



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3468512>Available online at: <http://www.iajps.com>

Research Article

**KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT DENGUE
FEVER AMONG PATIENTS IN PAKISTAN**¹Dr Rais Nawaz, ²Dr Faiza Sirbuland, ³Dr Zara Saleem.¹MBBS, Shalamar Medical and Dental College, Lahore., ²MBBS, Khwaja Mohammad Safdar Medical College, Sialkot., ³MBBS, Allama Iqbal Medical College, Lahore.**Article Received:** July 2019**Accepted:** August 2019**Published:** October 2019**Abstract:**

Dengue Fever (DF) is an acute febrile illness caused by a mosquito borne human virus belonging to Flaviviridae family. Four types of serotypes have been found (DENV 1, DENV 2, DENV 3 and DENV 4). The virus is transmitted by the Aedes mosquito, in which Aedes aegypti is the major vector. Infection with dengue virus may be asymptomatic, it may lead to a wide spectrum disease that ranges from non-severe fever to potentially fatal clinical manifestations. According to the World Health Organization (WHO), among arboviral infection diseases, dengue is considered to be one of the most common types in the world; with approximately 390 million infected cases yearly, and 40% of the world population living in at-risk areas. In many parts of the tropics and subtropics, dengue is endemic especially during rainfall season which is the breeding season of the Aedes mosquito. Incidence dramatically increased to 2 million cases from 2008 to 2015 among the American, South-East Asian and Western Pacific regions, and extended to some European countries due to globalization and traveling. Symptoms similar to the flu, dengue fever (DF) can progress to severe and life-threatening stages which involves severe bleeding, respiratory and organ impairment.

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Please cite this article in press Rais Nawaz et al., *Knowledge, Attitude And Practice About Dengue Fever Among Patients In Pakistan*, Indo Am. J. P. Sci, 2019; 06[10].

INTRODUCTION:

Dengue Fever (DF) is an acute febrile illness caused by a mosquito borne human virus belonging to Flaviviridae family. Four types of serotypes have been found (DENV 1, DENV 2, DENV 3 and DENV 4). The virus is transmitted by the Aedes mosquito, in which Aedes aegypti is the major vector [1]. Infection with dengue virus may be asymptomatic, it may lead to a wide spectrum disease that ranges from non-severe fever to potentially fatal clinical manifestations [2]. According to the World Health Organization (WHO), among arboviral infection diseases, dengue is considered to be one of the most common types in the world; with approximately 390 million infected cases yearly, and 40% of the world population living in at-risk areas [3,4]. In many parts of the tropics and subtropics, dengue is endemic especially during rainfall season which is the breeding season of the Aedes mosquito [5]. Incidence dramatically increased to 2 million cases from 2008 to 2015 among the American, South-East Asian and Western Pacific regions, and extended to some European countries due to globalization and traveling [6]. Symptoms similar to the flu, dengue fever (DF) can progress to severe and life-threatening stages which involves severe bleeding, respiratory and organ impairment [6]. The knowledge, attitudes and practices (KAP) of the general population are the most critical factors on preventing the infection of dengue virus [8,9]. A study in Malaysia found that lack of knowledge on the dengue transmission and its preventive methods can increase the chance of spreading DF [10,11]. It is also essential to investigate DF patients' health service seeking behavior [12]. Good treatment of dengue fever has largely depended on appropriate and early medical care by experienced clinicians to avoid complications and reduce the fatality rate. Initial diagnosis and treatment can reduce the fatality rate of DF patients from 20% to 1% or less [13]. Specifically, the number of DF cases increased in 2017. In the first seven months of 2017, there were over 58,000 cases of DF, including more than 49,000 hospitalizations and 17 deaths, which showed an increase of 11.2% as compared to the same period in 2016 [14,15]. The number of DF cases was extremely high during rainfall season in Northern side. Immediate efforts in strengthening prevention capacity have been made by the Ministry of Health, including instructions to improve public awareness of and response to the disease [16]. Current study aimed to explore this under-researched topic, with a focus on knowledge attribute and practice of DF patients, while also investigating the potential associated factors.

METHODS:**Study design:**

It was a cross-sectional study.

Inclusion criteria:

- Subject had DF or DF symptoms
- Subjects who were agreed to participate in this study
- Subjects were able to answer the questionnaire in 10–15 minutes.

Data Collection:

Convenient sampling method was used. We used a convenience sampling method. The eligible patients were introduced to the research and gave written informed consent prior if they agreed to enroll. Interviews were conducted using a structured questionnaire. All the researchers were working in the medical field and had been trained by experts to ensure the quality of data. Each interview lasted between 10–15 minutes. To ensure the confidentiality of the interview, we invited patients to a private area of the clinic. A total of 195 patients agreed to participate in the study.

Information on following topic were collected.

Social-Demographic Characteristics

Demographic data included age, gender, education, marital status.

Clinical and Epidemiological Characteristics

We collected clinical data of participants including whether they were an in-patient or out-patient, the level of severity, the coexistence of other comorbidities and the duration of DF. The epidemiological characteristics were also collected. The patients also reported mosquito density at home from very low to very high level.

Knowledge, Attitude, Practices Regarding Dengue Fever**Knowledge about DF**

Each correct answer regarding clinical symptoms, the DF transmission vector (mosquitoes), and methods to kill larvae and prevent mosquitoes counted as 1 point. The knowledge score ranged from 0–19 points.

Attitude regarding DF

We asked the respondent's feeling about the severe levels of DF disease, the necessity of hospitalization due to DF. Each question used a Likert scale with five levels. The scores for each item ranged from 0 (lowest) to 5 (highest).

DF Prevention Practices

Each action that patients performed to kill larvae and prevent mosquitoes counted as 1 point. The practices score ranged from 0–11 points.

Statistical Analysis Data analysis was performed using Stata version 12.0. Categorical variables were interpreted using frequency and percentage. The

continuous categories were interpreted using mean and standard deviation (SD).

Ethical Approval

The protocol of this study was reviewed and approved by the Institutional Review Board of Research Committee.

RESULTS:

Out of 195 participants who responded to the questionnaire, mothers were 98 (50%) and fathers were 97 (50%). 13 (6.7%) were illiterate, while majority had attended primary school (48.7%) and 35 (17.9%) had a college degree. Majority (33.8%) of the respondents were unemployed. This was because majority of them were housewives. Table 1 shows the socio demographic profile of the participants studied.

Variables	Number (percentage)
Respondents	
Father	97 (49.7%)
Mother	98 (50.3%)
Residents	
Rural	66 (33.8%)
Semi urban	45 (23.1%)
Urban	84 (43.1%)
Education	
Illiterate	13 (33.8%)
Primary school	95 (48.7%)
Secondary school	52 (26.6%)
University	35 (17.9%)
Occupation	
Profession	2 (1%)
Semi profession	7 (3.6%)
Clerical	43(22%)
Skilled	19(9.7%)
Semi-skilled	22 (11.3%)
Unskilled	37 (19%)
unemployed	65 (33.3%)

91.2% of the respondents identified mosquito as the vector for dengue transmission. However, only 9.2% could identify the type of mosquito (*Aedes*). 63 (32.3%) participants knew clean stagnant water as the breeding place for the mosquito. 86.6% knew about

mosquito coils and repellent electrical equipment as a way to prevent dengue. 75.4% knew removing stagnant water sources could prevent dengue while only 53.8% could associate it with proper garbage disposing (Table 2).

Table 2. Clinical and epidemiological characteristics

Characteristics	n	%
Types of patient		
In-patient	143	44.7
Out-patient	177	55.3
Level of severity		
Mild	52	15.8
Symptomatic	226	68.5
Severe	52	15.8
Having comorbidities		
Having DF in the neighborhood	140	43.1
Having relatives with DF	61	19.0
Traveling to other locals in the last 15 days	44	14.3
Mosquitoes density at home		
Very low	111	38.0
Low	68	23.3

Normal	40	13.7
High	59	20.2
Very high	14	4.8
	Mean	SD
Duration of illness	5.5	4.3

Table 3. Knowledge about DF

Characteristic	N	%
Initial symptoms when infecting dengue fever		
Having a fever more than 2 days	272	85.5
Having a skin rash	63	19.8
Nose bleeding, bloody diarrhea, blood vomiting	29	9.1
Cold extremities	15	4.7
Restlessness	24	7.6
Causes of dengue fever		
Bite of mosquitoes	287	90.5
Blood transfusion	2	0.6
Airborne	2	0.6
Foodborne	0	0.6
Measures to kill larvae		
Frequently changing water	120	37.7
Proper disposal of waste	59	18.6
Tightly covering water storage containers	31	9.8
	Mean	SD
Knowledge score	4.6	2.1

Characteristic	n	%
Level of the danger of dengue fever		
Very dangerous	116	36.7
Dangerous	172	54.4
Neutral	23	7.3
Not dangerous	5	1.6
Completely not dangerous	0	0.0
Self-perceived risk of dengue fever		
Very high risk	9	2.8
High risk	40	12.5
Having risk	78	24.5
Low risk	66	20.7
Very low risk	126	39.5
The necessity of hospitalization if suffering dengue fever		
Very necessary	18	5.9
Necessary	64	21.2
Neutral	187	60.9
Not necessary	37	12.0
Completely not necessary	0	0.0
	Mean	SD
Attitude score (0–15 points)	9.2	2.4

Table 5. Practice toward DF

Characteristic	N	%
Measures to kill larvae at home	56	17.6
Frequently changing water	31	9.8
Proper disposal of waste	21	6.6
Tightly covering water storage containers	10	3.1
Adding salt to the water	1	0.3
Measures to prevent mosquitoes at home		
Using mosquito repellent coils	9	2.8
Using mosquito net	157	49.2
Using insect repellent spray	154	48.3
House sanitation	19	6.0
Environmental sanitation	10	3.1
Applying insect repellent body	27	8.5
Solutions when having dengue fever symptoms		
Go to health facilities	191	61.6
Track and go to health facilities if the health condition is more severe	49	15.8
Taking drug/antibiotic	53	17.1
Other	15	4.8
Practice Score	Mean = 1.5	SD = 1.4

Majority (88.2%) of the participants knew fever as a symptom of dengue. More than half of the participants knew about other typical symptoms of dengue like headache, joint pain, vomiting and fatigue. Lesser number of participants knew about the complications like bleeding and hypotension. Around 37% of those unemployed had adequate knowledge.

Table 3 summarizes participant's attitude regarding dengue fever. Most of them (71.2%), strongly agreed or agreed about the serious nature of the illness. 84.1% had a positive attitude towards consulting a doctor for dengue. Majority of the participants had a positive attitude that they can individually contribute to the prevention and control of dengue fever. Table 4 shows the different measures adopted by participants to protect themselves from dengue fever. Nearly 60% of the participants used mosquito coil or repellent electrical equipment in their home. Nearly half of them claimed that they cover water containers at home and dispose water holding containers properly. 66.7% of the participants from urban areas had adequate knowledge. Only 9.1% from rural areas and none of those who were illiterate knew adequately about dengue. Around 83% of those who had done college degree and 100% of those in profession and semi professions knew adequately about dengue. The mean score for knowledge was 10.4 out of 20 (Minimum: 2, Maximum: 18, SD: 3.7). Mean attitude score was 4.5 out of 6 (Minimum: 2,

Maximum: 6, SD: 1.1) and mean practice score was 3.9 (Minimum: 2, Maximum: 6, SD: 0.9). There was a significant correlation (p value <0.001) between knowledge and attitude; knowledge and practice; attitude and practice (Table 5). Majority of the participants (89%) in current study reported television as their source of information about dengue.

DISCUSSION:

Current study found that the majority of participants possess basic knowledge about DF, consider the illness to be serious and practice some level of prevention and treatment seeking. There has been, however, a lack of knowledge and practices regarding measures to eliminate larvae and mosquitoes in living spaces. The higher knowledge score was found to be associated with the level of education, while reported mosquito density at home was found to negatively correlate with attitudes and positively correlate with practices.

Such level of basic knowledge may be a result of consistent efforts conducted by the health authority; the Ministry of Health has distributed and enforced detailed guidelines of DF prevention annually, especially in areas where the disease has been the most severe [17]. Nonetheless, knowledge of the measures to kill larvae and mosquitoes is still limited. Most respondents were unaware that keeping a high

level of sanitation (proper waste disposal, house sanitation, etc.) and limiting open, dirty water surfaces in living spaces can be effective prevention methods. This problem posed a challenge in dengue prevention especially with tropical characteristics of weather in Hanoi, with a humid and wet rainy season that would be in favor of spreading dengue [18]. Regarding attitudes towards DF, two-thirds of participants reported considering it a severe disease, however a large proportion perceived their risk of having dengue fever to be very low to low while most believed that hospitalization was neither necessary nor unnecessary. Similar findings were found in cross-sectional studies conducted in Yemen and Thailand [19]. Such an attitude may hinder the efforts in dengue prevention, as preventive measures may be deemed not necessary by healthy people who did not consider themselves to be at risk of dengue. Although adequate measures to kill mosquitoes at home have been reportedly used among our participants, the proportion of respondents taking measures to kill larvae at home was rather low, with the most popular method being the frequent changing of water conducted by 17.6% of participants. Limited practices in preventing mosquito breeding have reflected the gap in knowledge also discovered in this study. Thus, to improve the practices of dengue prevention that would support limiting the spreading of the disease in the community, more efforts should first be given to enhancing the knowledge of the public, especially regarding measures of prevention. This suggestion is further supported by the finding of this study which showed a positive correlation between knowledge score and attitude and practices scores.

Many studies have also provided evidence showing that the more people know about DF, the better attitudes and practices they have toward the disease [20, 21]. Our results further aided the argument that education is positively associated with better disease prevention and control, which has been highlighted by an extensive number of studies. Specifically, current literature states that school-based health education for dengue control provides good knowledge of DF signs and symptom as well when and how to seek treatment [22]. Meanwhile, occupation was found not to be associated with knowledge, but attitude and practices regarding DF. Farmers and workers were more likely to have a poor attitude regarding DF. Even though general literacy has been improved significantly in Vietnam, a large proportion of farmers and workers who come from rural and ethnic minorities remained undereducated [23]. Those who had blue-collared jobs often had a lack of education and health literacy. Adequate health literacy allows individuals to understand and make a

decision in health care, disease prevention and healthy behaviors. Similarly, Hairi et al. found an association between literacy level and DF related knowledge and practice among Malaysian rural populations [24]. In this study, we found that people who reported low density of mosquitoes at home have a poorer attitude regarding DF as compared to people who reported the very minimal number of mosquitoes. Such an attitude was found to be rather common in groups with lower socio-economic status [25]. In addition, people who reported a high density of mosquitoes were found more likely to practice prevention methods. Several implications can be drawn from the findings of this study. First, education on disease and disease prevention at the school level should receive attention and support from the health authority, especially in rural or less developed areas where schools play a primary role in providing knowledge and information. In addition, when designing and implementing public mass campaigns and posters regarding DF, the level of literacy and cognitive understanding of the concerned population should be taken into account and incorporated in the final product. The use of media, especially social media, should also be considered, however with care, such that information can be more far-reaching without being misleading for targeting an incorrect group of the population. Several limitations need to be noticed when interpreting the findings. First, the study used a convenient sampling method to recruit participants. Thus, this may limit the generalizability of the study. Second, socially desirable bias should also be considered as participants answered questions. To minimize the bias, interviewers were well trained to recognize the bias. Third, the reported KAP score might be higher than the general population because the study took place in the urban area where people might have more access to DF-related information. Moreover, the survey was employed on DF patients. There are possibilities that these patients searched for DF information. Last but not least, this is a cross-sectional study; therefore, we could not conclude causality of the relationship between KAP and associated factors.

CONCLUSIONS:

This study discovered that, although the participants had a basic knowledge regarding dengue transmission vector and symptoms, and were generally aware of the seriousness of the disease and practiced some level of prevention, much remains to be done to enhance the capacity of the community to combat dengue and dengue fever. The gap in prevention knowledge, attitude towards the risk of being infected, and practices of eliminating sources

of mosquitoes, to name a few, can be addressed through further education efforts. The literacy level and understanding of the targeted population, especially in less developed areas, should be considered when designing and implementing education campaigns and programs to ensure effectiveness

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