

School children's accessibility to insecticide-treated bednets in peri-urban Blantyre, Malawi

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SUMMARY

Malaria is a major cause of childhood morbidity and mortality in Malawi. Use of insecticide treated bed nets (ITNs) could reduce the burden of malaria. The objective of the study was to determine the general health status, and factors that influence reported access to ITNs among school children in a peri-urban area of Blantyre, Malawi. 454 school children participated in the study of which 253 (55.7%) were males and 201 (44.3%) females. Their mean age and range were 14 years (std. deviation, 1.4 years) and 10-19 years respectively. When asked about general health status questions, 263 (57.9%) reported ever having fallen ill while at school, 41.2% having ever come to school knowing they were unwell, and 40.7% of those that reported having fallen ill at school, categorized their illness as malaria. Regarding illness in the month preceding the study, 41.0% indicated that they had been ill. 40 (8.8%) participants reported that they were not allowed by their religious denominations to use medications when ill. 165 (36.3%) participants reported using bed nets themselves, 159 (35.0%) had a household member (other than parent) using nets and 254 (55.9%) had parent(s) sleeping under an ITN. Having someone in the household who uses an ITN was positively associated with ITN use while age of the participants was inversely associated with ITN access in the home. While more females (37.3%) reported using nets than males (35.6%), the difference was not statistically significant ($p=0.7$). It was concluded that many of the school children experience ill health in Ndirande, Malawi and malaria is perceived to be a common illness. While younger children seem to have higher access to ITNs, there seems to be no statistically significant gender differences in accessibility.

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Introduction

Malaria is a major cause of childhood morbidity and mortality in most of sub-Saharan Africa. In 1993, Malawi changed its first-line treatment of uncomplicated malaria from chloroquine to

suphadoxine pyrimethamine (SP) following high rates of resistance to the former [1]. In order to ensure high availability and accessibility of SP, the drug is available from grocery shops over the counter, from community drug revolving funds and is classified an essential drug which every health facility in the country is expected to have. The Roll Back

Malaria initiative aims to enhance prompt treatment of malaria and increased availability and accessibility to malaria preventative measures such as insecticide treated bed nets (ITNs) [2]. ITNs are crucial in the prevention of malaria not just because they result in reduced mosquito bites of the individual sleeping under the net but also provide community prevention in that widespread use of ITN results in the reduction of overall mosquito numbers in a community [3]. In the rural district of Mangochi, Malawi, morbidity and mortality from malaria has been reduced through providing prompt antimalarial treatment to school children [4]. This study was part of a much larger study aimed to determine the feasibility of providing malaria treatment at school in a peri-urban area of Blantyre. A qualitative study in Ndirande suggested that girls would have higher access to insecticide treated bed nets than boys [5]. We therefore aimed to determine what factors (age, sex, whether a relative or parent within the household used nets) influenced use of an ITN among school children in Ndirande, Blantyre, Malawi.

Materials and Methods

A self-completed questionnaire was administered to Standard 7 and 8 school children in Ndirande, a peri-urban area of Blantyre, Malawi. The questionnaire was in the local language of *Chichewa*. These groups of school children were chosen as they were perceived to be able to understand the questions and be able to complete the answers based on a multiple-choice like approach. Multiple choice approach of answering questions is the most favoured approach for answering questions for national examinations in Malawi (Standard 8, Forms 2 and 4) and so school children are trained on how to answer these types of questions. Data were coded, entered into an Excel spreadsheet and analysed using SPSS ® version 11. Pearson's Chi-square test was used. A p value of <0.05 was considered significant.

Ethical clearance

Ethical review and approval for this study was obtained from the University of Malawi College of Medicine Research and Ethics Committee

(COMREC). Permission was also obtained from the Ministry of Education, Science and Technology and the Parents' School Association. Verbal consent was obtained from the school children who participated in the study.

Results

Demographic characteristics

There were 454 study participants of whom 253 (55.7%) were male and 201 (44.3%) female. The mean age was 14 years, range 10-19 years, standard deviation 1.4 years. The age distribution is presented in **Table 1** below. Of these participants, 288 (63.4%) were living with both their biological parents, 62 (13.7%) were living with mother only, 15 (3.3%) living with father only, 68 (14.9%) living with relatives other than biological parents and 21 (4.6%) were staying in child-headed homes.

Table 1: Age distribution of study participants

Age	Number (%)
<12	50 (11.0)
13	132 (29.1)
14	107 (23.6)
15	93 (20.5)
16	50 (11.0)
>17	22 (4.8)

General health status of school children in Ndirande, Blantyre

263 (57.9%) participants recalled having fallen ill at school while 191 (42.1%) had never had such an experience. However 187 (41.2%) remembered having ever come to school already knowing they were ill, and 267 (58.8%) reported never to have come to school while feeling unwell. For those who reported having fallen ill at school, 184/263 (70.0%) reported that their condition was malaria. A total of 185 (40.7%) pupils could remember having ever been treated with medications at school by their teachers while 269 (59.3%) reported no such experience. When asked whether they had ever fallen ill within the month of study, 186 (41.0%)

indicated they had been ill while 289 (59.0%) had not. Some 154 (34.0%) participants reported that sulphadoxine-pyrimethamine (SP) is usually kept in their homes, while 228 (50.2%) reported not and 72 (15.9%) were not sure if SP is kept in their homes. 40 (8.8%) participants indicated that their religious denomination did not allow them to use medications when they were ill, 404 (89.0%) had no problems with medications in as far as their religion was concerned and 10 (2.2%) were not sure.

Use of insecticide-treated bed nets

We also aimed to determine the use of ITN within the participants' households. The results

are presented in **Table 2** below. Participants who had a relative within the house using ITNs, and those that had a parent using an ITN were more likely themselves to use an ITN ($p < 0.001$). Younger participants were more likely to use bed nets than older participants ($p, 0.003$). Whether one's religious denomination allowed use of medications or not did not have an effect on use of ITNs ($p, 0.58$). Of the 253 males, 90 (35.6%) reported net use while 163 (64.4%) did not and among the 165 female participants 75 (37.3%) reported net use and 126 (62.7%) did not use insecticide treated bed nets. While more females than males reported ITN use, the difference was not statistically significant ($p = 0.7$).

Table 2: Use of insecticide-treated bed nets in the household

Characteristic	Frequencies			
	Yes	No	Not sure	Stay in child-headed household parent
At least one relative sleeps in the household under a net	159 (35.0%)	245 (54.0%)	50 (11.0%)	Not applicable
Parents sleep under net	254 (55.9%)	106 (23.3%)	74 (16.3%)	20 (4.4%)
Participant sleeps under net	165 (36.3%)	289 (63.7%)	0	Not applicable

Discussions

The majority of participants in this study (63.7%) reported not using ITNs while over half of them (56.0%) reported having parents sleeping under an ITN. This is potentially an area of concern as adults, especially non-pregnant adults in malaria endemic areas are likely to have the requisite immunity against malaria. Children, on the other hand when infected by malaria are more likely to suffer severe effects of parasitaemia [6,7]. Of course, the school children that participated in this study were much older than under-fives. It is encouraging though, that the younger the child, the greater was the likelihood of reporting use of ITN. The finding that in households owning a net, parents themselves are likely to use that net

as compared to their children confirm an earlier finding in this population [5] where in focus group discussions, respondents with at least one ITN in the house, it was parents who were using the nets. While from it was suggested that girls would have higher access to nets than boys [5], in the current study, indeed there was higher reported accessibility of nets to girls but the difference with boys was not statistically significant. Despite intensive social marketing, a study by Holtz et al (2002) reported bed ownership in Blantyre being 6.4% and 29.8% in rural and urban areas respectively [8] Lack of money to buy the nets was mentioned frequently as reason for non- ownership of nets [8]. It is of particular note that 4.6% of the pupils reported

living in child-headed homes. In a community study from the same area, child headed homes were identified and this was perceived to be as a result of the HIV/AIDS pandemic [9]. Many of these children lack basic food and access to ITNs a luxury. It is important that orphan-oriented NGOs and other social services providers also consider providing free ITNs to child headed households as their ability to pay is severely compromised. Of course there may be fear that the children may end up selling or exchange the ITN for other basic life essentials. The prevalence of perceived ill health within a month of the study among this group at 41% is high. This could be explained by the fact Ndirande is an underserved or disadvantaged peri-urban area of Blantyre, and ill health, especially from infectious diseases is high. A previous study by Phiri et al [10] reported a prevalence rate of helminthiasis of 16.5% among children 3 to 14 years, thus indicating the poor level of sanitation and social deprivation in this area. While some of the participants who indicated that they had suffered from "malaria" may have had other febrile illnesses other than malaria, in malaria endemic areas and in Ndirande, the community definition of malaria is an acute febrile illness.

While household ownership of ITNs is important and has been relatively studied intra-household differences on use of ITNs is important. Although other household members may benefit from the insecticidal effect of the chemicals used for treating nets [3], an individual not sleeping under a net does not benefit from the physical barrier that the net offers.

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