Health and Environmental Education: Knowledge about Dengue Among Students at a State School in the Municipality of Ituiutaba-MG

Saúde e Educação Ambiental: O Conhecimento sobre a Dengue entre Discentes de uma Escola da Rede Estadual no Município de Ituiutaba-MG

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ABSTRACT
This work analyzed the knowledge and perception of dengue among high school students in a State School in the city of Ituiutaba-MG during the month of October 2020. In total, 30 semi-structured questionnaires were applied among the students. It was evident that they have some knowledge about the modes of transmission, severity and possible control of the disease, involving health, environment and society. However, there are still young people lacking knowledge about the subject in question. This information is relevant to support educational interventions and social mobilization.

Keywords: Society, Aedes aegypti, Environmental Sustainability, Education

RESUMO
Este trabalho analisou o conhecimento e a percepção sobre a dengue entre alunos do Ensino Médio de uma Escola Estadual da cidade de Ituiutaba-MG durante o mês de outubro de 2020. No total, foram aplicados 30 questionários semiestruturados entre os
alunos. Ficou evidente que eles possuem algum conhecimento sobre as formas de transmissão, gravidade e possível controle da doença, envolvendo saúde, meio ambiente e sociedade. No entanto, ainda existem jovens sem conhecimento sobre o assunto em questão. Essas informações são relevantes para apoiar intervenções educativas e mobilização social.

**Palavras-chaves:** Sociedade, Aedes aegypti, Sustentabilidade Ambiental, Educação.

1 INTRODUCTION

Dengue is currently the most significant and most common arbovirus in the world, being endemic in all continents, with the exception of Europe. Approximately 2.5 billion people are at risk of becoming infected, especially in tropical countries where climatic conditions (temperature and humidity) are favorable to the development of the mosquito vector (ARAÚJO et al., 2008).

According to Halstead (2007) about two-thirds of the planet's population live in places infested with dengue vectors, especially Aedes aegypti. One or more serotypes of the virus circulate in these areas.

* Aedes aegypti is the classic vector of dengue, chikungunya and urban yellow fever viruses. This is a daytime and domestic mosquito, preferably using clean water tanks for laying eggs, which have a high capacity to resist dehydration. This characteristic has indicated a high ability to adapt to different unfavorable environmental conditions (ZARA et al., 2016).

Dengue transmission occurs essentially in urban areas. Environments that have fundamental conditions for their development, especially environmental and socioeconomic factors, which constitute the foundation that enables the implementation of their transmission hierarchy. Urban expansion has resulted in the grouping of individuals susceptible to contamination in localized regions. This occurrence is related to precarious conditions of basic sanitation, inadequate housing and cultural and educational factors, which provide ecological conditions subject to the transmission of dengue viruses by the mosquito, which has adapted satisfactorily in these places (FLAUZINO et al., 2011).

According to the Ministry of Health (2003/2019), considering the classification for severe dengue cases - dengue with complications (DCC), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DCS), 89,265 were confirmed cases of severe dengue, with 68,968 (77.3%) CHD, and 20,299 (22.7%) cases of DHF and SCD cases.
As of 2014, Brazil started to use the new classification of dengue cases by the World Health Organization (WHO), the which considers only dengue with alarm signal (DSA) and severe dengue (DG). Thus, between January 2014 and April 2019, 4,420 cases of GD and 51,195 cases of ASD were confirmed, totaling 55,615 cases.

The instruments that define the occurrence of severe forms of these infections are still not fully recognized, and population and individual studies must be directed so that the undefined points can be elucidated. In this regard, it is necessary to reconcile the efforts of epidemiologists, virologists and clinicians in the perspective of interdisciplinary work capable of contributing to a greater understanding of the mechanisms involved in viral circulation in human populations, in order to identify the factors that influence this dynamic, and that modulate the transition between the appearance of classic dengue and hemorrhagic fever (DYE, 2007).

In view of the seriousness and relevance of this problem, this work aimed to carry out a research on the perception of dengue among young people aged between 15-16 years old in a Public School in the city of Ituiutaba-MG on the modes of transmission and possible control in disease dissemination processes, as well as presenting and discussing available control instruments and strategies, pointing out some reflections for debate.

2 MATERIALS AND METHODS

The methodology used to obtain data for this work consisted of the application of a semi-structured questionnaire, elaborated with an interview script with 4 questions. Thirty questionnaires were applied to 1st year high school students at Coronel Tonico Franco State School, located at Avenida Paranaíba, 375, Bairro Platina, in the city of Ituiutaba – MG. This school offers elementary and high school education, currently having approximately 1,200 students, working in three shifts, morning, afternoon and night.

The identity of the students who participated in the research was preserved.

For the analysis of the questionnaires, simple statistical methodology was used using Excel graphs to demonstrate the answer.

3 RESULTS AND DISCUSSION

The results obtained with the application of the questionnaire to students will be discussed in this section.
The main form of transmission of the disease is through its vector, the female mosquito *Aedes aegypti*, and the transmission cycle is through man-mosquito-man. In this study 47% of respondents reported knowing how the disease is transmitted. Knowledge about the disease was probably related to the school grade of the participants and also because it is a disease considered endemic in the region of this research. These data corroborate what was described by Kanyangarara et al. (2018) who explored the level of knowledge of residents of an endemic area in Africa about malaria and found that 85% of individuals were able to associate the vector with the disease.

Dengue has a worldwide distribution, and in 2016 large outbreaks of dengue were mentioned. The Region of the Americas registered more than 2.38 million cases, where Brazil contributed with just under 1.5 million cases, an incidence approximately three times higher than in 2014.

In addition, 1032 deaths from dengue were reported in the region (BHATT et al. 2013).

In this sense, there is a need to spread knowledge about the means of dissemination of the disease. Furthermore, *Aedes aegypti* is the vector responsible for the transmission of other acute viral diseases such as Zika and chikungunya (CULSHAW et al., 2016).

As mentioned earlier, dengue is an endemic disease in Brazil, where four dengue virus (DENV) serotypes circulate, causing major epidemics in urban areas. Zika and chikungunya were recently introduced in the Americas and spread rapidly in the country (ZARA et al., 2016; BRASIL, 2017).
Students were asked about reports of dengue cases close to their homes (Figure 2).

Figure 2- The graph indicates the answers to the question: Was there a case of dengue near where you live?

Diagnosing dengue quickly is one of the keys to fighting the disease more effectively. The first step in this is to know how the infection manifests itself. If dengue symptoms are recognized, it is essential to seek medical attention as soon as possible. In general, the disease evolves rapidly. Therefore, knowing beforehand can make the difference between the occurrence of a minor harm and more serious consequences, especially in the case of children (G1, 2015). Often the person has the disease and is not diagnosed, for not looking for a health service.

The diagnosis of dengue occurs mainly during clinical and laboratory evaluation. During the anamnesis, the objective is to investigate whether the individual presented fever, gastrointestinal alterations, in the state of consciousness and the presence of bleeding. In 2016, the Ministry of Health published a document called “Dengue diagnosis and clinical management for adults and children” designed to make public the conduct for diagnosis and treatment of individuals affected with the disease in our country (BRASIL, 2016).

Dengue can present itself in different ways, being classified according to its clinical manifestations in dengue, dengue with warning signs and severe dengue. A suspected case of dengue is one in which a person who lives or has traveled in the last 14 days to an area where dengue transmission is occurring or has the presence of Aedes aegypti, who has a fever, usually between two and seven days, and has two or more of the following manifestations: nausea, vomiting, rash, myalgia, arthralgia, headache, dorretro-orbital, petechiae or positive loop test and/or leukopenia. In addition, any child
from or residing in an area with dengue transmission, with an acute febrile condition, usually between two to seven days, and without an apparent focus of infection, can also be considered a suspicious case (BRASIL, 2016).

The knowledge about the severity of the disease (Figure 3) and its transmission and/or elimination (Figure 4) demonstrated among the study participants was high, showing good knowledge of the disease, which is probably associated with programs to prevent and combat the vector. However, there are still teenagers who do not know the subject, bringing to light the importance of this topic in health promotion campaigns, which should be increasingly intense, in order to raise awareness among young people and continue to encourage prevention against dengue.

Figure 3- The graph shows the answers to the question: Do you think dengue can lead to death?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sim</td>
<td>87%</td>
</tr>
<tr>
<td>Não</td>
<td>6%</td>
</tr>
<tr>
<td>Não sei</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: The Authors (2020)

Figure 4- Representation of responses when asked with the following question: How would you eliminate dengue outbreaks?

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>usando inseticidas</td>
<td>56%</td>
</tr>
<tr>
<td>eliminando a água parada em recipientes abertos</td>
<td>27%</td>
</tr>
<tr>
<td>chamando um agente de saúde</td>
<td>7%</td>
</tr>
<tr>
<td>lavando os recipientes onde há focos de dengue</td>
<td>10%</td>
</tr>
<tr>
<td>não sei</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: The Authors (2020)
Lefévre et al. (2004) found that the population understands the basic mechanism of transmission and that the responsibility for fighting the disease is shared between the state and society. However, even if there is knowledge about the vector and the forms of control, there are no real changes in behavior to do so (CLARO et al., 2004). In this sense, actions in environmental education and health (ecohealth), associated with other methods (TEIXEIRA, 2008), in the fight against diseases become important (CANÇADO et al., 2014; PEIXOTO et al., 2015), to bring in fact not only information, but also the change of attitudes and the transformation of the social environment.

4 FINAL CONSIDERATIONS

Based on the results obtained, it is clear that most young people have a good understanding of the modes of transmission and prevention of dengue. However, there are still teenagers who do not know the subject, bringing to light the importance of this topic in health promotion campaigns, which should be increasingly intense, in order to make society aware that taking care of the environment is a way to contain reproduction of the Aedes aegypti mosquito, which transmits dengue, Zika virus and chikungunya, diseases that constitute serious public health problems.
REFERENCES


