

Socio-educational strategies to fight *Aedes Aegypti*: interaction between health team and community

Estratégias socioeducacionais de enfrentamento ao *Aedes Aegypti*: interação entre equipe de saúde e comunidade
Estrategias socioeducativas para combatir el *aedes aegypti*: interacción entre el equipo de salud y la comunidad

RESUMO

Objetivo: construir estratégias para enfrentamento ao combate do vetor da dengue por meio de um Projeto Educador de Promoção em Saúde no território de uma Unidade Básica de Saúde da Família. Método: pesquisa descritiva, exploratória, intervencionista, participativa e com abordagem quali-quantitativa, desenvolvida no território da Unidade Básica de Saúde da Família no Jardim Europa I, em Uberlândia-MG. Resultados: vários casos de dengue foram registrados no território, em 2017 e 2018. A partir disso, grupos de estudo foram realizados para discussão dos temas e proposta da elaboração de um projeto que envolvesse a equipe de Saúde e a comunidade. No entanto, embora o período já mais anterior, pode-se trazer a reflexão para os dias atuais, podendo ser considerado um estudo retrospectivo, visto que o cenário dos anos citados provavelmente se repete em 2023. Conclusão: entre os desafios da Educação em Saúde, encontra-se a necessidade de qualificação dos agentes para práticas de educação, pautadas no diálogo e na sensibilização para lidar com a realidade dos moradores, proporcionando maior participação dentro de um quadro atualizado de informações sobre a doença, assim como inseri-los nas tomadas de decisões.

DESCRIPTORES: Dengue; Saúde Pública; Educação em Saúde; Atenção Básica.

ABSTRACT

Objective: to build strategies to combat the dengue vector through a Health Promotion Educator Project in the territory of a Basic Family Health Unit. Method: descriptive, exploratory, interventionist, participatory research with a qualitative and quantitative approach, developed in the territory of the Basic Family Health Unit in Jardim Europa I, in Uberlândia-MG. Results: several cases of dengue were registered in the territory, in 2017 and 2018. From this, study groups were held to discuss the themes and propose the elaboration of a project that involved the Health team and the community. However, although the period is already earlier, the reflection can be brought to the present day, and can be considered a retrospective study, since the scenario of the mentioned years will probably be repeated in 2023. Conclusion: among the challenges of Health Education, there is the need to qualify agents for educational practices, based on dialogue and awareness to deal with the reality of residents, providing greater participation within an updated framework of information about the disease, as well as including them in decision-making.

DESCRIPTORS: Dengue; Public health; Health education; Basic Attention.

RESUMEN

Objetivo: construir estrategias de combate al vector del dengue a través de un Proyecto Educador Promotor de la Salud en el territorio de una Unidad Básica de Salud Familiar. Método: investigación descriptiva, exploratoria, intervencionista, participativa con enfoque cualitativo y cuantitativo, desarrollada en el territorio de la Unidad Básica de Salud de la Familia en Jardim Europa I, en Uberlândia-MG.

Resultados: varios casos de dengue fueron registrados en el territorio, en 2017 y 2018. A partir de eso, se realizaron mesas de estudio para discutir los temas y proponer la elaboración de un proyecto que involucre al equipo de Salud y la comunidad. Sin embargo, aunque el período ya es anterior, la reflexión puede trasladarse a la actualidad, y puede considerarse un estudio retrospectivo, ya que probablemente el escenario de los años mencionados se repetirá en 2023. Conclusión: entre los desafíos de la Educación en Salud, está la necesidad de capacitar agentes para prácticas educativas, basadas en el diálogo y la concientización para enfrentar la realidad de los residentes, brindando mayor participación en un marco actualizado de información sobre la enfermedad, así como incluir ellos en la toma de decisiones.

DESCRIPTORES: Dengue; Salud pública; Educación para la salud; Atención Básica.

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INTRODUCTION

Among the arboviruses, dengue is an infectious disease prevalent in countries with a warm and humid climate caused by a virus of the Flaviviridae family and stimulated by socio-environmental issues, favorable to the proliferation of the vector that transmits the disease, the infected *Aedes* mosquito¹. The great concern about this arbovirus is related to the growth of the epidemic worldwide, since in the severe form, in addition to causing hospitalizations in humans, it can still lead to death².

Thus, it is considered a global public health problem, especially in tropical countries, where conditions favor the proliferation of its vector, the infected *Aedes aegypti* mosquito, and today the greatest challenge for health authorities is to reverse the increase in epidemics in populations living in urban areas of developing countries, where the high demographic concentration and insufficient basic sanitation structure produce favorable conditions for the reproduction of the vector^{3,4}.

In Brazil, the first clinically and laboratory documented dengue epidemic occur-

red in 1981 and 1982 and was associated with two serotypes. In recent decades, the country has experienced four major epidemics in 1998, 2002, 2008 and 2010. However, what is most striking is the growing proportion of severely affected patients and the increase in the number of deaths. Between 2000 and 2015, the dengue mortality rate increased by 500%, representing a major contribution to the loss of healthy years of life in Brazil. In 2016, the country experienced a serious public health situation associated with the simultaneous circulation of two other emerging arboviruses: Zika and Chikungunya⁵.

It is estimated that the cost of dengue morbidity and mortality in Brazil between 2001 and 2015 was US\$ 322 million and that, on average, it led to the loss of 1,391.68 potential years of life, representing an important socioeconomic impact. Despite these impacts and their magnitude, the high numbers of dengue underreporting do not reveal the real situation of the disease. Dengue mortality has also increased, with the years 2002 (121 deaths), 2008 (259 deaths), 2010 (300 deaths) and 2013 (235 deaths) standing out, which

show an increase above expectations⁶.

Among the current measures to combat dengue and according to the National Primary Care Policy, are actions carried out through health promotion and prevention activities, as well as health surveillance actions, through home visits and individual and collective educational actions in homes and in the community⁶.

The work of the First Level of Health Care teams must be developed in a multiprofessional and interdisciplinary way, through the planning, programming, and implementation of sectoral and intersectoral actions, individual and collective, in the face of the determinants and conditioning factors of health⁶.

The first level of Health Care in Brazil is developed with a high degree of capillarity, being as close as possible to people's place of life. The work of the teams at this level should be developed in a multidisciplinary manner, through the planning, programming, and implementation of sectoral and intersectoral, individual and collective actions, in view of the determinants and conditioning factors of human health¹⁹.

The specificity of the work of health te-

ams requires the adoption of the concept of territoriality, which is fundamental to the development of health surveillance⁷. Health surveillance covers the systematic monitoring of data relevant to the health of the population, in particular the morbidity and mortality profile, with a view to promoting strategic health actions, which include spatial diagnosis, proposing disease prevention and control measures, as well as health promotion⁷.

Considering the importance of the first level of health care in controlling the mosquito that transmits dengue, this work is part of the challenge of developing local and participatory practices to fight the disease. Thus, the general objective was to build strategies to combat the dengue vector (*Aedes aegypti*), through the construction of a health promotion educator project in the territory of a Family Health team through a questioning that raised how the community understood Dengue in its territory and what strategies and actions were used for its control. Thus, the secondary objective of the study was to verify the impact of participatory planning in coping with dengue in the territory of a Family Health Strategy.

METHODOLOGIES

Exploratory descriptive research, which describes the reality of a problem in order to provide information for further investigation, interventionist, in order to provide conditions for the subject to be able to conduct new actions, participatory in the search for community involvement and, in turn, based on the subjective character and on numbers and mathematical calculations, that is, with a qualitative-quantitative approach, developed in the territory of the Basic Family Health Unit (UBSF) Jardim Europa I, located in the Jardim Europa neighborhood, in the municipality of Uberlândia-MG (for the characterization of dengue in the territory, it should be considered that the Jardim Europa neighborhood is divided into Jardim Europa I, Jardim Europa II, Cidade Verde and Jardim Itália).

The research project was authorized by a Research Ethics Committee (CEP), 2.720.411, also approved on 18/06/2018 by

CAAE n.º80467517.9.0000.5152.

The UBSF Jardim Europa I serves a population of approximately 3300 people. Data from the municipality's health information system (Fast Medic) were used to characterize this territory.

The research was carried out in three stages, so that the first consisted of a literature review (articles on the subject were selected), the second in the characterization of dengue transmission in the UBSF coverage area, the third in a collective discussion of the explanation of the vector in the territory and the construction of the Health Promotion Educator Project (PEPS), through three focus groups (GFs).

The participants of the FGs were representatives of public, private and community institutions in the UBSF area, as well as traders and residents, of all genders, of any race/color/ethnicity and who, after guidance on the methodology and objective of the research, signed the Informed Consent Form (ICF), being guided as to non-identification.

The FGs were held at the Neighborhood Association of Jardim Europa I, with the participation of two observers, a group coordinator (responsible for conducting the FG) and a supporter.

In the first FG, held on 07/16/2018, among the participants were representatives of the Epidemiological Surveillance, the school, the president of the Neighborhood Association and the UBSF team totaling ten people. The second GF, held on 11/19/2018, was attended by representatives of the Fire Department, education, community representatives, president and vice president of the Residents' Association and an evangelical pastor, totaling thirteen people; aiming to build the PEPS, starting with the following question *"What actions can be developed by the community to reduce dengue cases in the neighborhood?"*.

The following was discussed: 1) How do you believe dengue is transmitted; 2) Why have we not been able to control dengue in our neighborhood? 3) What actions have been missed and impacted the number of people with dengue in the previous year? 4) What forms of dengue prevention do you know? Afterwards, a model of po-

sitive attitudes for dengue control in the territory was formalized.

The third FG, on 05/29/2019, aimed to evaluate the execution of the PEPS, with the participation of the UBSF team and community representatives. The discussion took place around the strategies, activities, and individual responsibilities in the implementation of PEPS.

Heat maps and FGs were used for data analysis, and the educator project was the final result. The specificity of the work of health teams and, given that health surveillance includes the systematic monitoring of data relevant to the health of the population, especially the profile of comorbidities and mortality, actions aimed at promoting health strategy actions are fundamental.

These actions range from spatial diagnosis, proposing disease prevention and control measures, as well as health promotion⁷. Thus, in view of the importance of Primary Care in the control of the dengue vector, the analysis of quantitative data was performed from the descriptive analysis of the data⁸.

The data analyzed are based on the Rapid Survey of the *Aedes aegypti* Infestation Index - LIRAA9, a tool used for diagnosis and planning of field activities, whose purpose is to promote reflection on the various health situations and the elaboration of interventions consistent with the problems of the territory.

Thus, the heat map was used to collaborate in the identification of the regions with the highest occurrence of dengue cases in the Jardim Europa neighborhood. This map was prepared using the Universal Transverse Mercator system, from the coordinates inserted in the GIS QGIS 3.16.4, generating the points and then the heat map or Kernel map, which is an alternative for geographical analysis of the behavior of patterns, in which it is plotted on the map, through interpolation methods, the punctual intensity of a given phenomenon throughout the study region, thus having an overview of the intensity of the process in all regions of the map.

RESULTS

To start the FGs, data were collected on the arbovirus index in the neighborhood under

study, as shown in Graph 1, which presents the number of cases of Dengue, Zika and Chikungunya Arboviruses, notified in 2017.

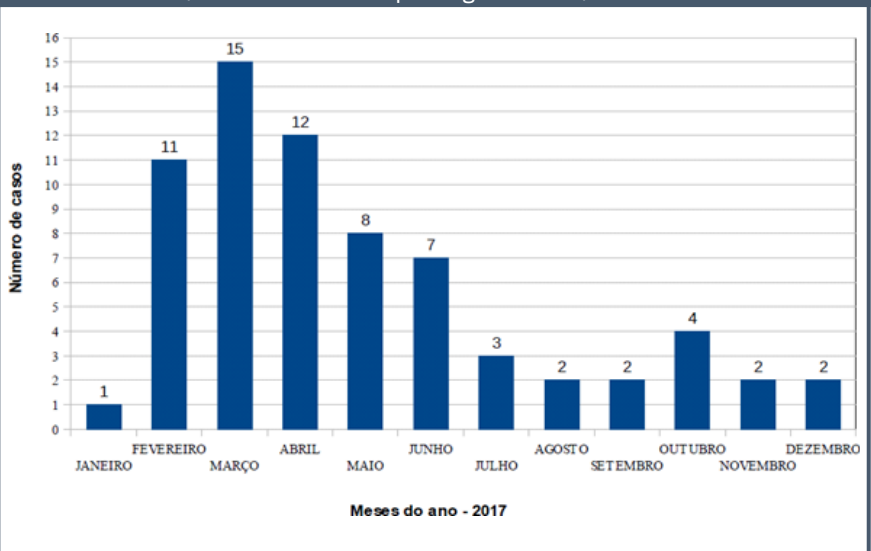
The Jardim Europa neighborhood had 69 notifications of arboviruses (Dengue, Zika and Chikungunya) in 2017, and 22 of these notifications (31.88%) were in the area covered by the UBSF Jardim Europa I. Regarding the prevalence in the month, March stood out with 15 notifications (21.73%), in April there were 12 notifications (17.39%), in February 11 notifications (15.94%) and the lowest notification rate was in January, with only 1 case (1.44%). Of the 69 notifications, 4 cases of Chikungunya (5.79%) and 2 cases of Zika (2.89%), and most cases were notified by the private health network, the rest of the notifications being distributed among 26 cases in the public emergency room (37.68%), 12 cases in the UBSF (17.39%) and 1 case notified by the Hospital de Clínicas da Universidade Federal de Uberlândia (HC-UFU) (1.44%).

In 2018, according to LIRAa, the prevalence of higher notification occurred in March, with 13 notifications (26%), also predominant in the previous year, followed by May, with 11 notifications (22%), and April, with 10 notifications (20%)⁹.

The graph also shows an increase in cases in January 2018, with 5 notifications (10%) compared to January 2017, when there was only one notification (1.44%), which may be associated with the higher rainfall rate in the period. It is noted that of the 50 notifications made in the period from January to June 2018 in the Jardim Europa neighborhood, contrary to what had happened in 2017, in which most notifications were made in the private network (44.92% of cases), most cases, totaling 29, were notified in the public emergency room (58%), leaving 5 notifications made UBSF (10%) and one notification made by HC-UFU (2%).

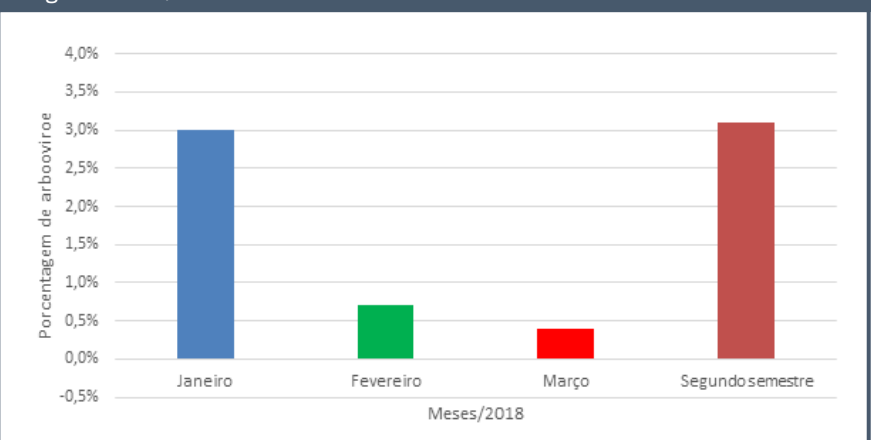
According to Graph 2, which presents information provided by LIRAa 2018, the first survey, carried out in the first three months of the year, shows an alert index; in the second and third quarters a satisfactory index is observed. However, in the last quarter there is an increase in the index, which reaches 3.10%, which leaves the Jardim Europa nei-

Graph 1 - Number of cases of Arboviruses Dengue, Zika and Chikungunya, notified in 2017, in the Jardim Europa neighborhood, Uberlândia-MG.



Source: Own elaboration, 2018.

Graph 2- LIRAa index year 2018, in the Jardim Europa neighborhood, Uberlândia- MG.



Source: Own elaboration, 2018.

ghborhood again in an alert situation.

Given the high rates described in the results, it was possible to present them, discuss and reflect with the community the main causes and consequences of arboviruses in the territory, bringing a critical analysis and co-responsibility on the importance of popular education and the effective participation of the community in health actions. In addition to these reflections, the results subsidized the discussions of this article in order to compare realities and indicators on the perspective of

new ways of confronting *Aedes aegypti*.

DISCUSSIONS

In the context of dengue and other arboviruses, the LIRAa survey is a tool used for diagnosis and planning of field activities from a spatial dimension, monitoring and evaluating health indicators and information within the scope of the Unified Health System¹⁰.

Thus, the mapping of reported dengue ca-

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ses in the Jardim Europa neighborhood from June 2017 to June 2018 was carried out to identify the areas with the highest concentration of cases and to understand the territorial contexts of disease transmission (Map 1).

As seen, there is one area of higher concentration of dengue cases and five areas of lower concentration of cases that indicated that the UBSF should take them as priority areas for prevention and social mobilization action.

The area with the highest concentration of dengue cases in the Jardim Europa neighborhood corresponds to a more recently occupied sector, with a large number of houses under construction, which is related to the presence of vector breeding sites (Figures 1 and 2).

In the first FG, the dengue rate in the Jardim Europa 1 neighborhood was discussed, highlighting the actions with which each representative there could contribute to the eradication of the vector and/or control of the disease.

The reports of professionals who highlight their perception of their responsibility in eradicating the vector are characterized by the lack of recognition of the need to play their role as health professionals, common to the reflection of what can be improved, in their own actions and attitudes:

[...] People know, it is very publicized by the media how to avoid mosquito breeding sites.

[...] People carelessly leave water tanks open, accumulate garbage. There is also a lack of awareness and education. (RESEARCH REPORTS)

Professionals believe that it is the duty of the population to appropriate knowledge about dengue vector control and use it efficiently. In this regard, it is stated that the role of UBSF professionals and epidemiology agents is to integrate with the community, understanding their psychosocial role, seeking to know the reality experienced by each member, aiming to improve the quality of life of community members, assuming a posture of transformation agent and motivating popular participation.

The statements of the endemic disease

Map 1- Notified cases of dengue in the Jardim Europa territory, from June 2017 to June 2018, Uberlândia-MG.



Source: COSTA, Iram Martins, 2018.

Picture 1 - Photo of Viterbo Street, in the Jardim Europa neighborhood, Uberlândia-MG.



Source: Google Maps (2018)

agents led us to deduce that they assume a role that they call "awareness", but, contradictorily, they all recognize that their actions are ineffective, since, for them, the population does not fulfill their role.

*[...] the resident takes care of the house, but does not take care of the yard...
 [...] There should be more agents to increase the number of monthly visits.
 [...] Everyone thinks only of themselves and not of the collective.*

It is also noticed that the endemic agents end up blaming the other, as evidenced in the statements in which the community is seen as irresponsible. The content offered by the agents does not resonate with the population, because it follows the traditional educational proposal, confirming¹² that when there is no concern with the culture of the student, the absorption of content becomes ineffective.

The agents believe that if the community acquired knowledge and awareness of the problem, participating effectively in the continuous elimination of potential mosquito breeding sites, there would not be the number of dengue notifications that the neighborhood currently has. It is necessary to thoroughly promote health education, until the community acquires knowledge and awareness of the problem, so that it can effectively participate in the continuous elimination of potential mosquito breeding sites¹³.

It was observed that there is still a predominant difficulty on the part of a portion of professionals to accept that the population is capable of elaborating thoughts on complex problems and executing them, since only transmitting knowledge is not enough.

The second FG was attended by thirteen people. Regarding the cause of the disease, residents and other participants report blaming, when they cite that the problem of dengue is the population: *"[...] If the focus of dengue increases, it is the fault of the people themselves"*. Residents bring as prevention practices the importance of education, through the media, and the need for collective adherence, also perceiving the need for the adherence of neighbors in prevention: "So we have to be careful, but it's no use me cle-

Picture 2 - Photo of Zurique Street, in the Jardim Europa neighborhood, Uberlândia-MG.



Source: Google Maps (2018)

aning my yard and the neighbor's is dirty, the mosquito flies away."

The firefighters, as well as the community participating in this FG, appear to be conflicted between the knowledge they possess and others they do not master, but want to know as necessary to inform the community. From the questions (Table 1),

it was possible to realize that there is no domain of technical-scientific knowledge about dengue, bringing their knowledge closer to common sense knowledge.

They also showed awareness of their limited knowledge about dengue, an essential factor for dialog and interactivity in the process of social signification. There is also the

Chart 1 - Categories of data analysis by affinity of concepts, from the Focus Groups conducted with the research participants at UBSF Jardim Europa, from 2017 to 2018, Uberlândia-MG.

Categories	Concepts	Questions asked
Knowledge/Conceptions	Knowledge/concepts about dengue	What do you know about dengue? Where and when (source and place of information)? Does your neighborhood have, or have you ever had dengue? Where?
Knowledge/Causality	Discussions on dengue causality	What causes/or causes dengue? What about your neighborhood? What types of places (breeding sites) do you relate to the presence of Aedes aegypti?
Prevention practice	What should be done to prevent dengue fever	What do you do to avoid/prevent dengue? What do others do to avoid/prevent dengue? What do you think should be done to avoid/prevent dengue? What about the others?

Source: Own elaboration, 2018.

complexity of educational processes, which points out that Health Education should not be thought of in a unidirectional way, as the transmission of knowledge and information between a sender and a receiver, as is often practiced in health services¹⁴.

The secret to success in dengue prevention, promotion and control measures is education, which generates new paradigms in the health-disease process¹⁵. Although achieving community awareness of their own responsibility is one of the approaches to health promotion, there is a risk that the emphasis of promotion will fall on the responsibility of the population, to the detriment of measures that modify the socio-environmental conditions favorable to mosquito reproduction.¹⁶

From the results observed, it seems to us that this transdisciplinary perspective of investigation is leading us to what the Literature points out as a path to effective actions in the context of broad changes. In this perspective, planning is influenced by factors that build the identity of the territory, making use of critical thinking for decision making and being essential to recognize the moment to adapt to situations that require creative solutions to the methodological strategy to be used for the problem encountered¹⁷.

Among the interventions agreed in the workshop, the following stand out: block round, with the objective of alerting the residents of the Jardim Europa 1 neighborhood community to the harm and diseases caused by the mosquito and the importance of the population's participation in the control of outbreaks; joint effort and pamphleteering, in order to remove items and containers that can accumulate water and serve as breeding grounds for the mosquito, stimulating community adherence in the control of outbreaks; setting up stands, with the purpose of mobilizing the blocks where the largest quantities of outbreaks were found, alerting the population to the consequences of the mosquito and the presence of outbreaks.

This reinforces the role of the UBSF in its permanent effort to communicate and exchange experiences and knowledge between team members and the assisted community. Therefore, community approaches based on strategies are essential for

vector control since the participation of civil society is of fundamental importance in combating mosquito proliferation¹⁸.

Thus, recognizing the complexity of the factors that favor the proliferation of the dengue vector highlights the importance of interventions that go beyond the health sector. The national guidelines for the prevention and control of dengue epidemics proposed by the Ministry of Health prioritize the decentralization of actions to control and combat the transmitting vector to the municipalities¹⁹.

Authors have demonstrated success in implementing a new proposal to combat dengue20 through the participation of residents in the identification of problems in the neighborhood and in the elaboration of solution proposals, with a satisfactory response from public services. The process of coping with the dengue vector, through the FGs, was based on the statement that when there is more than a social interaction among its participants, since there is a type of bond in search of a common goal²¹.

Transformational validity was chosen because we understand that it is broader than transactional validity, which has a procedural focus, since it transcends the researcher-researched relationship, in favor of the impact caused by the results obtained with the research itself²².

The results point to new perspectives, which show that dengue control and prevention are associated with a more complex approach, which raises a relationship and interaction between social, cultural, economic, biological, and environmental systems²³.

The proposal to involve the students of the nearby school meets the objectives set out in the proposal of the guidelines of the National Curriculum Parameters, which are: to stimulate health and learning at all times; to integrate health professionals, education, parents, students and community members, in an effort to transform the school into a healthy environment and encourage practices that respect individual and collective well-being and dignity, with the opportunity for growth and development of the individual, family and community⁶.

Another intervention is the popular clea-

ning task force, with the support of community leaders, in addition to visits to schools, which establish the school space as a favorable environment for health promotion in the community, considering it as a reference for action to develop the student and express health, provided that this is based on a participatory pedagogical practice and a methodological approach (transformative health education)²⁴.

This type of training fosters the sharing of cultural values and common positions, stimulates the development of integrated practices, and, at the community level, contributes to social awareness and mobilization. The continuity of these practices is pointed out as an important indicator of the positive impact of proposals aimed at health protection, promotion and intervention²⁵.

CONCLUSION

After the trajectory in search of answers to the problem of the dengue situation in the Jardim Europa 1 neighborhood, in the municipality of Uberlândia, it can be said that urban habits have contributed to the impact of the vector's ecology, but there are no efforts by the population to prevent the disease.

In order to better target social mobilization and health education actions, it was necessary to comprehensively approach the population's knowledge, attitudes, and practices in relation to dengue, since prior knowledge of how the population thinks and acts is essential to establish the dialogue and awareness necessary for the educational process.

Among the challenges of health education was the creation and improvement of regular intervention techniques to qualify agents for education and communication practices, based on dialogue and sensitization to deal with the daily reality of residents; provide them with greater participation within an updated framework of official information on diseases, as well as insert them in decision-making, experienced by these actors in the vector control process.

The data enabled a critical analysis of dengue control and what actions have been taken by residents and health professionals to eradicate and/or minimize the rate of

dengue cases. There is a need to rethink the role of citizens as agents of transformation of the environment in which they live, who should become more active in proposing and conducting educational actions to combat *Aedes aegypti*.

The results of the present study suggest that promotion and control measures be implemented, aiming at reducing dengue cases in the Jardim Eupora neighborhood, putting health professionals and also the citizens of the neighborhood before a challenge of defi-

ning the best strategies that should be used. We hope that these results can collaborate in health actions to reduce dengue cases.

The focus group strategy made it possible to perceive the needs and demands of both the community and the health and sanitary surveillance agents, as well as the local community, within the context of dengue control practices.

It is concluded from the initial questioning that the study made it possible to know and reflect on how the community perceived

dengue in its territory and, thus, strategies and actions were designed in a participatory way and with the aim of co-responsibility of the population for the process of building social health in the territory. Thus, the objective of the study was achieved, as it was possible to understand the impact and importance of participatory planning in coping with dengue in the territory of a Family Health Strategy, emphasizing the need for continuous and permanent education of the first level of health care on its enrolled population.

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