilgel Gibe Dam reservoir. Gilgel Gibe dam was built at Gilgel Gibe River which is located about 260km southwest of Addis Ababa and 55km northeast of Jimma town, in Jimma Zone of Oromia Regional State (8). Construction of the Gilgel Gibe plant was started in 1986 and completed in 2004, after being interrupted in the early 1990's (9).

The 9 Kebeles in the research project site encompass one urban Kebele called Asendabo, and one semi-urban and seven rural Kebeles. The results of a baseline survey conducted in August 2005 by Jimma University showed that these Kebeles had 8,852 households and a total of about 42,290 people. The survey also indicated that 51.7% of the population was illiterate (8). In the hydropower project area, majority of the population practice farming as their main means of livelihood. Historically, the project area was labeled to be endemic for malaria before construction of the dam (10).

A community based cross-sectional study design was employed to assess caregivers' knowledge about malaria in children around Gilgel Gibe dam. Data collection was undertaken from November to December 2005. There

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were 4,813 households in which children between 2-59 months of age reside and the primary caregivers in all of these households were taken as the source population. The sample size for the study was determined using the formula for estimating a single population proportion. Finite population correction was applied as the ratio of sample size to source population was greater than 0.05. The assumptions made were 50% of caregivers have proper knowledge about malaria, a confidence interval of 95%, and margin of error of 4%. The final sample size obtained after adding 10% contingency for non-response was 588. The study area was stratified into urban, semi urban and rural kebeles and then the total sample size was distributed into each stratum based on proportional to size allocation. Accordingly, the number of sampled households from the urban, semi-urban and rural Kebeles were 81, 75 and 432, respectively. Samples from rural households of 432 were distributed proportionally to all of the seven rural Kebeles. Finally, the sampled households were selected by simple random sampling technique.

A person who stays much of his/her time with and is responsible to give daily care for children in the sampled household was labeled as caregiver and included as respondent in the study. These respondents were interviewed using a validated and structured questionnaire that was originally prepared in English and then translated into local languages. And it was again back translated into English to check its consistency. Data collectors were 12th grade complete individuals who were given training and regularly supervised. Pre-testing was carried out on 27 (5% of the sample) households of neighboring populations that were not included in the study. The study passed through ethical clearance committee of public health faculty, Jimma University and permission was obtained from local authorities to conduct the study. Verbal consent was obtained from heads of the households and the caregivers before the interview was conducted.

The annual household income was classified as low and high in reference to the poverty line adopted for the Ethiopian situation that is annual per capita income of 1,095 birr (11). Household income given in kind was changed into monetary value by using the local market values of the crops. During assessment of knowledge, the caregivers were first asked to respond to the questions spontaneously and then they were prompted to give answers through provision of choices. Answers obtained without providing choices were labeled as 'spontaneous responses' and answers given after reading the options were labeled as 'probed responses'. The responses to knowledge questions were given score of 2 for a spontaneously mentioned correct answer, 1 for prompted correct answer and 0 for lack of knowledge on correct answer. The values for six variables were combined to get the total knowledge score about malaria. The six

variables were knowledge about the cause, symptoms, time to start treatment, place of treatment, symptoms for seeking immediate care and preventive measure of childhood malaria. The knowledge level of respondents was classified as 'good' if the total score was greater than the median for the sample and 'poor' if less than the median.

Data were cleaned, edited and entered to SPSS version 12 and organized, presented and described using tables, summary statistics and graphical techniques. Bivariate analysis was done using odds ratio (OR) and its corresponding 95% confidence interval to examine the crude association between caregivers' knowledge about childhood malaria and their socio-demographic and economic characteristics. Multivariable analysis was done using binary logistic regression to identify predictor variables. The level of statistical significance was taken at 5%.

Results

The response rate for the study was 97.3%. Most of the caregivers (96.9%) were mothers and the remaining were grandmothers (2.4%), sisters (0.35%) and fathers (0.35%) of the children they take care of. Concerning the caregivers' socio-demographic characteristics, 77.1% were in the age group between 20 to 34 years, 94.6% were married, 92.8% were Muslim by religion, 93% were of Oromo in ethnicity, 88.5% were illiterate and 75.3% were housewives by occupation. Most (82.5%) of the caregivers had annual family income per capita below the poverty line and a bit more than half of them (53.7%) had family size of less than 6.

Regarding caregivers' knowledge about the causes of childhood malaria the commonest spontaneously reported perceived cause of malaria (70.1%) was mosquitoes. Among the non-biomedical perceived causes, cold exposure was the commonest spontaneously mentioned one. After probing, the proportion of caregivers mentioning mosquitoes as cause raised and other perceived non-biomedical causes like being in the rain, exposure to sunshine and drinking dirty water came into picture (Figure 1). Over all about half (51.9%) of the caregivers believed that malaria is caused by non-biomedical causes such as drinking dirty water, exposure to cold, being in the rain and exposure to the sun.

Among the symptoms of malaria in children, fever was spontaneously mentioned by the majority of caregivers (86.2%) followed by shivering, headache, vomiting, loss of appetite and thirst in decreasing order of frequency. After probing, higher percentage of caregivers mentioned the symptoms of malaria and still fever, shivering and headache were the commonest ones (Figure 2). High fever was the commonest perceived reason, mentioned by 95.1% of the caregivers, to seek immediate care for children with malaria.

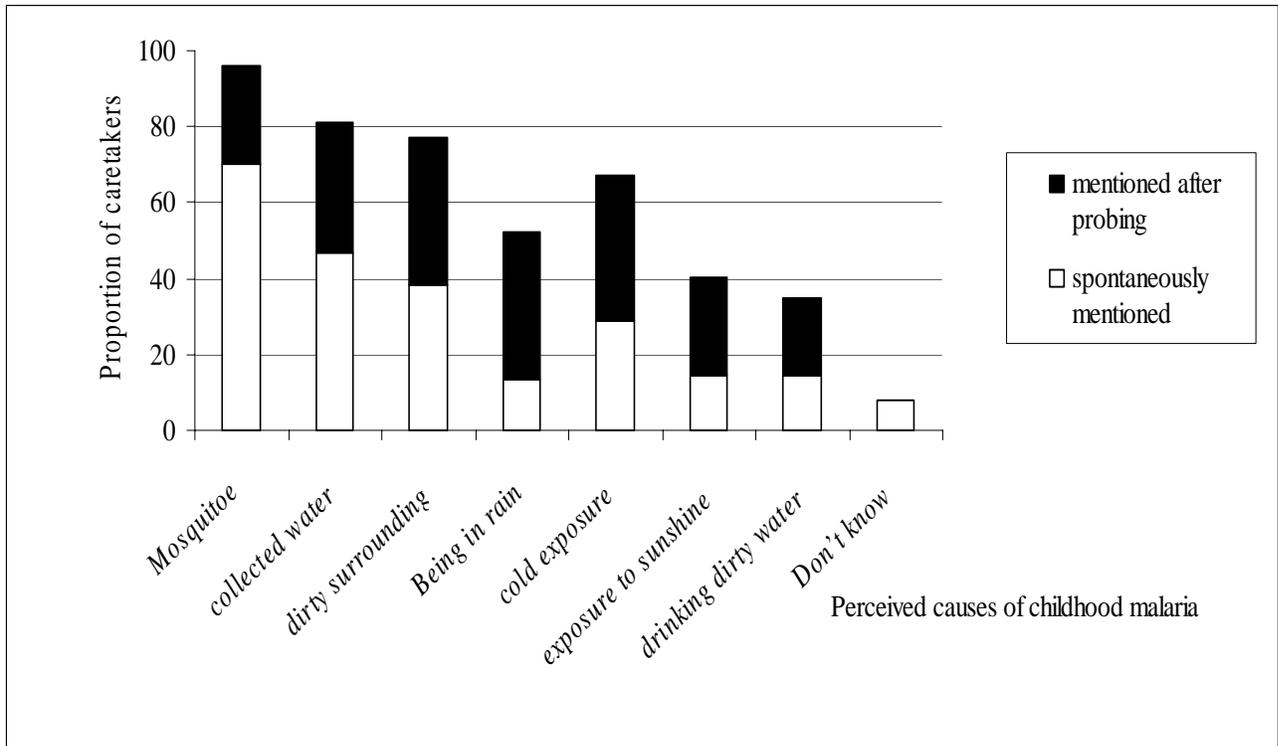


Figure 1: Perceived causes of childhood malaria mentioned by caregivers, Gilgel Gibe Field Research Center, Ethiopia, 2005 (n=572)

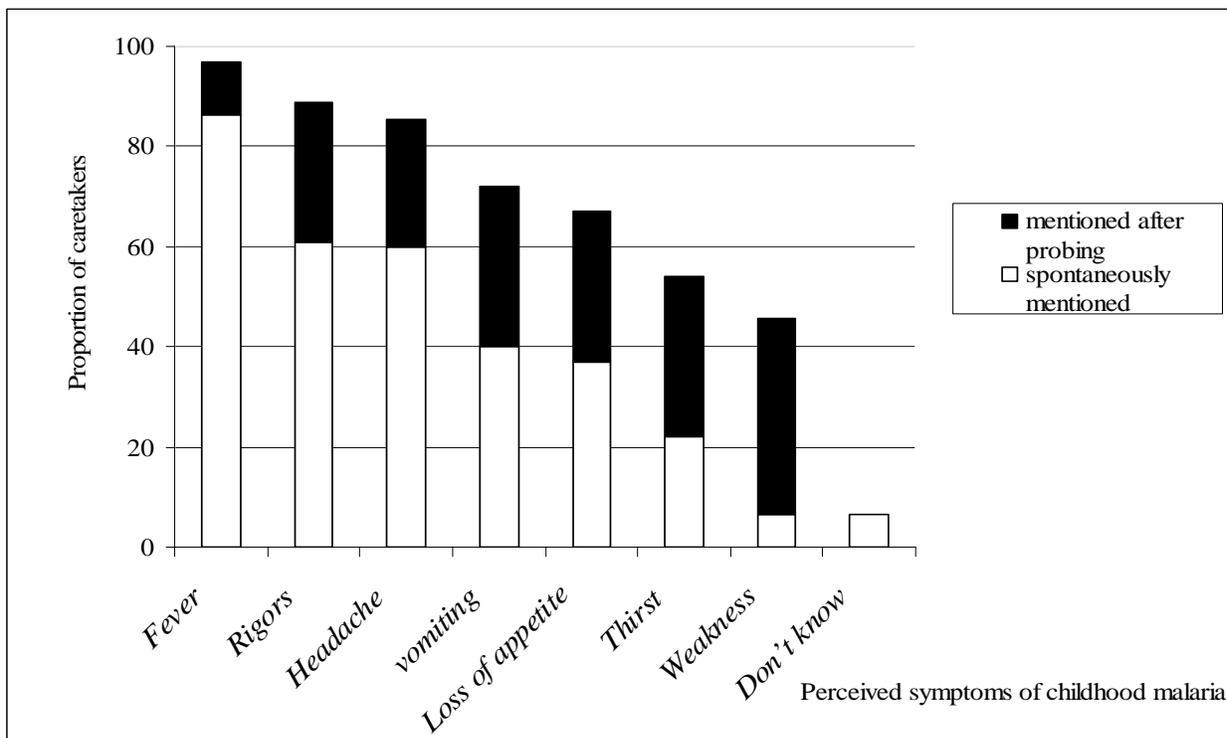


Figure 2: Symptoms of childhood malaria perceived by caregivers, Gilgel Gibe Field Research Center, Ethiopia, 2005. (n=572)

Health institution was the commonest preferred first place of treatment as mentioned spontaneously by the majority (84.6%) of caregivers followed by home care (5%) as far as caregivers' preferred place of treatment for childhood malaria is concerned. Fewer than 3% of the caregivers mentioned either traditional healer or religious healer as the first place to be visited for treatment. Health institution was again the commonest preferred second place of treatment (96.2%) if the child doesn't get well after treatment in the first place.

When caregivers were asked about preferred time of treatment seeking for childhood malaria, only about a

third (32.7%) of them said that treatment should be started in the first day after onset of symptoms. If the child doesn't get well, the majority (82.9%) said they would seek treatment from a second place of treatment 2 days after onset of symptoms.

The commonest perceived preventive measures of childhood malaria mentioned spontaneously by the caregivers were cleaning the surrounding (43.7%), keeping personal hygiene (35.7%), and mosquito net use (35%). After probing most caregivers (86.7%) were aware that malaria in children can be prevented by using mosquito net (Fig 3).

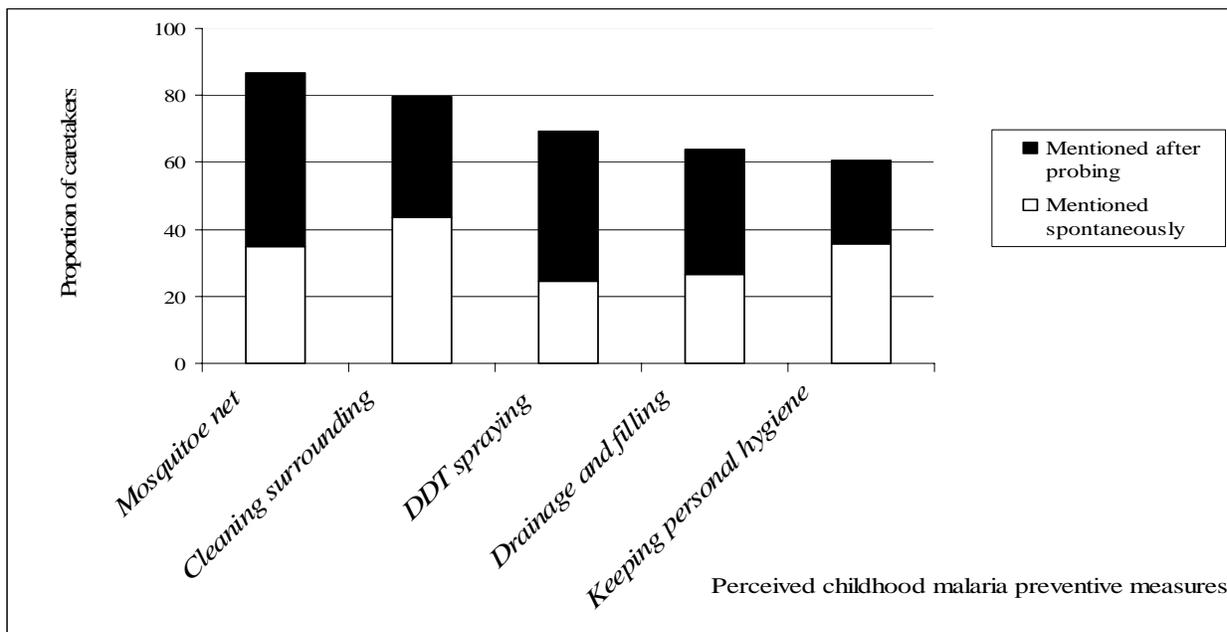


Figure 3: Knowledge of caregivers about preventive measures of childhood malaria, Gilgel Gibe Field Research Center, Ethiopia, 2005. (n=572)

In the bivariate analysis some socio-demographic variables showed association with knowledge about malaria. Urban or semi-urban residence, low income, and formal education were found to be significantly associated with having good knowledge about malaria. On multivariate analysis similarly urban or semi-urban residence, low income and having formal education were found to be independent predictors of good knowledge about malaria. Those caregivers living in urban or semi-urban area, having low income and having formal education were about 3, 2 and 3.8 times more likely to have good knowledge as compared to those living in rural areas, having higher income, and with no formal education, respectively (Table 1).

Discussion

This study has generated local data about caregivers' knowledge regarding childhood malaria which could be helpful when planning, implementing and evaluating childhood malaria control strategies. The overall level of

knowledge about childhood malaria was assessed by combining scores of knowledge in relation to cause, symptoms, symptoms indicating immediate care, preventive measures, time to treatment and place of treatment for childhood malaria. These variables although important might not be comprehensive as they only address certain aspects of knowledge. In most studies, level of knowledge is assessed by using spontaneously mentioned responses. However, spontaneous responses alone might not indicate the knowledge level of respondents as the respondents might have the knowledge, but fail to talk about it spontaneously. Hence, in this study it was tried to incorporate probes in the assessment of knowledge.

People in different societies hold a variety of beliefs about the cause and transmission of malaria that have direct consequences in both preventive and treatment-seeking behavior (12). The proportion of caregivers who

Table 1: Association between caregivers' socio-demographic characteristics and their knowledge about childhood malaria, Gilgel Gibe Field Research Center, Ethiopia, 2005.

Variables	Knowledge on malaria		Crude OR (95% CI)	Adjusted OR (95% CI)
	Poor	Good		
Age group in years				
<35	194(43.1%)	256(56.9%)	1	
≥35	56(45.9%)	66(54.1%)	0.893 (0.597-1.335)	0.852 (0.544-1.333)
Marital status				
Married	16(51.6%)	15(48.4%)	1	
Never married	234(43.3%)	307(56.7%)	1.399 (0.678-2.888)	1.357 (0.606-3.039)
Family size				
Small	115(43.4%)	150(56.6%)	1	
Medium and large	135(44.0%)	172(56.0%)	0.977 (0.701-1.361)	1.040 (0.717-1.509)
Residential area				
Rural	220(52.0%)	203(48.0%)	1	
Urban or semi-urban	30(20.1%)	119(79.9%)	4.299 (2.759-6.698)*	3.084 (1.914-4.968)*
Annual income per capita				
Low	194(41.1%)	278(58.9%)	1.824 (1.180-2.819)*	1.987 (1.241-3.183)*
High	56(56.0%)	44(44.0%)	1	
Occupation				
Housewife	70(49.6%)	71(50.4%)	1	
Non-housewife	180(41.8%)	251(58.2%)	1.375 (0.939-2.014)	1.270 (0.836-1.929)
Educational status				
No formal schooling	243(47.4%)	270(52.6%)	1	
Has formal schooling	7(11.9%)	52(88.1%)	6.686 (2.980-4.997)*	3.786 (1.575-9.099)*

*Mutually adjusted for other variables; *p-value<0.05

mentioned mosquitoes spontaneously to be the cause of malaria in this study (70.1%) is more or less comparable with the finding from the Butajira, Ethiopia study where 66% had similar response (13). However, our finding is much higher compared to another report from a study conducted in rural parts of central Ethiopia in 1991-92 where only 17.3% of the respondents perceived mosquito as a cause of malaria (14) and it is also higher compared to the finding from Southern Mexico (48%) (15). The endemicity of malaria in a given area might be one of the factors that can increase exposure of caregivers to information about malaria. However, the figure from this study is not reassuring because it is not uncommon for people to accept biomedical explanations for disease causation, and concurrently hold traditional beliefs about causation of diseases (12). This is shown in this study that half (51.9%) of the caregivers believed that malaria is caused by non-biomedical causes such as drinking dirty water, exposure to cold, being in the rain and exposure to the sun. The misperception in this study is higher than that of central Ethiopia in which 34.3% of caregivers mentioned exposure to cold and the rain as causes of malaria (14).

The ability of mothers to recognize the symptoms associated with malaria particularly fever has important implications on child survival in malaria-endemic areas. In this study, proportion of caregivers mentioning fever as a symptom of malaria (86.2%) is similar to the finding that was obtained in the study carried out in Butajira

district (89.7%) (13), but lower than the findings (93.5%) obtained in holoendemic district of Tanzania (16).

The proportion of caregivers who spontaneously mentioned mosquito nets as means of preventing malaria in this study (35%) is higher than that of Bungoma district, Kenya (17%) in 1996 (17). In this study, 86.7% of caregivers knew mosquito net as a preventive measure for malaria when prompted which is lower than the finding of the study conducted in Nepal (91%) (18). Knowledge of DDT spraying as a preventive measure is low (24.3%) compared to the finding in Butajira district (39.6%) (13). The low level of knowledge on preventive measures could be one of the factors that need to be addressed for effective malaria control in the area.

It is vital that sufferers, especially children aged under 5 years, should start treatment within 24 hours after the onset of symptoms to prevent progression to severe malaria and death. The proportion of caregivers in this study who said a child with malaria should be treated in the first day after onset of symptoms (32.7%) is higher compared to the respondents from central Ethiopia (16.7%) (14). The relatively higher level of knowledge about malaria in Gilgel Gibe area may be due to the fact that this study was conducted more than a decade after that of central Ethiopia and through this time socio-economic development and exposure to related information are likely to occur which can have effect in raising the level of knowledge in the people.

In this study living in urban or semi-urban area, having formal education and having low income were associated with good knowledge about malaria. The association between low income and good knowledge may be explained by higher prevalence of malaria among the poor as indicated by several studies which may lead to frequent exposure to information about the disease (12).

In conclusion, this study has identified several intervention points for improvement of caregivers' awareness on childhood malaria. Significant proportion of the caregivers, despite mentioning mosquitoes as a cause, they were also found to have concurrent misperception about causes of malaria in children. Besides, high proportion of the caregivers didn't have proper knowledge on symptoms, early treatment seeking and preventive measures of malaria in children. To improve the prevailing poor knowledge about malaria, planners of community education programs and health care workers in the area need to tailor their messages towards correcting the misperceptions about the cause, recognition of symptoms, the need for early treatment seeking and the preventive measures of childhood malaria. This study focused on caregivers of children where there is scarcity of recent research in Ethiopia and the information obtained from the study could be of high importance for implementation of home management of malaria in Ethiopia.

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