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Knowledge, Practice, and Awareness about Preventive Measures of Chikungunya among Traders Community in Mitford Region of Dhaka City

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Authors' contributions

This work was carried out in collaboration among all authors. Study concept and designed by authors FA and NB. Authors HJ and NB did the acquisition of data. Authors FA and NB managed the analysis and interpretation of data. Author FA wrote the first draft of the manuscript. Critical revision of the manuscript for important intellectual contented by authors HJ and NB. Authors FA and HJ managed the data analyses of the study. Administrative, technical and material supports by authors NB and HJ. All authors have read and agreed to the published version of the manuscript.

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ABSTRACT

Aim: Chikungunya virus (CHIKV) is an arbovirus transmitted by Aedes mosquitos that causes a regional epidemic and becomes a remarkable public health problem. Chikungunya disease outbreak was first identified in Bangladesh in 2008. Very limited information is available to assess knowledge, practice, and awareness of the community to prevent Chikungunya. As community engagement and motivational interventions are mainly focused to prevent mosquito bite and to control their breeding, the aim of this study was to assess knowledge, practice, and awareness (KPA) of the community for preventive measures about Chikungunya.
Methods: This descriptive cross-sectional study was conducted in Mitford region of Dhaka city from January to May 2021 among 280 traders and data were collected using a self-administered structured questionnaire and observational checklist.
Results: Most of the respondents had informed about Chikungunya from media (41.79%). About 50.71% respondents were informed about the transmitted vector of chikungunya and out of them,

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47.18% also had knowledge that Aedes variant is the specific vector for this disease, but more than half (55.71%) did not know that it is a viral borne disease. Again, only 16.43% of the respondents knew about the actual biting time. Study also revealed that 38.93% respondents practiced bed net, 18.21% mosquito coils and 13.22% aerosol as effective preventive measures. Only 25% aware to keep drain, free from blockage, 20.72% aware to change water from house plant container and only 6.79% aware to notify city corporation authority to take necessary action to prevent spreading of disease though 50% of the respondent stated that they were aware about government existing activity of fogging the areas, destroying the bush (23.93%) and improving water drainage system (18.93%) that effectively destroy further breeding of vector and spreading of transmission. About 67.5% took paracetamol as the primary management and 11.79% aware to take bed rest but 11% did not aware about the management. 62% were conscious about the joint complication but 28.22% did not have any idea.

Conclusion: This study found that community had lack of knowledge, practice, and awareness to take proper preventive measures that might be improved by formulating an extensive community-based guideline involving the concerned municipal authority and other stockholders by updating the gaps in knowledge, practice and to organize awareness tracing program among the community.

Keywords: Ades mosquito; Chikungunya; KPA; epidemic; preventive measure.

1. INTRODUCTION

Chikungunya is a reemerging arboviral disease that is caused by the Chikungunya virus (CHIKV) of the Togaviridae family and possess a positive strand RNA genome [1-8]. It is transmitted from man to man through the bite of female mosquitoes of the aedes species, mainly Aedes Aegypti, Aedes albopictus and Aedes polynesiensis [2,3,4]. This disease is characterized by sudden and severe fever, headache, skin rash, muscle, and joint pain. The most affected joints are the small peripheral joints such as ankles, wrist, and phalanges but involvement of large joints such as knee and shoulder are also reported. About 72-97% clinical signs were reported as multiple joints pain. In fact, the name “Chikungunya” means “that which bends up’’ in the Makonde language of East Africa, referring to the posture that the affected patient acquires because of the pain to the joint [5]. Again, the most severe form of this disease has been reported with neurological, dermatological, cardiovascular, and respiratory system problems but few reports of mortality have been documented [4,6]. Neonates, elderly, diabetic and immunocompromised persons are high risk groups of this disease.

This virus was first identified during an epidemic of febrile polyarthralgia in Newala district of Tanzania in 1952 [7]. Subsequently outbreak have been reported in more than 60 countries and since 2005 large number of cases reported in Singapore, Malaysia, and Thailand that is becoming a significant public health concern in Southeast Asia with [8,9]. The outbreak in India affected at least 13 states and more than 1.39 million people [10]. Epidemiologic studies stated that about 3 million people are infected each year, and around 1.3 to 2.7 billion people are presently residing in at-risk of this disease spread [11]. In Bangladesh, the first outbreak was detected in 2008 (39 cases) in two villages of Northwest areas near to the border of India [12,13]. Initially transmission was geographically confined in these two villages. However, in the following years infrequent outbreaks occurred in Bangladesh which are in 2011 (196 cases), 2013, 2014, 2015 and 2016 [14]. In 2017, 2,314 patients with febrile polyarthralgia were documented from 23 districts of the country and 13,000 clinically substantiated incidents were stated in Dhaka city [15,16,17]. After that, the ministry of Health and Family Welfare, GOB, took rapid actions to explore the vector and cases of CKG and finally they confirmed the epidemic spread of this viral disease. In their study, it was also discovered that the CKG virus in 2017 outbreak was a novel variant and genetically different from the strain observed in former outbreak.

Chikungunya is now a big challenge in Bangladesh since lack of diagnostic facilities in government hospitals as well as appropriate documentation system. Moreover, at present no vaccine is available for CHIKV. Hence, the community should practice preventive measures to alleviate the risk and severity of the disease. Again, the fatal rate is less due to this disease, but the clinical complication is associated with reduced quality of life (QOL). In one study, it was found that the QOL was reduced 20 times more

in non-recovered CKG affected patients while for recovered patients it was 5 times more as compared with the healthy control group [18].

The spreading time of CKG usually coincides with the breeding time of mosquitoes, particularly when intermittent rain occurs in Summer and Rainy season. They breed in stored fresh water of domestic sites such as flower vases, unused empty utensils, water-storage containers, air cooler trays etc. and predomestic zones like building construction areas, coconut shells, discarded domestic junk items such as vehicle tires, and metallic cages etc. The mosquitoes usually rest in dark, shady domestic places and bite people during the daytime especially, early morning and late evening. According to WHO guidelines it is suggest that eco-friendly interventions, such as demolishing mosquito breeding sites in and around residences, will be more cost- effective than chemical approaches to kill larva and adult mosquitoes [19].

Even though the mortality rate is low in CKG, it is associated with significant well-being of the affected population and their financial defeat due to prolonged disability to do daily activity for some cases. Therefore, it is necessary to record proper documentation of definite cases and to carry out detailed survey of the outbreak of disease. Furthermore, we should formulate a unified vector control organization policy that can be considered as an important pillar in public health sector to prevent vector borne disease. Focusing all these statistics, it is time to build up a KPA- based strategic guideline taking into consideration the current preventive measurement knowledge, practice, and awareness about Chikungunya among the community. So, the objectives of the study were to determine the knowledge, practice, and awareness about preventive measurement of CKG among the traders community in Mitford region of Dhaka city, Bangladesh.

2. MATERIALS AND METHODS

2.1. Study Design and settings

This descriptive type of cross-sectional study was conducted for assessing the knowledge, practice, and awareness among the traders about the preventive measures regarding Chikungunya disease. Midford region of Dhaka city is considered as an overcrowded business area where all medicine wholesalers of Dhaka city live in this place and usually the market become open during daytime. As the Ades mosquito bites mostly during daytime, this area was selected as study area for this research to collect data that was performed from the period of January to May 2021.

2.2 Sample Size and Sampling Method

Purposive sampling technique was followed to calculate sample size using the formula,

n = Z2P (1-q)/ d2 (when population lesser than 10,000).

Here, n=desired sample size, Z= level of confidence according to the standard normal distribution (Usually set at 1.96 which corresponds to 95% level of confidence interval), P= estimated proportion of the population that presents the characteristic (when unknown, p = 0.5),

q=1-p or percentage of failure which is (100 – 1) = 99%, d= proportion of sampling error which is usually 5% confidence limit [20].

Total sample size was measured 280. Data were collected by using a self-administered structured questionnaire and observational checklist after reviewing the literature and Vector borne diseases management guidelines. The questionnaire consisted of four parts, in that first part included the socio-demographic information of the respondents, second part about knowledge -based questionnaire related to preventive measures of CKG disease, third part about observational checklist to assess the practice of respondents on personal protective measures to prevent CKG. and fourth part related to assess their awareness concerning prevention, control, management, and complication of CKG. After explaining the objectives of the study and ensuring privacy and confidentiality, written informed consent was taken from all respondents involved in the study.

2.3 Data Collection & Analysis

Data were collected through face-to-face interview by asking semi structured questionnaire except checklist of practice tool. Questionnaire was developed in Bangla language, piloted on 15 respondents before data collection and then translated in English to utilize. After the accomplishment of all questionnaires, the practice tool was completed by the data collector using observational checklist. All data were

analyzed after checking, verifying, editing, and compiling by the Statistical Package for Social Sciences (SPSS), (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY, USA: IBM Corp.). Result was recorded as frequencies, percentages, and figures.

2.4 Inclusion Criteria

The traders who aged 20 years and above, including both male and female, staying in Midford for 2 years and more and available during data collection were included in the study.

3. RESULTS

In this study a total 280 traders were selected randomly from Mitford area. The socio-economic details of the respondents are given in Table 1. Out of 280 respondents majority (111,39.64%) belonged to the age group of 20-30 years. Because of the type of profession, almost all (253, 90.36%) the respondents were male. A large section (262, 93.58%) of the respondents was literate with higher secondary (31.07%), secondary (27.14%), primary (22.5%) and graduate and above (12.86%). About 18 (6.42%) were illiterate. Monthly income of the most respondents (110, 39.29%) was ranged between 10000-20000 BDT. Considering their living place, more than half respondents (144, 51.43%) lived in semi- structure building and (36, 12.8%) in tin shed house.

In Table 2, among the total respondents, (268, 95.71%) knew about the CKG disease and most (117, 41.79%) of them got this information from media. About half of the respondents (142, 50.71%) had knowledge that this is a carrier born disease and out of them (142), (67, 47.18%) mentioned the specific vector (Aedes) name. But (138, 49.29%) did not know that this is a carrier born disease. Again, most of them (197, 70.35%) did not know the main etiology of the CKG. Moreover, more than two third of the respondents (76.78%) did not have knowledge about mosquito biting time.

The practice of traders about CKG prevention stated in Table 3. To take preventive measures, out of 280, 109 (38.93%) were used to practice bed net, 51 (18.21%) and 37(13.22%) used coils and aerosol, respectively. Others wore long sleeves trousers 19, (6.79%), screening the house 13 (4.65%), close the house doors/windows at evening 24 (8.57%) but 27 (9.64%) respondents did not practice any preventive measures.

Table 1. Sociodemographic characteristics of the respondents (N=280)

Characteristics	Frequency	%
Age (years)		
20- 30	111	39.64
31 –40	86	30.71
41-50	49	17.50
>50	34	12 .15
Gender		
Male	253	90.36
Female	27	9.64
Educational status		
Illiterate	18	6.42
Primary school	63	22.50
Secondary school	76	27.14
Higher secondary	87	31.08
Graduation & above	36	12.86
Monthly income (BDT.)		
1-10000	104	37.14
10000- 20000	110	39.29
>20000	66	23.57
Housing status		
Building	100	35.71
Semi-structure building	144	51.43
Tin Shed house	36	12.86

Table 2. Distribution of the respondents according to their knowledge about CKG (N=280)

Characteristics	Frequency	%
1.Informed about CKG		
Yes	268	95.71
No	12	4.29
2.Sources of information		
Personal experience	35	12.50
Newspaper	45	16.07
Friends or another person	50	17.86
Media (Television, Internet)	117	41.79
Other sources	33	11.78
3.Mosquito as a carrier		
Yes	142	50.71
No	38	13.58
Don`t Know	100	35.71
4.CKG is caused by virus		
Yes	83	29.65
No	41	14.64
Do not know	156	55.71
5.Type of Mosquito (142)		
Aedes	67	47.18
Others	17	11.97
Do not Know	58	40.85
6.Most frequent biting time		
At night	100	35.71
Any time	88	31.43
Before sunrise and after sunset	46	16.43
Afternoon	19	6.79
Noon	27	9.65

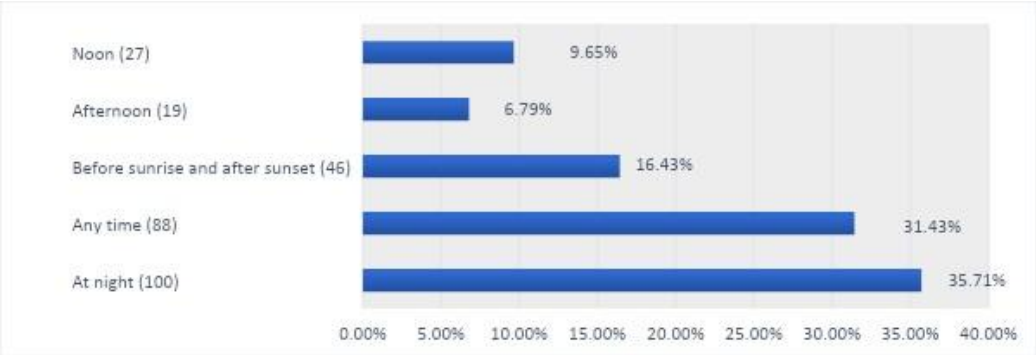

Fig. 1. Bar diagram showing the knowledge of respondents about most frequent biting time of mosquito

Table 3. Distribution of the respondents according to their practice on personal protective measures (N=280)

Characteristics	Frequency	%
1.Wear long sleeved trousers	19	6.79
2.Use mosquito aerosol	37	13.22
3.use mosquito Coils	51	18.21
4.Use bed net	109	38.93
5.Screening the house	13	4.65
6.Close the house doors/windows at evening	24	8.57
7. Nothing	27	9.64

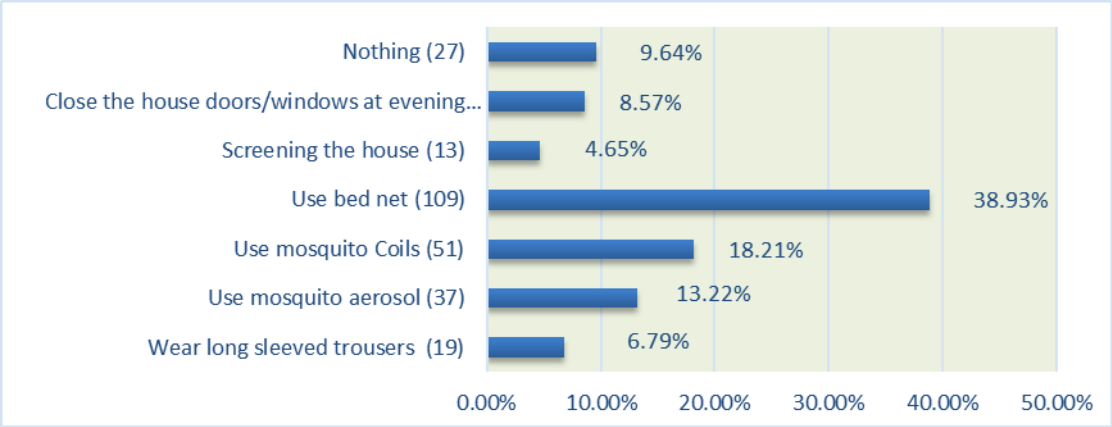

Fig. 2. Bar diagram showing the distribution of practice of respondents on personal protective measures about CKG

Table 4 showed the awareness status of the respondents about the preventive measures, management, and complication of chikungunya. Regarding the personal protective measures, 70 (25%) were aware to keep drain free from blockage, 58 (20.27%) changed water in plant container and 50 (17.86%) covered tightly all water containers, 43 (15.36%) and 13 (4.64 %) placed all the garbage into closed bin and removed unused container, respectively. Only 19 (6.79%) informed DCC to take preventive measures. Regarding awareness about existing preventive measures of the Govt., about half 140 (50%) of the respondents were aware about govt fogging system, destroying the bush 67 (23.93%), improving water drainage system 53(18.93%). The remaining 20 (7.15%) had others and no ideas about existing govt. preventive measures. To manage CKG,189 (67.5%) had opinion to take paracetamol, 33(11.79%) were aware to take bed rest, 28 (10%) took other measures ,17 (6.07%) did not aware to take any specific management and remaining 13 (4.65%) did not know about the CKG management system. Regarding the complication of CKG, about 110 (39.29%) respondents had awareness about the arthritis, 66 (23.57) % and 10 (3.57%) about joint stiffness and skin pigmentations respectively but 79 (28.22%) did not aware about complication of CKG.

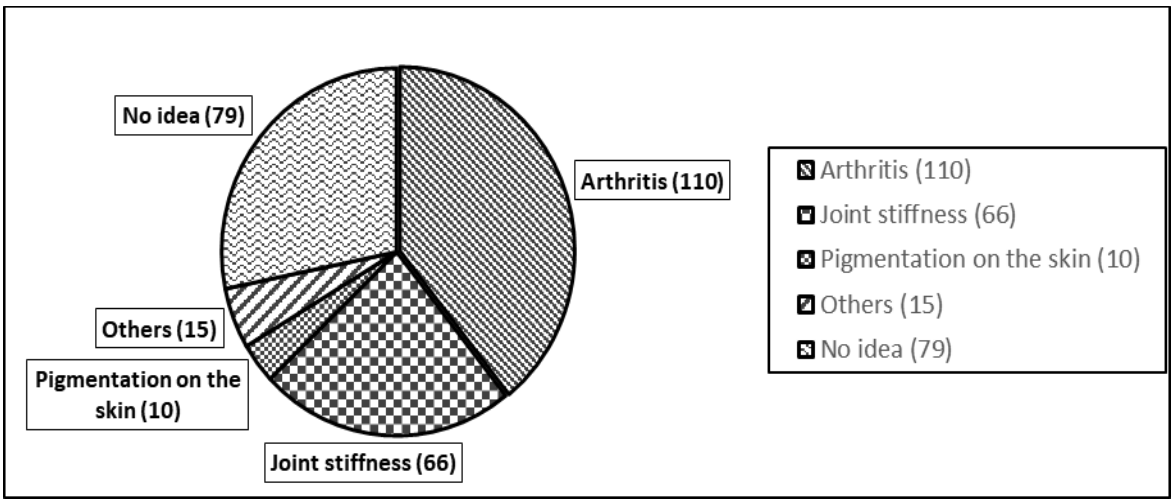

Fig. 3. Pie chart showing the distribution of the respondents about their awareness on complication of CKG

Table 4. Distribution of the awareness status of the respondents about the preventive measures, management, and complication of chikungunya

Characteristics to measure awareness of the respondents.	Frequency	%
1.Awareness about preventive measures		
1.1 Personal preventive measures		
Cover tightly all water container	50	17.86
Keep drain free from blockage	70	25.00
Change water in plant container	58	20.72
Change water in trays under or behind the fridge	20	7.14
Place all the garbage into closed bin	43	15.36
Remove unused container	13	4.64
Inform the DCC to take preventive measures	19	6.79
Others	7	2.50
1.2 Existing preventive measures of government		
Fogging the most susceptible area	140	50
Destroying the bush	67	23.93
Improving water drainage system	53	18.93
Others	7	2.50
No idea	13	4.65
2.Awareness about management of CKG		
Paracetamol	189	67.5
Bed rest	33	11.79
No specific treatment	17	6.07
Others	28	10
Do not know	13	4.65
3.Awareness on Complication of CKG		
Arthritis	110	39.29
Joint stiffness	66	23.57
Pigmentation on the skin	10	3.57
Others	15	5.35
No idea	79	28.22

4. DISCUSSION

During 2017 outbreak of CKG in Bangladesh, out of 65 districts 23 were affected as an epidemic manifestation. This study was aimed to assess knowledge, practice, and awareness about preventive measures of Chikungunya among the citizens in one of most crowded regions (Midford) in Dhaka city. A total 280 traders were selected randomly from Mitford area. Because of the type of profession, almost all the respondents (90.36%) were male, and majority (39.67%) belonged to the age group 20-30 years. In our study, 268 (95.71%) had informed about the CKG that is similar to the study of Nagpal et al. where 94% of the respondent in Betul were known to this disease [21]. But Cara C. Cherry et al. stated that in virgin island U.S.A fewer than half (47%) of the respondents and Supriya S. Patil et al reported that in north India, 59.25% of the respondents were informed about this disease [22, 23]. Currently as media is the primary source of information, in our study, majority of the respondents (41.79%) knew about chikungunya from media (Internet, television). It is almost similar to the study of Taran et al., Cara C. Cherry et al. and Rashid et al where the media was the most common source of information for Chikungunya [22,24,25]. Furthermore, proper knowledge about the carrier of disease is essential to take appropriate measurement to prevent transmission of Disease. In our study, 50% respondents knew that it is a carrier borne and out of them 47.18% mentioned the name of carrier that is dissimilar to the study of Rashid et al. [25] where about 90.2% knew this information but *Mishra A.* et al. *reported* that in Maharashtra state of India only 1.1% could mention the name of the carrier [26]. Also, Gul S. et al. in Pakistan

observed in their study that only 22.2% knew the carrier's name [27]. Again, in our study, more than half of the respondents (70.35%) did not have knowledge about the cause that is dissimilar to the study done by *Cara C. Cherry* et al. where 88% correctly identified that the virus spreads CKG via aedes mosquito bite [22]. This dissimilarity might be due to the different categories of respondents, more access of media users, and their educational status. Moreover, our study revealed that most of the respondents reported using mosquito net (38.93%), mosquito coils (24.29%), aerosol or mosquito repellent (18.57%), close the house doors/windows at evening (8.21%) as the effective protective measures. In some studies, it was found that the most stated preventive measures were using bed nets (60.6%), sprays (60.5%) and window nets (58.6%) that are similar with our study findings [28,29]. Screening the house 13(4.65%), wearing protective clothing 19 (6.79%) were less effective practice to prevent mosquito bites that are similar to the study of *Kuan G.* et al. in Nicaragua [30]. Practice of different community depends on different level of availability, efficiency, socio-economic conditions, level of knowledge and awareness. Considering awareness on personal preventive measures, our study revealed that most of the respondents were aware to keep water drainage system free from blockage 70 (25%), change plant container water 58 (20.27%), cover tightly all water container 50 (17.86%), placed all the garbage into closed bin 43 (15.36%) but only 43 (15.36%) and 19 (6.79%) thought that placing all the garbage into closed bin and informing the Dhaka City Corporation (DCC) respectively are necessary as preventive measures. Only 13 (4.64%) respondents were aware to remove unused water container that help to prevent breeding of vector. In a study in Thailand showed that, about 67.1% of the respondents mentioned that water jar, followed by household drain/ water retention in and around the houses (49.4%) are main source of breeding areas. Again, in some studies it was stated that 87.3% and 58.5%, and 57.1% respondents were unaware that vector lays eggs in water container and removal of stagnant water from containers can help to breeding of mosquito [31,32]. Again, fogging the susceptible area is one of the most effective measures taken by the government. But amazingly, only 140 (50%) of the respondents were aware about fogging their area, where other 25% of the respondent mentioned about destroying the bushes and improving water drainage system (17.85%).7.15% of them did not have any idea about preventive measures of CKG. Majority of the respondents 189 (67.5%) were aware to take paracetamol to get rid of fever in chikungunya, very few were aware taking bed rest (7.14%) and these findings are similar to Rashid et al. [25]. In a study, it was mentioned that 25.7% respondents believed that the disease should be treated symptomatically and there is no specific treatment for Chikungunya while the majority of them did not have any idea about the management [22] that are dissimilar to our study where 26.43% respondents mentioned that they didn`t aware to take specific measure to manage CKG. Considering the awareness on complication of CKG, 110 (39.29%) mentioned that they were aware about arthritis as one of the complications of disease, 66 (23.57%) mentioned their awareness about joint stiffness, pigmentation on skin 10 (3.57%) but one third of them (33.57%) did not have any idea about the complications of chikungunya. Fourie and Morrison stated in their research that about 73% of the patients suffered serious arthralgia in the critical phase of the symptom [33]. In some studies, there were shown that a significant proportion of patients had developed chronic arthritic symptoms after 1 to 2 years of acute infection and almost half of the patients who were suffered with persistent rheumatic pain had impaired daily household activities for more than three months [34, 35].

5. CONCLUSION

Chikungunya is considered now as a serious public health concern in Bangladesh as it affects a large number of people in a short sessional period. Again, due to the debilitating symptoms, it compromises the quality of life. This study was conducted to assess the KPA of the traders community about the preventive measures of the CKG disease in Dhaka, Bangladesh. During the last few decades, the health sectors in Bangladesh have improved significantly but our study revealed that lack of complete knowledge and awareness among the community, significantly impacts on practices to take preventive measures to control CKG outbreak. It is necessary to organize symposium, seminars, and workshops in government and non-governmental level to develop awareness among the community to take preventive measures in CKG. Therefore, it is recommended that all concerned health sectors authorities will work as a team to develop a nationally recognized standard KPA guidelines to manage the CKG

outbreak during the specific seasonal period in Bangladesh. In Addition, it is necessary to emphasize the importance of scrutinizing vector borne diseases and executing genome sequence for preventive measures of CKG.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

ETHICAL APPROVAL AND CONSENT

The methods and protocols used for this study were reviewed and approved by the Graduate Research Ethics Committee, Sir Salimullah medical college (SSMC), Dhaka. This investigation was carried out as a response to an outbreak investigation and thus the protocol was not reviewed by a human subjects committee. Informed written consent was taken from all participants involved in study. This study was conducted in accordance with the Declaration of Helsinki ,1975.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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