SIN-CHN
SCIENTIFIC PRESS PTE.LTD.

Sustainable Economies 2024, 2(3), 181.
https://doi.org/10.62617/se.v2i3.181

Article

Sustainability and health promotion actions in Brazil

Cicera Simoni da Silva[1], Jair Paulino de Sales[2], Estelita Lima Cândido[1,*]

[1] Universidade Federal do Cariri, Crato 63048-080, Brazil
[2] Centro de Informática, Universidade Federal de Pernambuco, Recife 50740-560, Brazil
*** Corresponding author:** Estelita Lima Cândido, estelita.lima@ufca.edu.br

CITATION

da Silva CS, de Sales JP, Cândido EL. Sustainability and health promotion actions in Brazil. Sustainable Economies. 2024; 2(3): 181.
https://doi.org/10.62617/se.v2i3.181

ARTICLE INFO

Received: 3 June 2024
Accepted: 1 July 2024
Available online: 22 July 2024

Abstract: This study explores sustainable programs or actions implemented within the work environments of students enrolled in a Postgraduate Program in Health Promotion in Brazil. Seventy participants, primarily healthcare professionals, were tasked with identifying the sustainable actions during the Health Promotion and Sustainability course. Responses were analyzed using the IraMuTeQ V. 0.7 alpha 2 program. Of these participants, 15 individuals did not identify any actions, while 55 highlighted various initiatives. Key strategies included waste management, health education, promotion of physical exercise, optimization of food resources, composting, and conscientious water usage. These actions not only offer potential cost savings but also contribute to a more responsible utilization of natural resources and the attainment of Sustainable Development Goals.

Keywords: health promotion; sustainable development; sustainable development goal; environmental health

1. Introduction

In recent years, Brazil has faced a series of challenges in the domains of health and the environment. Improper exploitation of natural resources and unplanned land occupation, both in urban and rural areas, have led to environmental disasters, such as the recent flood that devastated over 30 cities in a Brazilian state. In response, both government and private sectors are implementing strategies for sustainable environmental and human health.

Health promotion involves a broad political and social process aimed at modifying social, environmental, and economic conditions to enhance both individual and collective health. This goal requires both government and society to adopt an approach that supports collective solutions, combining health, well-being, and social and economic development. This concept is closely connected to the social determinants of health, which are social, political, economic, environmental, and cultural factors that strongly impact health outcomes [1,2].

Within this context, it is crucial to direct social, political, and technical actions towards addressing the social determinants of health to enhance health outcomes and alleviate inequalities. These actions align with the Agenda 2030, emphasizing the significance of empowering local governments to formulate policies aimed at promoting health and well-being, reducing health inequalities, and achieving Sustainable Development Goal (SDG) 3, Good Health and Well-being. The execution of initiatives across healthcare and diverse sectors is paramount, leveraging synergies to yield collective advantages [3].

Territories present distinctive chances for innovation and cross-sectoral collaboration, crucial for realizing the Agenda 2030's goals. Efficient local

governance is vital for coordinating these initiatives seamlessly across sectors. Thus, enabling sustainable enhancements in quality of life and socioeconomic advancement, in line with Agenda 2030 targets.

Themes related to sustainable development, indicators, innovation, and public policies have been widely disseminated in the scientific literature, with the aim of promoting effective social change. Moreover, the interfaces between health and sustainable development, innovation, and the participatory formulation and implementation of public health policies, committed to quality of life and the creation of healthy environments, are also significantly addressed [4].

Health promotion, as a social practice, emphasizes positive health through concrete actions. This field, still evolving and characterized by tensions arising from persistent social inequalities, confronts the complexity of various factors that influence the active role of individuals within the community. However, health promotion is largely confined to the health sector, with isolated intersectoral efforts often celebrated as major successes but also marked by significant weaknesses [5].

The challenges are significant due to deep socioeconomic inequalities, making the implementation of sustainable practices urgent to ensure effective long-term outcomes. There is a growing demand for studies that incorporate sustainability into health strategies, providing essential information for the development of more robust and inclusive public policies.

Brazilian universities play a crucial role in advancing the Agenda 2030, contributing to the education of students and the training of professionals sensitive to sustainability at both local and global levels. In the case of the Federal University of Cariri, in addition to the permanent policy adopted, some courses are offered online to broaden accessibility. Therefore, the aim of this study is to list sustainability initiatives implemented in the work environments, reported by students of a Postgraduate Program in Health Promotion during the Health Promotion and Sustainability course.

The next sections of the paper are dedicated to presenting the adopted method to achieve the proposed objective and describing the achieved results, Similarity Analysis (SA) and Word Clouds (WC). Next, these results will be compared with the literature and synthesized in the conclusion section.

2. Methodology

This study adopted the exploratory descriptive method. This type of research is suitable for enhancing familiarity with the problem, making it more explicit, or for constructing hypotheses. Among the applied techniques are interviewing individuals who have practical experience with the researched problem, and analyzing examples that enhance comprehension [6].

In this study, all students enrolled in a Postgraduate Course in Health Promotion in Brazil offered by a Brazilian federal public university, through distance education, were surveyed, totaling 70 students. This group is distributed across 14 states in Brazil and has diverse educational backgrounds, including nursing, dentistry, nutrition, physiotherapy, psychology, radiology, gerontology, pharmacology, biology, and veterinary medicine.

During the classes, the participants were asked about the existence of sustainable programs, policies, or actions in their work environments. Regarding ethical aspects, it is important to emphasize the strict adherence to the guidelines outlined in Resolution 510/2016 of the Conselho Nacional de Saúde do Brasil (National Health Council). In Brazil, studies of this nature, which aim to theoretically explore situations that have arisen spontaneously and contingently within the professional practices while safeguarding the anonymity of research subjects, do not necessitate review by a research ethics committee for studies involving human subjects [7].

The students' responses were structured into textual corpora to facilitate analysis using the IRaMuTeQ software, version 0.7 alpha 2. IRaMuTeQ, a free tool of French origin developed by Pierre Ratinaud in 2009 [8], provides a wide range of functionalities. In this study, Similarity Analysis (SA) and Word Clouds (WC) were utilized. SA provides a graphical representation known as a Similarity Tree, enabling comparisons between lexical forms by establishing a network of weighted connections. This technique is based on a graph composed of vertices connected by edges, where each edge is linked to two vertices, indicating a relationship of similarity between them. Further, Word Clouds use a graphical representation based on the frequency of words [9]. In this method, the most frequent words are grouped in the center of the image, with the size of the letters proportional to their frequency, giving greater prominence to the most frequent words. Additionally, summary tables were developed to synthesize the results related to the activities carried out by the students in their respective fields of practice.

3. Results and discussion

Out of the 70 participants, 55 reported that there was some sustainable program or action adopted in their work environments. The analysis of the textual corpus of the 55 students resulted in 76 text segments (ST) and 2392 occurrences. The corpus consists of 804 distinct forms, of which 415 appear only once.

In generating the word cloud (**Figure 1**), default software settings were utilized to emphasize the most representative words in the field under study, based on their frequency within the corpus. The spatial organization of the cloud reflects this frequency, with the most frequently mentioned words displayed in the center of the figure in a larger size, while less frequent words appear in smaller sizes and are positioned farther from the center. The terms "encourage", "sustainable", "reduce", "healthy", "environmental", "recycle", "promote", "avoid", and "correct" stand out as the most relevant and significant, prominently featured in the word cloud due to their high frequency. Additionally, there is a noticeable proximity between less frequent and more frequent words. For instance, the term "sustainable" is associated with less frequent themes such as "reuse" and "produce".

Further, Similarity Analysis (**Figure 2**), default software settings were also utilized, with only adjustments made to the graphical settings. To ensure a more legible tree without overlaps, only lexical forms occurring with a frequency equal to or greater than 10 were selected. The analysis revealed that the most relevant lexical forms are "health" and "waste" as they are centralized, and the most significant

relationships are found among the lemmas. Lexical forms “waste” is correlated with “material”, “reduce” “consumption” and “disposal”. Additionally, the term “health” is associated with “environment”, “activity”, “school” “education”, “water”, “well-being”, “community”, “sustainable” and “care”.

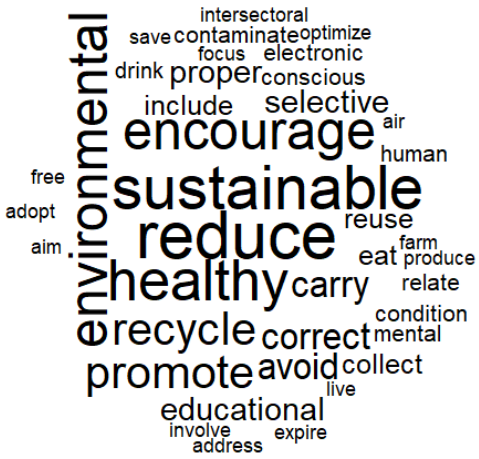

Figure 1. Word cloud extracted from the analyzed corpus.

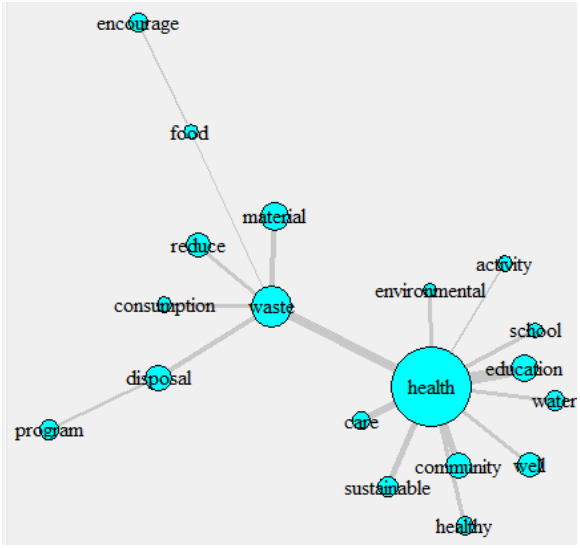

Figure 2. Similarity analysis.

Table 1 compiles the fields of activity of the students. The Program Estratégia Saúde da Família (Family Health Strategy, ESF), a Brazilian government initiative, is the most common field of activity among students, with 22 occurrences. While ESF leads in numbers, other areas such as Hospital and Pharmacy also have representation, with 2 occurrences each. Other mentioned fields include Specialized Services, Education, and Health Surveillance. It is important to mention that 16 individuals in the group did not specify the sector where the action was applied, based on their response.

Table 2 offers a comprehensive overview of the primary initiatives undertaken by students across various fields of activity. Notably, “waste management” is mentioned in 24 cases, with “Health education and Continuing Health Education” listed in 12 records. Furthermore, the “Promotion of physical activity” stands out

with 5 occurrences, and the "Integral use of food and Composting", as well as "Conservation and conscious use of water", each with 4 occurrences. These recurring actions illustrate significant economic impacts, suggesting that persistent investments can lead to long-term sustainable and economic improvements.

Table 1. Students' field of activity and number of occurrences.

Area of application	n
Family Health Strategy (ESF)	22
Hospital network	02
Pharmacy	02
Federal university	01
Specialized services	01
Municipal Education Department	01
Dental service	01
Health academy	01
City Hall	02
Health Surveillance	01
Secretariat of Health	03
Specialized outpatient care service	01
Municipal community kitchen	01
No information	16

Table 2. Sustainable actions or programs mentioned and their economic impact.

Sustainable actions or programs	Frequency of occurrence	Impact generated
Waste management	24	Reduction of raw material consumption
Health education and Continuing Health Education	12	Improved health/Quality of life/Professional qualification/ Reducing the costs of medical treatment
Promotion of physical activity	05	Increased productivity/Quality of life
Integral use of food and Composting	04	Reduction food waste/generation of organic fertilizers
Health Academy Program	04	Reducing health costs
Conservation and conscious use of water	04	Prevention of damage and costs related to water shortages/Energy savings
Telemedicine	03	Expansion of health care and improved access to services
Prioritizing Eco-Conscious Products	02	Reducing excessive consumption, accumulation and waste
Food acquisition program	02	Access to food/Encouragement of family farming
School Health Program	02	Reduction in school drop-outs/Reduced health costs
Planting vegetable gardens in schools	02	Financial education/Income generation/food security
Installation of solar panels	02	Energy saving
Water treatment in rural areas with hypochlorite	01	Reducing the costs of waterborne diseases
Living pharmacy	01	Encouraging organic and agro-ecological family farming
Sustainable architecture	01	Reducing Energy Consumption
Monitoring health data and indicators	01	Guides effective intervention and prevention measures
Territorialization	01	Efficient allocation of resources/Reduction of health inequalities

Table 2. (*Continued*).

Sustainable actions or programs	Frequency of occurrence	Impact generated
Young Environmental Agent Program	01	Youth Leadership/Sustainable entrepreneurship
Family planning and prenatal care	01	Reducing maternal and child mortality/Quality of life
Flourish project	01	Quality comprehensive care for adolescents

Regarding waste management, the emphasis was on practices such as waste sorting, recycling, reuse, and safe disposal of contaminated materials, alongside education programs promoting sustainable practices among healthcare professionals and users. These measures are essential to protect public health, ensure worker safety, preserve the environment, and enhance operational efficiency. Healthcare waste management aims to protect workers, natural resources, and the environment, representing a significant step towards regulating and implementing best practices in waste treatment and advancing efforts in sustainable development [10].

De Carvalho [11] conducted a study on healthcare waste at a hospital, highlighting deficiencies in environmental management and proposing improvements for enhanced efficiency in waste sorting. The study emphasizes the need to raise awareness among hospital professionals about the risks and responsibilities associated with waste management, aiming to reduce collection and final disposal costs. Additionally, it underscores the importance of environmental and social education initiatives at all levels of training to achieve social, environmental, and economic equity.

Moreover, implementing environmental education initiatives among employees and managers of a public hospital resulted in a significant increase in proper waste segregation. Prior to the educational initiatives, only 8% of departments performed segregation correctly. After implementation, this rate rose to 77%, highlighting the clear benefits of environmental education in improving the effectiveness of healthcare waste management [12]. Further, studies indicate that insufficient knowledge about healthcare waste management has resulted in failures in identifying, segregating, and properly disposing of these wastes. The lack of adequate training is a major contributing factor to these deficiencies, underscoring the necessity to implement training initiatives for personnel responsible for waste management and healthcare workers [10,13–15].

The students, across their diverse fields of study, implemented actions to manage waste. These included adopting efficient collection and treatment systems, recycling dental packaging, collecting and recycling medications, medical waste sorting, and organizing community waste collection drives. These initiatives encompass the entire spectrum of waste management, from proper segregation to responsible recycling and disposal, thus contributing to environmental preservation and the promotion of public health. By integrating education, regulation, and innovative practices, we can significantly advance towards achieving safer, responsible waste management aligned with the principles of sustainable development.

Health education was the second most cited practice, recognized as a set of approaches that promote the personal, professional, cultural, and social growth of healthcare professionals [16]. This concept is widely discussed in the literature, as exemplified by the development of the project Nazareno em Ação: Juntos Pela Conservação Ambiental (Nazareno in Action: Together for Environmental Conservation). In this initiative, the Nazaré community had the opportunity to learn about solid waste management, understanding the importance of the 3Rs, and engaging in waste sorting in domestic environments, educational institutions, workplaces, and public spaces [17].

Students have been developing various health education initiatives in their fields of practice. These initiatives encompass promoting nutritional education; mental health awareness; the Quer Saber (Want to Know) Project with individual and group educational interventions; lectures on health and the environment; socio-educational groups addressing various issues, such as the health of the cisgender and LGBT population, such as the health of the cis-heteronormative and LGBT population. These initiatives aim to improve the quality of life and promote well-being in the communities served.

In their diverse fields of practice, students have taken the initiative to implement a wide range of health education programs, empowering individuals and communities to make informed decisions about their health and well-being. These comprehensive initiatives encompass nutritional education; mental health awareness; environmental health education; socio-educational groups addressing various issues such as the health of the cisgender and LGBT population. By implementing these initiatives, students aim to improve the quality of life and promote overall well-being within the communities they serve.

The practice of physical activity stood out among students in various contexts, such as workplace gymnastics. Oliveira [18] analyzed the importance of this practice in promoting an active and healthy lifestyle, relating it to the SDG 3, Good Health and Well-being, and SDG 11, Sustainable Cities and Communities. The study emphasizes the benefits of physical and mental health, preventing non-communicable chronic diseases, while also promoting social equality and contributing to a more inclusive and sustainable society influenced by social, economic, and environmental factors.

The full utilization of food is mentioned as an action that encourages the consumption of local and seasonal foods, integrating composting methods to utilize raw food waste from production units, such as vegetable scraps, fruits, and other biodegradable materials. This approach promotes nutritional enrichment of diets by utilizing unconventional parts of foods in meal preparation [19,20]. Additionally, it generates food savings, helps improve the quality of life of the population, and reduces environmental impacts.

In a cross-sectional study on sustainability practices in fourteen Hospital Food and Nutrition Units (Unidades de Alimentação e Nutrição Hospitalares—UANs) located in the Northeast region of Brazil, it was observed that these units implement some sustainable practices, such as planning and designing menus that respect food seasonality and utilize regional products. However, other important measures, like regular staff training and the implementation of waste sorting, are still not widely

adopted in these units. da Santana Silva and de Lívia Oliveira [21] emphasizes that food utilization strategies offer benefits both to individuals and the community. However, they are poorly publicized and encouraged among the population, requiring more initiatives in healthcare units to promote their adoption.

Water conservation is also crucial for environmental sustainability and water security. Gaitán and Teixeira [22] assessed the potential water savings from implementing rainwater harvesting systems as an alternative water source in a hospital unit. Their findings underscore the importance of strategic water management, which can yield substantial financial, environmental, and social benefits. Santana and Sant'ana [23] conducted a similar study aiming to assess water consumption in basic health units in the Federal District of Brazil and propose solutions to reduce potable water use. The results revealed that 33% of the consumption in these units is attributed to sanitary basins. Furthermore, the study highlighted potential reductions in potable water consumption: Up to 51% with water-saving equipment, 57% with rainwater harvesting systems, and 14% with greywater reuse systems.

The sustainable practices and health promotion highlighted in **Table 2** are reflected in the students' activities, demonstrating a holistic and sustainable approach in education and social practice. According to Rebolledo and Giatti [24] actions outlined by the Atenção Primária à Saúde (Primary Health Care) at the municipal level are crucial for achieving the Sustainable Development Goals, but inadequate communication about this relationship can hinder the attainment of greater incentives for the sector. Therefore, there is a need for improved alignment among local, national, and global plans and policies, along with continuous and integrated education for communities and healthcare teams, as well as enhanced utilization and dissemination of available technologies within a territorial and intersectoral framework for municipal health plans.

4. Conclusion

This study identified sustainability actions implemented in the workplaces of students enrolled in a Postgraduate Course in Health Promotion in Brazil. The actions were categorized into 20 groups, with waste management and health education having prominence. Additionally, initiatives promoting health through programs such as Physical Activity, Telemedicine, Family Planning, and Prenatal Care were highlighted. Other activities mentioned were monitoring health data and territorialization, establishing living pharmacies, school health programs, and food acquisition programs. In the environmental sphere, actions encompassed prioritizing eco-friendly products, installing solar panels, establishing school vegetable gardens, and adopting sustainable architecture.

The initiatives highlighted in the research reflect a holistic and sustainable approach to education and social practice, demonstrating that health education and environmental management are essential pillars for building healthier and more resilient communities. These actions contribute to a more responsible approach to natural resource management and progress towards achieving the Sustainable Development. Nevertheless, maximizing the impact of these initiatives and

achieving a truly equitable and sustainable future for all requires collaboration across governance levels and effective communication regarding health and sustainability.

Furthermore, it is essential for everyone to participate in developing sustainable strategies for collective well-being. Establishing partnerships among educational institutions, research entities, and industries is recommended to create viable mechanisms that can be implemented effectively in both public and private sectors.

Author contributions: Conceptualization, ELC; methodology, ELC; software, CSdS; validation, ELC, CSdS and JPdS; formal analysis, ELC; investigation, CSdS; resources, CSdS; data curation, ELC; writing—original draft preparation, CSdS; writing—review and editing, JPdS; visualization, ELC; supervision, ELC; project administration, ELC; funding acquisition, CSdS. All authors have read and agreed to the published version of the manuscript.

Acknowledgments: We thank the CAPES for financial support.

Conflict of interest: The authors declare no conflict of interest.

References

1. da Saúde M, de Vigilância em Saúde S, de Atenção à Saúde S. National Health Promotion Policy: PNPS: Annex I of Consolidation Ordinance (Portuguese). Ministério da Saúde; 2018.
2. OPAS. 30th Pan American Sanitary Conference of PAHO (Portuguese). OPAS; 2022.
3. OPAS. Agenda for the Americas on health, environment and climate change 2021–2030 (Portuguese). Available online: https://iris.paho.org/handle/10665.2/55385 (accessed on 20 May 2024).
4. Dos Santos DAC, Horochovski RR, Horochovski MTH, Junckes IJ. Health and Sustainable Development in Brazil: Analysis of Scientific Productions after Rio+20 (Portuguese). Journal of Social, Technological and Environmental Science. 2022; 11(1): 76-87.
5. Marques PLP., Marques KBG, Tamboril BCR, et al. Reflections and concerns about the scope of health promotion (Portuguese). Brazilian Journal of Health Review. 2022; 5(4): 13403-13412.
6. Gil AC. How to prepare research projects, 4th ed (Portuguese). Atlas; 2007.
7. Conselho Nacional de Saúde do Brasil. Resolution No. 510, of April 7, 2016. Available online: https://conselho.saude.gov.br/resolucoes/2016/Reso510.pdf (accessed on 20 May 2024).
8. Souza MARD, Wall ML, Thuler ACDMC, et al. The use of IRAMUTEQ software to analyze data in qualitative research (Portuguese). Revista da Escola de Enfermagem da USP. 2018; 52: e03353.
9. Camargo BV, Justo AM. Tutorial for using IRAMUTEQ textual analysis software (Portuguese). Available online: http://www.iramuteq.org/documentation/fichiers/Tutorial%20IRaMuTeQ%20em %20portugues_2211.2021.pdf/view (accessed on 29 May 2024).
10. Júnior DDSM, Souza EML, Soares EO, Silva JD. Solid waste management in health services (Portuguese). Revista Ibero-Americana de Humanidades, Ciências e Educação. 2021; 7(11): 1788-1812.
11. De Carvalho RB, dos Santos VLP, Schwantz PI, et al. Health service waste management in a hospital in Rio Grande do Sul (Portuguese). Revista Estudo & Debate. 2021; 28(2).
12. Inhuma YG, dos Anjos Guimarães G, Kuwano RT, Batista MM. Segregation of health service waste: Environmental Education in a public hospital in the municipality of Itacoatiara (AM). Revista Brasileira de Educação Ambiental (RevBEA). 2021; 16(5): 217-232.
13. Delevati DDS., Castro MMRSD, Ries EF, et al. Challenges in waste management in public healthcare establishments in light of RDC 222/18 (Portuguese). Saúde em Debate. 2020; 43(3): 190-199.
14. De Souza CL, Magalhães DL, Vianna ACD, et al. Waste Management in Primary Care from the Nurse's Perspective (Portuguese). Revista Saúde e Meio Ambiente. 2021; 13(1): 01-16.

15. Mekaro KS, Moraes AIS, Uehara SCSA. Health service waste management in the routine of primary health care nurses (Portuguese). REME-Revista Mineira de Enfermagem; 2022).
16. Pavinati G, de Lima LV, Soares JPR, et al. Educational technologies for the development of health education: An integrative review (Portuguese). Arquivos de Ciências da Saúde da UNIPAR. 2022; 26(3).
17. OPAS. Exhibition of Experiences in Environmental Health. OPAS; 2023.
18. Oliveira ÉP, Parreira FM, de Oliveira CLA, et al. Benefits of physical activity for a healthy and active life (Portuguese). Pensar Acadêmico. 2023; 21(4): 1189-1200.
19. Silveira MS, Bedê TP, Nicomedes WH dos S. Aproveitamento Integral de Alimentos: Uma possível ferramenta de consumo sustentável/Integral use of food: A possible tool for sustainable consumption. Brazilian Journal of Development. 2021; 7(8): 80561-80585. doi: 10.34117/bjdv7n8-325
20. Luduvice BC, Souza AC, Fraga LN, et al. Sustentabilidade Ambiental Nos Serviços De Alimentação Hospitalar. MIX Sustentável. 2020; 6(3): 45-54. doi: 10.29183/2447-3073.mix2020.v6.n3.45-54.
21. da Santana Silva L, de Lívia Oliveira A. Making the most of food in a Primary Health Care Unit in the city of Juiz de Fora: an experience report (Portuguese). Em Extensao. 2021; 20(2): 167-178.
22. Gaitán MCP, Teixeira BAS. Harnessing rainwater and its relationship with water conservation actions: a case study in a university hospital, São Carlos (SP) (Portuguese). Engenharia Sanitaria e Ambiental. 2020; 25(1): 133-144.
23. Santana L, Sant'ana D. Analysis of the potential for reducing drinking water consumption in basic health units (Portuguese). Paranoá. 2023; 16(34): 1-16.
24. Rebolledo ES, Giatti LL. Convergences between primary health care planning and the Sustainable Development Goals: An evaluation of municipal health plans in Brazil and Chile (Portuguese). Available online: https://doi.org/10.1590/S0104-12902022191006pt (accessed on 6 May 2024).