

## Do we know about Zika virus infection?

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### Abstract

**Background:** This study was carried out in order to determine the levels of knowledge of nursing, midwifery and medical faculty students about Zika virus infection.

**Methods:** The population of this descriptive study consisted of 733 students who accepted to participate in the study between May-June 2016. The analysis of the data collected with questionnaire form including the socio-demographic features aimed at determining the level of knowledge about Zika virus infection prepared by the researchers in line with the literature, and by taking the permission of the ethics committee was performed using parametric and non-parametric tests in the computer environment.

**Results:** The age average of the students is  $20.67 \pm 2.04$  y, 44.1% are nursing, 34.4% are medical faculty, and 21.6% are midwifery department students. 62.1% of the students had no knowledge about Zika virus infection. It was determined that 67.8% of the participants did not know the symptoms of Zika virus infection, 74.9% did not know the ways of protection, and only 8.2% knew that it was necessary to be protected against mosquitoes. It was observed that the knowledge level total score average of the students was  $53.18 \pm 19.96$ ; and the average scores of those who had knowledge about Zika virus infection, who thought that they had sufficient knowledge, and the students of the department of nursing were statistically significantly higher, and the average scores of the first-grade students were low ( $p < 0.05$ ).

**Conclusion:** In the study, it was determined that students need more information about Zika virus infection.

**Keywords:** Zika virus, Zika virus infection, Zika virus disease, Level of knowledge, Student.

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### Introduction

Zika virus is an RNA virus from *Flavivirus* group, which was first isolated from a monkey named *Rhesus* in Zika forest in Uganda in 1947, reported to have first observed among humans during a jaundice epidemic in East Nigeria in 1954, and known to be transmitted by *Aedes* species mosquitoes [1,2].

The main way of transmission of Zika virus is the biting of people by *Aedes* species mosquitoes [3]. Mosquitoes become infected when they bite people who have the disease, and infected mosquitoes keep on infecting other healthy individuals by biting them. The transmission is theoretically possible by blood transfusion although there are no reported cases, however, no sexual transmission and transmission through

breast milk were reported [1,3]. Although there are different data in the literature, the incubation period is 3-12 d on average. The symptoms are observed for one week on average, and viremia frequently continues for a week [1,3,4]. It is quite hard to distinguish it from diseases transmitted by the same species of mosquitoes which are more well-known than Zika virus, such as dengue fever, Chikungunya, Western Nile, measles, and rubella [5]. It frequently manifests with fever, headache, eye redness, skin rash, muscle and joint pains. The symptoms are observed only in 1 of 5 infected individuals [1]. It is mostly asymptomatic, frequently does not require hospitalisation and death is rare. Neurologic complications, and frequently Guillain-Barre Syndrome, complications such as microcephaly especially in the second and third trimester in

pregnant women, intracranial calcification, and sight-threatening optic nerve anomalies can be observed [6,7]. Diagnosis can be made using serological tests and urine test. There is no specific treatment method, and abundant liquid intake and resting are suggested [8].

Although Zika virus can be observed among people in regions such as Tropical Africa, Southeast Asia, Pacific islands, it started to come up in Micronesia, Gabon and Senegal in 2007-2008, and in French Polynesia in October 2013 with major outbreaks, and it was reported that the virus was isolated from individuals coming from endemic regions from Norway, Germany, Australia, Canada, France and Italy in 2014. Zika virus started to spread rapidly on American continent with the outbreak of Zika virus infection in Brazil in May 2015, and it was reported that it spread to more than 20 countries since that date [4]. On 7 January 2016, the Maldives National UST Focal Point reported to the World Health Organization (WHO) that a person from Finland with the disease symptoms was diagnosed with Zika virus infection in June 2015 [9]. The WHO urgently gathered in Geneva City of Switzerland on 1 February 2016 and declared the Zika virus epidemic as an "International Emergency for Public Health" [10]. The dissemination of mosquitoes with the increase in trade routes and the approach of summer months is a facilitating factor for the dissemination of Zika virus. This also leads to the increase in the concerns of the society about Zika virus. The level of knowledge of the society about Zika virus that becomes increasingly widespread must be determined, and the awareness of the society must be increased in this direction. The aim of our study is to determine the levels of knowledge of Medical Faculty and Health Sciences Faculty students, who are closely related to health, with whom the society frequently consults in subjects related to health and who are candidate healthcare workers, about Zika virus. We foresee that the study will raise awareness among students on this subject.

## Methods

All students who enrolled for the course at Sakarya University Medical Faculty (360 students) and Sakarya University Faculty of Health Sciences (1023 students) made up the population of the study planned as a descriptive study in order to determine the students' levels of knowledge about Zika virus, and the sample was made up of 733 students who accepted to participate in the study and had no communication problems between May-June 2016. The data, collected using the information form consisting of 50 items aimed at determining the level of knowledge about Zika virus infection and prepared in line with the literature by the researchers (the level of knowledge score varies between 0 and 100, and a high score shows that the level of knowledge is good) and the questionnaire including 17 questions about socio-demographic characteristics and upon the permission of the ethics committee, were analysed using parametric and non-parametric tests in the computer environment.

## Results

The age average of the students is  $20.67 \pm 2.04$  y, 74.4% of the students are female, and 25.6% are male. 27.8% of the students are first-grade, 30.4% are second-grade, 24.6% are third-grade, 13.5% are fourth-grade, 2.3% are fifth-grade, and 1.4% are sixth-grade students. Upon examining the departments of the students who participated in the study, it was determined that 44.1% were nursing, 34.4% were medical faculty, and 21.6% were midwifery department students.

More than half (62.1%) of the students answered the question "Do you have information about Zika virus infection?" as "No". 41% of the students who said "Yes" (n=278) said that they learnt about Zika virus from television, 25.5% from the Internet, and 25.2% at school/from lessons. Almost all of the students (96.2%) said that they thought they did not have sufficient knowledge about Zika virus infection and 86.8% wanted to get information about Zika virus infection. When they were asked about the symptoms of Zika virus infection, more than half of them (67.8%) said that they did not know, and 9.3% said that congenital anomalies (hydrocephaly, microcephaly, etc.) can be observed. When they were asked about the ways of protection, again most of them (74.9%) answered that they did not know, 8.7% said that precautions such as washing hands and hygiene must be taken, and 8.2% said that people must be protected against mosquitoes (such as long-sleeved clothes, mosquito-repellent drugs, etc.). 3.4% of the students said that it is necessary to be protected during sexual intercourse. 29.7% of the students (n=303) who answered the question where wouldn't you go on holiday due to Zika virus infection said that they would not go to Africa, 16.5% said that they would not go to Brazil, while 22.1% said that they did not know. When they were asked about the precautions that must be taken in Turkey, it was determined that 45.7% answered as "I don't know", 22.7% said that travel precautions must be taken (such as checks at the entrance to and exit from the country), 8.9% said that individual precautions (such as long-sleeved clothes, mosquito-repellent sprays, etc.) must be taken, and 8.3% said that precautions against vectors must be taken. 45.7% of the students said that they had no information about the precautions that must be taken in Turkey. It was detected that 52.9% of the participants were not worried about contracting the Zika virus infection. It was determined that the students' average of the level of knowledge total score was  $53.18 \pm 19.96$ .

It was observed that age, gender and the state of being worried about Zika virus did not affect the level of knowledge of the students ( $p > 0.05$ ). It was determined that those who had information about Zika virus infection believed that they had sufficient information and the nursing department students had statistically significantly high average scores, and the average scores of first-grade students were low ( $p < 0.05$ ).

## Discussion

Although *Aedes* species, which is a Zika virus factor, is rare in our country, it can be thought that the possibility of

transmission has increased with the increase in trade routes and tourism. Upon examining the travelling abroad rates in Turkey, it is observed that the rates are gradually increasing by years. According to what is indicated in the statistics report of 2000 and 2015 published by the East Mediterranean International Tourism and Travel Exhibition (EMITT), a Zika virus case was observed in each of top 10 countries determined to attract most tourists in 2020. According to the same statistics data, upon examining the reasons for travelling abroad from our country, it is observed that those who travel abroad for education, course, seminar and conference purposes make up 4.3% [11]. Students who go abroad for education purposes can go to many places in the world frequently with exchange programs. Similarly, there are also students who come to our country from different countries for education purposes. Considering the possibility that these people may be infected, students must be given information about Zika virus infection.

Although unique studies performed in order to measure the levels of knowledge of students in our country are not encountered yet, no research articles were found while compilation articles on Zika virus can be easily found in the foreign literature. Hence, it was determined that more than half of the students studying in the fields related to Health at Sakarya University stated that they did not have knowledge about Zika virus in the study carried out for the purpose of determining the levels of knowledge about Zika virus of Medical Faculty and Health Sciences Faculty students, who are candidate healthcare workers, closely related to health, and with whom the society frequently consults in subjects related to health. In the studies carried out by Chinnakali et al. on dengue fever that is transmitted by the same species of mosquitoes as Zika virus with 189 participants, it was stated that almost all of the participants (96.3%) heard of the disease before [12]. 77% of the participants of the study of Dhimal et al. also stated that they heard of dengue fever before [13]. In the present study, it was determined that the average scores of the level of knowledge of the students were low ( $53.18 \pm 19.96$ ). While no study that is directly on the level of knowledge about Zika virus is found in the literature, when the studies carried out regarding other diseases with the same factor with Zika virus were examined, it was found out that the level of knowledge of the participants was low similarly to this study [13,14]. In the study carried out by Tavoosi et al., in which they measured the level of knowledge of high school students in Iran about HIV, it was stated that the knowledge level seemed to be moderately high, but there were misconceptions regarding the ways of transmission [15].

Although no suggestion was found in the literature regarding the extraordinary practices especially for the personnel working at schools or students, information booklets [16] or resources available on the Internet for district and school administrators in general were provided at universities such as Colorado State University [17], University of Connecticut [18] (UCONN), University of Tennessee [19] and by CDC (Centres for Disease Control and Prevention) in order to inform students due to their being in crowded environments. Upon examining the literature, it is noted that television and the Internet are

used quite frequently for informing students and the society [20-22]. It is also observed that universities or organisations such as CDC create information brochures/web pages directly for informing students about Zika virus infection. In this study, it was determined that students heard of Zika virus most from television and the Internet. In the study carried out by Degallier et al. with 130 individuals, it is stated that television is the most frequently used source of information (94.6%) [23]. In the study of Dhimal et al. it was reported that 83% of the participants heard of Dengue fever on the radio, and 81% heard of it on the television [13]. In the studies of Chinnakali et al. [12], it is observed that 54.9% of the participants and 74% of the students in the study of Ibrahim et al. [14] stated that their source of information on the disease was television. In the studies of Madeira et al. [24], it is similarly stated that both the intervention and control group (87.3% - 85.5%, respectively) heard of Dengue fever on the television. In the study of Magden et al. it was shown that 76.9% of high school students learnt the information about AIDS from communication tools such as television, radio, etc. [25]. These results support the result of the present study.

In the study, students were asked questions about the symptoms of the virus, ways of protection, where they would not go in order to measure whether they know the places where the virus is found, the precautions that must be taken for the country, signs and symptoms of Zika virus, treatment and general information. Upon examining the literature, it is clearly observed that action plans of the universities prepared for students contain similar questions and answers [12-14,23,24]. In this study, it was determined that more than half (67.8%) of the students did not know the symptoms of Zika virus infection. In the study of Ibrahim et al. participants expressed that they knew the symptoms of Dengue fever at varying rates between 79.7% and 90.2% (each symptom was scored separately) [14]. In the studies of Madeira et al. it is stated that 41.8% of the students know the symptoms of Dengue fever [24]. In the studies of Chinnakali et al. it is stated that only 2% of the participants express bleeding as one of the most important symptoms of Dengue fever, and 11% indicate that rash is among the most significant symptoms [12]. The rate of knowing congenital anomalies (9.3%), which is one of the most important symptoms of Zika virus, was found to be low in the present study just as in the study of Chinnakali et al. [12]. It was observed in the study of Betancourt et al. that the knowledge of healthcare workers and students about Zika-related microcephaly was low in a similar way to this study [26]. The reason for the difference between the study of Madeira et al. [24] and Ibrahim et al. [14] may be the fact that dengue fever is observed in countries where the study is carried out, and students are given information about dengue fever during lessons, and no information is provided on Zika virus infection during the lessons of the students in the present study.

In the study carried out by Bedoya et al. with healthcare workers and students, in which they measured the level of knowledge about Chikungunya fever in two cities of Colombia, it was expressed that having information on the

vector causing transmission had a significant role in the prevention [27]. In the study of Cherry et al. it was observed that participants knew the ways of protection against Chikungunya virus at varying rates between 56% and 92% (each precaution is shown separately) [22]. In the study of Dhimal et al. it was reported that the prevention of the interaction of people with mosquitoes was mostly suggested among the ways of protection of individuals (at varying rates between 69% and 95%) [13]. In the study of Chinnakali et al. it was shown that 34% of individuals knew the precautions for eliminating the mosquitoes [12]. In the study of Madeira et al. it was reported that the individuals in both the intervention and control group (95.7%-92.2%, respectively) answered the question what can you do to prevent Dengue fever correctly [24]. In the present study, it was observed that a great majority of the students (74.9%) did not know the ways of protection against Zika virus factor. The reason for the variation of the results of this study when compared to the literature may be because of the fact that the awareness of the students is not at the sufficient level due to such reasons as the fact that Zika virus infection is not observed in our country, such cases are not covered by the media, etc.

It was observed that age, gender and the state of being worried about Zika virus did not affect the level of knowledge of the students ( $p>0.05$ ). It was determined that the score averages of those who had knowledge about Zika virus infection, who believed that they had sufficient information, and the nursing department students were statistically significantly high, while the score averages of first-grade students were low ( $p<0.05$ ). In the study in which Kaya et al. examined the level of knowledge of high school students about HIV/AIDS, it was similarly expressed that no difference was determined between the knowledge score averages by the gender variable, but the score average of the fourth-grade students was significantly higher when compared to the first-grade students ( $p=0.001$ ), and the score average of the students of nursing department was higher when compared to the students of midwifery department. In the same study, it was shown that the scores of the first-grade students were low when compared to other grades [28]. In the study of Magden et al. it was shown that gender did not affect the level of knowledge ( $p>0.05$ ) [25]. In the study of Latman et al. it was reported that there was a significant relation between the degree of assessing the students' levels of knowledge and score averages. It was also determined that the knowledge scores of those whose knowledge levels were assessed as low were also low [29]. In the study of Ghojzadeh et al. it was expressed that the level of knowledge of university students about HPV after graduation was statistically significantly higher when compared to undergraduate students ( $p<0.001$ ) [30]. These studies support and show parallelism with the results of the present study.

Consequently, it is believed that the knowledge levels of students about Zika virus infection are not sufficient. Therefore, we believe that the knowledge and awareness levels of students can be increased by covering Zika virus infection during the lessons and organising seminars and conferences.

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