Original Article

Evaluation of Community Pharmacists Practices towards Dengue Control and Management

Muhammad Shahid Iqbal[1],*, Muhammad Zahid Iqbal[2], Nehad J. Ahmed[1]
[1]Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam bin Abdulaziz University, Al-kharj, SAUDI ARABIA.
[2]Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, AIMST University, Bedong, Kedah Darul Aman, MALAYSIA.

ABSTRACT

Objectives: This study was conducted to assess the practice level of Community Pharmacists (CPs) towards dengue control and management. **Methods:** A cross-sectional study was conducted among CPs by using a convenience sampling technique using a newly developed and validated research tool. **Results:** Out of 205 respondents, 70.2% had never taken part in any health-promotion campaigns against dengue. The majority of the participants (82.9%) never attended any particular training/workshops about dengue control and management. Around 65.9% of the CPs knew that NSAIDs should not be given to every dengue suspected patient. A total of 35.6% of the respondents agreed that the only method of controlling dengue infection is to combat the vector mosquitoes. **Conclusion:** Overall, the results revealed that the practices of the CPs to prevent, control and manage dengue infection were satisfactory but still continuing professional development seminars/workshops will further strengthen their skills to specifically control and mange dengue infections.

Key words: Community pharmacists, CPs, Dengue, Control, Prevention.

INTRODUCTION

Dengue has emerged as a worldwide health concern since the 1950s.[1] Today, about 40% of the world's population is living in areas with a high risk of dengue transmission. Dengue is endemic in tropical and subtropical regions around the world, particularly in countries in Africa, South-east Asia, the Americas, the Eastern Mediterranean and the Western Pacific regions. According to the World Health Organization (WHO), there are 50 to 100 million cases of dengue infection being reported yearly with 22000 deaths, mostly among the children.[2,3]

Dengue is caused by one of the four serotypes of the virus: DEN1, DEN2, DEN-3 and DEN-4. It is a mosquito-borne viral infection transmitted by the infected *Aedes aegypti* and *Aedes albopictus* mosquitoes.[2,3] Dengue fever should be suspected when a high fever comes with any two of these symptoms: severe headache, muscle and joint pains, nausea, vomiting, swollen glands or rash.[2] Dengue fever rarely cause death, but Dengue Haemorrhagic Fever (DHF) is a potentially fatal complication.[2]

WHO proclaims dengue and DHF to be endemic in the Asian sub-continent. Currently, dengue is endemic in 113 countries of the world.[4] The first dengue fever outbreak reported in Pakistan was in June 1994 and after that, a large number of cases have been reported. To date, dengue fever is still a major public health concern in Pakistan, especially in urban areas. According to the report published by the WHO in 2019, the highest number of confirmed dengue infection cases were reported in Islamabad Capital Territory (12,986 with 22 deaths), Sindh (12,053 with 33 deaths), Punjab (9,676 with 16 deaths), Khyber Pakhtunkhwa (7,641 with 7 deaths), Balochistan (3,075 with 3 deaths) and Azad Jammu and Kashmir (1,689 with 1 death).[5] The high incidence rate of dengue in urbanized areas suggested that a high-density population and rapid development activities facilitate the transmission of dengue infection.[6]

Since there is no specific treatment and vaccine to protect against dengue virus, the primary prevention against dengue is to combat the vector mosquitoes.[2] Therefore, good practice of the dengue preventive measures among the public is essential for the success of disease control. However, there are many studies that indicated that despite adequate knowledge regarding dengue prevention, the adoption of dengue control methods was still insufficient among the community. A study done by Mayxay *et al.* (2013) observed that there was a need to increase the application of dengue prevention methods in the community to stop the transmission of dengue disease.[7] Similarly, other studies performed in semi-urban towns in Pakistan, Central India and Jamaica also reported inadequate dengue control practices among the community.[8-10] All of these studies suggested that health education and health promotion campaigns are mandatory to improve the public's knowledge and practice of dengue preventive measures.

In view of the fact that health promotion and health education activities are important in the control of dengue, Community Pharmacists (CPs) can play a significant role due to their accessibility and creditability. A study was done by Judilynn in India (2013) described the role of pharmacists in dengue prevention by taking part in health promotion and health education campaigns.[11] At the same time, another study by Rohani *et al.* in 2010 also revealed that the involvement of primary care providers in dengue prevention in the community was crucial as they frequently acted as the first point of patient contact.[12] With the growing role of CPs as primary care providers, they can play an important role in dengue prevention by advising patients suspected of having dengue to take early preventive measures to break the chain of dengue transmission in the community.

Thus far, there were many studies investigating the community's KAP about dengue infection, but yet there are no similar studies targeting the CPs. Therefore, a cross-sectional study was conducted to evaluate the CPs' practices towards dengue management and control.

MATERIALS AND METHODS

A cross-sectional survey was conducted using a newly developed and validated research tool (questionnaire) based on extensive literature review and consultations with content experts. The questionnaire consisted of two parts: (1) demographic information, (2) practices regarding dengue.

This study was performed in Karachi Pakistan, between May and August 2019. A convenient sample of 205 CPs' was selected for this study and the survey was based on a self-administered questionnaire. The participants were pharmacists registered under the Pharmacy Board of Pakistan and currently practicing under the community pharmacy setting. Verbal and written informed consents were obtained from participants before commencing the study.

Data analysis and calculations were carried out using Statistical Package for Social Science® (SPSS) version 22.0. In order to evaluate the level of practice of the respondents, a scoring system was developed. The scoring pattern adopted was the "1" mark for unsatisfactory responses and '2' marks for satisfactory responses. A total score of more than 9 marks was considered having satisfactory practice. The Chi-square test was used to determine the bivariate association between demographic characteristics and practice level. Meanwhile, the correlation between demographics and practices regarding dengue was determined by using the Spearman correlation test. A p-value of ≤0.05 was considered statistically significant.

RESULTS

Demographic characteristics of the participants

A total of 205 CPs were interviewed and completed the questionnaire. Among the participants, 128 (62.4%) were females and 77 (37.6%) were males. The mean age of the participants was 32.98 (SD±8.09) years and the majority belonged to the age group of 24-34 years (72.2%). Table 1 described the basic demographic features of the participants in this study.

Practices regarding dengue infection

Table 2 summarizes the responses for questions on practice regarding dengue infection. Of all the respondents, 144/205 (70.2%) had never taken part in health campaigns against dengue and only 27 (13.2%) of them had participated in health campaigns against dengue. When asked about whether they regularly attend training/workshops on dengue or other infectious outbreaks, the majority (82.9%) of the participants answered "no" and only 5.4% regularly attended workshops about infectious diseases.

In the case of the dengue outbreak season, 76.1% of the respondents would advice preventive measures to their customers. However, in the case of dengue outbreaks, less than half of the pharmacists (46.8%) would prefer to recommend every patient having a fever to a physician, while 35.1% answered "no" and 18.0% were neutral about this.

Around two-thirds of the respondents (65.9%) knew that NSAIDs should not be given to every dengue suspected patient, though 7.3% answered "yes" and some (26.8%) answered "neutral". Regarding the preventive method against dengue, only approximately one third (35.6%) of the respondents agreed that the only method of controlling dengue infection is to combat the vector mosquitoes. 41% of the respondents revealed that they had been using mosquito repellents in their pharmacies, while more than half of them (53.2%) were not using any mosquito repellents in their pharmacies. When the participants were asked about

Table 1: Demographic characteristics of respondents (*n*=205).

Characteristics	Frequency	Percentage (%)
Gender		
Male	77	37.6
Female	128	62.4
Age (years)		
24-34	152	74.1
35-44	36	17.6
>44	17	8.3
Mother tongue		
Urdu	197	96.1
Others	8	3.9
Degree earned in pharmacy		
Undergraduate	180	87.8
Postgraduate	25	12.2
Continuing Professional Development (CPD) courses attended		
1-3	28	13.7
3-6	31	15.1
>6	146	71.2
Years of experience		
<10	142	69.3
>10	63	30.7
Dengue history		
Yes	27	13.2
No	178	86.8
Previous family experience with dengue		
Yes	55	26.8
No	150	73.2

Table 2: Responses for questions on practice regarding dengue infection.

Practice Questions	Yes (%)	No (%)	Neutral (%)
Do you take part in health campaigns against dengue?	13.2	70.2	16.6
In the case of dengue outbreaks, do you usually advise preventive measures to your customers/patients?	76.1	10.7	13.2
In the case of dengue outbreaks, would you prefer to recommend every patient having a fever to a physician?	46.8	35.1	18.0
Do you regularly attend training/workshops on dengue or other infectious outbreaks?	5.4	82.9	11.7
Do you think NSAIDs should be given to every dengue suspected patient?	7.3	65.9	26.8
Do you think the only method of controlling dengue infection is to combat the vector mosquitoes?	35.6	41.0	23.4
Do you use mosquito repellents in your pharmacy?	41.0	53.2	5.9
Do you participate whenever fogging is done in your pharmacy?	19.0	36.1	44.9

Table 3: Level of practice regarding dengue among respondents (*n*=205).

Level of Practice	Frequency	Percentage (%)
Unsatisfactory	24	11.7
Satisfactory	181	88.3

Table 4: Association between practice level regarding dengue and the selected demographic characteristics (*n*=205).

Demographic Characteristics	Level of Practice		*p*-value
	Unsatisfactory	Satisfactory	
Age Group			
24-34	21 (10.2%)	131 (63.9%)	0.192
35-44	3 (1.5%)	33 (16.1%)	
>44	0	17 (8.3%)	
Gender			
Male	10 (4.9%)	67 (32.7%)	0.658
Female	14 (6.8%)	114 (62.4%)	
Mother tongue			
Urdu	23 (11.2%)	174 (84.9%)	0.943
Others	1 (0.5%)	7 (3.4%)	
Years of Experience			
<10	20 (9.8%)	122 (59.5%)	0.112
>10	4 (2.0%)	59 (28.8%)	
Dengue History			
Yes	0	27 (13.2%)	0.042
No	24 (11.7%)	154 (75.1%)	
Previous family experience with dengue			
Yes	3 (1.5%)	52 (25.4%)	0.092
No	21 (10.2%)	129 (62.9%)	

whether they participated whenever fogging is done in their pharmacy, only 19.0% answered: "yes", while the majority answered "no" (36.1%) and "neutral" (44.9%) about this statement.

Overall, the majority of the CPs (88.3%) were having a satisfactory practice level regarding dengue infection as indicated in Table 3.

Association between practice level and demographic variables

Table 4 expresses the association between practice level regarding dengue and the selected demographic characteristics. A significant association was found between dengue history and the practice level regarding dengue (*p* = 0.042).

DISCUSSION

The results of this study showed that a large proportion of the CPs do not participate in health campaigns against dengue and do not regularly attend workshops/training on dengue control and other infectious diseases in Pakistan. These findings suggested that there is a need to motivate the CPs to be more involved in community health campaigns against dengue and also to participate in training on dengue disease management. Nandkumar *et al.* reported in their study that it is essential to conduct special training programs pertaining to dengue control in order to improve the CPs knowledge towards better practices on dengue prevention.[13] Besides, another study in Taiwan also suggested that newer forms of continuous professional development programs should be developed in response to cater to the professional needs of the CPs against dengue control.[4]

In this study, 76.1% of the respondents revealed that they would provide advice on preventive measures to their customers/patients during the season of dengue outbreaks. This result provided a clue that CPs as one of the first points of patient contact may have a golden opportunity to provide early preventive measures to dengue suspected patients to break the chain of transmission of dengue.[12] However, the results of this study are in contrast with a study done by Rohani *et al.* in which they found that most of the primary care providers had not given any advice on preventive measures to dengue suspected patients.[12]

When asked about the treatment for dengue fever, almost 66% of respondents knew that NSAIDs should not be given to dengue suspected patients. These results indicated that the practices of the CPs were directly affected by their knowledge, therefore adequate knowledge about the symptoms and complications of dengue is necessary to deliver a better preventive service in dengue control.[13] Since there is no vaccine to prevent dengue fever, vector control measures are deemed important strategies in dengue prevention and control.[2] Nevertheless, according to the result of this study, only 35.6% of the CPs agreed that killing the vector mosquitoes is the only method to combat dengue. At the same time, only 41% of respondents reported the use of mosquito repellents in their pharmacy.

In the present study, it was found that the majority of the CPs were having satisfactory practice regarding dengue infection. These results are different from the two studies done in India and Taiwan among health-care professionals. A study performed in India revealed that the health workers only had average practice regarding dengue control.[13] While another study in Taiwan showed that there is a lack of acquaintance in notification timing and important clinical features of dengue disease management among the CPs.[14]

The current study found that there is a significant association between dengue history and the practice level of respondents regarding dengue infection. Interestingly, respondents who had dengue infection before were all having satisfactory practice level regarding dengue. The previous study showed that people who had encountered dengue infection before had a higher level of knowledge about dengue than those who never had dengue in their life.[15] Their study findings are very similar to the result of our study although the sample size and study area varied.

It is presumed that good knowledge and a good attitude may lead to good practices about dengue control. However, this study revealed that even without good knowledge and positive attitude towards dengue control, still, CPs can play a significant role in dengue control in Pakistan. This is consistent with the findings of a study done in India where the authors found that the knowledge of the health workers was not associated with their practice level.[12] On the contrary, several KAP studies among the CPs showed that there was indeed some correlation exist between the knowledge and practice regarding dengue prevention.[8,15]

Conclusion and Recommendation

This study revealed that the overall practices regarding dengue infection control among the CPs were satisfactory. Nevertheless, the health authorities should provide more incentives to the CPs to increase their participation in health campaigns and training related to dengue disease. A future study with a larger sample size to assess the CPs' knowledge, attitudes and practices, as well as their professional role in dengue prevention, control and management is highly recommended.

Study Limitations

The results of this study were discussed bearing in mind several potential limitations. Firstly, a cross-sectional study design could only provide a

snapshot of information of the study participants at a specific point in time. As population characteristics constantly change over time, the results of this study might not reflect the actual situation.[16] Secondly, the small sample size may limit the ability to detect associations that were small and moderate; this may also affect the accuracy of the results in this study. Besides, the convenience sampling method may result in selection bias and the sample may not be representative of the whole population of CPs in Pakistan.[17]

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS USED

WHO: World Health Organization; **CPs:** Community Pharmacists; **NSAIDs:** Non-Steroidal Anti-inflammatory Drugs.

REFERENCES

1. Centers for Disease Control and Prevention. Dengue. 2010. [updated 2013 Sept 4; cited 2013 Oct 16]. Available from: http://www.cdc.gov/dengue/
2. World Health Organization. Dengue and severe dengue. 2013. [updated 2013 Sept; cited 2013 Oct 16]. Available from: http://www.who.int/mediacentre/factsheets/fs117/en/index.html
3. Centers for Disease Control and Prevention. Epidemiology. 2010. [updated 2013 Oct 28; cited 2013 Nov 5]. Available from:http://www.cdc.gov/dengue/epidemiology/index.html
4. Gibbons RV, Vaughn DW. Dengue: An escalating problem. BMJ. 2002;324(7353):1563-6.
5. Emergencies Preparedness. Dengue fever: Pakistan. Disease. 2019.
6. Mayxay M, Cui W, Thammavong S, Khensakhou K, Vongxay V, Inthasoum L, *et al*. Dengue in peri-urban Pak-Ngum district, Vientiane capital of Laos: A community survey on knowledge, attitudes and practices. BMC Public Health. 2013;13(1):434.
7. Naing C, Ren WY, Man CY, Fern KP, Qiqi C, Ning CN, *et al*. Awareness of dengue and practice of dengue control among the semi-urban community: A cross sectional survey. J Community Health. 2011;36(6):1044-9.
8. Taksande A, Lakhkar B. Knowledge, attitude and practice (KAP) of dengue fever in the rural area of central India. Shiraz E-Med J. 2012;13(4):146-57.
9. Shuaib F, Todd D, Campbell-Stennett D, Ehiri J, Jolly PE. Knowledge, attitudes and practices regarding dengue infection in Westmoreland, Jamaica. W Indian Med J. 2010;59(2):139-46.
10. Judilynn NS. The role of pharmacists in relation to medical doctors, nurses and BHWs in preventing dengue. J Life Sci and Technologies. 2013;1(1):14-8.
11. Ang KT, Rohani I, Look CH. Role of primary care providers in dengue prevention and control in the community. Med J Pakistan. 2010;65(1):58-62.
12. Nandkumar RK. Study to determine the knowledge and practices regarding prevention of dengue fever among the junior health workers working in the primary health centres in Belgaum Taluka. Int J Pharm Biol Sci. 2012;3(6):19-24.
13. Ho TS, Huang MC, Wang SM, Hsu HC, Liu CC. Knowledge, attitude and practice of dengue disease among healthcare professionals in southern Taiwan. J Formos Med Assoc. 2013;112(1):18-23.
14. Wan RWM, Yap BW, Veronica S, Mohammad AK, Lim KH. Knowledge, Attitude and Practice (KAP) survey on dengue fever in an urban Malay residential area in Kuala Lumpur. Malays J Public Health Med. 2006;6(2):62-7.
15. Weerasekera DR. Longitudinal vs. cross-sectional analysis. 2011. [cited 2013 Nov 24]. Available from: http://science.cmb.ac.lk/Departments/Statistics/statcircle/Publications/Articles/Longitudinal.pdf
16. Castillo JJ. Convenience sampling. 2009. [cited 2013 Nov 24]. Available from: http://explorable.com/convenience-sampling
17. Teddlie CFY. Mixed Methods Sampling: A Typology With Examples. J Mix Methods Res. 2007;77(1):100.