

MATERNAL INFLUENCE ON THE USE OF IMPREGNATED BEDNETS IN THE PROTECTION OF INFANTILE MALARIA

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Abstract. A cross-sectional survey of 184 mothers or caretakers was undertaken to investigate the effect of socio-behavioral background on decision making in relation to the use of impregnated bednets to prevent malaria for their children in Ratchaburi Province, Thailand. It was found that most mothers had knowledge of the cause, transmission and prevention of malaria. They perceived susceptibility and severity of malaria as a risk to their children, which might even cause death. They also perceived and had positive attitudes toward impregnated bednets as a protection for their children. Three-quarters (76.4%) of them used impregnated bednets regularly to protect their children whereas one-quarter (23.6%) used infrequently and few never used. Bivariate analysis showed that the use of impregnated bednets was significantly related to the factors such as knowledge of malaria prevention, perception of benefits of the use, the receipt of information about the impregnated bednets from malaria workers.

INTRODUCTION

Malaria is still a public health problem in Thailand. In endemic areas, children are always at risk of infection and it is a serious disease of childhood (Galway *et al*, 1987; Gilles, 1966). One of the primary goals to control malaria is the reduction of a man-vector contact, therefore, sleeping in the net is one way to avoid mosquito contact. However, the net also has problems of easily torn and mosquitos can feed through it if a part of the body touch it. Impregnation of bednets with a fast-acting insecticide that repels or even kills mosquitos is other way to control malaria (WHO, 1989). This intervention has been introduced to many malarious areas in the country. To achieve this intervention, it needs a fundamental knowledge and understanding of the factors influencing attitudinal development and behavioral patterns of people.

This study has contributed to the understanding of maternal knowledge, perception, attitudes and behaviors on the use of insecticide impregnated bednets to protect their children from malaria infection in Ratchaburi Province, one endemic area of the country.

District in Ratchaburi Province had highest prevalence of malaria within the province, a half of number of cases were children (MOPH, 1994). It was selected to be the research site depending on the basis of high malaria morbidity and all households had their bednets impregnated with an insecticide (permethrin).

The population comprised of mothers or caretakers who at least had children under 11 years of age in the family. We recruited all eligible families living in all ten hamlets. The total number of subjects from all households in the hamlets was 184.

Data collection

The study designed a cross sectional survey to employ a quantitative data collection. We used a structured interview schedule on the basis of Thai socio-cultural context to encompass the understanding of the mother's knowledge, perception, attitudes, and malaria related behaviors. In order to gain insight on mother's beliefs and behaviors of using impregnated bednets, the study conducted an unstructured indepth interview with some selected respondents during quantitative data collection.

MATERIALS AND METHODS

Study area and population

Ratchaburi is in central Thailand and is located approximately 101 km from Bangkok. Suan Phung

RESULTS

The mothers and caretakers were Thai (66.8%) and Karen (33.2%). The largest age group of 41.3% was 30-39 years. They had three living children

($x=2.8$) in a family. Most mothers (42.4%) did not attain school. The main occupation was hired labors (44.6%), and then minors were farming (28.8%), handicraft (14.7%) and others (11.9%). The highest family income per month which belonged to 47.9% of the mothers was between 3,000 to 5,999 Baht.

Knowledge regarding cause, transmission, prevention and symptoms of malaria

In the study areas, malaria education was given to people via malaria workers and also by posters and other forms of mass media in the villages. It was found that the great majority of mothers (91.3%) knew that the mosquito bite was a mechanism of infection of malaria, only 8.7% believed that drinking unboiled water could cause malaria and 8.2% believed that drinking water containing mosquito eggs was the cause of infection (Table 1).

Table 1
Causes of malaria as reported by mothers.

Causes of malaria*	No. (%) of mothers (N=184)
Mosquito bites	168 (91.3)
Drinking unboiled water	16 (8.7)
Drinking water containing mosquito's eggs	15 (8.2)
Others	25 (13.6)
Don't know, unsure	13 (7.1)

* Multiple responses possible

When they were asked whether malaria is transmitted from one person to another, 83.2% said yes, 14.7% said no and 2.1% unsure. Approximately 70.1% of mothers reported transmission of malaria via the bite of mosquito. Also some mothers believed multiple causes that malaria was transmitted by living together with infected persons (17.4%). Breast-feeding and coughing were also believed to be possible malaria causes.

Interestingly, an unstructured in-depth interview revealed that although most mothers reported the mosquito bite was a cause of malaria, there were some mothers who believed that the infection occurred because the mosquitos lived in the dirty surrounding such as unclean water and among fer-

mented leaves, rather than because they carried malaria pathogen. These factors led mothers to believe that malaria could not be transmitted to others if they had a clean house.

The mothers were familiar with symptoms of malaria. They reported symptoms of malaria that were headache, high fever, shivering chill everyday or every otherday, exhaustion, dizziness and vomiting (86.4%).

Prevention of malaria is based on avoidance of contact with the mosquito vector. Most mothers (73.9%) indicated that they believed the sleeping in bednets could prevent malaria. Some other preventive measures were avoiding of mosquito bites (25.0%), eliminating mosquito breeding sites around the houses (16.8%), taking malaria pills or bitter medicine and having blood examination frequently (16.3%) spraying house with DDT (8.2%) and others (11.5%) such as putting abate in a jar of water, having bednets treated with insecticides, drinking clean water and eating clean food, cleaning the house and seeking vaccination (Table 2).

Table 2

Knowledge of malaria prevention reported by mothers.

Knowledge of malaria prevention*	No. (%) of mothers (N=184)
Sleeping in bednets	136 (73.9)
Preventing mosquito bites	46 (25.0)
Eliminating mosquito breeding site around the house	31 (16.8)
Taking medicine and having blood examined	30 (16.3)
Spraying house with DDT	15 (8.2)
Others	21 (11.5)
Can not prevent at all	9 (4.9)

* Multiple responses possible

Perception of susceptibility and severity of malaria

The mothers perceived that their children were susceptible to malaria. More than half of mothers (65.7%) believed that their children had more chance of getting malaria and they would be reinfected again (81.0%). Most mothers (82.1%) viewed ma-

laria as a cause of death of children who had infection, but only 64.1% accepted that it was a serious disease in children.

Attitudes toward impregnated bednets

The mothers had a generally positive attitude towards impregnated bednets. They believed that it is better than ordinary bednets (84.8%). When they were asked about the chance of getting malaria between sleeping under impregnated bednets and ordinary bednets, only 65.3% of mothers believed that impregnated bednets protected malaria better than ordinary bednets. However, there were 87.5% of mothers thought that the children should sleep under impregnated bednets and 90.8% thought that the adults should do so.

Perception of benefits and barriers of impregnated bednets use

The benefits perceived by mothers from using impregnated bednets, as opposition to perceived detrimental effects, showed that the children might contract malaria because they did not sleep under the impregnated bednets. Most mothers reported that impregnated bednets had no side effects on their children such as an eye irritation (86.9%), a runny nose (89.1%), an allergy of the respiratory system (85.8%), or even itching (82.6%). Majority (84.2%) believed that sleeping under impregnated bednets everynight could prevent their children from malaria.

Behavior of using the impregnated bednets

The study found that majority of the mothers (96.7%) reported that their children should probably sleep in impregnated bednets. The mothers 76.4% said that they used everynight, 23.6% used irregularly because they felt hot in the summer or sometimes when they took their children into the field and 3.3% never used at all.

Malaria workers launched an impregnation of bednets program into the study area since 1994. Most of them (96.2%) cooperated with malaria workers and about 86.4% of the mothers mentioned that they received information of using impregnated bednets. They learned from the malaria workers that the impregnated bednets could protect malaria (48.7%), protect them from mosquito bite (28.8%), and were safe to use (11.6%).

Most mothers had an experience of contracting malaria at least one, or two or more than three times (31.0%, 12.5% and 23.4%, respectively). The mothers reported that their children also had malaria infection one, two and more than three times (13.6%, 6.0% and 20.7% , respectively).

We used bivariate analyses to determine whether there were any relationships between the use of impregnated bednets and various aspects of malaria related behaviors of mother. There were no significant relationship between the use of impregnated bednets and knowledge of the causes ($p = 0.776$), and transmission ($p = 0.754$) of the disease. Nevertheless, there was a significant relationship between knowledge of malaria prevention and the use of impregnated bednets ($p = 0.012$).

People who have a higher preception of the susceptibility and severity of malaria should use impregnated bednets more often. But the statistical test showed that there was no relationship between susceptibility ($p = 0.43$), and severity ($p = 0.90$) and the use of impregnated bednets.

The study found that most mothers had positive attitudes toward the impregnated bednets use. Unexpectedly, the relationship between the use of impregnated bednets was not found to be associated with attitudes toward the impregnated bednets ($p = 0.21$). However, the statistical test showed that there was a significant relationship between the use of impregnated bednets and the perception of benefits and barriers of impregnated bednets use ($p = 0.004$).

Information or suggestions about the impregnation of bednets and malaria would influence mothers to use the impregnated bednets to prevent malaria for their children. The study found a relationship between the use of impregnated bednets and the information gained about it ($p = 0.0007$).

DISCUSSION

Although most of the mothers were quite knowledgeable about the cause of malaria, there were also some ideas that malaria had multiple causes. As found in many studies (Klein *et al*, 1995; Vundule *et al*, 1996; Yeneneh *et al*, 1993), there were ideas about malaria caused by drinking unboiled water, changing of weather too hot or too cold, eating somethings that was a taboo and being tired from

work. This belief in multiple causes of malaria might divert the mother's efforts to malaria prevention away from preventing mosquito bites. However, most mothers had good knowledge about malaria prevention that relied on the reduction of man-vector contact. Many mothers reported more than one correct method. These included the sleeping in bednets avoiding mosquito bites, having blood examination, spraying household with DDT and treating bednets with an insecticide. Although, most mothers perceived susceptibility and severity of malaria and had positive attitudes toward the impregnated bednets use in preventing malaria for their children, an acceptance of using impregnated bednets for children was slightly less than adults. This may be because they were not sure that the impregnated bednets would be safe enough for their children. Some of them indicated that since an insecticide from impregnated bednets could kill mosquitos and other insects, so they believed it might be harmful to young children. In addition, there was no significant relationship between the use of impregnated bednets and perceived susceptibility to and severity of malaria. They might use bednets just to protect themselves from mosquitos, other insects or even from centipedes and to make themselves feel comfortable and safe while sleeping.

The findings of this study suggest that the efforts to promote malaria prevention by the use of impregnated bednets were likely to be successful. It appears that the perception of nets as generally beneficial lead mothers to use the impregnated bednets more regularly in their children's sleeping areas. The mothers in this study accept that the impregnated bednets protect people from mosquito bites and malaria and they had a willingness to use the bednet regularly.

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