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Household Expenditure on Personal Protection from Mosquito Bites – A Micro-econometric Analysis

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Insecticide treated bed nets are cost effective & can provide complete protection against mosquito bites. Many households use other methods of prevention which may be partially protective. Less is known about the pattern of household expenditure for prevention of mosquito borne diseases. To explore the pattern of personal protective measures for prevention of mosquito bites and to analyze expenses for such measures. An independent, cross-sectional, questionnaire based survey was done in the month of August and September 2011. A sample of 218 participants was selected by probability sampling. Data collected during the survey was analyzed by statistical software 'SPSS 13' for windows. None had purchased ITN (Insecticide Treated Net) in the past 6 months. Most of the participants accepted the use of other methods of prevention available in market as coils, repellants, sprays etc. Others revealed the use of home available methods like herbs, oils and smoke for dispersing mosquitoes. Fair amount of money was spent on marketed products. The range of expenditure was ₹ 45 - ₹360 per month. Cost of bed-nets impedes purchasing behavior in majority. A fair amount of expenditure is done for other marketed products. Behavior Change Communication is needed to promote ITNs.

Key words: Personal Protection, Mosquito bites, Expenditure.

Malaria and other vector-borne diseases are the most widespread cause of death, disability and economic loss, especially among the poor, with limited access to healthcare facilities. Curable if effective treatment begins early, delay in treatment may even lead to death [1].

Globally 300 to 500 million clinical cases of malaria occur each year and at least 1.1-2.7 million people die of malaria annually and over 2400 million are at risk [2]. Reduction in morbidity and mortality due to mosquito borne diseases is important to meet the overall objectives of Millennium Development Goals [3]. To achieve targets specified under NVBDCP, it is imperative to have active community participation for prevention and control of mosquito borne diseases. The use of personal protection (PP) methods has been advocated as an effective tool against vector borne diseases. However, success of these measures largely depends on the access, acceptability and proper usage by the target population.

Insecticide treated bed nets are cost effective & can provide complete protection against mosquito bites. On the other hand, many of the households use other methods of prevention like indoor spraying, aerosols, coils and smoking of herbs [4]. Views of some researchers in this field are that methods other than ITNs may be partially

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protective [5,6]. Less is documented about the pattern of household expenditure for prevention of mosquito borne diseases in Aligarh district of Uttar Pradesh, India. Thus, a study was planned for the under given objectives-

Objectives

To explore the pattern of personal protective measures taken for indoor prevention of mosquito borne diseases and to analyze the level of expenses for such measures in households.

MATERIALS AND METHODS

Study design

An independent, cross-sectional, questionnaire based survey was done in the month of August and September 2011, to assess the level of awareness, attitude and practices for the prevention of dengue fever in general public. This paper presents a part of survey concentrating only on the pattern of personal protection and the expenditure incurred thereon. The study was conducted in Jawaharlal Nehru Medical College Hospital, Aligarh Muslim University, Aligarh, Uttar Pradesh, India.

Subjects

A sample size of 221 individuals was determined by taking confidence level of 95% and confidence interval of 6.5 for a cumulative population of 7500 (approx.) over a period of two months. The sample was drawn from the main waiting hall of the Out-Patient Department. The hall had a capacity of 125 chairs fixed in rows. It was observed that usually the chairs remain fully occupied on working days. Thus 10 individuals were selected each day by systematic random sampling taking a sample interval of 12. Those not interested or sick were excluded from the survey. In this case the person sitting on the next chair was included in the sample. After screening the questionnaires for the completeness of information 3 were rejected. Thus, the results are based on 218 subjects.

Methods

A semi structured questionnaire was developed particularly for the purpose of this study. It was a combination of open and closed ended questionnaires to provide information about general socio-demographic characteristics and the pattern of personal protection from vector borne diseases and the monthly expenditure for the protection measures.

Statistical Analysis

Data collected during the survey was entered and analyzed by statistical software 'SPSS 13' for windows and appropriate tests were applied.

Ethical Issues

At the end of the interview each respondent was provided with a handout with information relating to mosquito borne fevers. This handout contained information on the vector, its breeding sites, biting time; dengue fever, its transmission, symptoms, treatment and preventive measures.

RESULTS AND DISCUSSION

Demographical Profile of Study Population

The age, sex and other demographic variables are presented in Figure-1. The majority (74%) of respondents was in the age group of 18-40 years. There were more males (63.3%) than female (37.7%) respondents. 29% of them had completed high school followed by those who had primary education (27%). Only 16% of respondents were graduates. About one fourth of the individuals were illiterate. Majority (42%) of them belonged to low socio economic classification and were in Class V of the modified B.G Prasad classification[7]. Large number of participants comprised the rural population (57%) compared to those who resided in the urban, peri -urban or urban slum (43%) area of Aligarh district. More than half (64%) of the respondents were Muslims and the rest of them followed Hinduism (36%).

Pattern of Personal Protective Measures taken by Study Population

None had an ITN (Insecticide Treated Net) nor purchased in the past 6 months. (Table-1) The reasons cited for not using ITNs were predominately ignorance and poor affordability. This is consistent with a number of studies that show that the use of preventive measures, particularly ITNs is strongly and positively correlated with income and socioeconomic status [8,9]. As apparent from the study, majority 194 (89%) of households had at least one non medicated bed net. Its use was not preferred by the majority in urban areas. Those who used to sleep in the open (on roofs or outside the home) used bed nets

preferentially, thus rural respondents used bed nets more than urban counterparts. Low use of bed nets in the population from other parts of India was highlighted by other researchers also.[10]

It is highlighted in this study that many respondents admitted that not one but multiple types of non-net measures were used in addition to the preferential ones. Similar observation was made by other researchers also[10]. Among these mosquito coils, mats and vaporizers were used by majority in urban areas whereas mosquito coils, smoke, herbs and bed sheet to cover them at night were the preferred measures among rural counterparts. As cited by other researchers some of these products give partial protection against mosquito bites.[6,11] In addition, continuous exposure to smoke all the night on regular basis is accredited with negative health consequences.

Expenditure on Personal Protective Measures

Fair amount of money was spent on marketed products. The money spent by the population for protecting them and their family members from mosquito bites also indicates indirectly, the perception of risk for transmission of mosquito borne diseases. Studies have demonstrated a link between the demand for bed nets and a household's perceived risk of malaria.[12] The range of expenditure was rupee 45 - 360 per month. The expenditure calculated in the survey does not include the money spent on bed nets and

Table 1. Pattern of Personal Protective Measures among Study Population

Preferred Use				Additional Usage			
Urban		Rural		Urban		Rural	
Measures	%	Measures	%	Measures	%	Measures	%
Mosquito Coils	48	Mosquito Coils	62	Mosquito Coils	53	Mosquito Coils	75
Mats	39	Mats	30	Mats	47	Mats	37
Vaporizer (Liquid)	82	Vaporizer (Liquid)	18	Vaporizer (Liquid)	85	Vaporizer (Liquid)	20
Electric Racket	8	Electric Racket	5	Electric Racket	15	Electric Racket	2
Bed nets	12	Bed nets	56	Bed nets	22	Bed nets	63
ITNs	0	ITNs	0	ITNs	0	ITNs	0
Repellent Cream	5	Repellent Cream	3	Repellent Cream	10	Repellent Cream	9
Oils	9	Oils	28	Oils	4	Oils	35
Others	4	Herbs	33	Others	2	Herbs	38
		Smoke	42			Smoke	49
		Bed sheet	51			Bed sheet	53
		Others	3			Others	5

Table 2. Expenditure on Personal Protective Measures

Category	Number	Mean Expenditure (Rs.) per month ±SD
Socio-economic status		
≥10,000	7	218.84 ± 86.52
5000-9999	15	153.65± 90.86
3000-4999	37	116.85± 62.87
1500-2999	68	83.32± 50.48
<1500	91	72.59± 27.83
Place of residence		
Rural	124	83.65 ± 38.53
Urban	94	180.52 ± 105.94
Religion		
Muslim	140	159.83 ± 86.51
Hindu	78	163. 45 ± 62.84

external netting of house as it is one time expense and is subject to recall bias. It is depicted in Table 2 that the expenditure varied between socioeconomic status and place of living. The average monthly expenditure in urban area was rupees 180.52 ± 105.94 while in rural area was rupees 83.65 ± 38.53. It is highlighted that people belonging to lower socioeconomic status spend proportionately more as compared to per capita income, on the personal protection against mosquito bites which is an additional burden on their pocket. Other studies also affirm that considerable amount is being spent on non-net products in other parts of India[10], as well as in other countries [13].

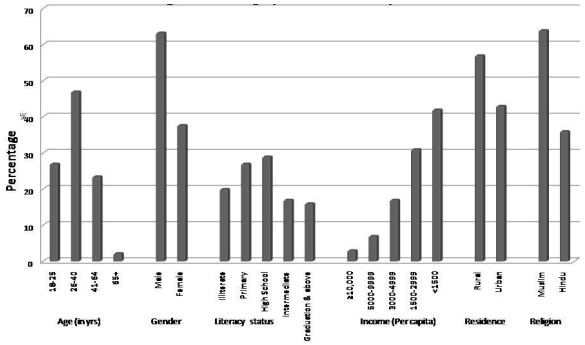

Fig. 1. Demogrphic profile of respondents

CONCLUSION

The present study highlights that the problem of mosquito bite faced by the population is severe. It is reflected by the use of various methods of preventions and the economic burden on the pockets of respondents for regular and long term use of these measures. Ignorance and cost of Insecticide treated bed-nets impedes purchasing behavior in majority. A fair amount of expenditure is done for other non-net, marketed products which may provide them with partial protection and many of these measures are attributed with potential health problems. Behavior Change Communication is needed to promote ITNs in addition to other non-net measures for in house prevention but emphasis should be given on outdoor eradication of breeding sites of mosquitoes are essential and will provide lasting protection for the community as well.

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