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Original Research Article

Assessment of knowledge, attitude, practice towards vector borne diseases in urban area of Bagalkote, Karnataka, India

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ABSTRACT

Background: Vector-borne diseases are a widespread and serious issue that affects populations all over the world and represent a global health challenge. These diseases, like malaria, dengue and chikungunya pose immense challenges due to their rapid transmission and leading to major public health crises during outbreaks. Effective management strategies, including vector control, public health interventions are crucial to curb their impact. The burden of VBDs extends beyond public health, impacting society and economies. These diseases can strain healthcare systems, reduce workforce productivity, and impose significant financial costs. Annually, alarming 700,000 deaths are attributed to vector-borne diseases, underscoring the urgency of addressing this issue. Aim was to assess and evaluate knowledge, attitude and practice towards vector borne diseases in urban area of Bagalkote.
Methods: This is an educational interventional study. This study will be conducted among the urban area of Bagalkote. The study was carried out for 6 months.
Results: In this study among 165 participant's knowledge of vector borne diseases was quite good. Majority of study subjects were aware about VBD causes death if untreated. Regarding the most frequent mosquito biting period maximum participants 99.39% responded with evening/night time. Almost 95.75% resonance had knowledge, that mosquito bite is the cause of dengue, malaria, chikungunya. The study revealed that majority participants considered dengue, malaria, chikungunya is serious health problem and their attitude vector control measures were positive in almost all study subjects.
Conclusions: The results are very positive and we suggest that people should continue to strengthen their knowledge, attitude and practice towards vector borne diseases. Participants showed adequate awareness towards vector borne diseases.

Keywords: Vector-borne diseases, KAP, Malaria, Dengue, Chikungunya

INTRODUCTION

Vector-borne diseases (VBDs), including significant illnesses such as malaria, dengue, and chikungunya, impose a substantial burden of suffering and death worldwide, with the most vulnerable populations bearing the brunt of their impact.[1] Many VBDs are classified as neglected tropical diseases (NTDs), e.g., diseases like malaria dengue and chikungunya.[2] India is no exception to this health crisis, as it grapples with the challenges of

uncontrolled urbanization, rapid industrialization, and a surging population, further exacerbated by the migration from rural to urban areas.[3] Vector control is the primary strategy employed to combat these diseases, with a rich historical background.[4,5] These VBDs, which can be caused by various pathogens, including parasites, bacteria, or viruses, represent over 17% of all infectious diseases globally and are responsible for more than 700,000 deaths each year.[6,4] Historically, vector control has been vital in curbing vector-borne diseases. Initially, it relied on a deep understanding of vector ecology and environmental management.[7] However, a shift to insecticide-based methods, particularly in malaria control, led to complacency and infrastructure dismantling, contributing to resurgence in vector-borne diseases due to factors like insecticide resistance and human migration. [3] Despite significant resources, these diseases persist and are often misdiagnosed in developed countries. The review emphasizes the biology of vector-borne diseases, major pathogens, and transmission by vectors like mosquitoes, ticks, and sand flies. Vector control strategies vary, focusing on personal and community protection, with new methods in development. Effective implementation depends on strong organizational support, such as from the World Health Organization. Common issues in returned travellers include fever, diarrhoea, skin rashes, and respiratory conditions, necessitating consideration of disease geography and incubation periods for accurate diagnosis and care.[6,8]

India, particularly Karnataka, faces endemic malaria and other vector-borne diseases. The government's efforts include the National Malaria Control Program (now National Vector Borne Disease Control Program), initiated in 1952. This program emphasizes prevention through environmental control, source reduction, health education, legislation, and community involvement. Personal protective measures like mosquito nets, screens, repellents, anti-mosquito products, and Long-Lasting Insecticide Treated Bed Nets (LLITNs) are provided to safeguard against mosquito-borne illnesses.[9,10] Malaria is a significant global health issue, causing 219 million cases and over 400,000 deaths annually, mainly affecting children under 5.[11] India is a major concern, with 95% of its population residing in endemic areas, mainly tribal, hilly, and inaccessible regions. India accounts for 75% of malaria cases in Southeast Asia and ranks 18th globally in reported cases and 21st in reported malaria-related deaths. High-burden states include seven north-eastern states and nine others. Malaria in India is primarily caused by *P. falciparum*, with frequent outbreaks. While reported cases decreased from 114 million in 1995 to 0.53 million in 2012, the proportion of *P. falciparum* cases increased to 50.01%, and the highest malaria-related deaths occur in specific states.[12]

Dengue, transmitted by Aedes mosquitoes, is a global concern affecting over 3.9 billion people and causing 96 million cases with 40,000 deaths each year. Dengue is now a risk for 2.5 billion people worldwide, with 50-100 million yearly infections. It's endemic in more than 100 countries. In India, dengue is widespread, with 74,201 cases and 167 deaths reported in 2013. Outbreaks are recurring, spreading to new areas, including rural regions, in states like Andhra Pradesh, Delhi, Gujarat, Karnataka, and more. Chikungunya is a viral disease transmitted by mosquitoes. It was first identified in 1952 in Tanzania and is known for causing severe joint pain. The disease is found in Africa, Asia, and the Indian Subcontinent, with mosquito vectors now present in Europe and the Americas. A significant outbreak occurred in the Indian Ocean Islands in 2005-2006.[12]

In India, chikungunya had major outbreaks in the 1960s and early 1970s. After a 32-year gap, a severe outbreak affected over 1.4 million people across 13 states in 2006. In 2017, there were 16,976 reported cases, with Karnataka (8,930 cases), Maharashtra (2,379 cases), and Gujarat (2,103 cases) having the highest numbers.[4] Certain population groups are at higher risk for vector-borne diseases: Young children, Non-immune pregnant women, People with HIV/AIDS and International travellers from non-endemic areas. Vector-borne diseases pose a significant global health threat. [12,5] Community participation is crucial for outbreak prevention and control. Understanding community knowledge, attitudes, and practices regarding these diseases is essential for an effective health education strategy. This study was conducted in the urban area of Bagalkote to address these concerns. The aim of this study is to evaluate the knowledge, attitudes, and practices (KAP) regarding vector-borne diseases within the urban population of Bagalkote. Its objectives include analysing the baseline KAP related to malaria, dengue, and chikungunya, improving KAP through health education, and assessing changes in KAP following the intervention.

METHODS

This educational intervention study was conducted at the urban health centre in Bagalkot, with a study population consisting of individuals aged 15 and older from the urban area of Bagalkote. The study spanned six months (April 2022 to November 2022), involving the initial collection of urban area details, the development of data collection forms, a pilot study, pre-study data collection, a month of educational intervention, post-study data collection, and two months for data analysis, typing, and printing.

Inclusion and exclusion criteria

Inclusion criteria encompassed individuals above 15 years old and who were willing to participate, while exclusion criteria applied to individuals who unwilling to participate or below 15 years of age.

Based on review of literature, knowledge regarding vector borne diseases among urban population was found

88.1%.[9] The total sample size for the study is 165 we got it by using Open Epi version 2 software. Total number of people were verified and distributed the locality and list was prepared in field practice area of urban health training centre (UHTC). In this study, data collection was carried out through a questionnaire-based approach to assess the knowledge, attitudes, and practices (KAP) related to vector-borne diseases, specifically malaria, dengue, and chikungunya, among the Urban population of Bagalkot. The questionnaire, designed by the study team, was distributed to individuals aged over 15 years. Anonymity was ensured to prevent social desirability bias, and the questionnaire used multiple-choice questions.

The questionnaire had four main sections: Demographic data, including gender, age, occupation, and education status. Knowledge about vector-borne diseases, covering aspects like parasites, viruses, epidemiology, disease, pathology, clinical features, and management. Attitudes towards these diseases, focusing on personal perceptions, including fear, insecurity, optimism, and responsibility. Practices related to vector-borne diseases, including the appropriate use of insect repellent, effective environmental management, and personal hygiene in work and social life.

The analysis of collected data focused on several parameters, including the age groups and gender of participants, their education status, baseline data regarding knowledge, attitude, and practices related to vector-borne diseases among the urban population. It also examined any previous knowledge individuals had about diseases like malaria, dengue, and chikungunya, as well as the post-test changes in knowledge, attitude, and practices concerning these diseases.

The measures and scoring system used for assessing knowledge, attitude, and practices were standardized: Knowledge was assessed using 10 items, with each question offering three response options. Scores of 3 were given for correct answers, 2 for neutral responses, and 1 for wrong answers. Scores ranged from 0 to 10, categorized as poor knowledge (1-9), average knowledge (10-19), and good knowledge (20-30). Attitudes were evaluated using 10 items and a similar scoring system, resulting in negative attitude (1-9), neutral attitude (10-19), and positive attitude (20-30). Practices were assessed with 10 items and the same scoring method, leading to poor practice (1-9), average practice (10-19), and good practice (20-30).

Statistical analysis

Statistical analysis was performed using software like MS Excel, and appropriate tests, such as the paired t test, were applied when necessary. The data was presented in tables, graphs, and figures and the results were interpreted and compared with previous studies.

RESULTS

In this study involving 165 participants, the gender distribution showed that the majority, accounting for 53.9%, were female, while males constituted 46.1% of the participant pool.

Table 1: Socio-demographic Characteristics of study population.

Socio-demographic Characteristics	N	%
Age (years)		
15 -19	18	10.90
20-29	59	35.80
30-39	36	21.80
40-49	28	17
50-59	18	10.90
60-69	4	2.40
70-79	2	1.20
Gender		
Female	89	53.90
Male	76	46.15
Education		
Nil	9	5.50
Primary	19	11.50
Lower secondary	19	11.50
Secondary	28	17
Higher secondary	33	20
Diploma	8	4.80
UG	41	24.80
PG	8	4.80
Socio-economic status		
Below average	34	20.60
Average	102	61.80
Above average	29	17.60

The age distribution revealed that the highest number of participants fell within the 20-29 years age group, making up 35.8% of the total. The 30-39 years age group represented 21.8%, followed by the 40-49 years age group at 17%. Additionally, there were 10.9% of participants in both the 50-59 years age group and the 15-19 years age group. Smaller percentages were observed in the 60-69 years age group (2.4%) and the 70-79 years age group (1.2%). Regarding the participants' educational backgrounds, the largest group, at 24.8%, had completed undergraduate (UG) education, while 20% had a higher secondary education, and 17% had a secondary education. Additionally, 11.5% had lower secondary and primary education, respectively. A smaller percentage, 5.5%, had no formal education (NIL), and 4.8% each had completed either a diploma or postgraduate (PG) education. When assessing the social economic status of the participants, the majority, comprising 61.8%, considered themselves to have an "Average" status. A significant percentage, 20.6%, categorized themselves as "Below Average," while 17.6% rated their status as "Above Average" (Table 1).

Table 2: Assessment of knowledge regarding vector-borne disease in the study subject.

Question	Pre-study			Post-study		
	Yes	No	Don't know	Yes	No	Don't know
Did you have Dengue/Malaria/ Chikungunya?	51	106	8	53	106	6
Do you know someone from your family or friend diagnosed with Dengue/ Malaria/Chikungunya?	82	76	7	84	76	5
Does Dengue virus/Malaria/ Chikungunya infection parasite transmit from infected pregnant mother to baby?	27	42	96	31	92	42
Can vector borne diseases cause death?	106	9	50	147	14	4
The same person can be infected with Dengue/Malaria/Chikungunya more than once?	104	37	24	137	18	10

Table 3: Assessment of attitude regarding vector-borne disease in the study subject.

Question	Pre-study			Post-study		
	Yes	No	No response	Yes	No	No response
Is it possible to control mosquitoes?	106	24	35	163	0	2
Do you believe Dengue/Malaria/ Chikungunya is a problem in Bagalkote?	98	14	53	149	1	15
Do you believe any outbreak of Chikungunya been reported in Bagalkote?	67	37	61	73	24	68
Is your attitude towards vector control is positive?	113	9	43	164	0	1
Do you allow health workers to take blood samples?	106	28	31	144	4	17
Will you take part in public activity for vector control or removal of mosquito breeding sites?	103	14	48	158	2	5

Table 4: Assessment of practice regarding vector-borne disease in the study subject.

Question	Pre-study			Post-study		
	Yes	No	No response	Yes	No	No response
Did government take any measures to prevent the transmission of vector borne disease?	116	19	30	161	1	3
Do you keep the Malaria/Dengue/ Chikungunya infected person separate?	33	56	76	76	71	18
Is there any specific vaccine available for Chikungunya prevention?	23	50	92	6	152	7
Do you call health authority for fogging?	50	74	41	97	37	31
Do you call private pest control?	25	95	45	89	47	29
Do your empty flower pots and vases at least every week?	97	22	46	133	5	27
Any dietary restriction to a person who has Malaria/Dengue/Chikungunya?	41	48	76	49	84	32
Served by garbage collection truck?	126	10	29	140	14	11

In present study result indicates that at end point assessment 32.12% of the study subject had dengue, malaria, chikungunya, were as majority of study subjects didn't have and 3.63% of study subject don't know that dengue, malaria, chikungunya in the past. Additionally, 49.69% were aware of someone in their family or among their friends being diagnosed with these diseases, while 50.30% were not aware. A total of 50.90% were aware of someone in their family or among their friends being diagnosed with these diseases, and 49.09% were not aware. The pre-knowledge assessment revealed that 83.36% of study subjects were unaware that the infection could transmit from an infected pregnant mother to her baby. After the educational intervention, this percentage decreased to 81.21%, indicating a slight improvement.

Initially, only 16.36% of participants were aware of this transmission route, which increased to 18.78% after the intervention. Furthermore, 64.24% of participants were aware that vector-borne diseases (VBDs) can cause death in the pre-knowledge assessment, and this awareness significantly increased to 89.09% after the educational intervention. Regarding the knowledge of whether the same person can be infected with dengue, malaria, or chikungunya more than once, 36.96% were not aware during the pre-assessment. This percentage decreased to 16.96% in the post-assessment (Table 2).

Initially, 84.24% were aware of the factors that increase mosquito spread, and after the intervention, this awareness remained the same at 98.78%. In the pre-study

assessment, 95.75% of study subjects were aware of the mode of transmission, and this remained consistent at 100% in the end-point assessment.

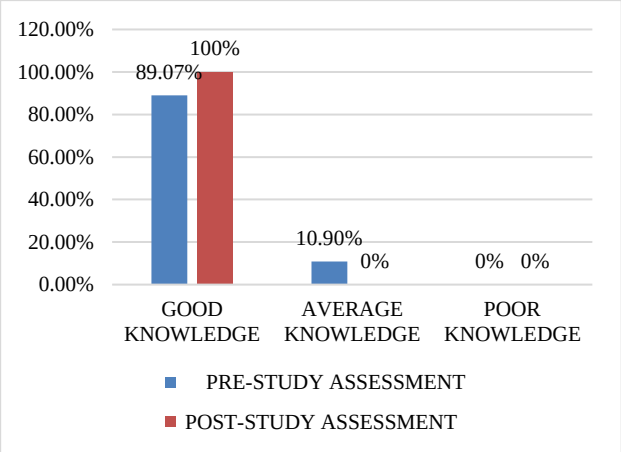

Figure 1: Bar chart showing knowledge level of study subjects regarding vector-borne disease.

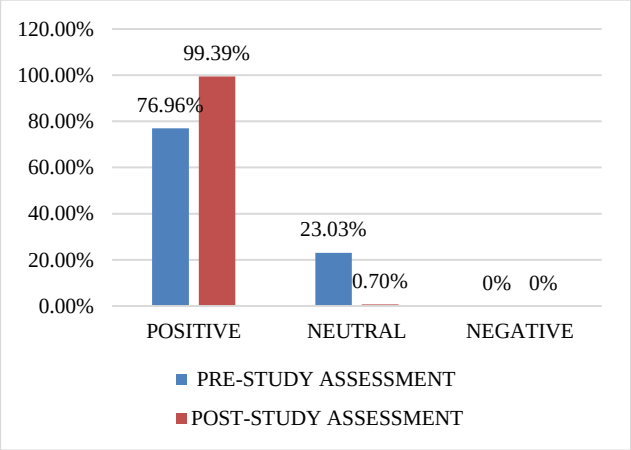

Figure 2: Bar chart showing attitude in the study subjects regarding vector-borne disease.

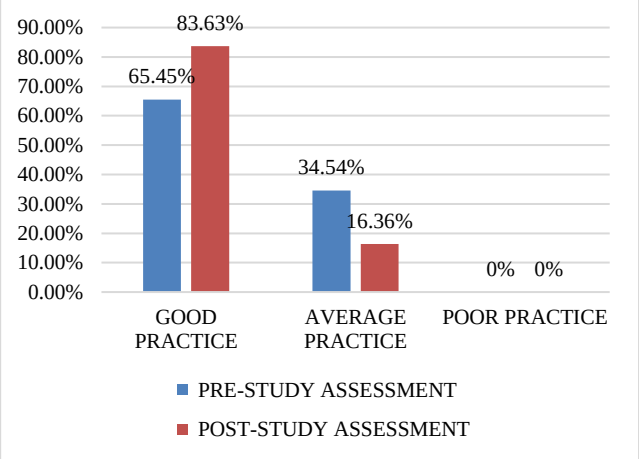

Figure 3: Bar chart showing practice in the study subjects regarding vector-borne disease.

Regarding knowledge about the most frequent mosquito bite period, 75.75% of participants answered correctly in the pre-study assessment. This percentage increased to 92.12% at the end-point assessment. Importantly, the majority of participants in both pre and post assessments obtained information about mosquito-borne diseases from healthcare professionals, emphasizing the critical role of healthcare providers in disseminating knowledge and awareness. In the pre-study assessment, a significant majority of the 165 participants, accounting for 89.07%, demonstrated good knowledge regarding vector-borne diseases. A smaller portion, 10.9%, had average knowledge, and none had poor knowledge. However, after the educational intervention, all 165 participants exhibited good knowledge, reflecting a substantial improvement across the board (Figure 1).

The educational intervention had a significantly positive impact on participants' attitudes, particularly in terms of mosquito control and recognizing vector-borne diseases as problems. Positive attitudes improved, negative attitudes decreased, and participants became more willing to cooperate with health workers and engage in public activities for vector control (Table 3). In the post study assessment, there was a significant positive shift in participants' attitudes. More of them believed that Dengue/Malaria/Chikungunya is a serious health problem, increasing from 64.24% to 90.30%, while negative attitudes dropped from 14.54% to 0.21%. Additionally, participants' willingness to consult a physician in case of fever symptoms significantly improved, rising from 88.48% to 100%. A substantial majority, 79.39%, believed that both the government and the people are responsible for mosquito eradication, and this positive attitude reached 100% in the end point assessment. Among the study participants, 73.93% were initially very concerned about catching mosquito-borne diseases, which increased to 96.36% after the educational intervention, while only 24.24% were initially not concerned, which decreased to 2.42% in the end point assessment.

In the pre-study assessment, most participants (76.96%) had a positive attitude toward vector-borne diseases, with no one holding a negative attitude. After the educational intervention, the vast majority (99.39%) maintained a positive attitude, with very few (0.7%) having a neutral attitude (Figure 2). Participants showed significant improvements in various aspects of practice. These included greater awareness of government measures for disease prevention (from 70.30% to 97.57%). Good practices, like keeping infected individuals separate, increased from 20% to 46.06%. Participants improved in practices such as calling health authorities (from 30.30% to 58.78%) and maintaining flower pots and vases (from 58.78% to 80.63%), with corresponding reductions in poor practices. Dietary restrictions for those with Dengue/Malaria/Chikungunya increased (from 24.84% to 50.90%). Waste collection

services also improved, with 84.84% being served by garbage collection trucks (Table 4).

Table 5: Comparison of mean score of KAP Pre and Post study intervention of study subjects using paired t test.

KAP	Average score		T value	P value
	Pre-Study	Post-Study		
Knowledge	24.55±3.280	26.88+2.193	11.247	<0.0001***
Attitude	24.78+7.076	28.27 +2.415	5.580	<0.0001***
Practice	21.33+4.176	25.00+3.768	9.545	<0.0001***

All values are expressed as average score, p<0.0001 using paired t test, *** indicates its highly significant.

In our study, there was a significant improvement in the proportion of study subjects practicing good practices, which increased from 65.45% to 83.63%. Additionally, the proportion of study subjects with average practice decreased from 34.54% to 16.36% (Figure 3). Effective educational intervention significantly improved the mean KAP scores among the study subjects. In the pre-study assessment, the mean scores were 24.55±3.280 for knowledge, 24.78±7.076 for attitude, and 21.33±4.176 for practice. After the intervention, there was a remarkable increase in mean KAP scores, which were 26.88±2.193 for knowledge, 28.27±2.415 for attitude, and 25.00±3.768 for practice. The comparison between mean scores in the pre-assessment and end-point assessment showed high significance ($p < 0.0001$), indicating the effectiveness of the educational intervention (Table 5).

DISCUSSION

The study conducted in Bagalkote highlighted a significant surge in Vector-Borne Diseases (VBD) cases. Neglecting attitudes towards the disease was identified as a major contributing factor to its spread. Furthermore, the lack of cleanliness and hygiene in slum areas was also noted as a significant contributing factor. One crucial factor identified was the Bagalkote reservoir and artificial water collection areas, which provided ideal breeding grounds for mosquitoes. The preference of mosquitoes for shallow pools, coupled with the presence of shorelines in the reservoir, exacerbated the issue. Additionally, the impact of climate change in Bagalkote was found to influence the increasing number of VBD cases. In terms of knowledge, the study reported that the majority of participants were aware that VBDs could lead to death if left untreated. This finding was consistent with similar studies, such as the one conducted by Animesh et al.

The awareness of mosquito-biting times, primarily in the evening/night, was widespread among the participants, aligning with the results of a study in rural Mangalore.[13] Almost 95.75% of the respondents correctly attributed dengue, malaria, and chikungunya to mosquito bites, which was in line with the findings of Animesh et al. [5] The study revealed that the majority of participants considered these diseases to be serious health problems and had a positive attitude toward vector control measures, consistent with results from a study in rural Mangalore. [13]

A significant proportion of participants demonstrated a willingness to consult a physician in case of fever symptoms, which was consistent with the findings of Animesh et al. Moreover, the majority of participants believed that the government took measures to prevent disease transmission, similar to results in the study conducted in the urban area of Bhavnagar by Mehta et al.[9] Personal protection was seen as an important preventive measure, with 98.78% of people using coil/all-out for mosquito control, 1.21% using window mesh/bed nets, and 30.04% using bed nets for prevention of VBD, as observed in the study conducted in rural Mangalore. [13] Overall, the study found that the majority of participants had good knowledge, a positive attitude, and adopted good practices towards VBD prevention. This suggests that community awareness and proactive measures, including government initiatives and personal protection methods, play crucial roles in mitigating the spread of VBDs in Bagalkote. The findings also support the importance of public health campaigns and education to further enhance knowledge and positive attitudes toward VBD prevention in the region.

Limitations

The significant limitations in our study impact the reliability of our findings. Firstly, the reluctance of some individuals to answer questions poses a challenge. They felt it's a waste of time and had a mindset where they neglect the importance of participating. This non-response can lead to an incomplete understanding of views on diseases spread by vectors, creating a potential bias in our study. Secondly, some people who aren't well-educated were afraid to participate. They worried that if they shared information, the government might report it, and make them go to the hospital. This fear is based on wrong myths, making it hard to get the right answers from this group. This introduces a non-response bias, as their perspectives, influenced by misinformation, may significantly differ from those who participate willingly. This limitation shows importance of implementing targeted educational efforts to dispel myths, we need to educate the people the right information so they feel more comfortable taking part in future studies.

CONCLUSION

The conclusion of the study emphasizes the positive results and highlights the importance of ongoing efforts to enhance knowledge, attitudes, and practices related to vector-borne diseases. In the study despite individuals having good knowledge and positive attitudes towards vector-borne diseases but outbreaks continue to be reported. This persistence highlights the alarming trend of neglected behaviour towards these diseases, contributing to the rising number of VBD cases each year. Urgent efforts are needed to bridge the gap between awareness and action to effectively and it also underscores the urgent need for more comprehensive awareness campaigns. The study points to Information Education and Communication (IEC) as a crucial tool to educate the community about the diseases, their treatment, and prevention. Furthermore, the study acknowledges that even on a global scale, there is a need for increased awareness regarding the spread of VBD, as well as prevention and control measures. While the government has been involved in spreading awareness, the conclusion suggests that additional educational programs and workshops should be organized. These initiatives aim to not only enhance understanding but also dispel any misconceptions or myths surrounding VBD. The conclusion ends with a powerful reminder that health is often undervalued until illness strikes, emphasizing the importance of prevention. It urges individuals and communities to take proactive measures to protect themselves against vector-borne diseases. In summary, the study's conclusion stresses the significance of continued education and awareness campaigns to combat VBD effectively.

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