Assessing the Lack Awareness and Dangers of Dengue in Rural Punjab Pakistan

Dr. Muhammad Pervaiz Iqbal
Master in Public Health Management, Gomal University, DIKhan, KP, Pakistan

Najam Affaq Qureshi
Assistant Professor
Department of Pharmacy, SARHAD University Peshawar
E-mail: qamaraqureshi@yahoo.com, gmkundi@hotmail.com (corresponding)

Abstract
Dengue is one of the dangerous fevers which are taking hundreds of precious lives every year in Punjab province of Pakistan. This disease is caused by an infection from a virus namely Flavi virus which is transmitted by the mosquito Aedes aegypti, also called Aedes albopictus. This study was undertaken to assess the lack of awareness about the dengue and how dangerous it is in the rural Punjab in order to suggest ways and means to control thy menace. The study has identified that lack of awareness among the rural citizens is the major reason besides integrated policies by the government. 5-point Likert scale was used to gather the opinion from respondents. Cronbach's alpha was calculated for reliability analysis. Descriptive and inferential analyses were done to find the fact. χ^2 test was used to test the hypotheses on ordinal scale for environmental, personal and chemical control as major variables of the study.
The study have identified that illiterate were less aware about the environmental and personal control then the literate with no information about chemical control. The study concludes that government must initiate strategies ahead of dengue season to educate the people through massive awareness campaign to save the precious lives.
Keywords: Dengue, Environmental, Personal, and Chemical Control.

INTRODUCTION

The ration of deaths due to dengue fever is alarming in the developing countries in general and the province of Punjab in Pakistan in particular. Majority of the people in Punjab province lives in the rural areas where lack of information and knowledge about the dengue and its dangers is a serious issue for the Pakistan health authorities. In rainy season of monsoon it become more serious issue and headache for the government and health authorities when it becomes an epidemic.

Simmons et al. (2012) and Statler et al. (2008) have conducted studies on Dengue virus infection that causes significant morbidity and. Dengue fever which is also known as break bone fever is caused by infection with a virus, namely Flavi virus, and the disease is transmitted by the Aedes aegypti mosquito or Aedes albopictus. The physical feature of this mosquito is that it has black and white stripes on its thorax and legs, which mosquito bites during the day. The female lays eggs in clean and stagnant water and feeds on blood. They need the protein found in blood to produce eggs. Chen & Wilson (2010) concluded that the mosquito bites and sucks blood containing the virus from an infected person and virus is carried in its body, thus it transmits the virus to healthy people when it bites them.

According to world statistics some 50 million new infection cases are reported annually, where some 24000 deaths occurs due to dengue annually. This implies that 2.5 to 3 billion people are risk, where some 500,000 cases are registered and hospitalized per year, among those, 90 % of those affected includes children, and 5% cases are reported leads to death. The study was conducted in the rural district (Bhakkar) of the Punjab province which is the western city of Punjab located at the adjacent area of near river sindh. According to statistics, In 2011, 47 cases of dengue were registered including 30 cases in Tehsil Bhakkar, 10 in Tehsil Darya Khan, 02 in Tehsil Kallur Kot and 05 in Tehsil Mankera, however, in year 2012 and 2013, no such cases have been reported.

This research highlights the issues confronted by the people in prevention and control of dengue and recommends some measures to address these issues. The study will be helpful the health authorities of the Punjab to make effective to prevent the dengue and safeguard the people from the dangers of dengue.

Problem Statement

This objective of the study was to know level of awareness of the people of the rural Punjab about the danger of the dengue and that how to prevent and control of dengue. This research focused on the environmental, personal and chemical control aspects of the dengue.
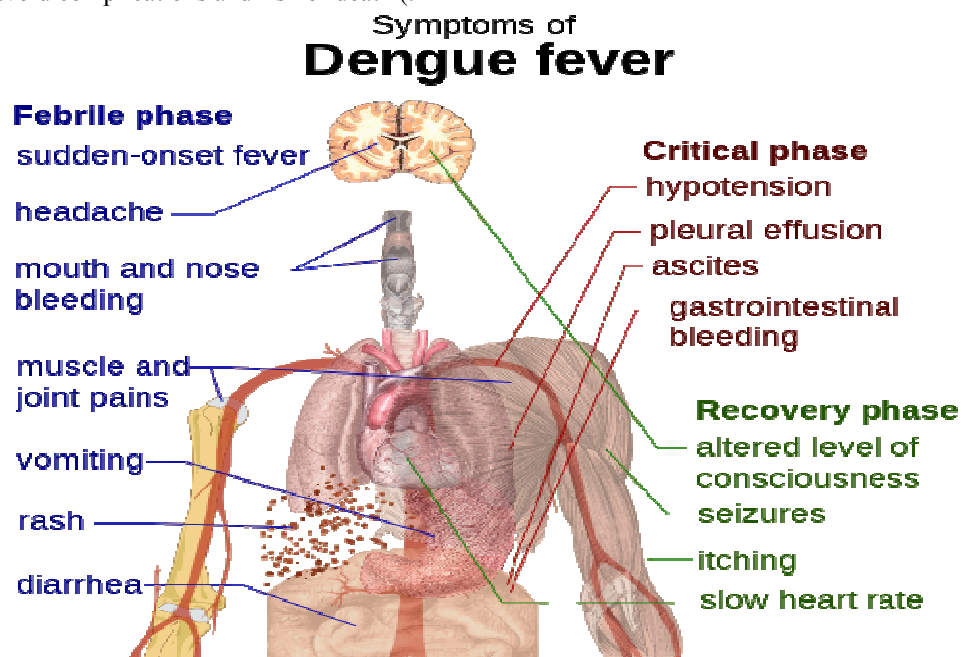
LITERATURE REVIEW

The better health improves the efficiency and productivity which leads towards economic development and well being of the citizens of any country. To get the skilled, efficient and productive human capital, governments

spends on health care facilities. However, according to Annual Progress Report of RMC & Allied Hospitals (2008) the nature of the existing circumstances of the human resource in Punjab Pakistan with even any marginal change may directly affect the health services, human capital and economic development in the country.

According to the constitution of the Islamic Republic of Pakistan, health is primarily the responsibility of provincial governments. In Pakistan the function of health service are integrated into a district level managed system of administration, where primary health care units called Basic Health Units (BHUs) serve about 10,000 to 15,000 people; five to ten BHUs are attached with a Rural Health Center (RHC) which serves about 25,000 to 50,000 people. Likewise, District Headquarters (DHQ) hospitals provide secondary care services, serving 100,000 to 300,000 and 1-2 million persons respectively. The DHQ hospitals have specialists and serve as referral centers (WHO, 2011)

Causes & Symptoms of Dengue Fever

There are four types of Dengue viruses (DENV) which result into dengue fever, all of them are spread by a species of mosquito known as the *Aedes aegypti* mosquito (Normile, 2013). *Aedes aegypti* was originated in Africa, but soon after spread around the globe (Normile, 2013). The virus is transmitted from an infected mosquito to human (Wilder-Smith & Gubler, 2008). The process starts when a person who is infected with the dengue virus is bitten by a mosquito; the virus is then passed on when someone else is then bitten by the infected mosquito (Normile, 2013; Reiter, 2010; Restrepo et al., 2008). The disease, also named as 'break-bone' fever affects infants and adults alike and could be fatal. The clinical features of the fever vary from agae to age (Normile, 2013) and the person could be suspected dengue if a high fever (40°C/ 104°F) is accompanied by severe headache, pain behind the eyes, nausea, vomiting, swollen glands, muscle and joint pains, and rash, which usually last for 2-7 days. The warning signs to look out for occur 3-7 days after the first symptoms in conjunction with a decrease in temperature (below 38°C/ 100°F) i.e. severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums, blood in vomit, fatigue, and restlessness. Bhatt et al. (2013) and Chen & Wilson (2010) asserts that the last 24-48 hours of the critical stage could be lethal, thus proper medical care is advised to avoid complications and risk of death (.

Symptoms of **Dengue fever**

Febrile phase
sudden-onset fever
headache
mouth and nose bleeding
muscle and joint pains
vomiting
rash
diarrhea

Critical phase
hypotension
pleural effusion
ascites
gastrointestinal bleeding

Recovery phase
altered level of consciousness
seizures
itching
slow heart rate

How to Diagnosis the Dengue Fever

The symptoms of dengue fever are similar to some other diseases, such as typhoid and malaria, which migh become complicated promptly if proper cure is not provided. However, according to Bhatt et al. (2013) and Ranjit & Kissoon (2011) to determine whether it is a dengue infection, or something else, the blood sample can be tested in a number of ways to find the signs of dengue virus. This implies that if dengue virus is detected then the diagnosis will be straightforward; if fails, other blood tests may be ordered to identify antibodies, antigens and nucleic acids, moreover, the doctor will be required to get the patient's travel and medical history, especially if it involves mosquito exposure.

The Treatment

Since dengue is a virus, so there is no specific treatment or cure, yet according to Bhatt et al. (2013) and Chen & Wilson (2010) it could be controlled through prevention of dehydration and Painkillers i.e. the use Tylenol

(paracetamol). Moreover, Ranjit & Kissoon (2011) suggested that Intravenous fluid supplementation (IV drip), Blood and Hospital care, it is important that patient should be treated by medical professionals in case the symptoms worsen.

Prevention & Control Strategies

The control efforts should target the habitats that are most productive and hence epidemiologically more important rather than all types of container, especially when there are major resource constraints. According to Restrepo et al. (2008), the environmental management seeks to change the environment in order to prevent or minimize vector propagation and human contact with the vector-pathogen by destroying, altering, removing or recycling non-essential containers that provide egg/ larval/ pupal habitats. Three types of environmental management are defined i.e. environmental modification, environmental manipulation and changes to human habitation or behavior – actions to reduce human–vector contact, such as installing mosquito screening on windows, doors and other entry points, and using mosquito nets while sleeping during daytime.   The improvement of water supplies is a fundamental method of controlling *Aedes* vectors, especially *Ae. Aegypti* (Restrepo et al., 2008) besides, the "solid waste" which refers mainly to non-biodegradable items of household, community and industrial waste. Restrepo et al. (2008) suggests proper storage, collection and disposal of waste are essential for protecting public health.

The biological control is based on the introduction of organisms that prey upon, parasitize, compete with or otherwise reduce populations of the target species. The biological control organisms are bred and distributed into water-storage containers or wells (Bhatt et al., 2013; Chen & Wilson, 2010) for example, breeding of fish/copepods, community mobilization and participation (willingness to accept the introduction of organisms into water containers) and distribution system for fish/copepods (regular restocking and monitoring). Besides above discussed experts like, Ranjit & Kissoon (2011) and Restrepo et al. (2008) have also suggested the the personal and chemical control as effective measure to prevent and control the dengue and its dangers.

List of the Variables

Variables	Description
Environmental Control	Responses (positive or negative) towards proper supply of water, mosquito proofed water tanks, measures to avoid water leakages and regular inspection of drainage pipes etc….
Personal Control	Responses (positive or negative) towards proper usage of clothes to reduce mosquito bite, use of insecticide-controlling nets and extensive use of house-hold insecticidal etc.
Chemical Control	Responses (positive or negative) towards the application of air- sprays to kill mosquitoes by the authorities, distribution of larvicide by the Govt. use of portable spray units etc.

Schematic Diagram of the Theoretical Framework

The theoretcal framework of the study is based on the previous studies and variables extracted from the exisiting research.
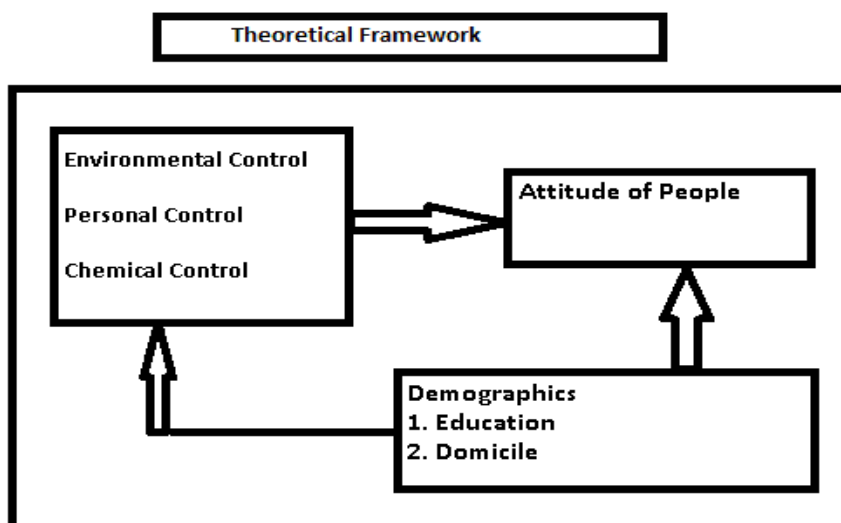
Sub-Hypotheses of the Study

H_1: Environmental control is perceived similar by the literate and illiterate.

H_2: The literate and illiterate have similar views about the personal Control.

H_3: There is no difference of opinion among the literate and illiterate on Chemical Control.

MATERIAL AND METHODS

The cross sectional design was used to assess the views of people towards awareness and dangers of the dengue in the rural Punjab. A survey approach suggested by Sekaran (1999) and Babbie (1993) was employed. The population of this study was all residents of the Tehsil Mankera District Bhakkar. A sample of 100 respondents was used through random and convenience sampling techniques. Primary data was collected through structured questionnaire of 5-point Likert scale. The data collected was analyzed through descriptive and analytical method i.e. chi square test of significance.

Data Analysis

According to descriptive results, 62% respondents were literate while 38% were illiterate

The location -wise breakdown of the respondents, similarly, 83% of the respondents were local and 17% were among non-local.

Hypotheses Testing

The evidence in the favor of or against the hypotheses pinpoints the reality of the survey study. The three hypotheses have been developed and tested through the application of chi square test. The results and their interpretations are discussed below.

H_1: Environmental control is perceived similar by the literate and illiterate.

Contingency Table

Observed Frequencies

Total (RT)	No	Yes	Status
63	6	57	Literate
37	14	23	Illiterate
100	20	80	Total (CT)

Expected Frequencies

Total	No	Yes	Status
63	12.60	50.40	Literate
37	7.40	29.60	Illiterate
100	20	80	Total

Chi-square Test

(Fo-Fe)2/Fe	(Fo-Fe)2	(Fo-Fe)	Fe	Fo	
0.86	43.56	6.60	50.40	57	
3.45	43.56	-6.60	12.60	6	
1.47	43.56	-6.60	29.60	23	
5.88	43.56	6.60	7.40	14	
11.66	174.24	0	100	100	Total (GT)

$\sum$**11.66**

Analysis: As both the variables were nominal, thus chi-square test was applied with 0.05 significance level, since the tabulated value of X^2 for 1 degree of freedom is 3.84. The calculated value of X^2 is 11.66. Since the calculated value is greater than the tabulated value. Hence we reject the H_{01} which implies that there is a difference of attitude of Literate and Illiterate people upon environmental control.

H_2: The literate and illiterate have similar views about the Personal Control.

Contingency Table

Observed Frequencies

Total (RT)	No	Yes	Status
62	24	38	Literate
38	23	15	Illiterate
100 - (GT)	47	53	Total (CT)

Expected Frequencies

Total (RT)	No	Yes	Status
62	29.14	32.86	Literate
38	17.86	20.14	Illiterate
100	47	53	Total (CT)

Chi-square Test

(fo-fe)2/fe	(fo-fe)2	(fo-fe)	Fe	Fo	
0.80	26.42	5.14	32.86	38	
0.90	26.42	-5.14	29.14	24	
1.31	26.42	-5.14	20.14	15	
1.48	26.42	5.14	17.86	23	
4.49	105.68	0	100	100	Total (GT)

$\sum$**4.49**

Analysis: It could be seen from the results that both the variables are nominal hence the chi-square test was used to check the association between the Literate and Illiterate. The level of significance was 0.05, whereas, the tabulated value of X^2 for 1 degree of freedom is 3.84. Likewise, the calculated value of X^2 was 4.49.

As the calculated value is greater than the tabulated value, therefore, we reject our H_0 and state that is significant difference between Literate and Illiterate people upon personal control.

H$_3$: There is no difference of opinion among the literate and illiterate on Chemical Control.

Contingency table

Observed frequencies

Total (RT)	No	Yes	Status
62	52	10	Literate
38	34	4	Illiterate
100	86	14	**Total (CT)**

Expected frequencies

Total (RT)	No	Yes	Status
62	53.32	8.68	Literate
38	32.88	5.32	Illiterate
100	86	14	Total(CT)

Chi-square Test

(fo-fe)2/fe	(fo-fe)2	(fo-fe)	Fe	Fo	
0.20	1.74	1.32	8.68	10	
0.03	1.74	-1.32	53.32	52	
0.32	1.74	-1.32	5.32	4	
0.05	1.74	1.32	32.68	34	
0.60	6.96	0	100	100	Total (GT)

$\sum$ **0.60**

Analysis: As it is evident from the results that since both the variables are nominal hence the chi-square test was used to check the association between the Literate and Illiterate with 0.05 level of significance, the tabulated value of X^2 for 1 degree of freedom is 3.84. The calculated value of X^2 is 0.60. As the calculated value is less than the tabulated, so we accept H_0, that there is no difference among the Literate and Illiterate upon Chemical Control.

FINDINGS OF THE STUDY

This research was conducted to assess the level of awareness and dangers of dengue with reference to prevention and control (environmental, personal l and chemical control) of dengue in rural Punjab province of Pakistan. Based on the review of the literature and the results of the primary data collected from the samples of the study, the study found that there is a significant difference of attitude among the literate and illiterate people for environmental control. Moreover, this research also points that there is a difference of opinions between literate and illiterate for personal control, yet, it could be deduced from the results of the Chi-square test that there is no significant difference in the views of literate and illiterate for chemical control.

CONCLUSIONS AND RECOMMENDATIONS

To understand the demographic impacts, Chi-square test was employed. Three hypotheses were developed to assess the dangers, level of awareness about the environmental, personal and chemical control of dengue disease. The results show that there is a significant difference of attitude between literate and illiterate people upon environmental and personal control. However, there is no difference of attitude between literate and illiterate among the people with reference chemical control. In the light of the results of the present study, public health authorities should devise such ways and means that result into mass scale awareness about the dangers and control measures of the dengue disease through electronic and print media besides arranging different level of seminars, workshops, conferences through engagement of the local communities and other programs via different programs for example, LHWs and School Health and Nutrition Supervisors should be given the task to do/perform Health Education Sessions in the community.

To increase the knowledge about dengue, it is further suggested that some sort of refresher courses may be arranged in hospitals for the doctors and paramedical staff at tehsil and district level hospitals for the Health Care Providers. Besides, personal and chemical control, cleanliness measures may be adopted to improve environmental control for prevention of dengue. In this regards, is further suggested that all sources of stagnant water for eradication of mosquitoes must be removed and filled. Likewise, the fogging and residual spray for the eradication of mosquitoes are to be applied by the local government authorities in the dengue affected areas in particular besides ensuring the use of chemical and biological larvacides.

References
1. Bhatt, S., Gething, P.W., & Brady. O.J. (2013). The global distribution and burden of dengue, *Nature,* 496(7446): 504–7.
2. Chen, L.H., & Wilson, M.E. (2010). Dengue and chikungunya infections in travelers, *Current Opinion in Infectious Diseases,* 23 (5): 438–44.
3. Guy, B., Barrere, B., Malinowski, C., Saville, M., Teyssou, R., & Lang, J. (2011). From research to phase III: Preclinical, industrial and clinical development of the Sanofi Pasteur tetravalent dengue vaccine, *Vaccine,* 29 (42): 7229–41.
4. Guzman, M.G., Halstead, S.B., & Artsob, H. (2010). Dengue: a continuing global threat, *Nature Reviews Microbiology,* 8 (12 Suppl): S7–S16.
5. Normile, D. (2013). Surprising new dengue virus throws a spanner in disease control efforts, *Science,* 342(6157): 415.
6. Panpanich, R., Sornchai, P., & Kanjanaratanakorn, K. (2006). Corticosteroids for treating dengue shock syndrome, *The Cochrane Database of Systematic Reviews,* (3): CD003488.
7. Ranjit, S., & Kissoon, N. (2011). Dengue hemorrhagic fever and shock syndromes, *Pediatr. Crit. Care Med,* 12 (1): 90–100.
8. Rawalpindi Medical College & Allied Hospitals Rawalpindi (2008). Annual Progress Report of, Rawalpindi, Pakistan.
9. Reiter, P. (2010). Yellow fever and dengue: a threat to Europe?, *Euro Surveill,* 15 (10): 195-209.
10. Restrepo, B.N., Ramirez, R.E., Arboleda, M., Alvarez, G., Ospina, M., & Diaz, F.J. (2008). Serum levels of cytokines in two ethnic groups with dengue virus infection, *Am J Trop Med Hyg. , 79(5)*: 673-7.
11. Rodenhuis-Zybert, I.A., Wilschut, J., Smit, J.M. (2010). Dengue virus life cycle: viral and host factors modulating infectivity, *Cell. Mol. Life Sci,* 67 (16): 2773–86.
12. Schmidt, A.C. (2010). Response to dengue fever--the good, the bad, and the ugly? *N Engl J Med.*, 363(5):484-7.

13. Shah, I. (2008). Dengue and liver disease. *Scand J Infect Dis.*, 40(11-12): 993-4.

14. Simmons, C.P., Farrar, J.J., Nguyen, V., & Wills, B. (2012). Dengue, *N Engl J Med,* 366 (15): 1423–32.

15. Statler, J., Mammen, M., Lyons, A., & Sun, W. (2008). Sonographic findings of healthy volunteers infected with dengue virus, *J Clin Ultrasound*, 36(7): 413-27.

16. Varatharaj, A. (2010). Encephalitis in the clinical spectrum of dengue infection, *Neurol, India* 58 (4): 585–91.

17. Webster, D.P., Farrar, J., & Rowland-Jones, S. (2009). Progress towards a dengue vaccine, *Lancet Infect Dis,* 9 (11): 678–87.

18. Wilder-Smith, A., & Gubler, D.J. (2008). Geographic expansion of dengue: The impact of international travel, *Med Clin North Am,* 92(6): 1377-90.

19. Wiwanitkit, V. (2010). Unusual mode of transmission of dengue, *Journal of Infection in Developing Countries,* 4 (1): 51–4.

20. World Health Organization. Impact of Dengue, [Online] available at: http://www.who.int/csr/disease/dengue/impact/en/index.html, (October 14, 2011).

21. Zhang, J.L., Wang, J.L., Gao, N., Chen, Z.T., Tian, Y.P., An, J. (2007). Up-regulated expression of beta3 integrin induced by dengue virus serotype 2 infection associated with virus entry into human dermal microvascular endothelial cells, *Biochem Biophys Res Commun,* 356(3): 763-768.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar