

# AWARENESS ABOUT THE RISK FACTOR AND COMPLICATIONS OF DENGUE VIRUS AMONG COLLEGE STUDENTS - A SURVEY

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## ABSTRACT

Dengue is especially affecting the tropic and subtropic regions of the planet . It's mainly caused by Dengue, a member of Family Flaviviridae. Four serotypes of Dengue are DENV1, DENV2, DENV3 and DENV4. 67,000 people are diagnosed by Dengue and it's been reported by NVBPCP. The aim of this study is to make awareness on risk factors and complications of Dengue virus among college students .The Survey on awareness about the danger factor and complications of Dengue virus among college students was conducted employing a google form link. We've distributed our survey among 100 college students. Then , we used a sampling method. Also, we've used statistical software as SPSS for our data. 59.05 % agreed that they're conscious of Dengue virus, 40.95% are still not aware . 58.10 % agreed that it had been transmitted by files, 27.62 % responded thanks to mosquitoes, 11.43 % responded thanks to Aedes mosquito, 2.86 % responded and still don' t know. Awareness camps , social media , workshops , seminars could also be conducted to make awareness of risk factors and complications of Dengue virus among college students.

**KEYWORDS** - Aedes aegypti, Awareness, DF/ DHF, Dengue Virus, Dengue virus, Online survey, Serotypes

## INTRODUCTION

Dengue is the only single human viral infection which was caused by insects (Gabriel *et al.*, 2020). During the past five years, dengue fever has increased rapidly up to 30 fold, as it makes global and public health a concern (Radhika *et al.*, 2019). Dengue is mainly tropic and subtropic regions which can occur epidemically, and they might cause Dengue virus, a member of family Flaviviridae. Dengue is mainly transmitted is human by two species of Aedes mosquito they are Aedes aegypti and Aedes albopictus (Abbasi, 2016). There are four serotypes of Dengue; they are DENV1, DENV2, DENV3 and DENV4. The main principle vector for transmission of dengue all over the world is Aedes aegypti. To a lesser, albopictus is also popularly known as Asian tiger mosquito (Ramaiah and Jayarama, 2018). Dengue fever

was first named as “water poison” associated with flying insects in a Chinese medical encyclopedia in 992 during the Jin Dynasty ( 264 - 420 AD ) (Gupta *et al.*, 2012). Dengue / Dengue hemorrhagic fever ( DHF ) is an emergent disease in developing countries like India. The first recorded clinically dengue-like illness occurred at Madras in 1780 (C., S. and S., 2016). As WHO guidelines we can classify the Dengue into +/- warning signs and it includes dengue shock syndrome, respiratory distress syndrome, Dengue hemorrhagic fever and organ failure (R. *et al.*, 2017). Traditionally methods of treating dengue virus using Porcupine dates (Pong *et al.*, 2020). Breakbone fever is due to Dengue virus (Sanjay *et al.*, 2018). MiR -927 is upregulated in C6/36 - HT cells at 57 weeks as it works on the persistent infection (Avila-Bonilla *et al.*, 2020). Mainly hepatic dysfunction is more to dengue shock syndrome and it is related to dengue hemorrhagic fever (S.r. *et al.*, 2019). This species of Aedes mosquito is mainly a daytime feed and its biting periods are early morning house and the evening houses before dark (Javed, Ghazanfar and Naseem, 2018). Dengue that is mainly caused by the rainy season. Dengue virus can show some symptoms of high fever ( 103 - 106 F ), several headaches, backache, intense pain in joints and muscles, retro-orbital which is also known as “ Black Bone fever” (Kalra, Kaur and Sharma, 2014). India is having one - third of dengue cases reported globally. In the last few decades, dengue has been reported in various states of India like Haryana, Tamil Nadu, Punjab, Uttar Pradesh and Karnataka (Sugunadevi and Dharmaraj, 2017). Till now 400 million people are infected by the Dengue virus. 67,000 people are diagnosed with dengue and it has been reported by NVBDCP. Dengue is endemic in 112 countries all over the world.

Previous literature explained about dengue fever prevention in Dire Dawa, eastern Ethiopia (Amir Mohammed Yusuf, 2019) , discussed about the knowledge about dengue in southern Thailand (‘Risk factors related to dengue infections in primary school students: Exploring students’ basic knowledge of dengue and examining the larval indices in southern Thailand’, 2013)(Suwanbamrung et al ,(‘Risk factors related to dengue infections in primary school students: Exploring students’ basic knowledge of dengue and examining the larval indices in southern Thailand’, 2013) , Dengue virus infection in Africa (Amarasinghe *et al.*, 2011).

Previous studies on Endemic Goitre in geographical Distribution (Samuel and Devi, 2015), obesity to infertility (Baheerati and Gayatri Devi, 2018), thyroid function test in obese patients ( Fathima and Preetha, 2016), a sleeping patter of different age group (Rj and R, 2016), neonatal jaundice and how it can prevention of kernicterus (Harsha *et al.*, 2015), treatment of asthma (Dave and Preetha, 2016), muscular endurance among dentists (Abigail *et al.*, 2019) was done in our lab .The main motive of my survey is to educate the student about the risk factor and complications of Dengue virus . This type of research is required to am,e the students aware about the factor causing the dengue virus . Through this survey people may gain knowledge about the symptoms and signs of Dengue virus in the first stage itself . So that treatment can be planned before the virus progress .

The aim of this study is to create awareness about the risk factor and complications of Dengue virus among College students.

## **MATERIALS AND METHODS**

Study setting is a prospective observational study on an online survey. The advantages of this study was economical, easy to create, wide reach, gather data and quick interpretation. It has been approved by scientific review board Saveetha Dental College, Chennai. Number of participants involved in this study is 100 college students. We use simple Random sampling methods. For data collection we have used our self-structured questionnaire .We use an online google form link as a data collection software. The list of output variables is demographic information about the risk factor and compilations of the dengue virus. Pie chart and bar diagram was used to represent our output variable . Chi-Square analysis was performed

and  $p < 0.05$  was considered as statistically significant.

## RESULTS AND DISCUSSION

In this current study, the questionnaires were prepared and circulated among 100 college students [Figure 1] It shows that participants age, 1 % belong to age 17 years, 13.3 %: belong to age 18 years, 13.33 % belong to age 19 years, 14.29 % belong to age 20 years, 19.05 % belong to age 21 years, 14.29 % belong to 22 years, 17.14 % belong to age 23 years, 5.7 % belong to age 24 years, 1.90 % belong to age 25 years. [ Figure 2 ] It shows that participants' gender, 71.43 % are female , 28.57 % are male . [ Figure 3 ] It shows that participants belong to a residence, 65.57 % belong to rural , 34.29 % belong urban . [ Figure 4 ] It shows that participants are aware of dengue 59.05 % agreed that they are aware of dengue but 40.95 % were still not aware. [ Figure 5 ] It was asked from participants where dengue breeds, 42.80 % responded to clean water, 36.19 % responded to dirty water, and 16.19 % responded to hot water . [ Figure 6 ] It shows participants are aware of vector dengue virus, 50.48 % agreed that Mosquito is the vector, 34.29 % responded to air droplets, 8.57 % responded to house life, 6.67 % responded all the above are vectors of dengue virus. [Figure 7] It shows that students are aware of time dengue bite, 50.48 % it was bitten during sunrise/sunset, 37.14 % responded to bite during Night, 9.52 % responded to bite during the afternoon, 2.86 % are still not sure. [ Figure 8 ] It shows that disease transmitted by dengue virus, 59.05 % agreed that it was fever, 30.48 % agreed transmitted by malaria ,10.48 % agreed it transmitted by Dengue fever. [Figure 9] It shows the symptoms of dengue virus, 50.48 % agreed high fever,31.40 % had joint pain/muscle pain, 13.3 % had rashes, 1.90 % had maybe. [Figure 10] It shows that dengue transmitted by 58.10 % agreed to flies, 27.62 % had mosquitoes, 11.43 % had Aedes mosquito, 2.86 % didn't know. [Figure11 ] It is the most life-threatening, 51.43 % shows bleeding, 31.43 % had a fever, 12.38 % had shocks. [ Figure 12 ] It shows participants can avoid dengue, 48.57 % agreed that it was covering storage to avoid dengue, 34.29 % agreed that it was a window screen to avoid dengue, 8.57 % agreed that it was insecticide can avoid dengue, 8.57% agreed that it was all of the above can be used to avoid dengue. [Figure 13] It shows students can prevent dengue, 80.0% agreed that dengue can be prevented, 20.00 % had still not agreed [ Figure 14 ]. Its shows that why students are affected by dengue mostly, 47.62 % agreed that it was a high immune system so that it mostly affected, 36.19 % agreed that it was low immune system, 16.19 % still doesn't know. [ Figure 15 ] It shows that it is mostly affected by dengue annually, 40.82 % agreed that it was 800 people mostly affected by dengue, 21.43 % responded 100 are mostly affected, 21.43 % responded 9500 infected annually. [ Figure 16 ] It shows dengue has affected India, majority 79.05 % agreed that it was dengue affected in India, 20.05 % not affected. [ Figure 17 ] It shows types of food should be avoided during dengue, 44.76 % agreed that we should avoid caffeine, 34.29 % had avoided oily and fried food, 16.19 % had avoided carbonated drink, 4.76 % had avoided all the above food during dengue virus. [ Figure 18 ] It shows how students gather information about Dengue, 60.00 % agreed that they got information from TV/radio , 28.57 % had got information from schools , 9.52 % had got information from the hospital, 1.09 % had got information from newspapers .

We have seen the association between gender and awareness of dengue virus [ Figure 19 ] , symptoms of dengue virus [ Figure 20 ] , way to avoid dengue virus [ Figure 21 ] , food we should avoid during dengue virus [ Figure 22 ] .

[ Figure 4 ] It shows that students are aware of dengue virus, majority 59.05 % “Yes” they are aware of dengue which can be compared to a similar study conducted by Ahmed Itrat et al in the year 2008 state that 89.9% are aware of dengue virus (Itrat *et al.*, 2008). [ Figure 6 ] Its shows that students are aware of vectors that cause dengue virus, majority 50.48 % are said mosquitos, which can be compared to an opposite finding that was conducted by Rafaqat Bota et al in the year 2014, 58.6 % Aedes mosquitoes cause dengue virus vectors (Bota *et al.*, 2014). [Figure 9 ] It shows that symptoms of Dengue virus 50.48

% symptoms are High fever, as we compare with similar findings by CA Vinod Kumar in the year 2013 state that 100 % are having fever as a symptom of dengue virus (Vinodkumar *et al.*, 2013). [ Figure 12 ] It shows how students can avoid dengue, majority 48.57 % covering storage, 34.29 % window screen to avoid dengue as compared with Az Ma et al in the year 2019 state that for to prevent dengue virus they use some prevent like 89.2 % they removal stagnant water, 88.9 % are mosquito repellent, 86 % covering water containing, 82.5 % use window screen at bed nets (Az *et al.*, 2019)

Previous research which we can relate to our life like myocardial infarction (Renuka and Sethu, 2015), Acupuncture and lower back pain (Swathy and Gowri Sethu, 2015), peak expiratory flow rate (Timothy, Gayatri Devi and Jothi Priya, 2019), evaluation of adenoids by oronasal and nasal spirometry (R and Sethu, 2018), treatment and prevention of Onychocryptosis (Iyer, Gayatri Devi and Jothi Priya, 2019), an important study was done about Non-alcoholic fatty liver disease (Choudhari and Jothipriya, 2016), physical fitness of dental physician, UG and PG (David *et al.*, 2019), Tongue exercise which we can do simple habitual Snorers (Shruthi and Preetha, 2018).

The limitation of those studies is to extend in sample size, inclusion, more criteria, No of articles, online distribution and population. In future, we'll help to extend the notice about dengue virus and risk factor among all different professional students on an outsized scale

## CONCLUSION

The government of India and therefore the medical council of India should take some important steps to market education, knowledge about Dengue virus and prevention to all or any institutions. No significant association was identified for gender during the study. These findings demonstrate that our prospective study enhanced knowledge and awareness of dengue in the volunteers. From this study, we conclude that students are having a better knowledge about dengue virus and its complications.

## AUTHORS CONTRIBUTION

Raja Kumar participated in Structure study design, data collection. Dr V.Vishnu Priya helped in the collection of reviews, drafting manuscripts, Dr Jothi Priya carried out revising manuscript, final approval of the manuscript.

## CONFLICT OF INTEREST

The author declares that there was no conflict of interest in the present study.

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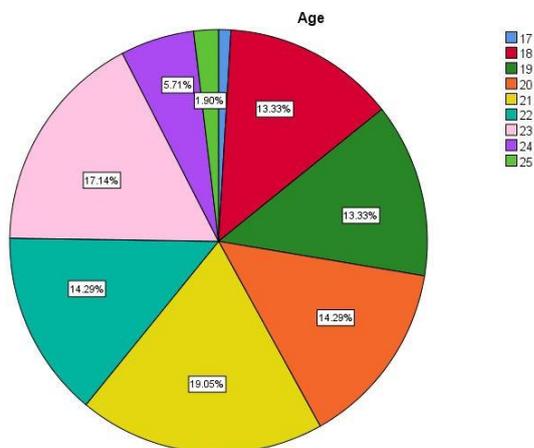


Figure 1 : Pie chart representing percentage distribution of age group of participants. Majority (17.29 %) of the participants belong to age group 23 years (pink ), (1.90 % ) of the participants belong to age group 17 years ( blue) , (13.33 % ) of the participants belong to age group 18 years (red ) ,( 13.33 % ) of the participants belong to age group 19 years (hunter green ) , (14.29 % ) of the participants belong to age group 20 years (oranges), (19.05 % ) of the participants belong to age group 21 years (yellow) , (14.29 % ) of the participants belong to age group 22 years (grey ) ,( 5.71%) of the participants belong to age group 24 years (violet ) and (1.90 % ) of the participants belong to age group 25 years (kelly green ) .

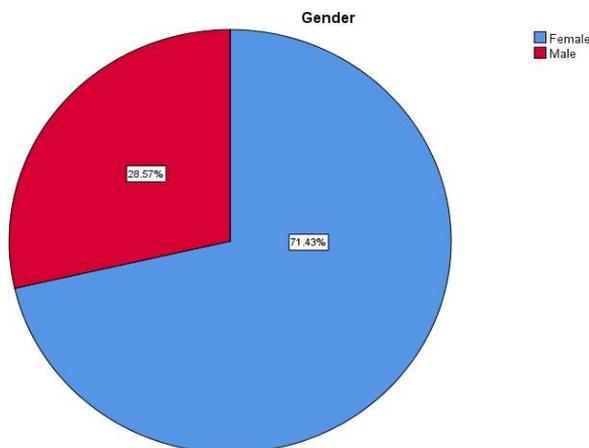


Figure 2 : Pie chart representing percentage distribution of gender of the participants. Majority of the participants were female for about 71.43 % (blue ) and the remaining 28.57 % were male participants (red).

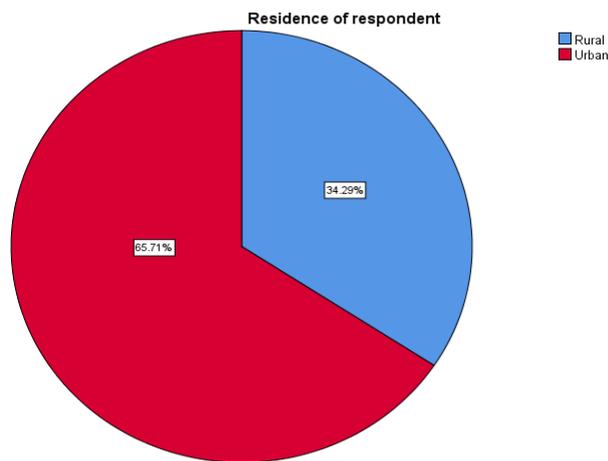


Figure 3 : Pie chart representing percentage distribution of residence of the participants. Majority (65.71 %) of the population were from the urban area (red ), and the remaining (34.29 %) were from the rural area (red).

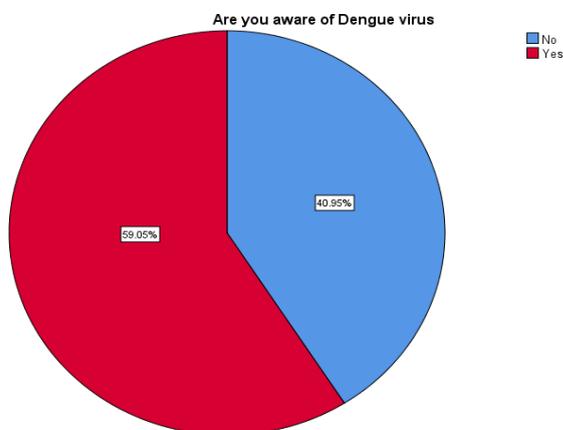


Figure 4 : Pie chart representing percentage distribution of awareness of dengue virus. Majority (59.05%) of the participants are aware about dengue virus (red) and the remaining (40.55 %) are not aware of dengue virus (blue ).

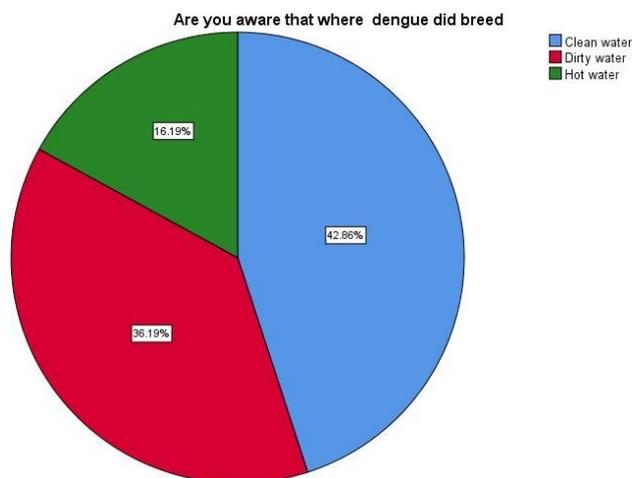


Figure 5 : Pie chart representing percentage distribution of awareness of dengue breed. Majority (47 %) of the participants say clean water (blue),( 36.19 %) of the participants say dirty water (red) and the remaining ( 16.19 %) say hot water (green).

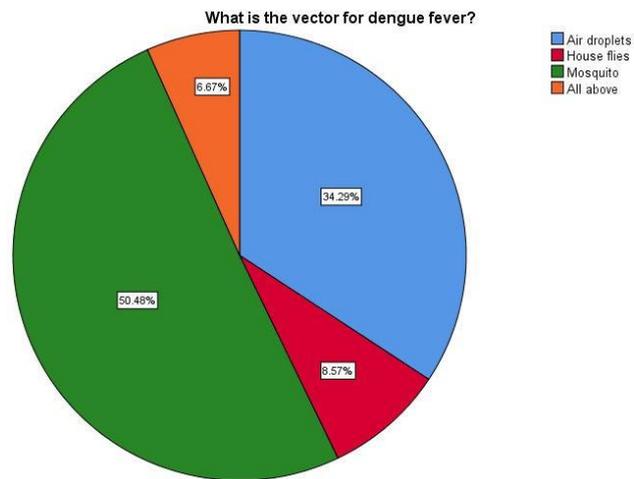


Figure 6 : Pie chart representing percentage distribution of vectors of dengue virus . Majority (50.48 %) of the participants says that the vector for dengue virus is mosquito (green), (34.29 %) says Air droplets (blue) ,( 8.57 % ) says house flies (red) , ( 50.48 % ) says mosquito (green) , (6.67 % ) says all the above ( orange ) .

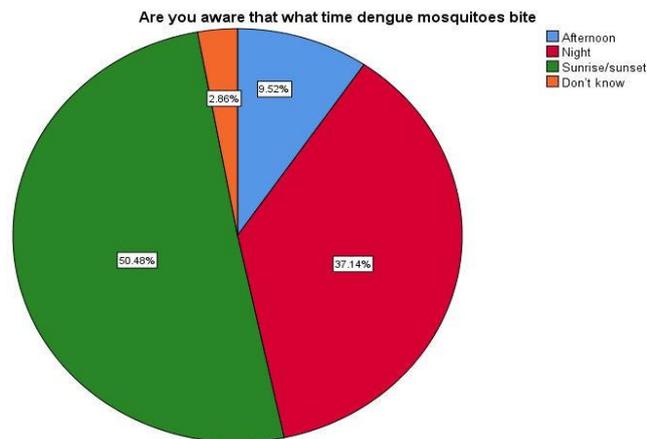


Figure 7 : Pie chart representing percentage distribution of awareness of the time of mosquito bites . Majority (50.48 % ) of the participants says that the mosquito bites during sunrise /sunset (green) , (9.52 %) of the participants says during Afternoon (blue) , (37.14 %) of the participants says Night (red) , (2.86) % says Don't know ( orange ) .

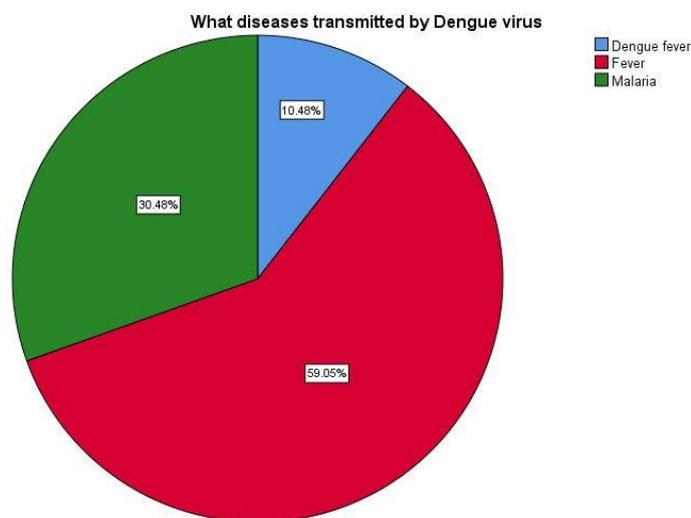


Figure 8 : Pie chart representing percentage distribution dengue transmitted . Majority (59.05 % ) of the participants say that Fever (red) , (30.48 % ) of the participants says Malaria (green) , (10.48 % ) others say dengue fever (blue) .

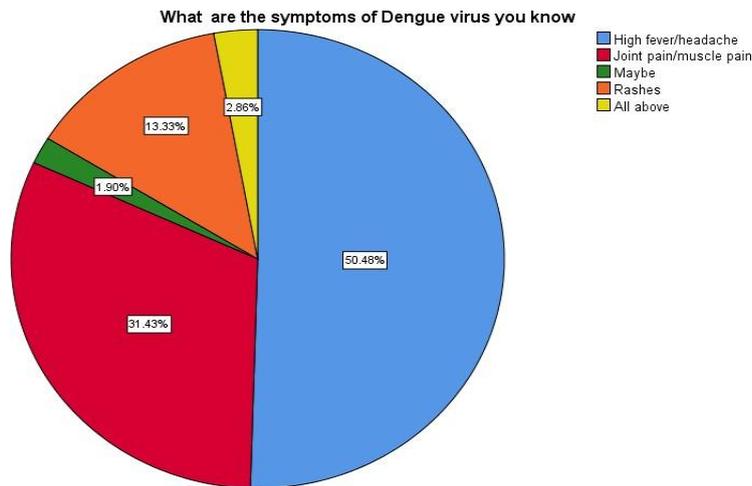


Figure 9 : Pie chart representing percentage distribution of dengue symptoms . Majority (50.48 % ) of the participants say high fever / headache (blue ) , ( 31.43 % ) of the participants says joint pain /muscle pain (red ) , ( 1.90 % ) of the participants says maybe (green ) , (13.33 % ) of the participants says rashes ( orange ) and (2.86 % ) says all above ( yellow )

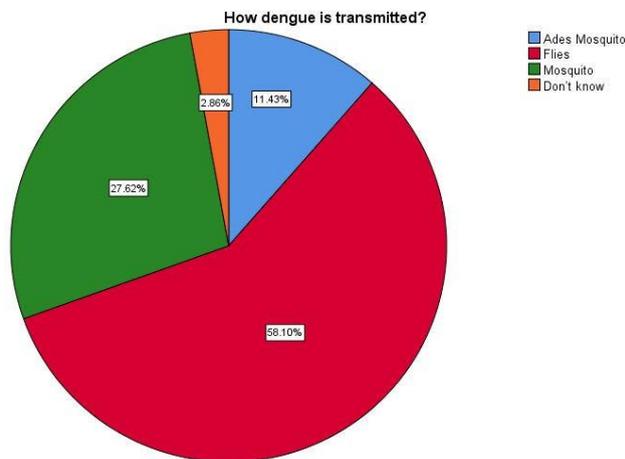


Figure 10 : Pie chart representing percentage distribution of dengue virus transmitted . Majority (58.10 % ) of the participants say flies (red ) ,( 11.43 % ) of the participants say Aedes mosquito (blue ) , (27.62 % ) of the participants say mosquito (green ) and (2.86 %) says Don't know ( orange ) .

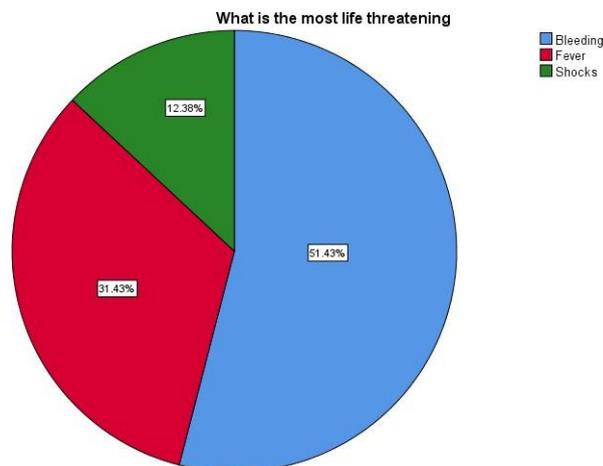


Figure 11 : Pie chart representing percentage distribution of life threatening during dengue virus . Majority (51.43 % ) of the participants say Bleeding (blue ) ,( 31.43 % ) of the participants say Fever (red ) and ( 12.38 % ) say shocks (green ) .

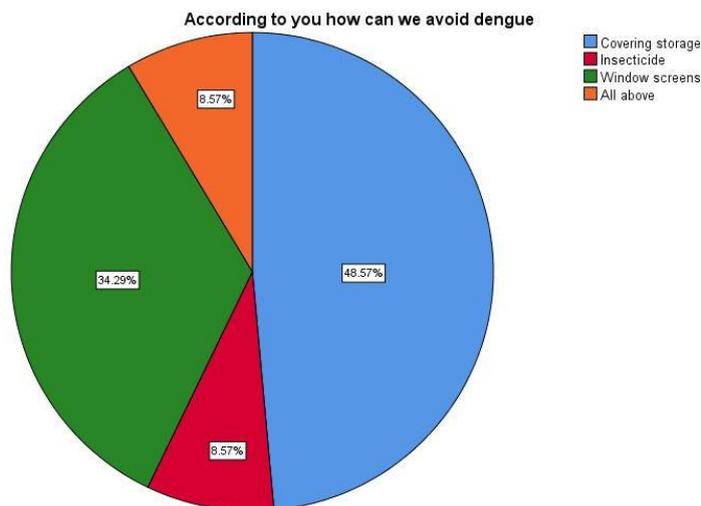


Figure 12 : Pie chart representing percentage distribution of techniques to avoid dengue mosquito . Majority (48.57 % ) of the participants say covering storage (blue ) , (8.57 % ) of the participants say Insecticide (red ) , ( 34.29 % ) of the participants say window screens (green ) and ( 8.57 % ) says all the above ( orange ) .

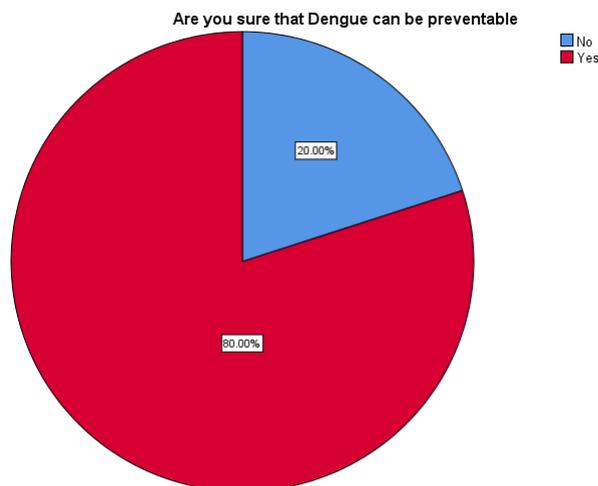


Figure 13 : Pie chart representing percentage distribution of dengue can be preventable . Majority ( 80.00 % ) of the participants say Yes dengue can be prevent (red ) and (20.00 % ) of the participants say No dengue cannot be prevent (blue ) ,

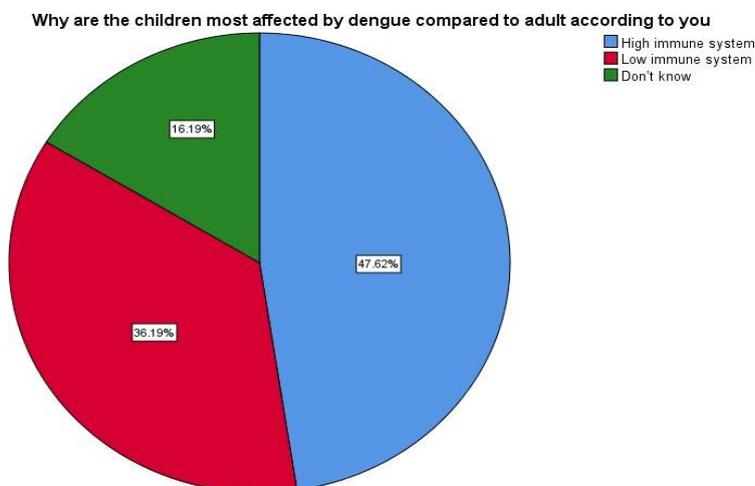


Figure 14 : Pie chart representing percentage distribution of children are mostly affected . Majority (47.62 % ) of the participants say high immune system (blue ) , (36.19 % ) of the participants say low immune system (red ) , (16.19 % ) say Don't know (green ) .

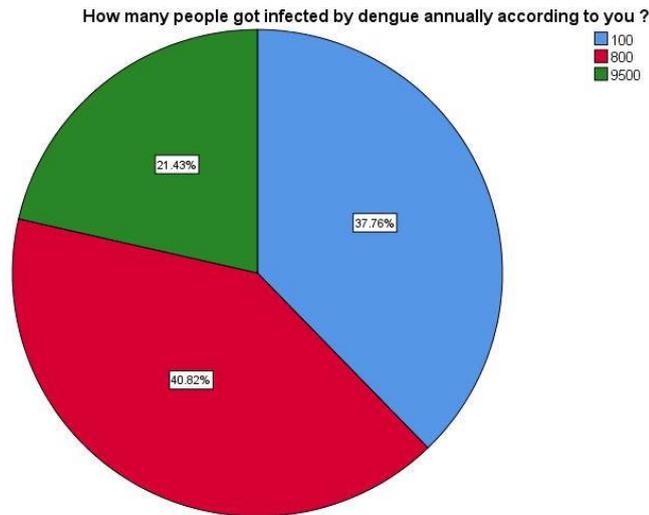


Figure 15 : Pie chart representing percentage distribution of annually infected by dengue . Majority (40.82 % ) of the participants say 800 (red ) , (21.43 % ) of the participants say 9500 (green ) and (37.76 % ) say 100 (blue ) ,

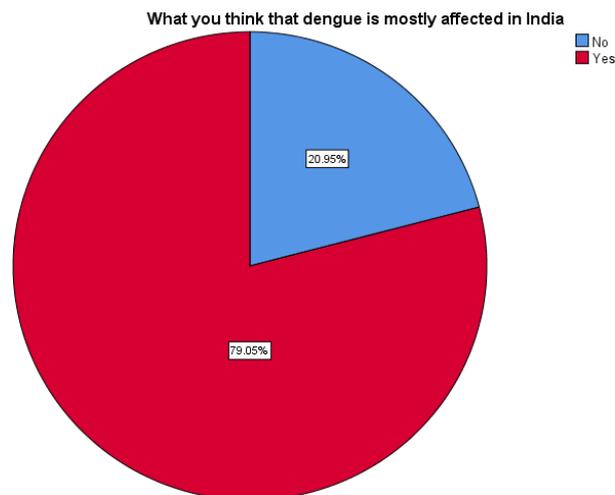


Figure 16 : Pie chart representing percentage distribution of dengue is mostly affected in India . Majority (79.05 % ) of the participants say Yes dengue mostly affected in india (red ) (20.95 % ) of the participants say No dengue is not affecting in India (blue ) ,

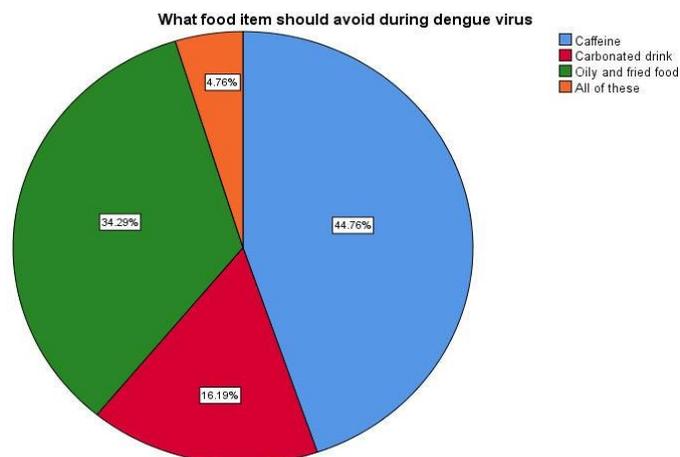


Figure 17: Pie chart representing percentage distribution of food should we avoid during dengue . Majority (44.76 % ) of the participants say Caffeine (blue ) , (16.19 % ) of the participants say carbonated drink (red ) , (34.29 % ) of the participants say oily and fried food (green ) and ( 4.76 % ) say all of these ( orange ) .

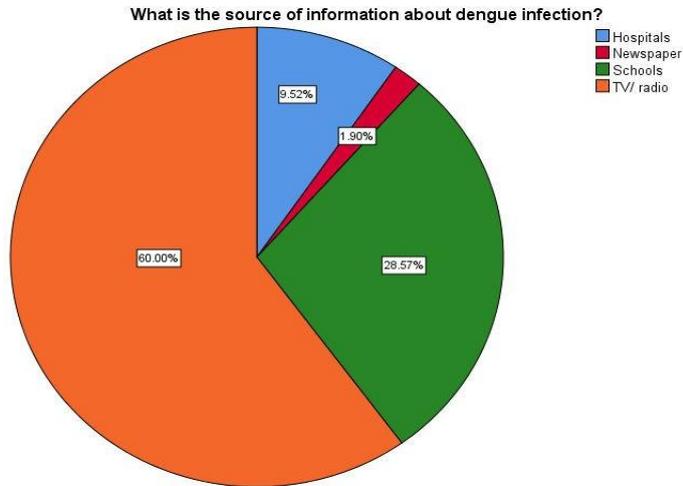


Figure 18: Pie chart representing percentage distribution of source of dengue information . Majority (60.00 % ) of the participants say TV / radio (orange ) , ( 9.52 % ) of the participants say Hospital (blue ) , (1.90 % ) of the participants say Newspaper (red ) and (28.57 % ) say Schools (green ) .

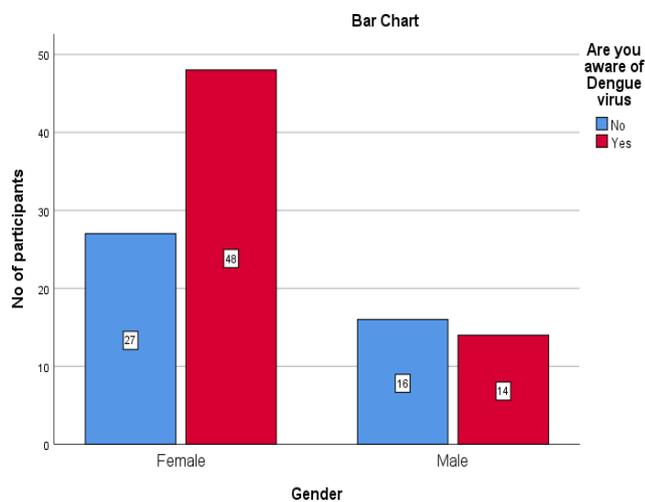
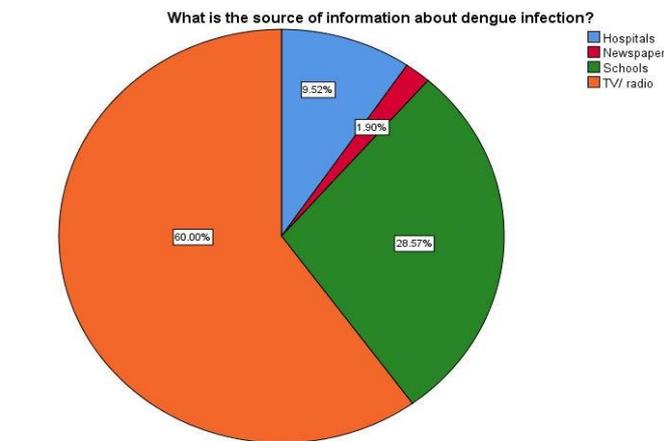


Figure 19: Bar graph showing the association between gender and awareness on dengue virus.X axis represents the gender and the Y axis represents the no of participants, of which red colour indicates yes and blue indicates no. Majority of females (48 participants) have more awareness about dengue virus

rather than males. Pearson’s chi square value = 2.662 , p value = 0.103, (p<0.05), hence statistically not significant).

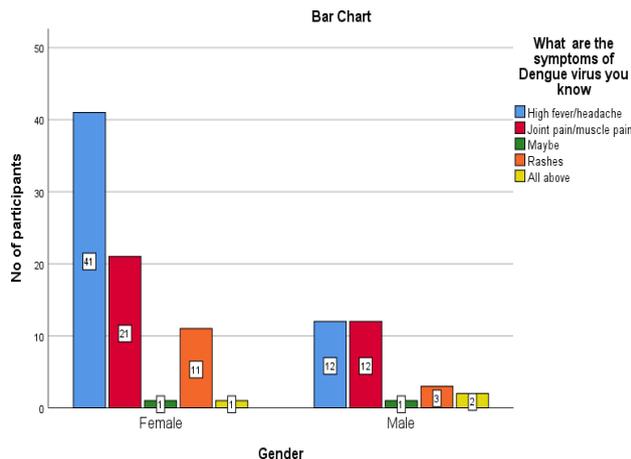


Figure 20: Bar graph showing the association between gender symptoms of dengue virus. X axis represents age and Y axis represents the no of participants of which Blue denotes high fever/ headache, red denotes joint pain/ muscle pain , green denotes maybe , orange denotes rashes and yellow denotes all the above. Majority of the females (41 participants) know that fever is the major symptom of dengue virus rather than males. Pearson’s chi square value = 4.828 , p value = 0.305, (p<0.05), statistically not significant.

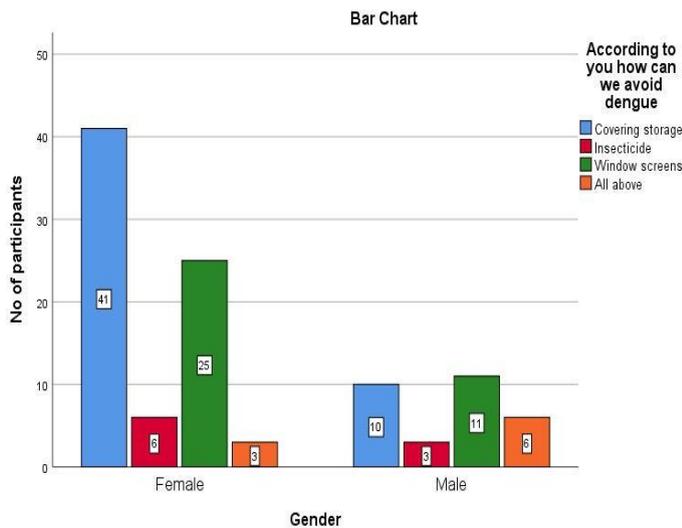


Figure 21: Bar graph showing the association between gender and precautionary measures to avoid dengue. X axis represents gender and Y axis represents the no of participants, of which blue indicates covering storage, red indicates insecticides, green indicates window screens and orange indicates all of the above. Majority of females feel that covering storage helps to avoid dengue than males. Pearson’s chi square value =8.577 , p value = 0.035, (p<0.05), hence statistically not significant.

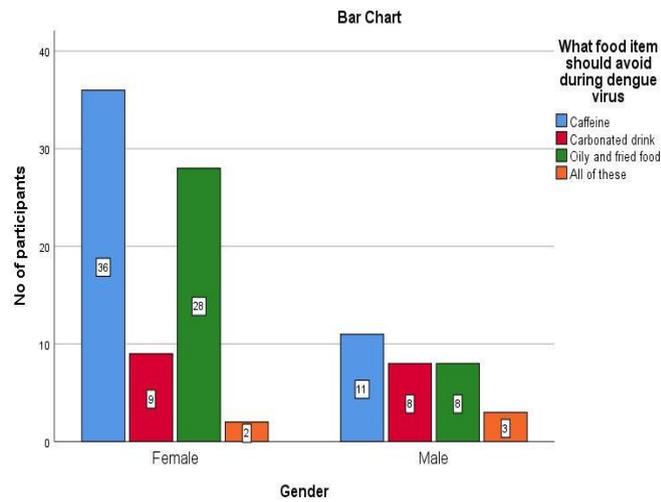


Figure 22: Bar graph showing the association between gender and dietary habits for the avoidance of dengue. X axis represents gender and Y axis represents the no.of participants, of which, Blue denotes Caffeine , red denotes Carbonated drink , green denotes Oily and fried food orange denotes all of these. Majority of females say that caffeine is the only food that avoids the dengue virus when compared to males. Pearson's chi square value =6.593 , p value = 0.086, ( $p < 0.05$ ), hence statistically not significant.