



Knowledge, attitude and perception regarding dengue fever among university students of interior Sindh

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KEYWORDS

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Summary

Background: Dengue is among the most common mosquito-borne viral diseases that affect humans. It has now become a major public health dilemma, annually affecting approximately 50–100 million people worldwide. This study aimed to assess the knowledge, attitude and perception of dengue fever among university students of interior Sindh.

Methods: A cross-sectional study was conducted during the period of April–June 2012. Four hundred and fifty students were surveyed. A structured pre-tested questionnaire was used to collect data. The data were analyzed using SPSS version 17.

Results: Overall, 94.6% of participants (43.3% male and 56.7% female, p -value 0.03) reported that they had heard about dengue, and 58.6% of participants reported “*Aedes mosquito*” as a vector of dengue virus, with gender difference (37.5% male vs 62.5% females with p -value <0.001). The *Aedes mosquito* is “*A small dark mosquito having white stripes on its leg*” was reported by 54.8% students. The *Aedes mosquito* breeds in “*Stagnant clean water*” was reported by 47.6% (male 40.2% vs female 59.8%, p -value 0.003) and usually bites at “*Dusk*” by 44.7% and at “*Dawn*” by 51%. Regarding symptoms of dengue fever, “*Prolonged high fever*” was reported by 52.6%, “*Muscular pain*” by 39.6% (p -value 0.009), “*Bleeding*” by 41.3% (p -value 0.001) and “*Headache, nausea and vomiting*” by 44.7% (p -value 0.001).

Conclusion: Approximately half of the participants in our study were unable to correctly identify the *Aedes mosquito* as a transmission source (41.4%), its appearance

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(45.2%), its breeding place (52.4%) and its bite time (52.2%). The enhancement of knowledge through different educational programs is needed to increase awareness of dengue fever.

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Introduction

Dengue is among the most common mosquito-borne viral diseases that affect humans. It has now become a major public health dilemma, annually affecting approximately 50–100 million people worldwide. Dengue fever has made a remarkable upsurge all over the world in recent decades, exposing more than 2.5 billion people to the risk of acquiring this infection [1]. Dengue virus is an RNA virus that belongs to the family Flaviviridae and has four different but closely related serotypes: DEN-1, DEN-2, DEN-3 and DEN-4 [2]. Infection with one serotype provides lifelong immunity for that particular serotype but only partial immunity for the other serotypes [1,2]. Infection with dengue produces a broad array of illnesses, from flu-like fever and typical dengue fever to more dangerous forms such as dengue hemorrhagic fever and dengue shock syndrome [2].

Dengue fever is found all over the world in tropical and sub-tropical regions. Its increased transmission in addition to a preference for urban and semi-urban areas has gained much more attention in recent decades [1]. However, three quarters of all cases of dengue fever worldwide occur in Southeast Asia and the Western Pacific regions [3]. In the Americas (2007), more than 890,000 cases of dengue were identified, of which 26,000 cases were dengue hemorrhagic fever [4]. Classical dengue fever and dengue hemorrhagic fever are now endemic in the sub-continent of Asia. Currently, dengue is endemic in 112 countries, making dengue fever one of the world's most common emerging infectious diseases [5]. Multiple epidemics have also been reported in different regions of India, Sri Lanka and other Asian countries [6]. In Pakistan, the most significant epidemic of dengue fever was first recognized in 1994–1995 [7]. Subsequently, many epidemics have been reported from different regions of Pakistan. In recent years, transmission has increased significantly, particularly in the post-monsoon period, and floods have also contributed to the rise in transmission [2]. In Pakistan, the number of cases of dengue fever is still on the rise. The WHO reported 1931 laboratory confirmed cases in 2006, 1226 cases in 2007,

2469 cases in 2008, 1085 cases in 2009, 11,024 cases in 2010 and 17,057 cases in 2011. A total of 4388 cases of suspected dengue fever have been reported from January 01 to September 11, 2013 [8]. However, currently, the disease typically manifests in a more severe form, with an increased number of epidemics in Pakistan [9].

The increasing incidence of dengue fever and its more severe forms clearly calls attention to the importance of health behaviors and attitudes toward the prevention of dengue, which may be enhanced by studies addressing the knowledge, attitude and practices related to dengue fever. Therefore, this study endeavored to assess knowledge and awareness among university students of interior Sindh.

Methods

Study area and participants

This study was conducted at three universities of Interior Sindh, CEAD (Centre of Excellence in Art and Design), LUMHS (Liaquat University of Medical Health Sciences) and IPR (Institute of Physiotherapy and Rehabilitation). These universities were selected randomly, and the sampling technique was simple random; the sample size was 385, assuming 50% prevalence at a confidence interval of 95% with type 1 error (alpha) 5%, $SS = Z^2 \times p(1 - p)/d^2$. However, the sample size increased to 450, and the target was to complete this sample size from these three universities.

Ethical approval

The study was commenced following approval from the Institutional review board of Dow University of Health Sciences. For ethical considerations, consent was obtained from the studied universities and individual participants, and the confidentiality of information was assured.

Study design

A descriptive cross-sectional study was conducted during the period of April–June 2012.

Data collection

A structured pre-tested pre-coded self-administered questionnaire containing both open and closed-ended questions was used to collect the data. The study was explained to the students upon receiving the questionnaire, and assistance was provided to anyone experiencing difficulty completing it. The questionnaire was specifically designed for the study and consisted of two parts. The first part included demographic characteristics, e.g., age, gender, qualification, institute, educational year and socioeconomic status of participants. The second part consisted of questions about awareness, knowledge and perception of dengue fever.

Data analysis

The data were entered and analyzed on SPSS version 17 (SPSS Inc., Chicago, IL, USA). Descriptive analysis was performed to calculate frequencies or percentages of categorical variables (e.g., socio-economic status). For cross-tabulation and computation, statistical significance using a 95% confidence interval (CI) was calculated and a Chi-square test was used with a statistically significant p -value <0.05 .

Results

Demography

In total, 450 students from three universities participated in the study. Of these participants, 46.5% were male and 53.5% female. Ages ranged from 17 to 29 years. Forty-five percent of the students were from IPR (Institute of Physiotherapy and Rehabilitation), 31.2% from CEAD (Centre of Excellence in Art and Design) and 23.8% from LUMHS (Liaquat University of Medical Health Sciences). Overall 26% of participants belonged to low, 43.5% to middle and 30.5% to high socio-economic status.

Knowledge, attitude and perception

The question “Have you heard about dengue?” was answered “Yes” by 94.6% of participants, of which 43.3% were male and 56.7% female, with a p -value 0.03. Overall 58.6% of participants reported “Aedes mosquito” as a vector of dengue virus (with a gender difference of 37.5% male vs 62.5% females with p -value <0.001). The question addressing the appearance of the mosquito, “A small dark mosquito having white stripes on its

legs,” was correctly answered by 54.8% of participants. The question “Where does the dengue mosquito breed?” was answered as “Flowing dirty water” by 14.1%, as “Flowing clean water” by 19.0% (male 69% vs female 31%, p -value <0.001), as “Stagnant dirty water” by 38.1% (male 53.8% vs female 46.2%, p -value 0.05) and as “Stagnant clean water” by 47.6% (male 40.2% vs female 59.8%, p -value 0.003). The question “Dengue mosquito usually bites at what time?” was answered as “at Dusk” by 44.7% (male 38.9% vs female 61.1%, p -value 0.002), as “at Dawn” by 51% and as “at Night” by 21% (male 64.7% vs female 35.3%, p -value <0.001). The details of the knowledge of dengue are presented in [Table 1](#).

Overall 77.6% of the participants responded “Dengue can be prevented” and 45.7% responded “No Vaccination” is available yet for dengue. The detail of symptoms, diagnostic tests and treatment of dengue fever is presented in [Table 2](#).

Discussion

This study was carried out to assess the knowledge, attitudes and perceptions related to dengue fever among university students. As cases of dengue fever are still on the rise, it is imperative to initiate educational campaigns to increase awareness among students who may serve as carriers of knowledge about dengue fever for family and friends. Our study has demonstrated the deficiency of knowledge regarding attributes of dengue infection, such as the cause of dengue fever and its symptoms, the appearance of the Aedes mosquito and its bite time, whether dusk or dawn, and the breeding places of the Aedes mosquito.

Although 94.4% of participants reported that they had awareness of dengue, the Aedes mosquito, which is responsible for dengue fever transmission, was confirmed by only half of the participants. These results are similar to those of other studies [10,11]. It can be hypothesized that if inhabitants are not aware of the cause, then they may be powerless to protect themselves from contracting the disease. Most of the students were unable to give correct answers about the symptoms of dengue, as approximately half of the participants thought prolonged fever, bleeding, headache, nausea and vomiting may be the symptoms of dengue fever. The knowledge of the symptoms in our study correlates with the results of previous studies [11–14]. This deficiency of knowledge results in delayed consultations with a health care facility.

The appearance of the Aedes mosquito was correctly identified by 54.1% of participants. Another

Table 1 Knowledge variables regarding dengue fever among study populations.

Questions	Total (%)	Male (%)	Female (%)	p-Value
Have you ever heard about dengue?				
Yes	94.4	43.3	56.7	0.03*
What is the cause of dengue fever?				
A special mosquito "Aedes"	58.6	37.5	62.5	<0.001*
Australian tiger mosquito	10.2	60.9	39.1	0.08
A virus	8.4	55.6	44.4	0.34
A fly	6.5	61.4	38.6	0.15
How do dengue mosquito and its bite look like?				
A small dark mosquito having white stripes on its legs	54.8	44.6	55.4	0.09
Marking in form of a lyre on its thorax	22	54.5	45.5	0.19
Bite is painless	10.5	42.8	57.2	0.45
Where does the dengue mosquito breed?				
Flowing dirty water	14.1	47.5	52.5	0.946
Flowing clean water	19.0	69	31	<0.001*
Stagnant dirty water	38.1	53.8	46.2	0.053
Stagnant clean water	47.6	40.2	59.8	0.003*
Puddles	6.4	50	50	0.814
Garbage	5.7	43.3	56.7	0.663
Plant pot trays	9.9	12	88	<0.001*
Empty buckets	1.7	29.2	70.8	0.722
Where does the dengue mosquito prefer living?				
Underneath furniture	18.5	62.1	37.9	0.014*
Sheltered places	39.3	42	58	0.022*
Indoors	40.6	51.9	48.1	0.336
Dengue mosquito usually bites at what time?				
Dusk	44.7	38.9	61.1	0.002*
Dawn	51	43.9	56.1	0.114
Night	21	64.7	35.3	<0.001*
How is dengue transmitted?				
An infected dengue mosquito bite	72.2	41.41	58.59	<0.001*
By contacting a dengue patient	13.4	54.6	45.4	0.257
By drinking dirty water	11.6	50	50	0.706

* Significant p-values.

study reported that 69.2% of participants gave correct answers about the appearance of the dengue mosquito [15].

The Aedes mosquito is well known for its bite time, which is after dawn and before dusk [16]. Interestingly, about half of the participants responded that the bite time is dusk, the other half dawn; other studies [2,17,6] reported similar results. This is important for the adequate adoption of protection strategies at specific bite times.

Our study reported that about one third of participants recognized stagnant dirty water as a breeding place for the dengue mosquito, and approximately half reported stagnant clean water as a breeding place. These results are similar to those of other studies [11,6]. One study reported that 68% of the participants believed water to be

necessary for mosquito breeding [6]. Fourteen percent of participants reported flowing dirty water as the breeding site for the dengue mosquito, and nineteen percent reported flowing clean water as the breeding site for dengue mosquito. These results are similar to those of other studies [5].

Knowledge of the transmission of dengue fever was not very high, as 72.2% of the participants reported transmission by infected mosquito bite, 13.4% by contact with a dengue patient and 11.6% by drinking dirty water, thus supporting the results of other published data [5,14,17]. Regarding attitudes of the participants, 77.6% reported that dengue can be prevented, and 55.5% said it can be treated fully. Knowledge about the treatment of dengue fever was expectedly low, as 20.6% of participants reported it can be treated with

Table 2 Attitude, symptoms and diagnostic test variables regarding dengue fever among study populations.

Questions	Total (%)	Male (%)	Female (%)	p-Value
Can dengue be prevented?				
Yes	77.6	43.7	56.3	0.004*
Is vaccination available for dengue?				
Yes	24.1	48.9	51.1	0.039*
No	45.7	41.3	58.7	
Don't know	30.2	56.3	43.7	
Can dengue be treated?				
Yes	55.5	43.8	31.2/56.2	0.011*
How can it be treated?				
By using antibiotics	20.6	50	50	0.282
Anti-pyretic	37.2	36.9	63.1	0.001*
Never use pain killers	15.7	61.1	38.9	0.020*
What are the symptoms for dengue?				
Prolonged high fever	52.6	46	54	0.554
Muscular pain	39.6	39.4	60.6	0.009*
Rash	32.6	38.9	61.1	0.017*
Bleeding (from nose and other areas)	41.3	37.3	62.7	0.001*
Headache, nausea and vomiting	44.7	38.5	61.5	0.001*
By what tests was dengue confirmed?				
PCR	27.5	45.8	54.2	0.460
ELISA	32.4	45.4	54.6	0.325

* Significant p-values.

antibiotics and 37.2% with antipyretics, and 15.7% reported avoidance of painkillers as the treatment of dengue. These results exhibit higher numbers than a similar study [5].

In our study, relatives, friends and family were the most common source of information (65.3%). Second, radio and television were common sources of information (22.6%), while seminars, books and the Internet were less common (4%, 4.3% and 4%, respectively). This illustrates that, currently, knowledge is spread from friends and family to close contacts, perhaps as a result of the instant communication of text messages. Mass campaigns using electronic media are needed to spread awareness, as well as community programs, which have proven to be the best alternative for enhancing knowledge regarding the disease.

Approximately half of the participants in our study were unable to correctly identify the *Aedes* mosquito as the transmission source (41.4%), its appearance (45.2%), its breeding place (52.4%) and bite time (52.2%). Half of the students were not aware of the symptoms. Health awareness seminars should be planned by academic institutions to educate students about dengue fever. Printed and electronic media administered by health care providers should arrange programs to disseminate knowledge and awareness.

Conflict of interest

Funding: No funding sources.

Competing interests: We have no conflict of interest to declare.

Ethical approval: The study was commenced following approval from the Institutional review board of Dow University of Health Sciences. For ethical considerations, consent was obtained from the studied universities and individual participants, and the confidentiality of information was assured.

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