

Perception and Practices on Transmission of Vector Borne Diseases among Rural People

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Abstract

Introduction: Vector-borne diseases are illnesses transmitted by arthropods or invertebrates and caused by different microorganisms in human. These diseases accounts for almost 20% of the diseases and disability suffered globally. More than 50% the global population at present projected to be at risk of diseases transmitted by arthropod or invertebrate vectors. Knowledge on the existing perception and practices on transmission of vector borne diseases among rural community would be beneficial to provide a need-based health care delivery system to them.

Objective: To know about the perception and practices regarding vector borne diseases in rural community.

Materials and Methods: This observational type of cross-sectional study was conducted by non-probability purposive sampling method in 474 respondents of Dhamrai and Saturia Upazila from August 2019 to February 2020. Data were analyzed by using Microsoft office packages and calculator and presented in the form of tabulation and diagrams.

Results: Findings of this study showed that 76% respondents were Muslims and 35% respondents were above 50 years old. Among 474 respondents, 88% and 78% stated mosquitos and houseflies as vectors responsible for transmitting various diseases, after that 35% Itch mite, 34% Louse and 42% Sandflies. Respectively 72% and 85% respondents stated Malaria and Dengue is transmitted by arthropod vectors, followed by 54% Chikungunya, 35% Kala azar, 13% Filariasis and 33% Typhoid fever. Though, 64%, 67%, 86% and 22% respondents stated bite of mosquito as mode of transmission of malaria, chikungunya, dengue and filariasis correspondingly. In particular, 95%, 87%, 1% and 17% respondents stated personal protection measures, removal of water collection, fogging and spraying as the control measures for mosquito and other vector associated diseases respectively. However, 91%, 74% and 78% respondents used mosquito net, mosquito coil and screening of windows as their frequently used methods for preventing vector borne diseases.

Conclusion: Knowledge about arthropod vectors and vector borne diseases at rural level requires improvement. A fair percent of respondents having satisfactory information regarding the name of

arthropod vector and illnesses transmitted by them, their mode of transmission in addition to distinct control measures for the prevention of vector borne diseases. Community oriented health education modules should be adopted by the government to boom the knowledge of the village people concerning name of precise vectors and the sicknesses transmitted by means of them.

Key-words: Vector borne diseases, Rural people, Perception and Practices.

Introduction

Vectors are arthropods or invertebrates that transmit infectious agents from infected person to healthy individuals or from animals to human being. Several vectors are bloodsucking animals which transmits infection by inoculation into or through the skin by biting or by deposit of microorganisms on the skin or on food or other substances. Anopheline and culicine mosquitoes are the deadliest disease vectors throughout the world. Others consist of housefly, sandfly, fleas, ticks, bugs, crustaceans and few aquatic molluscs¹. Vector-borne diseases are illnesses transmitted by arthropods or invertebrates and caused by different microorganisms in human being. Throughout the world approximately one billion people gets infected and more than one million people die from different vector-borne diseases consisting malaria, dengue, chikungunya, leishmaniasis, yellow fever, and lymphatic filariasis every year. Almost 20% diseases and disability suffered globally is attributable to vector-borne diseases, with more than 50% of the global population now projected to be at risk of getting these diseases². Vector transmitted diseases affect both urban and rural communities but flourish chiefly among people living in poor living conditions – predominantly lack of access to healthful housing, pure drinking water and goods sanitation. Malnourished people and immunocompromised persons are predominantly vulnerable. Vector transmitted diseases also exaggerate poverty, illness and disability, further preventing people from leading their normal life, causing further adversity and hindering economic development^{3,4}.

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Dengue fever in particular is evolving as a notorious public health concern in many countries including Bangladesh. This disease imposes substantial financial burden on families and governments⁵. Data from different countries demonstrated that a dengue case represents about 15 lost days for critical patients at an average cost of US\$ 514.^{4,6} Vector-borne diseases therefore play a dominant role in socio-economic growth. According to an econometric model for malaria, it was found that countries with higher burden of malaria cases have income levels of only 30% of those countries that do not have malaria as a burden⁷. In conjunction with this alarming blowout of vectors, increased insecticide resistance is a solemn concern to public health experts working for pest control. Currently many species of arthropod vectors are developing their ability of resistance to major classes of commonly used insecticides. If major insecticide classes lose their efficiency for public health pest control, this could obliterate all the gains made against dengue, malaria, filaria and other vector-borne diseases⁸.

Vector management programs need to associate intervention measures and resources to target Integrated Vector management (IVM) approaches. In many cases, increased resources and commitment from community leaders are needed to scale-up access to existing vector management tools. Instantaneously, proper investment in research is critical to find out appropriate methods for combating mosquito and other arthropod vectors and arthropod borne diseases. Renewed drive on an inclusive scale is needed for battling arthropod borne diseases; from public health sectors throughout the world, between nations and within regions, across government organizations, at all levels of administration, and within societies and households⁹.

Any vector management program requires the entomological study of particular vector animal to emerge with the pragmatic actions for vector control. These intervention measures are ineffective or less effective without the dynamic participation of the community people especially in remote rural areas with underdeveloped transport and communication system. Hereafter, for the development of an effective health education method and for the progress of community-oriented action plans, understanding the level of knowledge and awareness of the community people about vectors, modes of diseases transmission, effective preventive measures taken and how effectively the people from all segments of community can participate in the control efforts, is a crying need. Therefore, this community-based study was undertaken to determine the level of

perception of the people living at Upazilla level regarding prevention of arthropod vector borne diseases. Besides, every year vector borne diseases are appearing in more new divergences and adding to the sufferings to people around the world¹⁰.

There are 34 species of *Anopheles* mosquito in Bangladesh which transmit malaria, predominantly occurs in hill areas of Chittagong division. In Bangladesh mortality and morbidity from dengue, malaria and vector borne diseases are increasing day by day. Hence, community people need to obtain knowledge about the arthropod responsible for particular vector borne diseases, their preventive measures and become aware about these diseases¹¹.

In addition, updated information on the existing perception and practices at rural settings is essential to provide equitable and timely health care delivery to them. Mainly hospital-based studies are currently available for various disease patterns. Community oriented researches can only draw the actual scenario of a given community and fix their priorities in seeking services related to health care needs. Findings obtained from this study may attribute to the further improvement of perception and practicing pattern of rural people against vector borne diseases.

Materials and Methods

This was an observational type of cross-sectional study conducted in Dhamrai Upazilla of Dhaka district and Saturia Upazilla of Manikganj from August 2019 to February 2020. The study population was people of selected villages of Dhamrai and Saturia Upazilla. The sample size was 474. Data were collected by face to face interview using close ended semi-structured questionnaire. Non-probability purposive sample technique was followed. Data were checked and verified for any inconsistency, error or incomplete information. The collected data were analyzed by using Microsoft office packages and calculator. Data were presented in the form of tabulation and diagrams after analysis.

Results

In this study age of 35% respondents were more than 50 years, with mean age 39.67 years and \pm SD 14.4. Majority respondents (55%) were male. Study shows 30.3% respondents were illiterate or can only put a sign and 75.9% respondents were Muslim. However, 44.7% respondents were housewives. Twenty seven percent respondents were poor, having monthly income less than 5000 Taka. In this study 41.7% couples had 1 or 2 children in their family (Table-I).

Table-I: Distribution of respondents by socio-demographic characteristics (n=474).

Variables		No of people	Percentage (%)
Age(Years)	>20	62	13.0
	21-30	81	17.0
	31-40	94	19.8
	41-50	71	14.9
	>50	166	35.0
Sex	Male	261	55.0
	Female	213	45.0
Educational status	Illiterate/ Sign only	144	30.3
	Class- I-V	96	20.2
	Class-VI-X	123	25.9
	SSC/ Equivalent	48	10.1
	HSC/ Equivalent	31	6.5
	Graduate and above	24	5.0
	Others/ Informal	8	1.6
Religion	Muslim	360	75.9
	Hinduism	114	24.1
Occupational status	Cannot work	58	12.2
	Employed	75	15.8
	Self- employed	102	21.5
	Retired	27	5.6
	Housewife	212	44.7
Monthly income (in Taka)	No income	71	14.9
	<5000	128	27.0
	5001-10,000	104	21.9
	10,001-15000	76	16.0
	>15,000	95	20.0
Number of children	Nil	106	22.3
	1-2	198	41.7
	3-4	136	28.6
	>4	34	7.1

Study shows, 88.3%, 78%, 35%, 34.2% and 42.5% respondents mentioned mosquitoes, houseflies, itch mite, louse and sand fly as a vector for disease transmission respectively.

Whereas 72.5 % and 84.8% stated malaria and dengue fever transmitted by vectors followed by 54.2% Chikungunya, 34.8% Kala azar, 12.8% Filariasis and 33.7% Typhoid fever (Table-II).

Table-II: People's perception on diseases that are transmitted through vectors(n=474).

Name of the Disease	Response (Bite of Mosquito)	n	%
Malaria	Yes	344	72.5
	No	31	6.5
	Don't know	99	20.8
Dengue	Yes	402	84.8
	No	38	8.0
	Don't know	34	7.1
Chikungunya	Yes	257	54.2
	No	56	11.8
	Don't know	161	33.9
Kala azar	Yes	165	34.8
	No	61	12.8
	Don't know	248	52.3
Filariasis	Yes	61	12.8
	No	71	14.9
	Don't know	342	72.1
Typhoid	Yes	160	33.7
	No	102	21.5
	Do not know	212	44.7

The study shows 64.5% respondents stated bite of mosquito as the mode of transmission of Malaria whereas 25% respondents know nothing about it(Figure-1).

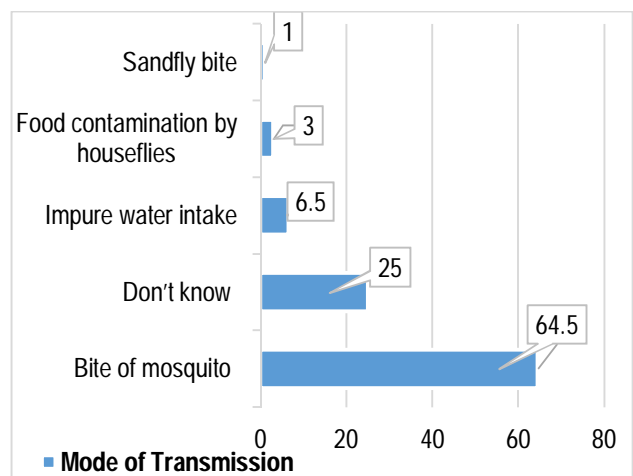


Figure-1: Distribution of respondents according to knowledge on the mode of transmission of malaria (n=474).

In this study 67% respondents stated bite of mosquito as the mode of transmission of chikungunya whereas 27% respondents knew nothing about it.

Whereas 86% respondents stated mosquito bite as the mode of transmission of dengue, whereas 10% respondents knew nothing about it(Figure-2).

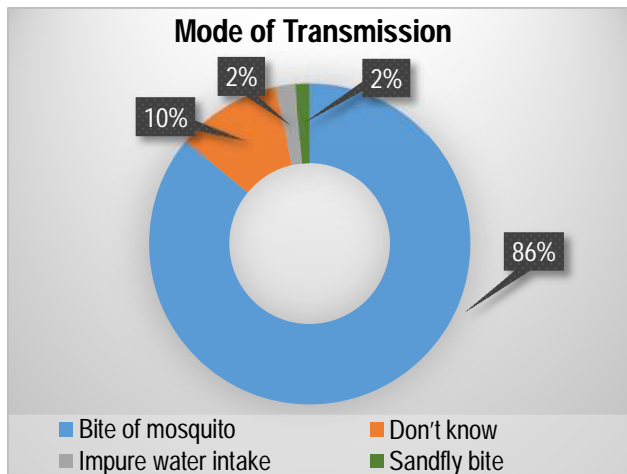


Figure-2: Distribution of respondents according to knowledge on the mode of transmission of dengue (n=474).

Only 25% respondents correctly stated sand fly bite as a mode of transmission of Kala-azar, conversely 7% respondents correctly stated bite of mosquito as a mode of transmission of Filariasis (Table-III).

Table-III: Mode of transmission of kala azar and filariasis. n= Multiple response

Mode of transmission	Kala-azar		Filariasis	
	Number of respondents	Frequency and Percentage	Number of respondents	Frequency and Percentage
Mosquito bite	79	17 (21.5%)	32	7 (21.9%)
Sand fly bite	8	2 (25%)	7	1 (14.3%)
Food contamination by houseflies	22	5 (22.7%)	6	1 (16.7%)
Impure water intake	13	3 (23.1%)	14	3 (21.5%)
Do not know	352	74 (21.1%)	415	88 (21.2%)

As per study findings 94.55%, 0.6%, 87.3%,16.6% and 12.4% respondents stated Personal protection, Fogging, prohibition of water collection, Insecticidal spraying and cultivation of larvivorous fish (e.g., Guppy) as the vector control measures (Table-IV).

Table-IV: Measures taken by the respondents to control the vector in preventing disease(n=474).

Measures taken	Yes	No	Don't know
Personal protection	448(94.5%)	17(3.5%)	9(1.9%)
Fogging	3(0.6%)	454(95.7%)	17(3.6%)
Prohibition of water collection	414(87.3%)	47(9.9%)	43(9.0%)
Insecticidal spraying	79(16.6%)	276(58.2%)	119(25.1%)
Cultivation of larvivorous fish	59(12.4%)	135(28.4%)	280(59.1%)

Nevertheless, 91%, 74% and 78% respondents were found using mosquito net, mosquito coils and screening of windows as their mosquito control measures respectively. Liquid repellent vaporizer was rarely used(5%)(Figure-3).

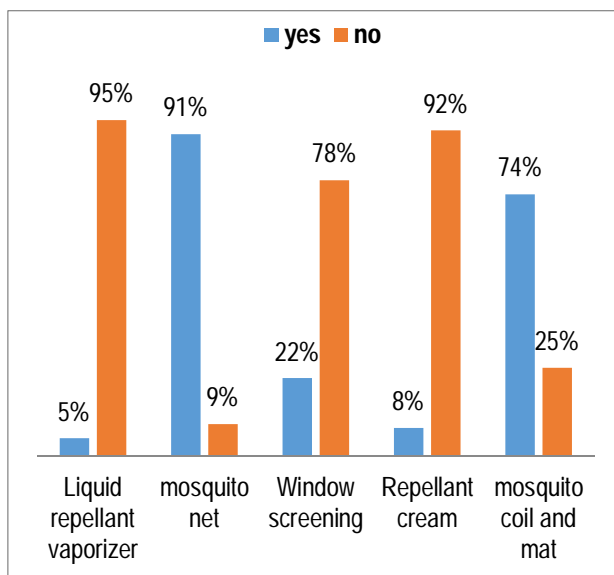


Figure-3: Measures taken to control the vector in preventing diseases(n=474).

Discussion

As most of the population of our country is unaware of the vector borne diseases and their magnitude, the study was conducted to find out perception and practices on transmission of vector borne diseases among people residing in rural areas.

Study result shows within 474 respondents, 13% of the respondents were below 20 years of age. 17% were in the age range of 21-30 years. In 31-40 years age group there were 20% and in the age group of 41-50 years there were 15% and 35% respondent's age were above 50 years. According to a study done by MM Rahman et al in rural Bangladesh, 2% respondents were between the age of 20 years then between 21-30 years was 33% and above 50 years was 65% of the respondents¹². In this study, data collectors got to interact with people of the age above 50 years because the younger members of the households were somehow busy and these respondents were retired. So greatest percentage of respondents were of the age group above 50 years. According to this study 55% were male respondents and 45% were female respondents. Therefore, majority respondents were female, the male female ratio was 11:9. This study result does not accord with the study done by MM Rahman et al¹². In this study, female respondents were greater in number because data were collected mainly from the rural households during daytime, so data collector mostly got to interact with the housewife females as our respondents. Among 474 respondents 30.3% were illiterate and they could give signature only. Maximum number of respondents received education till secondary level, which was a small number of respondents and 5 % were found taking graduate level courses and further informal education. This finding was seen similar with knowledge, attitude and practice regarding water borne disease in Western Jamaica. The percentage of secondary level education was highest that is 65.9²².

In this study, it has been found that, people were either self-employed or employed where it is obvious that maximum number of people 21.5 was self-employed. On the contrary, the study done by MM Rahman et al showed that 45.93% were housewife and next were businessman and other service holder¹². In this study data were collected from suburb of a town, most people had their own farm or cultivation, as there are no enough employments available in that area. According to this study respondents had mean monthly income <5,000 taka whereas study done by of MM Rahman et al. shows that the mean monthly income of their respondents was 8,000-11,000 Taka¹².

According to this study, the number of minimum two children in each family was 41.7% and 22.3% had no children. Therefore, from this study it can be estimated that maximum number of people in that area and as well as our country are conscious enough about the population growth. It is a good sign that respondents were following the two-child rule. As Jamaica is an advanced state, the people have been more conscious about the fact that is why maximum number of people had only two children¹².

Regarding the knowledge of people about insects acting as vector, it was found that, 88.3% people know that mosquito acts as vector and 78% people consider housefly as a vector of diseases. Another study done by Matta S et al. in the areas of

Delhi shows that, 71% of the rural respondents and 89 % of the urban respondents knows that mosquito act as vector¹³.

Among 474 respondents, 72.5% had idea about Malaria and 20.8% of them didn't have knowledge about Malaria. A study conducted at Rangamati, Bangladesh shows that about 89% of the people knew about Malaria and 11% didn't about Malaria. The same study also stated about the knowledge of respondents about Malaria transmission. It was observed that 1% of the people there think the disease spreads through drinking of contaminated water. On the contrary, this study shows 7% people think the same. Again, 1.5% respondents in Rangamati study thought eating contaminated food could be another reason for occurring Malaria whereas 3% of respondents in this study had this kind of idea. A large amount of people said that Malaria spreads through the bite of mosquito, which was 88.5% and from this study 64% of respondents thought the same. Only 1% of people told this disease spreads through close contact with infected person. Lastly, 8% respondents of Rangamati District had no idea about the disease and in this study, it was 25%¹⁴.

In a study conducted by Harapan H et al 45% of respondents had good knowledge about dengue and only 32% had good attitudes and good dengue preventive practices¹⁵. The study done by Thaver AM et al. in Karachi, Pakistan stated the respondents thinks the mode of transmission of dengue is through blood borne and vector borne which were 7% and 93% respectively¹⁶.

In this study, among 474 people, 54.2% of the total respondents know about Chikungunya. On a study conducted by Mustari S, 82% of the total respondents were informed about chikungunya¹⁷. On another study that was done by Rashid Md HO et al. in Dhaka city found that 92.5% respondents heard about Chikungunya infection¹⁸. Mallhi et al also did a study on the same topic and got with the result that 56.7% knew about the disease 6.7% respondents were aware that Chikungunya was caused by the bite of mosquito. Only 31% respondents had good disease knowledge while others had fair (36.4%) and poor (32.6%) knowledge¹⁹.

In this study 33.7 % of the respondents have perceived about typhoid on comparison to study done by Nyamusore J et al, it is seen that 52.8% people heard about typhoid²⁰. Among 474 respondents, 91 % has mentioned about the use of mosquito nets. A study conducted at Tribal and Non-Tribal Communities in a Rural Area of Kamrup District, Assam, shows that among 300 households, 97.3% of the tribal households and 99.4% of the non-tribal households uses mosquito nets. Modern techniques to prevent vector borne diseases are still unfamiliar to the respondents of this study. 95% and 92% of the respondents do not use liquid vaporizer or repellent creams respectively. On the contrary, the study of Kamrup, Assam shows that 45% of the tribal and 89% of the non-tribal households use repellents²¹. Another

study by Wilson M. et al. in Western Jamaica shows that 47.4 % respondents declared their intention to use repellents in the future²².

Conclusion

The sole purpose of this study was to know about the perception and practices among the rural people regarding mosquito and other vector borne diseases at community level. Knowledge about vectors and vector borne diseases at rural level requires improvement. Results of this study reveals that a critical level of respondents didn't have adequate information with respect to the name of arthropod vectors and vector borne diseases. Lack in knowledge also found in certain percentage of respondents regarding methods and practices of control measures for mosquito and other insects. Study findings also showed that a fair percent of respondents having satisfactory information regarding the name of vector and illnesses transmitted by them, their mode of transmission in addition to distinct control measures for the prevention of vector borne disease. Findings of this study suggest that community-oriented health education modules should be adopted by the government to boom the knowledge of the village people concerning name of precise vectors and the sicknesses transmitted by means of them. In addition, increased efforts have to be made to create community awareness and strengthening expertise and practice of vector control measures to prevent vector borne diseases.

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