interface
comunicação, saúde, educação
https://www.interface.org.br
eISSN 1807-5762

Articles

Ecobiosocial approach and health promotion at school: building knowledge for community surveillance in *Aedes aegypti* control

Abordagem ecobiossocial e promoção da saúde na escola: tecendo saberes para a vigilância comunitária no controle do *Aedes aegypti* (resumo: p. 19)

Abordaje eco-bio-social y promoción de la salud en la escuela: cómo tejer saberes para la vigilancia comunitaria en el control del *Aedes aegypti* (resumen: p. 19)

Roberta Duarte Maia Barakat[a]
<robertadumaia@gmail.com>

Andrea Caprara[b]
<andreacaprara1@gmail.com>

[a] Assistente Social, Universidade Estadual do Ceará (Uece). Rua Inácio Vasconcelos, 263, Messejana. Fortaleza, CE, Brasil. 60841-535.
[b] Programa de Pós-Graduação em Saúde Coletiva, Uece. Fortaleza, CE, Brasil.

This study aims to implement community surveillance actions for *Aedes aegypti* vector control in the school environment in the light of health promotion and the eco-bio-social approach. This qualitative study addresses the assumptions of action research. Data was collected through a short course coupled with the Photovoice technique, and the collection was completed with focus groups. The empirical data were processed by Iramuteq® software and submitted to Minayo's content analysis. The research was conducted in two municipal schools of Fortaleza, Ceará, Brazil, with the participation of 55 students. The results showed the incentive to reflect participation and socially-shared accountability practices in the community surveillance and environmental care actions as vector control allies. Photovoice proves to be a driver in the alignment of these themes, awakening the cooperative and integrative spirit, and its dissemination and continuation are suggested in other schools.

Keywords: Health promotion. Ecobiosocial. School health. Photovoice. Community surveillance.

Barakat RDM, Caprara A. Ecobiosocial approach and health promotion at school: building knowledge for community surveillance in *Aedes aegypti* control. Interface (Botucatu). 2021; 25: e190805
https://doi.org/10.1590/interface.190805

Introduction

Arboviruses Dengue (DENV), Chikungunya (CHIKV), and Zika (ZIKV) remain one of the most critical public health problems in Brazil. The three circulating arboviruses result in very relevant issues in society, ranging from illness to the development of the disease, with complications ranging from chronicity to lethality. Transmission occurs through vector *Aedes aegypti*, and multiple factors are associated with its appearance and permanence: uncoordinated urbanization, mosquito-related biological aspects, insecticide resistance, aspects related to public policies, the organization of health services, and vertical vector control programs[1].

The *Aedes aegypti* is a mosquito that dwells in urban areas, takes shelter in homes, or eventually in a peridomestic environment to rest after meals. Only females feed on blood and have a fundamentally anthropophilic and endophilic behavior[2]. The responsibilities for actions to prevent and control DENV, CHIKV, and ZIKV arboviruses lead to observing and responding to environmental conditions affecting vector reproduction and life cycles and exposure to the virus and its transmission. It is essential to eliminate all potential outbreaks to prevent its proliferation. It is important to note that water treatment does not replace removing and protecting potential breeding sites.

Associated with the various mechanical vector control methods, the eco-bio-social approach emerges as another form of combat based on information to the population through education and health promotion actions[3]. Recommended as an innovative technology for vector control in Brazil, it plays an essential role in the sustainability of combating *Aedes aegypti*[4] and is a promising proposal for fighting against the vector and the diseases it transmits. In this sense, community surveillance must act intensely, especially in low transmission periods, keeping the alert about the disease, detecting pattern changes early, and intervening in the control timely[5].

The eco-bio-social approach is based on the ecosystem theory and the International and National Health Promotion Conferences. It triggers reflecting on awareness and empowerment, social participation, equity, sustainability, and transdisciplinarity. It also proposes elaborating health intervention strategies that meet policies aimed at improving the quality of life of urban populations. The approach consists of six underlying principles: Systemic Thinking, Transdisciplinarity, Social Participation, Sustainability, Social and Gender Equity, and Knowledge for Action[6].

Health Promotion equips the population with the means to ensure greater control and improvement of their health, not limited to the accountability of the health sector[2]. Two groups of approaches are identified from this perspective: the development of activities aimed at the behavioral change of individuals, focusing on educational components; and the understanding that health results from a wide range of factors (multiple determinants) related to the quality of life, adequate working conditions, educational opportunities, clean physical environment, social support for families and individuals, responsible lifestyle, and health care services for the groups.

The recognition of diversity proposes different worldviews that assist in collective construction, especially in the process of the subject's autonomy in his community. Education is immersed in intersectoral actions, promoting health promotion in dialogue with culture. The approach of this line of investigation related to arboviruses was driven by the recognition of the relevance of the theme, on the possibility of sharing knowledge capable of subsidizing interventions based on integrative, participatory, and sustainable practices in the ecosystem consistent with the school environment. This scenario contextualizes and correlates the historical-cultural processes contributing to health promotion actions.

From this perspective, this study believes in implementing the eco-bio-social approach in the actions and relationships that configure daily school activities, especially with students, given that health issues can be discussed in the routine of several social spaces and differently as social practices. Education and health have always been articulated in public schools, and health-related issues arise in classrooms with different representations by teachers, students, and family members, expressing concerns about better health, environment, and quality of life.

Historically, schools are essential experience and practice environments in the relationships between subjects coexisting in this scenario. Determining factors of health and disease conditions can be debated and analyzed in this space where the theme is recurrent and promotes learning[7]. In a context in which disease control and prevention campaigns are of an emergency and palliative nature, combined with more inspecting actions than educational, it is necessary to understand the viewpoint of social stakeholders from the angle of community surveillance.

This is one of the meanings of this study, the reflexive promotion of participation and shared social accountability in actions, and the enhancement of the students' role in the perspective of health promotion through an ecosystem approach. Given these considerations, this action research follows the theoretical assumptions of the eco-bio-social approach, which aimed to implement community surveillance actions in the control of the *Aedes aegypti* vector in a school environment in the light of the eco-bio-social approach.

Methods

This is a qualitative intervention study that selects an excerpt from the author's master's thesis developed between 2017 and 2018. This is about the assumptions of action research, which aims to understand and intervene in the reality to modify it. While carrying out a diagnosis and analysis of a given situation, the action research proposes to the set of subjects involved changes that lead to the improvement of these investigated practices through a close association between action and the resolution of a collective problem[8].

The dissertation is nested in the project entitled *"Prevención de la enfermedad del Zika mediante nuevos abordajes de control vectorial"*, a multicenter research carried out in three countries (Brazil, Colombia, and Mexico) funded by the International Development Research Center (IDRC-Canada). Since the early 21st century, IDRC has implemented initiatives against vector-borne diseases based on the principles of the eco-bio-social approach to achieve a better understanding of the determinants of health and improving the health of the population through actions that promote sustainable environmental changes, in partnership with the Ceará State Health Secretariat (SESA), Fortaleza Municipality (PMF), and the State University of Ceará (UECE).

A community intervention was planned for the 2017-2020 period, namely, a case-control study in four neighborhoods of Fortaleza, two of which were intervention groups, and another two were control groups. The first entomological survey was previously carried out from 15/09/2017 to 27/10/2017 to identify potential breeding grounds for the *Aedes aegypti* as an initial part of the research intervention. PMF's Endemic Control Workers (ACE) visited each household in the four neighborhoods to carry out the survey.

Conjunto Ceará I and Vila Manoel Sátiro neighborhoods were defined as the intervention areas, and Prefeito José Walter and Granja Portugal neighborhoods as the control areas. The criteria for selecting the study areas were based on the cases reported with the highest incidence of DENV, CHIKV, and ZIKV by the regular surveillance system in the last three years. The intervention and control areas were assessed for homogeneity regarding socioeconomic status, health coverage, household type, access to water supply, sewage, and other characteristics of the neighborhood's infrastructure, such as roads and leisure spaces.

The study was developed in two municipal schools located in two neighborhoods, Vila Manoel Sátiro and Conjunto Ceará I, in the Regional Health Administration V (RHA-5), consisting of 18 neighborhoods located in Fortaleza, capital of the state of Ceará. This extension's population is located in the regions with the highest index of social inequalities and low income in the municipality and is more exposed to social and health vulnerabilities. It is the most populous and most impoverished RHA in the capital, and one of the RHAs with the youngest population profile in Fortaleza, with 44% of the population aged up to 20 years. It is also the area of the city with the second-highest illiteracy rate (17.83%). The schools were selected according to their locations, as they are within the intervention area, and across the municipal management. The same activities were carried out in the two locations, and only the age range and school grades of the participants[9] were different.

The study participants were 55 students regularly enrolled and attending Elementary School I (4th and 5th grade) at school 1 and Elementary School II (6th to 9th grade) at school 2 in the morning and afternoon shifts. We selected these subjects because the age group is appropriate for applying data production techniques, particularly Photovoice. The inclusion criterion was based on the cognitive and critical development for the discussions and the ability to know how to handle the cell phone camera or the camera itself, and their interest and availability in contributing to the research.

The student selection process started from meetings with teachers, pedagogical coordinators, and students. The research project was presented, revealing a cycle of planning and implementing actions, production, and data analysis. Among the students who expressed interest and agreed to participate, at least three representatives from each class were selected by the teachers in the convenience sample mode, considering the criterion of greater class participation. The chosen students received permission from their parents or guardians to participate in the study by signing the Informed Consent Form (ICF).

Action build-up was presented as a dynamic and participatory process of the different subjects involved, with a significant representation of diversity in the development process of what was proposed, as shown briefly in Figure 1 below:

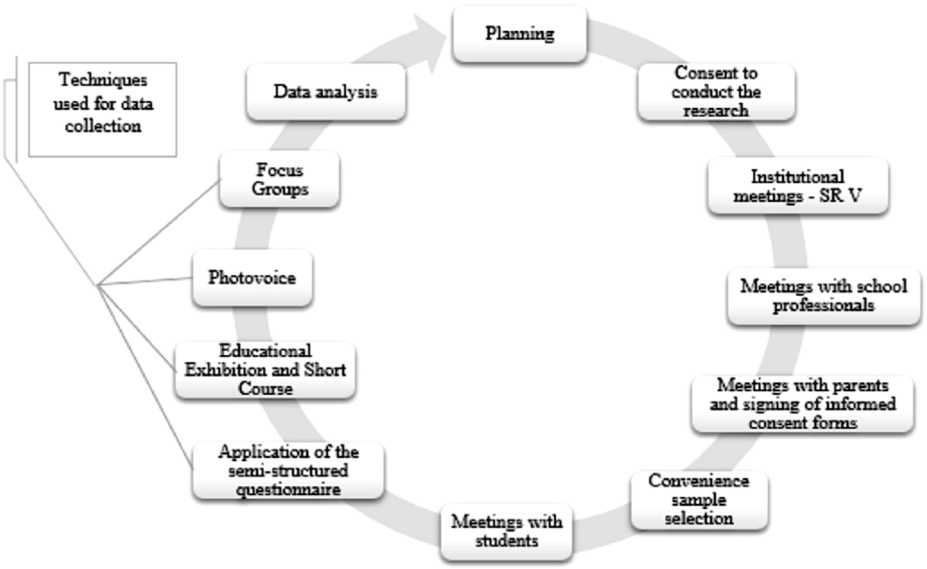

Figure 1. Representation of the research cycle.
Source: Elaborated by the authors.

Student participation in the study was voluntary by signing the informed consent form without any external influence. The students were divided into blocks of five to sign the terms and apply the semi-structured questionnaire. The completion of the questionnaires allowed characterizing the sociodemographic profiles of the participants, given the presence of other data such as questions related to previous knowledge about *Aedes aegypti*, its morbimortality, and the ways of controlling and fighting the vector from the perspective of health promotion, allowing the recognition of the issue from the viewpoint of the subject's experience.

The following data production instruments and techniques were used to achieve the proposed study objectives: educational exhibitions, a short course, Photovoice, and focus groups. The educational exhibitions were held in the two schools for two days, with models and educational material exhibited in a collective space with full access for the entire school and community. We counted on the partnership of SESA and PMF, who contributed with the stands and models symbolizing the breeding

and reproduction cycles of the vector, live vector's larval cycle, printed materials for dissemination (posters, folders, and stickers), a professional dressed as a mosquito, and three professionals to advise on the exposed material. The activities carried out by the educational exhibition were extended to all students, teachers, employees, and the community.

The eight-hour short-course discoursed the implementation of the eco-bio-social approach in a school environment to promote health and control of the *Aedes aegypti* vector. The entire content was explained with playfulness and dialogicity, covering themes related to the transmission routes, the vector's life cycle, how water is stored in their homes and at school, the control and prevention of arboviruses (DENV, CHIKV, and ZIKV), and community surveillance, using the eco-bio-social approach as a reference. It should be noted that, among the actions carried out in the short course, some were conceived from the results of the semi-structured questionnaires applied to the research participants, highlighting the action-reflection-action process concerning action research. UECE's Dean of Extension issued extension course certificates to participants, facilitators, and support staff.

Photovoice was carried out by the students selected at the school perimeter as the main practical data production activity. Adopted and adapted for this research, it is a theoretical and methodological approach used in various contexts and perspectives and is widely used in participatory action research projects. Developed in the mid-1990s by Caroline Wang, professor, and researcher at the University of Michigan School of Public Health, and Mary Ann Burris, associate researcher at the School of Oriental and African Studies at the University of London, the method proposes the inclusion of community-based research activities in the investigative process to jointly train vulnerable social group members in order to identify, represent, and reinforce the resources of these communities through photographic techniques and representations[10].

It uses pictures as an instrument, and, in this research, it addressed the theoretical frameworks of Health Promotion and the eco-bio-social approach to community surveillance and vector control. Through visual frameworks, photography revealed itself as a work tool "that served as an instrument" to build relationships, inform, and organize individuals in the community, allowing them to prioritize their concerns and discuss their problems and solutions collectively.

Guided by the themes addressed in the educational exhibition and the short course, the students took original pictures exploring the school scenery. Thus, the photographs translated, by image, the knowledge assimilated by the students. Picture taking was authorized by the school board and allowed each participant to bring a cellphone or digital camera on the day of applying the Photovoice, considering a State Law[11] prohibiting cellphone use in schools.

The records originated by Photovoice were characterized as the primary material produced in the research and are in full; that is, they were not subjected to filter, downsizing, adjustment, or any other procedure. Four focus groups were held, two in the morning and two in the afternoon, to discuss the pictures. The reports that accompanied the exhibitions of ideas and the meanings attributed to the pictures were recorded and transcribed in full.

The transcribed volumes were organized after transcribing the statements originating from the focus groups with the students. At first, these volumes were processed in the computer program Iramuteq® (*Interface for R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*), 0.7, Alpha 2. The Iramuteq® software is a tool that enables different ways of organizing data, such as basic lexicography, which mainly covers stemming and word frequency calculation, by which the vocabulary distribution can be organized in an easily understandable and visually clear way with graphic representations based on lexicographic analyses[12].

Data analysis started with the pre-analysis of the transcript content. It consisted of selecting the material to be studied through a floating reading followed by the corpus constitution. According to Minayo, the corpus comprises the number of interviews to be worked on. In this case, the quality of the analysis replaces the quantity of the material. The researcher considers the central and objective research question to outline the dimensions of the corpus and the developments in order to make subsets of the set (Corpus)[13], if necessary.

The analyzed material was organized through the formation of the corpus. The registration unit, the context unit, the selected materials, categorization, coding, and the more general theoretical concepts were defined. The handling of the material obtained, namely, the participants' statements, was submitted to lexical analysis carried out by Iramuteq® followed and correlated to Minayo's thematic content analysis[13].

The relationship between the pictures, the participants' statements, and the theoretical references on the subject under study were established to answer the questions and the research objectives. The thematic content analysis[13] completed the process. Firstly, we aimed to read the transcriptions of the narratives and add them to the lexical analysis of Iramuteq®, seeking to sort them into categories that can organize the results to interpret them. After being classified into thematic categories, listed by the researcher, the material was organized concerning these prevalent themes and classified within the pre-established categories. Finally, interpretations were carried out, expanding the understanding from the empirical data articulated with the theoretical framework.

Participants were informed that acceptance is voluntary. They were free to leave the research at any time, without questions asked or repercussions, keeping confidentiality, privacy, and anonymity. Agreement with the participation terms was documented by students, parents, or guardians signing the informed consent form. Informed consent forms were signed by both parents/legal guardians and students for students appearing in the pictures. The project was submitted to the UECE Ethics Committee (CEP), which approved the study under Resolution No. 466/12 as per opinion No. 2248326/CAAE:70826017.8.0000.5534, issued on August 30, 2017.

Results and discussion

Word categorization: pre-analysis

Forty-three of the fifty-five students participated in the focus groups. However, the corpus consisted of the statements of 29 responding participants. The triggering questions were: What motivated you to take these pictures? Why did you take them? Five semantic classes were associated with the participants' feedback, who responded by referring to the statements' pictures. The correlation between the classes is shown in Figure 2. From these analyses, the Iramuteq® software organized the study of the data using the Descending Hierarchical Classification (DHC), which consists of a multivariate analysis divided into classes. Thematic units emerged from the movement of the following arrangement:

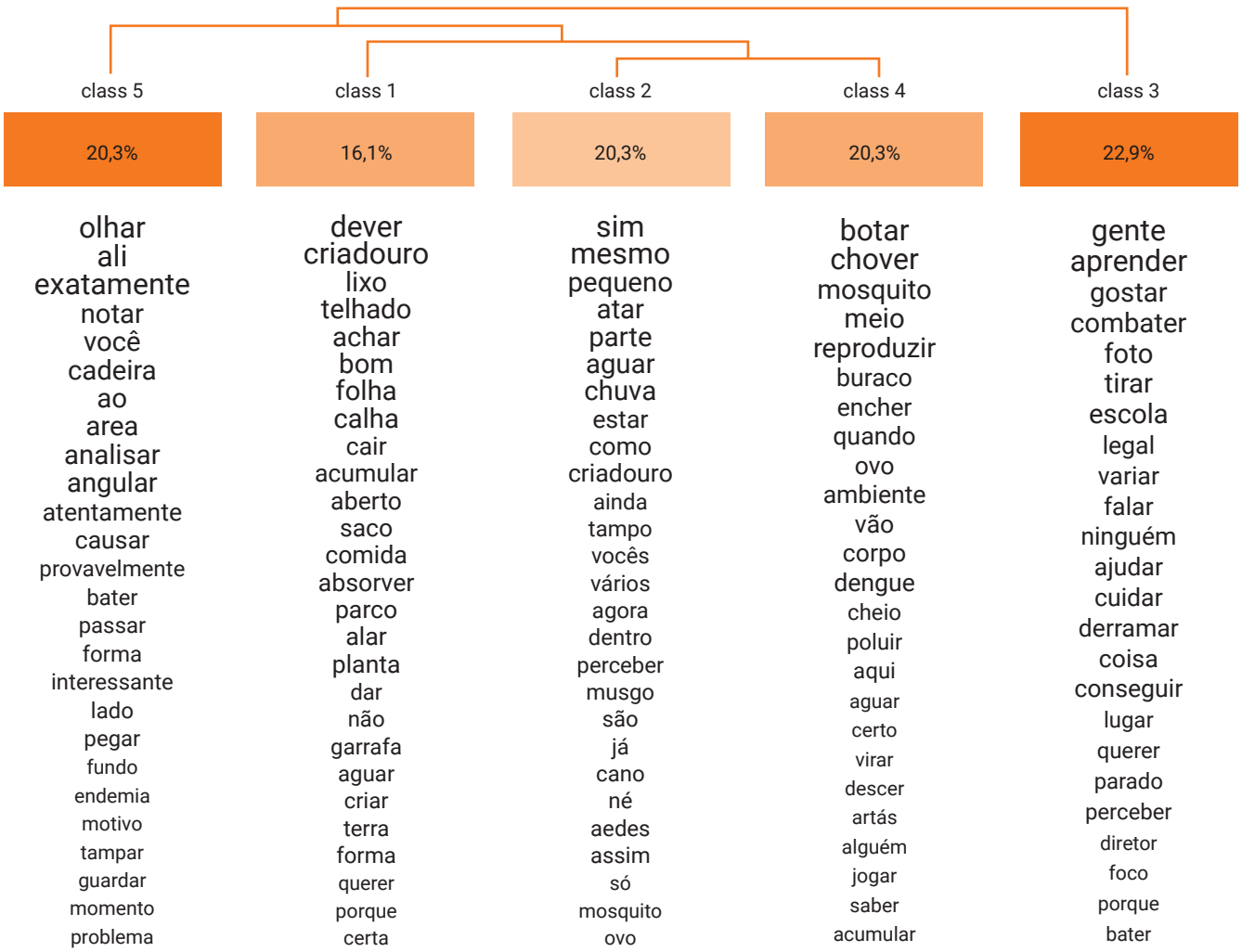

Figure 2. DHC from students participating in the focus groups. Fortaleza, 2018.
Source: Organized by the author from *Software Iramuteq®*, version 0.7, Alpha 2. Fortaleza, 2018.

The categorization of the corpus under analysis resulted in the setup of two categories through the keywords representing the findings. Five word classes were identified. We observe that class 5 develops to class 1 and subsequently unfolds to classes 2 and 4. Class 3 did not develop. Considering the conceptual similarity between them, classes were reduced to 2 main categories.

Categories belong to classificatory concepts and are not entities. They are found in the historical constructions that traverse the development of knowledge and social practice. In general, the word category refers to a concept that encompasses elements or aspects with common characteristics loaded with meaning or related to each other. The researcher creates systems of categories striving to find meanings in the diversity of generalizations, and this word is linked to the idea of class or series[14,15].

Pictures, voices, and words: Photovoice

A connection with the themes related to the study's theoretical foundation, pictures, and transcribed lines was established in the data analysis. Thus, we could perceive elements consistent with systemic thinking, social participation, social and gender equity, knowledge for action, transdisciplinarity, sustainability, and the eco-bio-social approach.

The development of the discussions was based on the content analysis method, which, in qualitative research, is a data organization and analysis method. Its characteristics include accepting in its focus the quality of the subjects' experiences and their perceptions about certain objects and their phenomena. The names of the students who contributed to the study were omitted in order to preserve the participants' identity, using terms "A1", "A2", and so on, to distinguish the statements.

In the content analysis, we aimed to discover meaning nuclei underpinning communication. Specific themes identified reveal relevant structures and behavior models in the discourse. In the one presented, the researcher proposes inferences and makes interpretations, interrelating them with the established categories[13].

The narratives about the pictures produced by the young people were classified into two categories. The first includes pictures that portray the sense of active, participatory surveillance for the prevention and control of *Aedes aegypti* breeding sites. The second consists of pictures indicating the (inter)action for school health promotion. Both portray the school environment and the interaction between students, the environment, and health promotion. Then, excerpts from some of the reports elucidate and justify the defined categories.

Active, participatory surveillance

The application of Photovoice in the research resulted in the enhancement of students' role in the fight against *Aedes aegypti*. The literature describes the methodology and analyzes its value for assessing participatory needs, corroborating public health promotion. Image strength is a potent instrument for the empowerment of socially sidelined population groups. It allows creating the representation of their diverse experiences as group or community members[16].

The short course also allowed participants to learn about the origin, principles, and applications of Photovoice. The report-derived analyses revealed mainly the expression of actions referring to shared responsibility and reflection on practices. The statements evidence that active participatory surveillance presupposes specific and individual actions and the implication with community-based actions for the prevention and control of risk factors regarding diseases transmitted by the *Aedes aegypti*.

Figure 3. *Photovoice*. Fortaleza, 2018.
Source: A2

> The photo of the roof, as I saw it, had bottles. It is not because bottles are unsealed, but because it can be a breeding ground. As I said earlier, any type of object can accumulate water and breed mosquitoes. On the roof, there may be gutters, but the one observed had none. [...] And this can also accumulate all kinds of water. So, don't throw bottles in the middle of the roof, because it is also kind of strange. It's also ugly. It can accumulate water. [...]. (A2, 12 years)

The students' narratives evidence the surprise concerning something that is part of their daily lives: bottles are thrown on the roofs, and the community fails to see them. According to Tana[17], a community-based program's sustainability cannot be achieved without the involvement of individuals. The level of satisfaction and respect for prevention practices are significant sustainable behavioral changes, and establishing a support network is essential for the actions' success. One of the principles of the eco-bio-social approach is Knowledge for Action. The idea that knowledge is used to improve health and well-being through an enhanced environment is crucial for an ecosystem approach to health. In this context, knowledge is preferred to action rather than the most commonly used translation of knowledge. The subjects' participation in the problems under analysis, either because they perform or they suffer from environmental and social interventions, echoes in health, and triggers positive effects[6,14].

Figure 4. Photovoice. Fortaleza, 2018.
Source: A4

> [...] the water was dirty, and we learned here that the mosquito could reproduce in dirty water. We also learned that the mosquito could reproduce with little water [...]. Rainwater can accumulate there. (A6, 14 years old)

The implementation of community school surveillance activities indicated how attentive the students are to the vector's unusual possible breeding sites. Narratives and images provided new elements to the discussion, as they fled the traditional sites mentioned in most of the research. The World Health Organization (WHO) has stipulated ten priorities for 2019, including tackling DENV, an infection that has been a growing threat to health in recent decades and is sometimes lethal[18].

Another principle of the eco-bio-social approach is Social Participation, which considers the engagement of both community representatives and all those coexisting in the studied reality. The commitment of these participants enhances the possibility of meeting and overcoming new challenges and sharing new knowledge. In this context, community surveillance can be considered continuous and permanent observation, the consolidation of the knowledge acquired during the process, and the integration of subjects and communities for a common purpose: the health of all.

The integration of various sets of knowledge and the meanings of local stakeholders' practices refer to Social Participation for the engagement of all those who share that scenario. Individual and community surveillance and social participation actions are essential to rethink vector control strategies. Combat policies must be integrated and transcend territorial limits[19]. We need to appropriate the knowledge on the topic at its different levels to formulate innovative and intelligent strategies, adapted to reality, in the fight against *Aedes aegypti*[20].

(Inter) action for school health promotion

The prefix "inter", derived from Latin, expresses reciprocity or intermediate position, and simultaneously as interrelated. This category's conception resulted from the reciprocal and plural concepts, spaces, words, and subjects in the convergence of actions for Health Promotion in the control of *Aedes aegypti* in the school scenario. It portrays the participants' mutual relationships and their interactions with the environment. The words school, learn, like, fight, and picture were mentioned several times, and the subjective and objective dimensions of students depended on them to promote healthy environments.

In the images and narratives that follow, the participants mention the new interpretation, attentive to the school, and what happens in its surroundings. They also remember the importance of what is public and the significant role of the ACEs. They start the discussion about caring for that space (school) from the perspective of Health Promotion.

Figure 5. Photovoice. Fortaleza, 2018.
Source: A7

[...] it is located where we do not have access, for reasons that are not relevant now. [...] there is an air conditioner that is responsible for the secretariat. If the chair didn't have precisely that inclination in that place, the water would probably drain and enter the ground, and there wouldn't be so much trouble. But the chair is diagonal, in a "v" shape, which causes an accumulation of water. And you can see that the water is not so dirty. Dirt has settled on the bottom, and that is very conducive to entry. So much so that it is in the open. If it had a lid on, the odds of the mosquito entering would be much less. [...]. So, this is the thing. Here at school, if I swiftly pass by during recess, I overlook that. If you don't look closely at that thing over there, with the rush of everyday life, or you end up noticing with time [...] but that over there is an area where not only that chair is conducive. There is precisely another room next to it with a considerable accumulation of water. So, I think to myself, if a public school here has it, imagine what you could find in the middle of the streets. If in a school that was supposed to technically receive the care of public authorities and staff, they already have it here, imagine outside, inside, on vacant lots. Where people don't look or analyze. I find it very interesting that endemic control workers analyze these lands because you don't mess around with these diseases. (A7, 13 years old)

The school is conceptualized as the place par excellence where education occurs through the transmission of information in the classroom and functions as a systematizing agency of a complex culture[21]. Health Promotion includes education, practice and action plans, strategies, and intervention methods. It aims to revive the concept of health as social production and seeks to develop community-based public policies and actions. Closely related to surveillance and education, it is a critical movement in which the concept of health acts on the determinants related to the prevention and control of diseases.

In a recent study from his doctoral thesis, Lima Neto[1] adds in his discussions that the epidemiological scenario of the intervention area where his research was conducted reinforces the daily return of a relevant number of children and adults who contracted the virus in schools or their workplaces. It highlights the possibility that many of the transmissions occurred outside the homes, considering two characteristics of the *Aedes aegypti* described in Fortaleza, namely above-average longevity and a high vector competence shown in successive epidemics.

The eco-bio-social approach points to applying concepts and practices related to environmental and social education as allies to mosquito control. The students participating in this research had the opportunity to live both experiences: the concepts discussed in the short course, followed by Photovoice's practical exercise. The following report mentions the school's structural space, exemplifying the rights and wrongs of its viewpoints on health promotion in *Aedes aegypti* control.

Figure 6. *Photovoice*. Fortaleza, 2018.
Source: A5

> This is a scene that shows what is correct. The water tank is sealed, clean. It is the correct scene. (A5, 12 years old)

It appears that the research participants paid attention to the smallest details when dealing with possible mosquito breeding sites. One of the six guiding principles of the eco-bio-social approach is Sustainability. This is the protection of ecosystems and the improvement of degrading environments, recognizing these requirements as extremely important for human health, well-being at this time and for future generations. As research for development, it aims to bring about ethical, positive, and lasting changes. It implies that these changes are environmentally friendly and socially sustainable[6].

The Systemic Thinking principle structures the complex reality considering the socio-ecological systems and the relationships between the ecological, socio-cultural, economic, and political elements of a given problem, corroborating the understanding of its limits, levels, and dynamics. The involvement of people and their interaction are essential to shape complex systems and understand these dimensions. It intends a richer and more effective research process in which investigations may affect changes in practices and policies.

Final considerations

It is evident that education and health went hand in hand in this study and reverberated among the participants. There is an understanding that we always have a lot to discover when we learn to listen, hear, and carefully see the other and his environment. The reports revealed the discoveries about a school that is still 'unknown' in the positive and negative aspects, and the empowerment to intervene in this reality with the imperative of respect for diversity and dialogicity.

It is noteworthy that all movements or policies that aim to combat or eliminate the *Aedes aegypti* vector's reproductive cycle are well-accepted in public health. No control action will be successful without the effective participation of each subject. Public authorities cannot be present in all of these actions with the ideal frequency, so information, knowledge, and training for action are essential to trigger the necessary attitude changes.

Thinking about community surveillance and health promotion is thinking about individuals and the community. Through the eco-bio-social approach, the ecosystem approach translates into its six principles the ways of coping with situations of inequality and fosters the adoption of health-promoting initiatives. Thus, it is necessary to integrate various sets of knowledge, researchers, and local actors (communities) to understand the determinants of health in order to improve society through healthy and sustainable environments.

This study's implementation points to the recording of students' visual and oral impressions on the themes involved with the principles of the eco-bio-social approach through community surveillance for *Aedes aegypti* control. The opportunity to work with Photovoice to address these issues with children and adolescents in a school environment has awakened in everyone involved, including the researcher, the essence and spirit

of cooperation and integration for these actions. Photovoice's innovative proposal in this study strengthened the sense of expanding and applying in other schools the continuation of these educational actions, which allows us to believe in the possibility of conscious citizens with the ability to dialogue and educate a new generation attentive to individual and community health and respectful of the environment.

Authors' contribution

Both authors participated in the conception and design of the work, the discussion of results, and the final approval of the manuscript. Roberta Barakat was responsible for the production and analysis of the data and for drafting the manuscript. Andrea Caprara was responsible for the critical review of the content.

Funding

Research funded by the International Development Research Centre (IDRC-Canada).

Conflict of interest

Both authors have no conflict of interest to declare.

Editor
Denise Martin
Associated editor
Sérgio Resende Carvalho

Translator
Jean Pierre Barakat

Submitted on
12/02/19
Approved on
10/23/20

References

1. Lima Neto AS, Nascimento OJ, Souza GS. Dengue, zika e chikungunya: desafios do controle vetorial frente à ocorrência das três arboviroses. Rev Bras Promoç Saude. 2016; 29(3):305-8.
2. World Health Organization. Handbook for integrated vector management. Outlooks Pest Manage. 2012; 24(3):1-78.
3. World Health Organization. TDR: Special Programme for Research and Training in Tropical Diseases. Dengue control support through eco-bio-social approach. Geneva: WHO; 2013 [citado 21 Out 2017]. Disponível em: http://www.who.int/tdr/news/2013/dengue_control/en/
4. Zara ALSA, Santos SM, Fernandes-Oliveira ES, Carvalho RG, Coelho GE. Estratégias de controle do Aedes aegypti: uma revisão. Epidemiol Serv Saude. 2016; 25(2):391-404.
5. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância de Doenças e Agravos Não Transmissíveis e Promoção da Saúde. Saúde Brasil 2015/2016: uma análise da situação de saúde e da epidemia pelo vírus Zika e por outras doenças transmitidas pelo Aedes aegypti. Brasília: Ministério da Saúde; 2016.
6. Charron DF, editor. La investigación de ecosalud en la práctica: aplicaciones innovadoras de um enfoque ecossistêmico para la salud. Ottawa: Plaza y Valdés Editores; 2014.
7. Silva CS, Bodstein RCA. Referencial teórico sobre práticas intersetoriais em Promoção da Saúde na Escola. Cienc Saude Colet. 2016; 21(6):1777-88.
8. Thiollent M. Metodologia da pesquisa-ação. 18a ed. São Paulo: Cortez; 2011.
9. Barakat RDM. Lagarta Pintada, quem foi que te picou? A implementação da abordagem eco-bio-social em ambiente escolar para a vigilância ativa no controle do *Aedes aegypti* [dissertação]. Fortaleza: Universidade Estadual do Ceará; 2019.
10. Wang CC, Burris MA. Photovoice: concept, methodology, and use for participartory needs assessment. Health Educ Behavior. 1997; 24(3):369-87.
11. Lei nº 14.146, de 25 de Junho de 2008. Dispõe sobre a proibição do uso de equipamentos de comunicação, eletrônicos e outros aparelhos similares, nos estabelecimentos de ensino do Estado do Ceará, durante o horário das aulas. Diário Oficial do Estado do Ceará. 20 jun 2008.
12. Souza MAR, Wall ML, Thuler ACMC, Lowen IMV, Peres AM. The use of IRAMUTEQ software for data analysis in qualitative research. Rev Esc Enferm USP. 2018; 52:e03353. Doi: http://dx.doi.org/10.1590/S1980-220X2017015003353.
13. Minayo MCS. O desafio do conhecimento: pesquisa qualitativa em saúde. 14a ed. São Paulo: Hucitec; 2013.
14. Minayo MCS. Amostragem e saturação em pesquisa qualitativa: consensos e controvérsias. Rev Pesqui Qual. 2017; 5(7):1-12.
15. Gaskell G, Bauer MW. Pesquisa qualitativa com texto, imagem e som: um manual prático. 13a ed. Petrópolis: Rio de Janeiro: Vozes; 2015.
16. Latz AO. Photovoice research in education and beyond: a practical guide from theory to exhibition. New York: Taylor & Francis; 2017.

17. Tana S, Abeyewickreme W, Arunachalam N, Espino F, Kittayapong P, Wai KT, et al. Investigación eco-bio-social sobre en Ásia: princípios generales y um estúdio de caso de Indonesia. In: Charrón D, editor. La investigación de ecosalud en la práctica: aplicaciones innovadoras de um enfoque ecossistêmico para la salud. Ottawa: Plaza y Valdés Editores; 2014. p. 253-68.

18. World Health Organization. WHO Director-General summarizes the outcome of the Emergency Committee regarding clusters of microcephaly and Guillain-Barré syndrome. Geneva: WHO; 2016 [citado 15 Set 2017]. Disponível em: http://www.who.int/mediacentre/news/statements/2016/emergency-committee-zikamicrocephaly/en/

19. Caprara A, Lima JW, Peixoto AC, Motta CM, Nobre JM, Sommerfeld J, et al. Entomological impact and social participation in dengue control: a cluster randomized trial in Fortaleza, Brazil. Trans R Soc Trop Med Hyg. 2015; 109(2):99-105.

20. Medronho RA. Dengue no Brasil: desafios para o seu controle. Cad Saude Publica. 2008; 24(5):948-9.

21. Mizukami MGN. Ensino: as abordagens do processo. São Paulo: E.P.U.; 2016.

Este estudo objetiva implementar ações de vigilância comunitária no controle do vetor *Aedes aegypti* em ambiente escolar à luz da promoção da saúde e da abordagem ecobiossocial. Trata-se de uma análise qualitativa que versa sobre os pressupostos de uma pesquisa-ação. Para a produção de dados, utilizou-se um minicurso agregado à técnica Photovoice, concluído com grupos focais. Os dados empíricos foram processados pelo *software* Iramuteq® e submetidos à análise de conteúdo de Minayo. A pesquisa foi realizada em duas escolas municipais de Fortaleza, Ceará, Brasil, com a participação de 55 estudantes. Os resultados mostraram o incentivo à reflexão das práticas de participação e corresponsabilidade social nas ações de vigilância comunitária e cuidado com o meio ambiente como aliados do controle vetorial. O Photovoice mostra-se propulsor no alinhavo dessas temáticas, desperta o espírito cooperativo e integrativo, possibilitando sua difusão e continuação em outras escolas.

Palavras-chave: Promoção da saúde. Ecobiossocial. Saúde na escola. Photovoice. Vigilância comunitária.

El objetivo de este estudio es implementar acciones de vigilancia comunitaria en el control del vector *Aedes aegypti* en el ambiente escolar bajo la óptica de la promoción de la salud y de un abordaje eco-bio-social. Se trata de un estudio cualitativo que trata sobre las presuposiciones de una investigación-acción. Para la producción de datos, se utilizó un minicurso agregado a la técnica *Photovoice*, concluido con grupos focales. Los datos empíricos fueron procesados por el *software Iramuteq*® y sometidos al análisis de contenido de Minayo. El estudio se realizó en dos escuelas municipales de Fortaleza, Ceará, Brasil, con la participación de 55 estudiantes. Los resultados mostraron el incentivo a la reflexión de las prácticas de participación y corresponsabilidad en las acciones de vigilancia comunitaria y cuidado con el medio ambiente como aliados del control vectorial. El *Photovoice* se muestra propulsor en el esbozo de esas temáticas, despierta el espíritu cooperativo e integrador y sugiere su difusión y continuación en otras escuelas.

Palabras clave: Promoción de la salud. Eco-bio-social. Salud en la escuela. Photovoice. Vigilancia comunitaria.