Publisher
MEDRESEARCH
www.medresearch.in

International Journal of Medical Research and Review

2021 Volume 9 Number 4 July-August

E-ISSN:2320-8686
P-ISSN:2321-127X

Research Article
Population

A cross-sectional study on knowledge and perception about preventive strategies of selected vector-borne diseases among the rural population of coastal Karnataka

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DOI: https://doi.org/10.17511/ijmrr.2021.i04.01

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Background and Objectives: Malaria and other vector-borne diseases (Dengue, Chikungunya and Filariasis) are a major public health problem in WHO's South-East Asia Region. Due to the growing resistance to pesticides and drugs, there is a need to set up integrated vector management strategies. These strategies should involve local communities in managing the environment to decrease the health risks and increase the sustainability of programmes to control these vector-borne diseases. Hence, an important step in disease management is educating the local community regarding vector-borne diseases and their prevention. **Objectives:** To assess the Knowledge & perception regarding preventive strategies of selected vector-borne diseases among the study population. **Methods:** This study was conducted in two selected villages. A cross-sectional study design was used with a sample size of 966. A questionnaire method was used to collect the data. **Results**: Around 46.5% of them had good knowledge regarding preventive strategies of vector-borne diseases. Whereas, Around 42.2% and 40% of the population had average perception and high perception respectively. **Conclusion:** Even though only half of the population had good knowledge regarding preventive strategies for vector-borne diseases. Most of them had average to high perceptions about preventive strategies. Hence to increase their knowledge many camps and health education activities should be conducted on vector-borne diseases and should mainly emphasize community participation to increase their awareness. So that it leads to better practice which in turn will lead to a decrease in vector-borne diseases.

Keywords: Knowledge, Perception, Vector-borne disease, Preventive strategies

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How to Cite this Article

Priyadarisini NJ, Badiger S, Keerthana D, Subasree NJ. A cross-sectional study on knowledge and perception about preventive strategies of selected vector-borne diseases among the rural population of coastal Karnataka. Int J Med Res Rev. 2021;9(4):205-212.
Available From
https://ijmrr.medresearch.in/index.php/ijmrr/article/view/1303

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Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2021-06-14	2021-06-24	2021-07-06	2021-07-21	2021-07-25

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
No	Nil	Yes	5%	

Introduction

Malaria and other vector-borne diseases are a major public health problem in WHO's South-East Asia Region. Due to increasing resistance to both drugs and pesticides, there is a need to establish integrated vector management strategies.[1]. Vector-borne diseases account for more than 17% of all infectious diseases, causing more than 700 000 deaths annually. They can be caused by either parasites, bacteria or viruses. The burden of these diseases is highest in tropical and subtropical areas, and they disproportionately affect the poorest populations.

Since 2014, major outbreaks of dengue, malaria, chikungunya, yellow fever and Zika have afflicted populations, claimed lives, and overwhelmed health systems in many countries. Other diseases such as Chikungunya, leishmaniasis and lymphatic filariasis cause chronic suffering, life-long morbidity, disability and occasional stigmatization.[2]. These vector-borne diseases mainly affect urban, peri-urban and rural communities but are predominantly seen in communities with poor living conditions like lack of access to adequate housing, safe drinking water and sanitation. Malnourished people and those with less immunity are especially vulnerable [3].

The lack of vaccines and other effective prevention for most VBDs and the complexity of the disease life cycles require highly integrated approaches that target the disease transmission system rather than only the pathogens [4]. There is a need to intensify prevention and control efforts, including controlling vectors, diagnosing and treating diseases early (to remove sources of infection available to feeding vectors), vaccinating, improving water and sanitation systems, cooling urban heat islands, and other intervention [5].

Along with the above interventions a crucial element in reducing the burden of vector-borne diseases is behavioural change in the population.[6]. For the behavioral change to occur in the community. Awareness regarding the disease is required among the population. Awareness and strict regulations play a major role in the prevention of vector-borne disease. For the prevention of vector-borne diseases there should be coordination between the health agencies and the community. For the community to involve actively for the prevention of vector-borne disease there should be an appropriate knowledge and perception regarding preventive strategies.

Once adequate knowledge is inculcated in the community through health education. It is easier to prevent the disease at the grass-root level.

Objectives

01. To assess the knowledge regarding preventive strategies of selected vector-borne diseases
02. To assess the Perception regarding preventive strategies of selected vector-borne disease

Materials & Methods

Study design: Cross-sectional study design

Study setting: This study was conducted in two villages that were under the field practice area of a medical college in Mangalore.

Study duration: 6 months (April to September 2015)

Sample size: Was calculated according to the District census 2011 [7]. The population of Kutthar and Manjanandy villages of Mangalore are 8,919 and 10,401 respectively. A minimum of 5% of the total population was included in the study. With this method the sample size works out to be 966 subjects. The population list was obtained from the Gram panchayath of Kuthar and Manjanady.

Sampling technique: Simple random sampling was done from this list, for the selection of subjects.

Study Population: Adults > 18 years who are residents of Kuthar and Manjanady villages.

Inclusion criteria: Adults > 18 years of age, who are residents of Kuthar and Manjanady villages.

Exclusion criteria: The members or households who were not willing.

Method of data collection: Data collection was done in Kuthar and Manjanady villages which come under the field practice areas of KSHEMA College.

Households were consecutively approached to assess the Knowledge and perception of preventive strategies of selected vector-borne diseases until the desired sample size was reached. The data was collected by interview method using a pre-tested, pre-structured questionnaire after obtaining informed written consent.

Tools used: Questionnaire (pre-tested and pre-structured). It is composed of the socio-demographic section, Housing and Environmental section, Knowledge component and perception

Component (Related to Malaria, Dengue, Chikungunya and Filariasis)

Statistical analysis: Data entry and management were done in excel. SPSS software 16 version was used for Analysis. Proportions were used for all quantitative data's. To know the association between socio-demographic characteristics with knowledge and perception. A Chi-square test was applied.

Ethical considerations: Written informed consent was obtained from all the participants.

Ethical clearance: Ethical clearance was obtained from the Institutional Ethics Committee of K. S. Hegde Medical Academy, Mangalore

Results

Demographic details& Housing, Environmental and Living conditions

In this study around 966 individuals participated. Out of 966 individuals participated. 673(69.7%) were females and 293(30.3%) were males. The mean age of the individuals was 40 years. Demographic details of the study population are elaborated in Table 1. Housing, Environmental and Living conditions of the study population are recorded in Table no. 2

Table 1: Distribution of socio-demographic characteristics

Characteristics	Frequency(n)	Percentage (%)
Gender		
Male	293	30.3
Female	673	69.7
Education		
Illiterate	152	15.7
Primary level	309	32.0
High school	281	29.1
PUC	106	11.0
Graduate	118	12.2
Religion		
Hindu	441	45.7
Muslim	461	47.7
Christians	64	6.6
Occupation		
Unemployed	442	45.8
Unskilled workers	309	32.0
Skilled workers	132	13.7
Professionals	59	6.1
Retired	24	2.5
Socioeconomic status (Modified BG Prasad classification)		
Class II	54	5.6
Class III	201	20.8
Class IV	627	64.9
Class V	84	8.7
Marital status		
Married	742	76.8
Unmarried	224	23.2

The majority 461 (47.7%) of the participants belonged to the Muslim religion and were married 742(76.8%). Most 627(64.9%) of the study subjects belonged to the upper lower class of Modified BG Prasad classification. Around 309 (32%) were educated up to primary level and Majority442(45.8%) of the participants were unemployed, 32% (309.

Table 2: Housing, Environmental and Living conditions

Characteristics	Frequency (n)	Percentage (%)
Type of family		
Nuclear	717	74.2
Extended	249	25.8
Type of house		
Pucca	532	55.1
Semi pucca	406	42.0
Kutcha	28	2.9
Water supply		
Piped	565	58.5
Well water	380	39.3
Others	21	2.2
Waste disposal		
Open disposal	409	42.3
Burial	106	11.0
Burning	363	37.6
Through panchayat dustbins	66	6.8
Others	23	2.3
Drainage of waste water		
Open	706	73.1
Closed	260	26.9
Water stagnation around the house		
Present	358	37.1
Absent	608	62.9

When environmental and housing conditions were enquired. Most of the 717 (74.2%) belonged to a Nuclear family and 532(55%) of the individuals lived in a pucca house, Most 565(58.5%) of them had piped water supply. Most 409(42.3%) of the participants disposed of the waste to an open space and 706(73.1%) of the households had an open drainage system for water. Wastewater was let out openly to the plants in most 753(78%) of the houses

In most 608(62.9%) of the houses stagnation of the water was absent

Knowledge and perception regarding preventive strategies of vector-borne disease

Knowledge regarding preventive strategies was scored. Each correct answer was given a score of 1 and for the wrong answer NO score was given. Based on that a score between 0 and 9 was considered poor or low knowledge and a score more than 10 was considered as good or high knowledge. The perception score was calculated according to the Likert's scale. Based on the Likert's scale score Perception was divided into Low, Average and Good perception. (Table 3)

Table 3: knowledge regarding preventive strategies of vector-borne disease

Is the government of India taking necessary action to prevent VBDs		
	Frequency (n)	Percentage (%)
Yes	680	70.4
No	191	19.8
Don't know	95	9.8
Are these diseases preventable		
Malaria		
Yes	858	88.8
No	39	4.0
Don't know	69	7.1
Dengue		
Yes	835	86.4
No	47	4.9
Don't know	84	8.7
Chikungunya		
Yes	823	85.2
No	42	4.3
Don't know	101	10.5
Filariasis		
Yes	782	81.0
No	48	5.0
Don't know	136	14.1

Table 4: Knowledge regarding Preventive Strategies of VBDs (Contd.)

Personal protective measures against mosquitoes		
	Frequency (n)	Percentage (%)
Repellents	526	54.5
Staying indoors	202	20.9
Screening of the house	211	21.8
Bed nets	586	60.7
Prevention of mosquito breeding		
Avoid stagnation of water	840	87.0
Avoid improper storage of water	758	78.5
Weekly cleaning of tanks	508	52.6
Reduction of mosquito larva		
Larvicidal oil	147	15.2
Larvivorous fishes	424	43.9
Larvicidal powder	203	21.0
Reduction of mosquito density		
Fogging	254	26.3
Spraying	627	64.9
Others (Electronic bat, household measures)	309	32.0

Table 5: perception regarding preventive strategies about vector-borne diseases

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Avoiding mosquito bite is the main preventive factor in VBD	4(0.4)	6(0.6)	65(6.7)	587(60.8)	304(31.5)
Spraying, use of bed nets, coils helps in preventing VBD	5(0.5)	17(1.8)	72(7.5)	465(48.1)	407(42.1)
Prevention of stagnant water & covering of water containers/overhead tanks prevents VBD	11(1.1)	8(0.8)	98(10.1)	491(50.8)	358(37.1)
Do you think some fishes are useful in controlling mosquito larva in water.	6(0.6)	42(4.3)	366(37.9)	372(38.5)	180(18.6)
Application of mosquito larvicidal oil/larvicidal powder to water is also used to prevent VBD	3(0.3)	30(3.1)	437(45.2)	361(37.4)	135(14)
Cleaning weeds and tall grass will reduce the density of mosquitoes near houses	14(1.4)	28(2.9)	189(19.6)	456(47.2)	279(28.9)
Insecticides sprayed into atmosphere in the form of mist/fog prevents VBD	4(0.4)	13(1.3)	166(17.2)	517(53.5)	266(27.5)
Cleaning open tanks once a week prevents breeding of mosquitoes.	3(0.3)	7(0.7)	141(14.6)	516(53.4)	299(31)

Screening of houses prevents VBD to a large extent	3(0.3)	26(2.7)	185(19.2)	494(51.1)	258(26.7)
Burning neem leaves, coconut shells and husks are used to repel mosquitoes which helps in the prevention of VBD	11(1.1)	21(2.2)	247(25.6)	478(49.5)	209(21.6)
Community participation plays a vital role preventing VBD	15(1.6)	11(1.1)	149(15.4)	496(51.3)	295(30.5)
Health workers should regularly educate the community about vector-borne diseases	18(1.9)	12(1.2)	76(7.9)	440(45.5)	420(43.5)
VBD can be best prevented by the integrated effort of government initiatives and community acceptance and participation	9(0.9)	5(0.5)	113(11.7)	449(46.5)	390(40.4)
If there is a free vaccine available for vbd, it is better to vaccinate children	7(0.7)	18(1.9)	196(20.3)	292(30.2)	453(46.9)

Based on the Total scores around 46.5% of them had good knowledge and 53.5% of them had poor knowledge regarding preventive strategies of vector-borne diseases. Concerning Perception Most (42.2%) of them had average perception, 40% of them had high perception and 17.7% of them had a low perception about preventive strategies of vector-borne diseases (Table 6)

Table6: Knowledge and Perception regarding preventive strategies of vector-borne diseases

Knowledge Regarding Preventive Strategies of VBDs		
	Frequency (n)	Percentage (%)
Low/Poor	517	53.5
High/Good	449	46.5
Perception regarding Preventive Strategies of VBDs		
Low	171	17.7
Average	407	42.1
High	388	40.2

Association between sociodemographic characteristics and knowledge, perception regarding preventive strategies of vector-borne disease

On associating. There was no significant difference between knowledge scores for preventive strategies and socio-demographic characteristics.

With respect to Perception Good/ High perception was associated with females (p value 0.05, chi: 15.6), Class II SES (p value < 0.05, chi:14.9) and higher level of education (p value < 0.05, chi:17.2)

Association between Knowledge and perception regarding preventive strategies of vector-borne disease

When Knowledge and perception were associated. Around 68.3% of the people who had high perception had good knowledge regarding the prevention of vector-borne diseases.

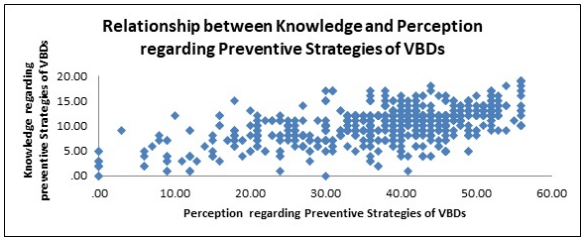
Likewise 95.3% of the people who had low perception had low knowledge and the association was statistically significant (p-value:<0.05, chi:1.961) (table 7)

Table 7: Association Between Knowledge and Perception Regarding Preventive Strategies Of Vbds

	Low knowledge	High knowledge	P-value
Low perception	163(95.3%)	8(4.7%)	<0.05 CHI: 1.961
Average perception	231(56.8%)	176(43.2%)	
High perception	123(31.7%)	265(68.3%)	

To know the relationship between knowledge and perception about preventive strategies of vector-borne disease Pearson correlation and simple linear regression was used. A positive correlation between knowledge and perception regarding preventive strategies of VBDs were seen. (Pearson Correlation = 0.475, p value= <0.05).(Figure 1)

Figure1: Knowledge and Perception of Preventive Strategies



On using simple linear regression between knowledge and perception regarding preventive strategies of VBDs. They had a positive relationship which was significant with the equation.

Knowledge (Preventive strategies) = 3.806 + 0.173(Perception). i.e., For every unit increase in Perception. The knowledge regarding preventive strategies of VBDs increased by 0.173 units.

Discussion

In our study population. Around 891(92.3%) of the study population agreed that avoiding mosquito bites is the main factor for prevention. Likewise in a study by Joshi AB et al 42% of them told that avoiding mosquito bites prevents malaria [8]. Around (57.1%) of the study population felt that the use of certain fishes is useful in the prevention of VBDs. In a study by Joshi A B et al. Very few knew about the usage of larvivorous fish in limiting mosquito population [8]. Cleaning weeds and trash items around the house were considered as a measure to reduce mosquito density by (76.1%) of the people similarly in a Study by Joshi AB et al 32 % told that removing bushes in the surroundings reduces VBDs [8]. Use of bed nets, coils and sprays were considered as one of the methods to prevent VBDs by 90.2% of the population and in a study by Joshi AB et al. also around 92% told use of bed nets also protects from mosquito bite [8]. Household measures like burning leaves and coconut shells were considered as a measure to repel mosquitoes by (71.1%) of them. In a study conducted by Joshi AB 12% agreed about creating smoke through household items [8]. Preventing stagnant water was also considered as one of the Methods to prevent VBDs by 887.9% of the population. Similarly in the study conducted by Anand T et al. Cleaning tanks weekly was considered as a measure to reduce mosquito breeding by 815(84.4%) of the people [9].

In the study by Doke P P et al 38% suggested weekly dry days [10]. Around (77.8%) of the population felt that screening of the house will surely prevent them from acquiring VBDs. Whereas In study of Unnikrishnan et al Most of them knew about (45.8%) screening of windows [11]. The role of community was considered important by 791(81.8%) of the population. In the study by Perez et al Most of them agreed that community participation is required to tackle the disease [12]. In the study by Perez et al population expected that government should collaborate and co-operate with the community and also provide public services in the disposal of waste. [12]. In a study conducted by Amul B et al 76.5% mentioned mosquito control was the government's responsibility [13]. If there was a vaccine available for VBD (77.1%) of them were told that they would vaccinate their child. The integrated effort by the government and the community was considered the best way to combat VBDs by (86.9%) of the population

On associating knowledge regarding preventive strategies with socio-demographic characteristics. Educated (60%) people knew more about repellents compared to uneducated (48%) (p-value: < 0.05, chi:31). Similarly people belonging to the upper social-economic class (77.8%) were more aware compared to people of low socio-economic class (41.7%). (p-value:< 0.05, chi: 18.3). In a study by Kumar A et al. males and had better knowledge about insecticide spray and space spray [14].

With respect to Awareness regarding prevention of stagnation of water. Knowledge was more in males (91.8%) compared to females (84.8%). (p-value:< 0.05, chi: 8.7). likewise educated (89%) had more knowledge compared to the uneducated (83.6%) (p-value: <0.05, chi:12.7). Similarly people of upper socioeconomic class (100%) had better awareness compared to people of lower socioeconomic class (83.3%). In a study by Ahmed Education was also an influencing factor on knowledge of preventive strategies [15].

Females had a high perception compared to males which was statistically significant. Low perception (17%) was seen in people belonging to class V of SES compared to Class II which was statistically significant. Average to high perception was seen high among graduates (84.7%) compared to the uneducated (74%) which was statistically significant. Which was similar to a study by Ahmed et al. Where Education was also an influencing factor on knowledge regarding transmission and preventive strategies [15]. In another study by Dhimal et al There was a significant association between education and preventive practice [16].

A positive correlation between knowledge and perception regarding preventive strategies of VBDs(Pearson Correlation = 0.475, p value= <0.05 which was similar to study by Dhimal et al.where there was a positive correlation between knowledge and attitude, between knowledge and practice and between attitude and practice[16]Similarly study by Liu et al The correlation analysis showed a significant positive linear correlation between knowledge and experience scores, experience and practice and knowledge and practice scores [17].

Conclusion

Even though only half of the population had good knowledge regarding preventive strategies of vector-borne diseases. Most of them had average to high perceptions regarding preventive strategies.

In item analysis, Education showed a significant difference with good knowledge and perception. Hence, education plays an important in acquiring knowledge. Knowledge and perception had a positive correlation. This means that as perception increases knowledge increases.

Recommendations

To Increase their knowledge regarding preventive strategies many camps and health education activities should conduct on vector-borne diseases and should mainly emphasize community participation to increase their awareness. So that it leads to better practice which in turn will lead to a decrease in vector-borne diseases.

Contributions By Authors

Priyadarisini NJ: Planning and conduction of the study. **Sanjeev Badiger:** Co-investigator, Guidance and supervision throughout the study period. **Dr. D Keerthana:** Data Analysis and Paper Writing. **Dr. Subasree NJ:** Data Analysis and Paper writing

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