

## Reality of having bed nets at home, their status and pattern of using it at night among the population of Lakhantari Village Development Committee of Nepal

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### ABSTRACT

**Background & Objectives:** The use of insecticide treated nets has been advocated for the prevention of the vector borne transmitted disease (malaria) by the World Health Organization and UNICEF for more than a decade. In spite of this, there is no significant reduction in the transmission of the disease. Main objectives of study were to find out the real pattern of using it, to find out the physical integrity of the bed nets being used, and to prove the correlation in between the physical integrity of bed nets and the disease outcome. Torn bed nets with holes size more than 1.2 mm were considered as “holes” in this study. **Materials & Methods:** A community based cross-sectional study was carried out in Lakhantari VDC within the duration of two weeks. This VDC has been named recently as Gramthan Gaupalika one of State one. Sample size of 384 was determined by the WHO sample size calculator. Face to face interview technique was used after taking consent from individual. Confidentiality was maintained. It was ethically approved by the IRC (Institutional Review Committee) of Nobel Medical College. **Results:** A total of 384 household were studied. Total household had bed nets but the physical integrity of bed nets was not intact. Almost 73% of the bed nets were torn having more than four holes in them. Nearly 94% of household used bed nets only for three to four days a week. Nearly half of the Malaria was found among 22% and encephalitis in 17% of household. **Conclusion:** Use of bed nets do not prevent and provide guarantee from vector borne disease unless it is properly used. Torn bed nets are of almost no use unless people are using other preventive measures. **Key words:** Bed nets; utilization; febrile illness

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### INTRODUCTION

There are many mosquitoes borne diseases like Malaria, Dengue and Japanese Encephalitis which still are the main threat despite decades of control efforts made by the government of Nepal. In the past decade, malaria incidence has fallen by at least 50 percent because of government's effort. These gains were because of the active implementation of different vector control program and through a combination of interventions, including timely

diagnosis and treatment using reliable tests and anti-malarial drugs; indoor spraying with safe insecticides; and the use of LLINs (long lasting insecticide treated nets) to protect people from mosquito bites at night. Easily available treatment for pregnant women and integrated management of vector control method are the main strategies for malaria prevention in Nepal. ITNs (insecticide treated bed nets) distributed free-of-charge has been in existence in households in Nepal. ITNs are always

being distributed in the country free-of-charge to pregnant women. The use of insecticide treated nets has been advocated for the prevention of the vector borne transmitted disease (malaria) by the World Health Organization and UNICEF for more than a decade. In spite of this, there is no significant reduction in the transmission of the disease. This makes it desirable to obtain answers to some pertinent questions on the transmission of these diseases such as, is the bed nets preventive strategy recommended by the government being used, or is it ineffective. Furthermore, mosquito net ownership in itself is not synonymous with utilization of nets. Proper utilization of net has been not much focused. The present study seeks to determine the presence of bed nets, pattern of using bed nets and the physical integrity of those bed nets.

## MATERIALS AND METHODS

Community based quantitative cross-sectional study was carried out in Lakhantari VDC which has been now changed into Gramthan Gaupalika- one, within one month of duration. Sample size of 384 was determined by the WHO sample size calculator.<sup>1</sup>The calculation for required sample size was as follows:  $p = 0.5$  and hence  $q = 1 - 0.5 = 0.5$ ;  $e = 0.05$ ;  $z = 1.96$ . Where,  $p$ =prevalence,  $q=1-p$ ,  $e$ =margin of error,  $z$ = sample power, and level of  $\alpha=z$ . Main objectives of study were to find out the real pattern of using it, to find out the physical integrity of the bed nets being used, and to prove the correlation in between the physical integrity of bed nets and the disease outcome. Pretested questionnaires were administered to head of household (HOH) which consisted of demographic information, availability of bed nets, and pattern of their effective use. Torn bed nets with holes size more than 1.2 mm or 25 holes /cm<sup>2</sup> were considered as "holes" in this study. All data collected were entered into SPSS (Statistical Package for the Social Sciences) version 16 for analyses. Associations between the use and condition of LLINs, numbers of holes, age, how often the nets were changed and newly bought, pattern of using LLINs, level of education, and malaria or other disease along with the febrile illness symptom's prevalence were evaluated using Pearson Chi Square ( $\chi^2$ ) test. It was ethically approved by the IRC of Nobel Medical College.

## RESULTS

A total of 384 household were studied. There were

54 Females as a head of household comprising only 14%. The ages of these HOH ranged between 21 years and 77 years and the mean age was 47.52. More than half of household were of extended type having third generation family members which was more than 54 %. One fourth of the household were nuclear type. The family members in the family ranged from 2 to 9. More than one third of the HOH were factory worker. Half of the HOH were illiterate comprising 49.5%. But one third of the HOH were educated up to primary level. The demography profile of household and head of household studied is shown in Table 1.

Table no.2 is showing the relationship in between the number of holes found in bed nets, frequency of using bed nets and the present of febrile illness amongst the household members. Febrile symptoms were mainly found among those household who had more than four holes in their bed nets comprising of sixty percent. Febrile illness was mostly found among 36.2% household with usage of bed nets less than three days a week.

Results not shown in article are related to the number of pregnant women, color of the bed nets, frequency of number of holes in the bed nets and the diagnosis of the disease with febrile illness. Only 4 household had pregnant women comprising of single in each household. The color of the bed nets used by the households. Most of the household had light blue colored bed nets which comprised 39% followed by white, purple and brown having 25%, 20% and 16% accordingly.

Total households were having bed nets. Nearly 9% households had intact bed nets with no holes found. At least one hole was found among 4.4% of households. Twenty five percent of household had minimum of three holes in their bed nets. One percent of household had minimum nine holes or torn at nine places in their bed nets. Among 17.2% household four and five holes were found. Mean holes number found was 3.5 among household's bed nets.

Typhoid was the most diagnosed disease comprising of 61% followed by malaria among 22% and encephalitis in 17% of household among total of 36 households.

Figure 1 is a summary of duration of using the same bed nets by the members of household. Nearly 41% bed nets were used for 3 to 4 years followed by 29.4 % and 19.2% for 2 to 3 and 1 to 2 years. Almost 9% of household were using bed nets for

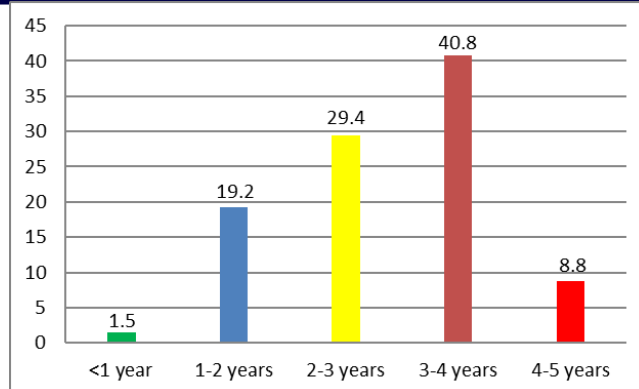
**Table1. Demographic profile of total households**

Characteristics	Frequency	%
<b>Sex wise distribution of Head of Household</b>		
Male	330	85.9
Female	54	14.1
<b>Total</b>	<b>384</b>	<b>100</b>
<b>Age of Head of Household</b>		
20-30 years	67	17.4
31-40 years	105	27.3
41-50 years	44	11.5
51-60 years	39	10.2
61-70 years	78	20.3
>71 years	51	13.3
<b>Total</b>	<b>384</b>	<b>100</b>
<b>Family type</b>		
Nuclear	97	25.3
Joint	79	20.6
Extended	208	54.2
<b>Total</b>	<b>384</b>	<b>100</b>
<b>Family members in Household</b>		
Two	6	1.6
Three	17	4.4
Four	57	14.8
Five	96	25.0
Six	96	25.0
Seven	49	12.8
Eight	60	15.6
Nine	3	0.8
<b>Total</b>	<b>384</b>	<b>100</b>
<b>Occupation of Head of Household</b>		
Housewife	21	5.5
Factory worker	156	40.6
Farmer	148	38.5
Rickshaw puller	20	5.2
Shopkeeper	15	3.9
None	24	6.2
<b>Total</b>	<b>384</b>	<b>100</b>
<b>Educational status</b>		
Illiterate	190	49.5
Primary	116	30.2
Secondary	55	14.3
Higher Secondary	2	0.5
SLC above	9	2.3
Intermediate	12	3.1
<b>Total</b>	<b>384</b>	<b>100</b>

around five years.

**DISCUSSION**

In this study, the physical condition of bed nets of households in various wards was examined in Lakhantari VDC. Total household have had bed nets. At least one hole was observed in nearly 90% of the bed nets surveyed. This study resembles with the works of Ergot et al.<sup>2</sup> Also this study is consistent with the result of the study conducted by J.Pulfold et al.<sup>3</sup> which shows that, mosquito net



**Fig.1** Time duration of using same bed nets

ownership in itself is not synonymous with utilization. The results suggest that bed nets were not adequately utilized and also not kept physically intact which is also suggested in the study of S. Githinji et al.<sup>4</sup> Not all households were utilizing bed nets regularly. They had irregular use of bed nets because of several reasons. Irregular use of bed nets in spite of availability could be one of the reasons they have had febrile illness symptoms. Most of the household had large family size which could be the reason of inadequate bed nets per person.

Febrile illness symptoms were seen among the household who had their bed nets not intact rather, had holes and torn. Most of the febrile illness symptoms were not diagnosed so no evidence of disease related to mosquito transmittable could be proven. Nevertheless, few were diagnosed with the diseases related with mosquitoes. Malaria occurred at higher prevalence among non-users and this is in line with the study done by CA Maxwell et al.<sup>5</sup> This study is consistent with other different studies resembling with the findings that most of nets are physically damaged by 1.5 years of use. This study also suggests same results as a study done in Ethiopia by JM Ngondi et al.<sup>6</sup>

The use of bed nets is seen different at the individual level, where factors influencing net use have been reported to include age and gender by other studies.<sup>8-11</sup> Most influencing factor such as education, occupation/livelihood were also seen in this study as seen in study by Thomson M et al and Dunn CE et al.<sup>12-14</sup> degree of control over household decision-making as seen by the study conducted by Wiseman V et al<sup>15</sup> was also consistent with this study where most of the household decisions were made by the head of the household. Malaria knowledge, beliefs and risk perceptions always played very important role in using bed nets which was similar to the study conducted by different researchers such as Toe LP et al,<sup>7</sup> along

Table no. 2 Relation between Febrile symptoms at household and holes in bed nets

Number of holes	Febrile symptoms				Total	P value
	No	%	Yes	%		
≤3 holes	90	23.4%	14	3.6%	104	27.1%
≥4 holes	51	13.3%	229	59.6%	280	72.9%
<b>Total</b>	<b>141</b>	<b>36.7%</b>	<b>243</b>	<b>63.3%</b>	<b>384</b>	<b>100.0%</b>
<b>Frequency of using bed nets</b>						
0-3 days/week	51	13.3%	139	36.2%	190	49.5%
4-7days/week	90	23.4%	104	27.1%	194	50.5%
<b>Total</b>	<b>141</b>	<b>36.7%</b>	<b>243</b>	<b>63.3%</b>	<b>384</b>	<b>100.0%</b>

\*P value ≤0.05 is significant

with Hwang J et al.<sup>16</sup> In this study people used bed nets according to the knowledge on perceived benefits and disadvantages of nets also consisted with the study of Adongo P et al, Ng'ang'a PN et al and Widmar M et al.<sup>7,17-19</sup>

## CONCLUSION

Use of bed nets do not prevent and provide guarantee from vector borne disease unless it is properly used. Torn bed nets are of almost no use unless people are using other preventive measures. People may use bed nets for the sake of using it in spite of being aware of the physical integrity of it. That may be because people cannot afford to change the bed nets as per need. Further step proposing a more systematic evaluation of the incidence of disease and the physical integrity and the pattern of the bed nets used by the community people is needed. This knowledge from this study shows that people are needed to be made aware about the proper way of using and replacing older bed nets per need.

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## Conflict of Interest Statement:

None Declared

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