

## **Participatory Research on Environmental Health: Exploring the perceptions of family health strategy professionals**

**Pesquisa Participativa em Saúde Ambiental: Explorando as percepções de profissionais da estratégia saúde da família**

**Investigación Participativa sobre Salud Ambiental: Explorando las percepciones de profesionales de la estrategia de salud familiar**

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## Abstract

The increasing environmental degradation and the diversity of environmental issues affecting public health in Brazil have required changing the routines and norms of primary healthcare services. The aim of the current study was to explore the perceptions of family health strategy professionals about priority environmental issues associated with risks to the health of local communities. Participatory action research based on the photovoice and focal group techniques and conducted with 28 professionals from two family health strategies in the Casimiro de Abreu County, Rio de Janeiro State, Brazil. Although participants were sensitive to health risk situations associated with inadequate environmental sanitation conditions, they showed limited perception about these risks and about possible actions to be taken in order to change local issues. Professionals of the two localities did not perceive themselves as co-responsible actors for improving the environmental conditions of the territory. There is need of taking contextualized environmental education actions focused on empowering and engaging health professionals, and the investigated community, to reduce health risk conditions through the equal access to sanitation services.

**Keywords:** Environmental health; Health promotion; Health personnel.

## Resumo

A crescente degradação ambiental e a diversidade de questões ambientais que afetam a saúde pública no Brasil têm exigido mudanças nas rotinas e normas dos serviços de atenção primária à saúde. O objetivo do presente estudo foi explorar as percepções de profissionais da estratégia saúde da família sobre questões ambientais prioritárias associadas aos riscos à saúde de comunidades locais. Pesquisa-ação participativa baseada nas técnicas fotovoz e grupo focal e conduzida com 28 profissionais de duas estratégias saúde da família do município de Casimiro de Abreu, estado Rio de Janeiro, Brasil. Embora os participantes tenham se mostrado sensíveis a situações de risco à saúde associadas a condições inadequadas de saneamento ambiental, eles demonstraram percepção limitada sobre tais riscos e as possíveis ações a serem tomadas para mudar os problemas locais. Profissionais das duas localidades não se perceberam como atores coresponsáveis pela melhoria das condições ambientais do território. Há necessidade de ações de educação ambiental contextualizadas com foco na capacitação e engajamento dos profissionais de saúde e da comunidade investigada para a redução das condições de risco à saúde por meio da igualdade de acesso aos serviços de saneamento.

**Palavras-chave:** Saúde ambiental; Promoção da saúde; Profissionais da saúde.

## Resumen

La creciente degradación ambiental y la diversidad de problemas ambientales que afectan la salud pública en Brasil han requerido cambiar las rutinas y normas de los servicios de atención primaria de salud. El objetivo del presente estudio fue explorar las percepciones de los profesionales de la estrategia de salud familiar sobre los problemas ambientales prioritarios asociados con los riesgos para la salud en las comunidades locales. Investigación acción participativa basada en las técnicas de fotovoz y grupo focal y realizada con 28 profesionales de dos estrategias de salud familiar en el municipio de Casimiro de Abreu, estado de Río de Janeiro, Brasil. Aunque los participantes eran sensibles a las situaciones de riesgo para la salud asociadas con condiciones inadecuadas de saneamiento ambiental, demostraron una percepción limitada sobre tales riesgos y las posibles acciones que se tomarán para cambiar los problemas locales. Los profesionales de ambos lugares no se percibieron como actores coresponsables para mejorar las condiciones ambientales del territorio. Es necesario tomar acciones de educación ambiental contextualizadas, enfocadas en empoderar e involucrar a los profesionales de la salud y la comunidad investigada para reducir las condiciones de riesgo para la salud a través del acceso igualitario a los servicios de saneamiento.

**Palabras clave:** Salud ambiental; Promoción de la salud; Personal de salud.

## 1. Introduction

The increasing environmental degradation and the diversity of environmental issues affecting public health in Brazil have required changing the routines and norms of primary healthcare services. Old health risks associated with aspects such as disorderly urbanization processes, regional imbalances, non-inspection of environmental situations by responsible bodies and inadequate environmental sanitation conditions were added to new risks deriving from different technologies, industrialization

and from the use of non-renewable natural resources, which together increased the risk of spreading chemical and radioactive agents in the environment (Almeida, Reis & Araújo, 2020).

The promotion of strategies focused on acknowledging environmental factors as key determinants of the health condition of individuals and communities is favored by family health units. Thus, the Family Health Strategy (FHS) emerged in the Brazilian scenario as a priority service focused on consolidating and expanding collective actions capable of encouraging the pursuit of healthy environments and sustainable development and, consequently, capable of improving the quality of life of the general population (Dias et al., 2018).

Accordingly, primary healthcare professionals should encourage health practices to enable the applicability of community intervention methods focused on broadening the perception of people affected by environmental issues, as well as on empowering them to improve their environmental and health conditions (Moniz, Daher, Sabóia & Ribeiro, 2020). However, these health professionals are often unprepared to take actions aimed at promoting healthy environments and ecologically sustainable attitudes (Bruno et al., 2021).

The participatory approach in the environmental health field has been adopted as scientific methodology to help developing community learning and training practices focused on tackling and solving collective issues. However, studies involving health professionals in this process remain scarce in the Brazilian scenario (Moniz, Sabóia, Carmo & Hacon, 2017).

The aim of the current study was to explore the perceptions of family health strategy professionals about priority environmental issues associated with risks to the health of local communities.

## **2. Methodology**

Participatory action research based on the photovoice and focal group techniques and conducted in Rio Dourado and Barra districts, Casimiro de Abreu County, Rio de Janeiro State, Brazil. Action research is a qualitative methodology that seeks problem-solving with the groups involved in a social interventions process (Pereira et al., 2018). This type of research was utilized to incorporate the awareness of a social problem, turning the research into a changing vehicle in which the researchers and participants were involved by group techniques (Minayo, Assis & Souza, 2016).

The study involved eight professionals of the family health strategy in Rio Dourado district and twelve professionals of the family health strategy in Barra district agreed to participate in the study. The data collection occurred from May 2017 to June 2018. Participants from each locality were asked to take pictures of the environmental issues they thought to have high priority due to risks to the health of the local community. They had one month to photograph the territory as many times as they wanted. Photos were filed and printed before the focus group meeting in order to be used in panels.

The next stage comprised a focus group meeting aimed at making environmental and health-risk diagnosis, based on the expectations and perceptions of professionals who knew the community well. Participants were identified by different numbers, based on the sequence in the group, to assure anonymity. Speeches were audio recorded. A panel was collectively built with the pictures taken by participants, who discussed about them in order to reach group consensus about the selection of a priority issue and to analyze the cause-effect-intervention relationship.

Multiple data analysis was carried out through systematized triangulation and it was based on thematic content analysis (Minayo, Assis & Souza, 2016). The organization of data gathered during the group meetings through drawings, photo panel and speech transcriptions allowed grouping the analyses based on the Protocol for Assessing Community Excellence in Environmental Health (PACE-EH) (Centers for disease control and prevention, 2000).

The present study is part of the project entitled “Environmental Education and Nursing: a path to ethics, sustainability and health promotion”, and was approved by the Research Ethics Committee of Federal Fluminense University (Opinion N. 1.934.809). The participants provided informed consent by written.

### 3. Results

The following categories were defined based on the main issues addressed by the participants. The team of ESF Rio Dourado was named team 01 and the team of ESF Barra was denominated team 02.

#### Water and Sewage Problems and Risks of Infectious and Parasitic Diseases

The lack of sanitary sewage treatment service and the small coverage of the water treatment service in the investigated community were the main issues highlighted by the participants. Rainwater drainage was not mentioned; however, participants did not acknowledge this aspect as a sanitation matter when one of the moderators addressed it at the end of the group discussion.

Two participants reported that the water supply for human use in Rio Dourado district derives from the water source at Mountain Farm and from artesian wells. One participant expressed his concern about the location of some wells on the grounds of the dwellings because they were very close to cesspits:

*When we arrive at these houses, it is possible seeing that the wells are very close to cesspits that were built in the same place...There is a place where the water in natura comes from the source, everyone drinks it and there is no water treatment there (Participant 1, team 01).*

Participants reported that artesian wells are often inappropriately installed, as well as that the population does not carry out chemical and microbiological water analyses. Accordingly, professionals also mentioned the risk of having the aquifers and the wells contaminated due to the discharge of domestic waste and sewage in the soil and in the river, as seen in the following speeches:

*All the sewage leaving the houses flows towards the river, half of the population has septic tanks, whereas the other half discharges their sewage in the river (Participant 06, team 01). During the visits, we instruct dwellers to throw chlorine into the wells, to boil the water; nowadays, nobody else boils it because the cooking gas is expensive, so it is just used to cook the food (Participant 1, team 01).*

One participant addressed the importance of adopting complementary traditional means of treating drinking water such as boiling, filtering and chlorination, in neighborhoods. However, these alternatives are not used by dwellers due to costs with the purchase of cooking gas and filter. Two professionals did not know about the existence of a water treatment network in Rio Dourado district.

In addition, no participant in the localities mentioned that the local government should monitor the chemical, bacteriological, parasitological and toxicological aspects of the aquifer and river waters through the environmental health surveillance sector. Participants were also unaware of the state’s responsibility to preserve the environmental quality of the water source.

Participants of the team 01 reported that the means of domestic sewage destination used by the population was based on dumping sewerage into the river or in septic or rudimentary septic tanks, as seen below in participants' speeches:

*Half of the population living in Rio Dourado district has septic tanks, whereas the other half discharges their sewage in the river (Participant 1, team 01); Open sewage, insects and rats in the houses (Participant 04, team 01); All the sewer leaving the houses flows towards the river, this one still has a current in the gully... (Participant 06, team 01).*

The same situation was reported by the professionals of the team 02, except the problem of the discharge of sewage in the river:

*Problems caused by sewage in the tanks (Participant 05, team 02).*

Three professionals of the team 01 and one professional of the team 02 only associated the risk of developing diseases such as worm infections and dermatitis with the use of water from artesian wells and aquifers in the region.

Two participants of the team 01 associated the risk of developing other diseases, such as dengue and zika with mosquito proliferation due to the incidence of stagnant and contaminated water from the river and from the well, as seen in the following speeches:

*And the effects comprise dermatitis, dengue and Zika, worm infections, as well as soil and water contamination (Participant 10, team 01).*

While four participants of the 02 teams reported on the risk of zika, dengue and chikungunya due to the appearance of mosquitoes because of the standing water of plant pots and open water boxes. No participant from any locality mentioned the proliferation of the vector from the problem of drainage of rainwater as a dimension of basic sanitation.

Although one participant mentioned the contamination of water and soil by heavy metals and drugs, no causal relationship between the environmental exposure to these substances and its possible effects on people's health was established by any professional, as seen in the speech of one of them:

*It's not just parasites, they even throw drugs and cell phone batteries there, and it will contaminate our water tables...light bulbs in the garbage, lead (Participant 01, team 01).*

Risks to human health due to contact with soil and water possibly contaminated with different chemical substances and with several other infectious agents were also not perceived. Thus, participants associated the risk of having groundwater and surface water contamination in the district with lack of adequate final domestic sewage and waste disposal, rather than with the increasing use water by local agriculture and human consumption.

### **Garbage Problem and risks of Infectious and respiratory diseases**

According to participants from both localities, household garbage collection is irregularly done by the company hired by the local government, fact that leads to inappropriate accumulation of domestic waste in the streets and in vacant lots, as shown in the following speeches:

*The garbage collection situation has worsened, nowadays. I would say that garbage collection is barely done once a week (Participant 01, team 01); The garbage truck goes to Vila Verde once a week (Participant 07, team 01); Look, it's a lot of garbage to be near a commercial establishment and houses (Participant 04, team 02).*

A single participant from each locality mentioned that garbage accumulation in the streets favors the proliferation of mosquitoes that can be arboviruses vectors:

*Pots thrown in the garbage left in the streets can lead to the proliferation of mosquitoes and to dengue (Participant 03, team 01); Diseases caused by mosquitoes: dengue, chikungunya, zika (Participant 09, team 02).*

Only one participant of the team 01 and two participants of the team 02 mentioned about the risk of leptospirosis due to the proliferation of rodents attracted by the accumulated garbage:

*Leptospirosis is another effect (Participant 10, team 01).*

Thus, one of the alternative practices often inadequately implemented by the population lies on burning household garbage and debris in public places or in vacant and abandoned lots, as seen in the following reports:

*The garbage, the stench of the material, the garbage being burned, one thing leads to another (Participant 07, team 01); The garbage collection issue and residents burn it (Participant 10, team 02).*

Garbage burning was perceived as likely to increase the risks of having people developing respiratory diseases, as seen in the following statements:

*The burning process is also directly linked to respiratory diseases (Participant 7, team 01); People complain that the burnings cause respiratory diseases in children with allergies (Participant 1, team 02); Lack of air, sinusitis, headache (Participant 05; team 02).*

Participants only associated the garbage problem with the risk of developing dengue, leptospirosis and respiratory diseases. In addition to respiratory diseases, such as rhinitis and sinusitis, other chronic diseases were not mentioned by any participant from both localities.

This finding evidenced their insufficient knowledge about other situations, such as garbage burning and accumulation in public spaces, which can be potentially dangerous to the environment and to people's health.

### **Actions focused on coping with inadequate basic sanitation**

In relation to social participation, professionals of both studied communities raised as a priority the need for only people from the communities to begin to participate in concrete of the deliberative spaces for planning and decision-making on issues related to the increased sanitation coverage. The speeches below reflect this situation:

*Population has to walk side by side of management to function (Participant 3, team 02); The representative of the residents' association must attend the council to follow the situation of the sewage and garbage (Participant 7, team 01).*

In this sense, it was observed that the health professionals who participated of the current study did not perceive themselves as co-responsible actors for improving the environmental conditions of the territory. They just held the population and the local government accountable for the local environmental condition, as it is observed in the following speeches:

*Lack of interest of the population, indifference... do not seek to claim for their rights (Participant 01, team 02); I think it's a problem of education, people have to be aware (Participant 4, team 02); From the community too, be more careful right? To prevent (Participant 05, team 01); Problem of the public administration (Participant 01, team 01).*

Despite this, some family health professionals recognized that they should educational actions, mainly, environmental education to enable the population to apply emancipatory primary health care practices, to improve people's knowledge about their environmental and health rights, as well as to empower them to pursue better health, environmental and life conditions. However, participants said they are not prepared to do such actions.

#### **4. Discussion**

Sanitation was selected by the participants as priority environmental health issue in territories studied. This is a chronic structural problem of most Brazilian counties. Lack of adequate basic sanitation conditions remains one of the main causes of poor environmental and life quality in Brazil, as well as of hospitalizations and deaths due to infectious and parasitic diseases (Ferreira, Grazielle, Marques & Gonçalves, 2021).

Sanitation has been highlighted as one of the fundamental pillars of the health and well-being of both humans and the planet. The advancement and applicability of technologies focused on reducing inequality in the access to sanitation services by vulnerable populations worldwide, mainly by those living in developing countries, have been addressed in the United Nations' policy through the Millennium Development and Sustainable Development Goals (Zhou et al., 2018; World Health Organization, 2021).

Water contamination in Dourado River and in the aquifers of the region, by the inappropriate discharge of domestic sewage, as well as the proximity between wells and cesspits, were perceived as a worrying situation by participants. Lack of sewage treatment networks contributes to environmental degradation and to the emergence of imminent risks to human health. Household waste generates toxic residues that can contaminate different aquifer layers due to percolation and to groundwater precipitation through natural infiltration processes (Tran, Gin & Ngo, 2015).

The contamination of freshwater sources poses one of the main risks to public health. Participants showed insufficient knowledge about the great diversity of microorganisms (viruses, fungi, protozoa, worms, algae and bacteria) that can be found in the water and transmitted through fecal-oral route due to contaminated water intake, inadequate domestic and personal hygiene and to contact with insect vectors that breed in water (Ferreira et al., 2021). The application of measures focused on expanding the coverage of sanitation services can significantly reduce pathogen-transmission risks (Ferreira et al., 2021).

The risk of developing non-infectious diseases associated with the contact with contaminated soil or water was not mentioned by the here in investigated professionals. However, there is also the risk of having intoxications and diseases due to

human exposure to different environmental contaminants such as heavy metals, agrochemicals, volatile organic compounds, drugs, among others (Moniz et al., 2017).

According to participants, some residents living in neighborhoods subjected to irregular garbage collection service leave their garbage accumulating in the streets, whereas others resort to burning practices. Only one participant associated garbage accumulation with possible endemic diseases in the region, such as zika, chikungunya caused by the transmitting agent (mosquito vector) in the last years (Donalisio, Freitas & Zuben, 2017; Ribeiro, Teles & Tuon, 2020).

Another participant associated garbage accumulation with the proliferation of *Leptospira*-transmitting rodents. Inadequate waste management and, consequently, garbage accumulation were associated with endemic incidences of leptospirosis throughout Brazil (Segurado, Cassenote & Luna, 2016).

Participants were concerned with the fact that garbage-burning practices increase the risk of having populations developing respiratory diseases, mainly the most vulnerable groups such as children and elderly, who are already affected by these issues due to other factors. This concern of the professionals is in agreement with the literature. The emission of toxic particles and atmospheric gases through the burning of domestic solid waste cause environmental and health impacts. These pollutants are associated with the risk of premature birth, low birth weight, increased incidence of cancer, respiratory and neurological diseases (Vollmer et al., 2021; Campos & Costa, 2017).

In addition, these health issues have negative impact on the health sector due to increased health system-related expenditures, besides decreasing agricultural productivity (Campos & Costa, 2017).

The professionals showed that they do not take measures to deal with environmental issues, and none of them had knowledge about strategies and educational contents focused on raising the awareness of the population about environmental health matters. These results were found in other studies (Bruno et al., 2020; Moniz et al., 2017). This fact is possibly due to the absence of inclusion of environmental health in undergraduate health students training (Souza, Andrade & Silva, 2017; Vollmer et al., 2021; Kligler, Zipp, Rochetti, Secic & Ihde, 2021).

Thus, the results showed the need of taking contextualized environmental education actions aimed at empowering and encouraging both health professionals and community to pursue greater equity in sanitation services. Professionals need qualification to improve their knowledge and prepare them to develop environmental education actions that take into consideration the complexity of environmental determinants and their relation to human health and it is the government's duty to promote permanent health education actions (Moniz et al., 2020).

The sanitation crisis in Brazil highlights the importance of the social participation in instances for decision making, because this is the best way to guarantee the human rights to their environmental determinants and to minimize the impacts of this crisis, especially in health (Moniz et al., 2017).

Environmental education is an important instrument used to encourage people to engage in sanitation matters (Souza, Santos, Guimarães, Ribeiro & Silva, 2018). Such educational process is one of the main means to encourage people's participation in, and social control of, basic sanitation in the county, since it enables spaces where, in a critical way, it is possible exchanging knowledge about the reality and about the need of organization to comply with sanitation rights and duties (Piccoli, Kligerman, Cohen & Assumpção, 2016).

In addition, the educational action enables clarifying doubts and exchanging information about inadequate environmental attitudes such as garbage burning. The participatory diagnosis proved to be a valuable tool to encourage the participation of all local FHS professionals in the reflexive and critical analysis of the environmental health status, besides contributing to the way of rethinking health promotion practices with emphasis on the environmental care in the scope of Primary Health Care.



## 5. Conclusion

Although FHS professionals were sensitive to health risk situations associated with inadequate environmental sanitation conditions, they showed limited perception about these risks and about actions that could be taken to change local issues. Based on this finding, it was possible inferring the need of taking contextualized environmental education actions focused on empowering and engaging health professionals, and the investigated community, to reduce health risk conditions through the equal access to sanitation services. It is hoped that the knowledge of this study can subsidize the development of new participatory studies and care practices in environmental health in the territories.

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