

ENVIRONMENTAL HEALTH DEMANDS FOR NURSING PRIMARY HEALTH CARE: AN INTEGRATIVE REVIEW

Luana Alves e Costa Soares

<https://orcid.org/0000-0002-5369-3811>

Marcelo Melo Silva

<https://orcid.org/0000-0003-3145-1923>

Fábio da Costa Carbogim

<https://orcid.org/0000-0003-2065-5998>

Denise Barbosa de Castro Friedrich

<https://orcid.org/0000-0002-3321-1707>

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Abstract: The present study aimed to identify, from an integrative review of the scientific literature, the demands related to environmental health, directed to nursing, in the context of Primary Health Care. The search was carried out in the MEDLINE, VHL, SciELO and CINAHL, using the descriptors “Environmental Health”, “Primary Health Care” and “Nursing”, in Portuguese, English and Spanish, combined by the Boolean operator AND, which resulted in the identification of 447 works, of which 25 articles were included. From the analysis of the studies, five main aspects that interfere in the population’s quality of life and health were identified: housing conditions, basic sanitation, atmospheric pollution, noise pollution and environmental disasters. Thus, it became evident that several factors present in the environment influence the health conditions of the population, making it essential that nurses have knowledge about health determinants to which users are exposed. Therefore, it is necessary for it to be inserted in the daily lives of users, doing it through home visits, territorialization, educational and multi professional actions.

Keywords: Environmental Health, Primary Health Care, Nursing, Public Health.

INTRODUCTION

The current global context of intense economic and social development, characterized by changes in the population’s lifestyle and consumption patterns, has contributed significantly to the emergence of environmental and consequently health problems (ARAÚJO and OLIVEIRA, 2017).

In several countries, including Brazil, several environmental problems bring health risks, from the old ones, such as precarious basic sanitation conditions, to the most recent, such as drug residues, plastics, technological waste, among others. There are also unhealthy

lifestyle habits, which permeate environmental practices, reflecting a higher incidence of diseases in the population (MONIZ *et al.*, 2017; LIMA *et al.*, 2018). These problems, despite affecting the entire population, in most cases, intensify existing socioeconomic disparities, making groups in poverty more vulnerable to environmental risks, leading to the emergence of diseases and health problems (CAMPANOGORA *et al.*, 2013).

Environmental health addresses issues of care practices for professionals working in Primary Health Care (PHC), due to the proximity of these workers to the territories where the environmental risks that affect populations are (SANTOS and RIGOTO, 2010; PEREIRA *et al.* 2012). Thus, PHC professionals, particularly nurses, must know the environment in which users are inserted, identify the demands in environmental health and then articulate a multi professional strategy to promote health).

Faced with the complexity of the socio-environmental problems currently experienced, the role of nursing in this context must occur in several dimensions, such as assistance to people with morbidities related to the environment. Actions of educational practices on this issue with the population, prevention and early detection of threats, promotion of a healthy care environment, management of environmental risks, diagnosis and environmental surveillance and monitoring of the epidemiological profile of the territory, are examples to be practiced (MONIZ *et al.*, 2020).

Given the importance of nursing work in the identification, care and direction of conditions sensitive to environmental problems, it is important that nurses are aware of these issues that, directly or indirectly, interfere with the health of communities. In this scenario, the objective of this study was to identify, through an integrative review in

the scientific literature, the demands related to environmental health, directed to nursing in the context of PHC.

METHOD

This is an integrative literature review, inserted in a Master's research in Nursing entitled "Environmental Health: Nurses' Action of the Family Health Strategy". This review was prepared using the six steps recommended by Souza *et al.* (2010): definition of the guiding question of the review, search in databases, selection of articles, critical analysis of studies, discussion of results and presentation of the review.

In this study, the PCC (Population, Concept and Context) strategy was used to prepare the research question (BRUN and ZUGE, 2015). The Population listed consisted of PHC users, the Concept encompassed the demands of environmental health, and the Context is related to nursing care in PHC. Reconciling the topics of the PCC, the research question of the integrative review was constituted as: "What demands of users, directed to nursing, in environmental health in the context of PHC?"

To search for articles, the following databases were chosen: MEDLINE (Medical Literature Analysis and Retrieval System Online) via PUBMED; VHL (Virtual Health Library); SciELO (Scientific Electronic Library Online) and CINAHL (cumulative index to nursing and allied health literature).

Articles published in the aforementioned databases that fully or partially answered the guiding question of this review were included in the present work; written in Portuguese, English or Spanish; with text available for reading in full and with free access. Studies that did not correlate with the theme of this review and other sources of literature, such as books, chapters, conference proceedings and research reports were excluded.

The search for studies took place in September 2021, using the descriptors: "Environmental Health", "Primary Health Care" and "Nursing", in Portuguese, English and Spanish, combined by the Boolean operator "AND". The bibliographic survey was carried out in the time frame of 5 years, corresponding to the period between September 2016 and September 2021.

For the critical evaluation of the works included in this research, the Content Analysis technique was used, thematic modality (BARDIN, 2016). The results and discussion of the proposed review are presented below.

RESULTS

Through searches in the aforementioned databases, 447 publications were identified: 330 in MEDLINE, 63 in CINAHL, 41 in VHL and 13 in SciELO. Of these, 41 were duplicates, resulting in the total of 406. For the primary selection of studies, titles and abstracts were read, excluding those that showed no correlation with the proposed theme, resulting in the total of 62 works. In the secondary stage, a superficial investigation of the articles that showed greater affinity with the proposed theme was performed, excluding those that did not answer the research question, resulting in 39 publications. In the last screening phase, there was an investment in in-depth reading and critical analysis, analysing the correlation with the proposed theme, excluding 14 studies, resulting in the final sample of 25 articles.

At all stages, the reading and analysis of the articles were performed by two independent researchers to avoid selection bias. In cases of disagreement, they were discussed and evaluated by a third reviewer.

Figure 1 demonstrates the process of identification, selection, eligibility, analysis and inclusion of articles by reviewers.

Among the selected articles, one (4%) was

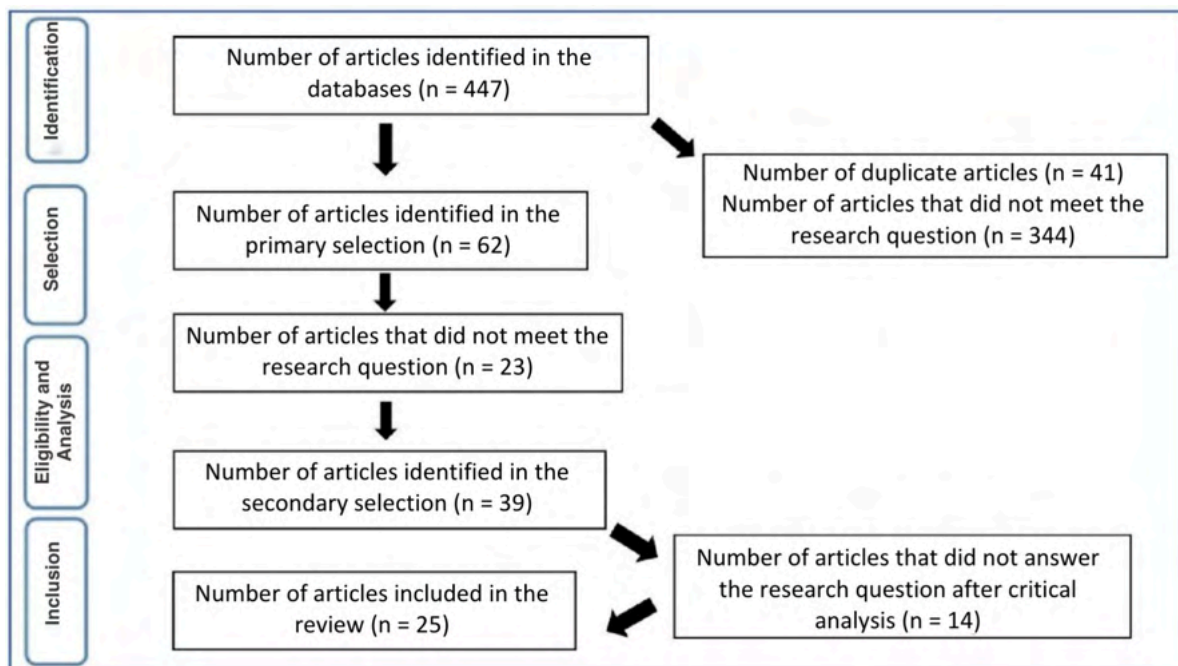


Figure 1 - Flowchart referring to the stages of selection of studies by the reviewers.

Source: The authors, 2021.

published in 2016, two (8%) in 2017, five (20%) in 2018, five (20%) in 2019, five (20%) in 2020 and seven (28 %) in 2021, as shown in table 1. Regarding the study location, seven (28%) were carried out in the United States, six (24%) in Brazil, two (8%) in Taiwan, two (8%) in Japan, two (8%) in Switzerland, one (4%) in China, one (4%) in Canada, one (4%) in Greece, one (4%) in the UK, one (4%) in Scotland and one (4%) in two countries, including the Netherlands and Norway. Thus, it was found that the articles come from developed and developing countries.

In panel 1, through the critical assessment by Content Analysis - Thematic modality (Bardin, 2016) of the included studies, users' demands in relation to environmental health can be identified. Issues of housing conditions appear in 40% of the selected articles, basic sanitation in 24%, air pollution in 20%, noise pollution in 12% and environmental disasters in 8% of them.

DISCUSSION

In this integrative review, users' demands were identified, related to environmental health for nursing in the scope of PHC in the last five years. From the critical analysis and categorization of the articles, it was possible to identify five recurrent environmental problems that generate demands for nursing actions: housing conditions, basic sanitation, atmospheric pollution, noise pollution and environmental disasters, which are discussed below.

HOUSING CONDITIONS

Problems related to housing conditions were evidenced in nine articles (A01, A07, A09, A10, A13, A19, A21, A22, A23, A24). Individuals in poverty are constantly exposed to unhealthy environments, food insecurity and domestic and urban violence, which directly influences physical and mental

Article	Title	Authors	Year	Journal
A01	Quality of life and time since diagnosis of Diabetes Mellitus among the elderly.	LIMA, L. R. <i>et al.</i>	2018	Rev. bras. geriatr. gerontol
A02	Health promotion from the perspective of primary care nurses.	PIOVESAN, L. R. <i>et al.</i>	2016	Rev enferm UERJ
A03	Implementation of sanitary sewage, impact on infant mortality rate.	AZEVEDO, R. F.; RODRIGUES, F. M.	2019	Rev. enferm. UFPE on line
A04	Solid waste management in Primary Health Care.	SILVA, J. T. <i>et al.</i>	2019	Rev. enferm. UFPE on line
A05	View of professionals, academics and users of primary health care on the correct disposal of medicines: an integrative literature review.	DANTAS, A. M. S., SILVA, P. L. N., FONSECA, J. R.	2018	J. Health Biol Sci.
A06	Cumulative Disaster Exposure and Mental and Physical Health Symptoms Among a Large Sample of Gulf Coast Residents.	LOWE, S. R. <i>et al.</i>	2019	J Trauma Stress
A07	Child Poverty, Toxic Stress, and Social Determinants of Health: Screening and Care Coordination.	FRANCIS, L. <i>et al.</i>	2018	Online J Issues Nurs
A08	Patient-Provider Discussions About Strategies to Limit Air Pollution Exposures.	MIRABELLI, M. C. <i>et al.</i>	2018	Am J Prev Med.
A09	Risk Factors for Snoring in Two Canadian First Nations Communities.	DOSMAN, J. A. <i>et al.</i>	2019	Clocks Sleep
A10	Perceptions of Nature and Access to Green Space in Four Urban Neighborhoods.	SEFCIK, J. S. <i>et al.</i>	2019	Int J Environ Res Public Health
A11	Air pollutants and development of interstitial lung disease in patients with connective tissue disease: a case-based control study in Taiwan.	CHEN, H. H. <i>et al.</i>	2020	BMJ Open
A12	Private well water testing promotion in pediatric preventive care: A randomized intervention study.	MURRAY, C. J. <i>et al.</i>	2020	Prev Med Rep.
A13	Recurrence of WHO-defined fast breathing pneumonia among infants, its occurrence and predictors in Pakistan: a nested case-control analysis.	BROWN, N. <i>et al.</i>	2020	BMJ Open
A14	Source-Specific Volatile Organic Compounds and Emergency Hospital Admissions for Cardiorespiratory Diseases.	RAN, J. <i>et al.</i>	2020	Int J Environ Res Public Health
A15	Road traffic noise, air pollution and incident cardiovascular disease: A joint analysis of the HUNT, EPIC-Oxford and UK Biobank cohorts.	CAI, Y. <i>et al.</i>	2018	Environment International
A16	Is aircraft noise exposure associated with cardiovascular disease and hypertension? Results from a cohort study in Athens, Greece.	DIMAKOPOULOU, K. <i>et al.</i>	2017	Occup Environ Med
A17	Geospatial analysis of individual-based Parkinson's disease data supports a link with air pollution: A case-control study.	FLEURY, V. <i>et al.</i>	2021	Parkinsonism & Related Disorders
A18	Long-term exposure to road traffic noise, ambient air pollution, and cardiovascular risk factors in the HUNT and lifelines cohorts.	CAI, Y. <i>et al.</i>	2017	Eur Heart J

A19	The Role of Social, Economic, and Physical Environmental Factors in Care Planning for Home Health Care Recipients.	Irani, E. <i>et al.</i>	2020	Res Gerontol Nurs
A20	Role of Health Professionals Regarding the Impact of Climate Change on Health-An Exploratory Review.	Dupraz, J.; Burnand, B.	2021	Int. J. Environ. Res. Public Health
A21	Are Rurality, Area Deprivation, Access to Outside Space, and Green Space Associated with Mental Health during the COVID-19 Pandemic? A Cross Sectional Study (CHARIS-E).	Hubbard, G. <i>et al.</i>	2021	Int. J. Environ. Res. Public Health
A22	Home environment allergen exposure scale in older adult cohort with asthma.	Castner, J. <i>et al.</i>	2021	Can J Public Health
A23	Prevalence of Depression in Older Nursing Home Residents in High and Low Altitude Regions: A Comparative Study.	Wang, F. <i>et al.</i>	2021	Front Psychiatry
A24	Environmental Factors Affecting Cognitive Function among Community-Dwelling Older Adults: A Longitudinal Study.	Motohiro, A. <i>et al.</i>	2021	Int J Environ Res Public Health
A25	Basic knowledge about visceral leishmaniasis before and after educational intervention among primary health care professionals in Midwestern Brazil.	Carvalho, A. G. <i>et al.</i>	2021	Rev. Inst. Med. trop.

Table 1 - Characteristics of the articles selected for the integrative review.

Source: The authors, 2021.

Category	Article	Study objective
Housing Conditions	A01	To evaluate the quality of life of elderly people with diabetes mellitus and to relate the time of diagnosis of diabetes with the quality of life of these elderly people treated at a basic health unit.
	A07	Present three examples of poverty to demonstrate the impact on child health and well-being and propose a model of care for nurses to assess and address the social determinants of health in the pediatric clinical setting.
	A09	To explore snoring-related factors as a possible indicator of disturbed breathing and sleep in two First Nations communities in Saskatchewan.
	A10	Assess attitudes towards nature and the use of green spaces in urban areas.
	A13	To test the associations between housing, indoor air pollution and children's respiratory health and recurrent rapid respiratory pneumonia in a poor urban environment in Pakistan.
	A19	Explore the non-clinical factors that home health nurses assess and describe how these factors influence care planning decisions.
	A21	To investigate whether rurality, area deprivation, access to outdoor space and frequency of visit and duration in green space are associated with mental health during the COVID-19 pandemic.
	A22	Develop and compare scales of exposure to allergens in the home environment; to test the associations of the three household allergen exposure scales with asthma control and asthma-specific quality of life; and testing associations of household allergen exposure scores with racial disparities.
	A23	To compare the prevalence of depression in the elderly, living in high and low altitude regions and its association with quality of life.
	A24	To investigate the role of neighborhood environmental factors in cognitive decline among rural older adults.

Basic Sanitation	A02	To identify the understanding of primary care nurses in the city of Santa Maria, Rio Grande do Sul, about health promotion.
	A03	Evaluate the impact of the implementation of the sanitary sewage service on the infant mortality rate.
	A04	Evaluate the impact of the implementation of the sanitary sewage service on the infant mortality rate.
	A05	To analyze the view of PHC professionals, academics and users on the correct disposal of medicines.
	A12	Determine the most effective practice approaches for successful well water testing in routine pediatric care.
	A25	To evaluate the impact of an educational intervention on basic knowledge about visceral leishmaniasis (VL) among PHC professionals in the Brazilian city of Rondonópolis, an endemic area for VL.
Atmospheric pollution	A08	Describe the extent to which healthcare professionals report talking about limiting exposure to air pollution during periods of poor air quality with their at-risk patients.
	A09	To explore snoring-related factors as a possible indicator of disturbed sleep breathing in two First Nations communities in Saskatchewan.
	A11	To assess the association between exposure to air pollutants and interstitial lung disease in patients with connective tissue diseases.
	A14	Identify sources of volatile organic compounds (VOCs) and estimate the short-term associations between VOCs distributed by sources and emergency hospital admissions for cardiovascular and respiratory diseases in Hong Kong.
	A17	To examine the spatial dependence of Parkinson's disease prevalence in the Canton of Geneva, Switzerland.
Noise Pollution	A15	To investigate the effects of long-term exposure to road traffic noise and air pollution on incident cardiovascular disease in three large cohorts: HUNT, EPIC-Oxford and UK Biobank.
	A16	To evaluate the association of exposure to aircraft noise and road traffic, with the incidence of hypertension and other cardiovascular outcomes.
	A18	To assess associations between road traffic noise, air pollution and cardiovascular disease risk through blood biochemistry.
Environmental Disasters	A06	Examine the influence of cumulative exposure to Hurricane Katrina and the Deepwater Horizon oil spill on physical and mental health outcomes.
	A20	To identify in the literature, articles that address the role of health professionals to inform about the impact of climate change on health, as well as the effectiveness of interventions mediated by health professionals with the objective of reducing the environmental impact of human activities.

Panel 1 - Categories of analysis of population demands, for nursing actions in the context of environmental health.

Fonte: Os autores, 2021

health, and can result in behavioral problems in children, acute and chronic diseases and psychological problems. In this context, PHC is part of an attempt to identify such situations and intervene in a timely manner, by promoting health actions that consider the home and social environment of families (FRANCIS *et al.*, 2018; MENDES, SÍGOLO and TOLEDO, 2021).

A study carried out with elderly people with Diabetes Mellitus from a Basic Health Unit (UBS) in Brasília, found that low satisfaction with the environment in which they live may be related to inadequate housing conditions, mainly to the precariousness of the streets and paving. These problems interfere with locomotion and accessibility, leading to social isolation and increased risk of depression (LIMA *et al.*, 2018). The longitudinal study by Motohiro (2021) and collaborators that accompanied elderly people in a rural region of Japan, corroborates those rough environment are a barrier to the practice of physical activity, having also found an increase in cognitive decline with greater difficulty in access and locomotion. in the territory.

For individuals with limitations, especially the elderly and people with disabilities, the precarious conditions of the streets and the lack of accessibility impair mobility. In addition to favoring social isolation, they become a barrier to access to health services, which directly affects the quality of life and mental health of these people (KLEIN and GRIGOLETTI, 2021).

Still related to geographical issues, a cross-sectional comparative study with elderly people in China pointed out the correlation between the prevalence of depression and housing at high altitudes. This can be explained by socioeconomic reasons, since the population of that region of the country has greater structural precariousness and less access to health services. In addition, elevated

regions are characterized by low atmospheric pressure, which is related to hypoxia and sleep problems (WANG *et al.*, 2021).

Therefore, it is important that nursing, together with the multidisciplinary team, carry out the diagnosis of environmental issues of accessibility and geographical barriers, which can make it difficult for the population to access physical activities, leisure, admission to health services, causing injuries and illnesses.

In addition to external issues, it is relevant when providing care to consider the users' home environment, especially in the case of elderly people with limitations. Factors such as poor housing conditions, uneven floors and poor hygiene negatively interfere with the quality of life of individuals, favoring the occurrence of adverse events, such as falls and infections, in addition to hindering health care at home (IRANI *et al.*, 2020).

Several factors in households can cause health conditions. In a case-control study in a peri-urban slum in Pakistan, he found that poor housing conditions, as well as overcrowding, lack of potable water, and exposure to secondhand smoke were associated with recurrences of pneumonia in children (BROWN *et al.*, 2020). The Canadian research by Dosman *et al.* (2019) identified that homes with the presence of humidity and mold, as well as overweight and household exposure to secondhand smoke, may be related to the prevalence of snoring, nasal congestion and respiratory sleeping disease.

Still on the respiratory problems arising from poor environmental conditions, in the North American cohort study that followed up elderly people with asthma, related factors in the home environment, such as inadequate ventilation, presence of dust, humidity and mold, with the exacerbation of the disease (CASTNER *et al.*, 2021).

A PHC network in the city of Porto Alegre obtained positive results in the control

of children and adolescents with asthma, reducing the number of hospitalizations, through several multidisciplinary actions, among them, the identification and elimination of environmental factors in the households that trigger the disease (BRAZIL, 2015). This work corroborates the findings in this review, stressing the importance of the internal environment for the prevention and control of diseases. The need to know the environmental conditions in which users are inserted is evidenced, allowing the recognition of triggering factors of acute and chronic diseases, for action in the health determinants of this community, from environmental guidelines (SANTANA *et al.*, 2021).

If, on the one hand, some environments trigger illness processes, on the other hand, exposure to green areas in urban centers allows contact with nature, providing numerous benefits to the physical and mental health of the population, through the practice of physical and leisure activities. , among others (SANTANA, ARGÔLO and BATISTA, 2021). However, an American study pointed out the difficulties of the population to attend these spaces, in which the participants reported facing barriers, such as lack of security, drug addiction and prostitution in these places, in addition to the garbage presenting risks, among others (SEFCIK *et al.*, 2019).

In addition to these barriers mentioned, measures to contain the COVID-19 pandemic have become a new complicating factor for exposure in green areas in urban centers. The research by Hubbard and collaborators (2021) related the quarantine and social distancing resulting from the COVID-19 pandemic, to the limitation of access to green and natural areas and the consequent health impacts caused by these actions, demonstrating that the environment is closely related to mental health. Still, they suggest at the level of public health, the importance of an environmental

management planning, which considers open public green spaces.

The decrease in these green areas is related to the increase in urbanization, which is related to a growing population concentration in urban centers. In addition, neighborhoods with precarious socioeconomic conditions and high rates of urban violence are limiting factors in the population's access to leisure activities in public spaces and contact with nature (SEFCIK *et al.*, 2019; SANTANA, ARGÔLO and BATISTA, 2021).

Over the last decades, violence rates have intensified in the world context, occurring synchronously with urbanization, representing not only a social problem, but also a public health problem. The lack of security is a challenge in terms of access to health services, both in the context of the user, who is exposed daily to risky situations, and of professionals, making it difficult to carry out actions in the territories covered (IRANI *et al.*, 2020; SILVEIRA *et al.*, 2020).

Thus, in addition to natural and artificial geographic barriers, communities also face social ones, such as violence, which is strongly present in areas of precarious conditions, such as slums. According to the study by Lima *et al.* (2018), high rates of violence interfere with quality of life, as they lead to a feeling of insecurity and favor social isolation and lack of contact with nature, negatively affecting mental health. of individuals.

Nurses, in their care process, must know and evaluate the environmental factors that interfere in the health conditions of individuals, and thus, act in order to mitigate exposure and reduce the deleterious effects, through an interprofessional clinical approach and education. in health (FRANCIS *et al.*, 2018; IRANI *et al.*, 2020; MENDES, SÍGOLO and TOLEDO, 2021).

A holistic view is needed for health promotion in communities, because from the

studies analyzed, it is evident that in addition to diseases caused directly by exposure to some environmental contaminant, there are still social problems. Violence, mobility difficulties, lack of leisure areas and social isolation are more present in areas of structural precariousness, which can lead to physical and psychological problems.

BASIC SANITATION

Basic Sanitation is understood as the provision of essential conditions for the preservation of human health, such as the availability of treated water, sewage collection and correct waste management (BAYER, URANGA and FOCHEZATTO, 2021). It is a right of the population, foreseen as a health determinant in Law 8080 of September 19, 1990 (BRASIL, 1990). In this research, six articles were identified that correlate with the theme of basic sanitation (A02, A03, A04, A05, A12, A25).

The lack of basic sanitation leads to water and soil contamination, being an important factor in the spread of infectious diseases, constituting a relevant cause of mortality, especially among children (AZEVEDO and RODRIGUES, 2019). Currently, a portion of the population is still exposed to inadequate sanitation conditions, which in addition to favoring the spread of endemic and epidemic diseases, is related to higher costs for the health system (BAYER, URANGA and FOCHEZATTO, 2021; VIEGAS *et al.*, 2021). It is also noteworthy that PHC has an important role in controlling vectors and infectious diseases (CARVALHO *et al.*, 2021).

Sanitary sewage prevents the contamination of soils and water by human waste, making it difficult to spread diseases (VIEGAS *et al.*, 2021). A survey carried out in Bahia concluded that after the implementation of a sewage network, associated with the increase in FHS teams and improvement of the

population's financial conditions, there was a decrease in cases of infant mortality from diarrhea, which is the most important disease related to lack of basic sanitation. Thus, the importance of adequate sanitation conditions for public health is noted, resulting in lower rates of morbidity and mortality and lower costs for the public health system (AZEVEDO and RODRIGUES, 2019).

In some locations, it is common to use water from wells, either by individual choice, to reduce costs, or even due to the lack of treatment and availability of potable water in the region. However, as this source does not undergo specialized treatment before consumption, it is recommended that in addition to being boiled or filtered, they have their quality tested to avoid exposure to harmful substances to health. In the northeast of the United States, the contamination of rocky water wells by arsenic, a potentially carcinogenic substance, has been identified. In general, there is a lack of knowledge and concern about water quality (MURRAY *et al.*, 2020).

The fact that PHC services ask about water quality testing and offer the tests free of charge, to be performed after pediatric consultations, mainly guided by the medical professional, provided greater concern and testing by users in an American study (MURRAY *et al.*, 2020). In this sense, the role of health professionals is highlighted, in the identification of exposure to contaminated water and guidance for families and public authorities.

The concept of basic sanitation includes the issue of solid waste, which is a concern in environmental health due to its large-scale production, generating accumulation and often inappropriate disposal. This has unintended consequences for public health, such as the transmission of diseases, the spread of vectors, the occurrence of floods, contamination of water and soil. (SILVA *et al.*,

2019; CRUZ, *et al.*, 2021).

Keeping backyards clean, avoiding the accumulation of stagnant water, garbage and decomposing organic materials, prevents the proliferation of mosquitoes and other disease-carrying animals. A survey carried out in Rondonopolis, an endemic region for Visceral Leishmaniasis, evaluated whether PHC professionals identified symptoms and transmission of this disease. As a result, it showed that after the course carried out by the researchers for the participants, the answers were more satisfactory than those of the pre-test, demonstrating that the professionals became more aware of the relevance of environmental management in the prevention of this pathology. (CARVALHO *et al.*, 2021). The presence of basic sanitation is a way to avoid the accumulation of materials in the streets and backyards, preventing the proliferation of various diseases.

It is worth mentioning that waste from health services deserves even more attention, as it can lead to the spread of pathogens, and should be disposed of in a way that does not cause harmful outcomes to humans and the environment. Therefore, health units must adopt the Health Services Waste Management Plan (PGRSS), in order to follow recommended measures regarding the waste they produce. In this way, it is noted that the correct management of waste from these establishments contributes to the maintenance of good socio-environmental and health conditions in the community. (WHO, 2014; MOREIRA and GUNTHER, 2016; SILVA *et al.*, 2019).

However, the study carried out in nine UBS in a municipality in the south of Bahia, which used direct non-participant observation, identified several erroneous measures carried out by professionals in the disposal, packaging and management of waste produced in these units. The study authors recommended the

need for follow-up of a PGRSS (SILVA *et al.*, 2019).

Still on waste from health services, another issue analyzed in one of the articles was the disposal of medicines. Currently, the use of drugs is part of the daily life of the population, however, the disposal of leftovers and expired cannot occur in common waste, since these substances are classified as chemical and can cause damage to the environment and human health. Problems such as household disposal, lack of knowledge about the toxicity caused to the environment and little incentive from the public authorities to inform the population about the appropriate disregard were evidenced. (DANTAS, SILVA and FONSECA, 2018).

These facts raise concerns for public health, and it is important that professionals give importance and take the necessary measures, in order to avoid contamination and exposure of materials that bring risks to the community. It is also the responsibility of PHC professionals to provide guidance on the use, handling and destination of such waste. Continuing and permanent health education actions should be stimulated, problematized and carried out by management and care professionals on the subject, to meet existing needs, contributing to the promotion and prevention of diseases resulting from exposure to these residues.

The study by Piovesan *et al.* (2016) pointed out that nurses consider environmental health actions, such as the proper disposal of waste, performing tasks for health promotion, such as activities on waste management. Thus, it is noted that issues related to basic sanitation constitute demands for systematic nursing action, which range from the understanding of the territory in which users are inserted, to education and health promotion actions, aiming at comprehensive care for the population. population (MONTEIRO *et al.*, 2020).

ATMOSPHERIC POLLUTION

Among the articles included in the present study, five addressed air pollution as an environmental factor that interferes with human health (A08, A09, A11, A14, A17). Air quality is directly related to the emission of atmospheric pollutants, among which industrial emissions and those related to vehicular traffic stand out. Air pollution is a known cause of health problems, being responsible for an alarming number of deaths, and related to the increase in health expenditures. (REZENDE, 2021).

A study found in this review pointed out that exposure to air pollutants may be associated with greater risks of developing chronic lung and cardiovascular diseases (CHEN *et al.*, 2020). Other work corroborated the findings so far, in which exposure to atmospheric pollution from gasoline, architectural paints and household products may have a positive association with the occurrence of lung disorders and the exacerbation of cardiovascular diseases (RAN *et al.*, 2020).

Cardiovascular diseases are currently the leading causes of death in the world, followed by respiratory diseases that affect and kill a large number of the population, especially in poor countries (WHO, 2020). The works in this review pointed to an association between pollution and an increase in cardiorespiratory problems. Air pollution affects the lung, which is considered an organ vulnerable to infections and injuries from the environment (FORO DE LAS SOCIEDADES RESPIRATORIAS INTERNACIONALES, 2017).

In another study, the possibility of a higher prevalence of snoring and sleep-disordered breathing due to exposure to pollution was found (DOSMAN *et al.*, 2019). Parkinson's disease was another pathology related to this environmental problem in recent research, which showed a positive association between exposure to air pollution and cases of the

disease (FLEURY *et al.*, 2021).

These results highlight the need for better air quality for the prevention of diseases associated with air pollution. Given that this pollutant causes numerous harmful effects on health and with the accelerated technological evolution, exposure to pollution has been increasing. It is up to PHC health professionals, including nurses, to guide patients about these effects and develop strategies to avoid or reduce exposure to these pollutants. In the research carried out in the north of Minas Gerais, in a region considered to be at environmental risk due to atmospheric pollutants from the industrial sector, he found higher rates of diseases and respiratory problems in the population, especially among children and the elderly (MENDONÇA, MAGALHÃES and SILVA, 2019).

However, in the American survey that investigated whether nursing and medical professionals, including PHC, advised patients on how to limit exposure to air pollution, the results showed that only about 40.8% of 1751 respondents did so. This demonstrates the need for these professionals to update themselves on scientific knowledge, aiming to provide quality care to patients for the maintenance of health (MIRABELLI *et al.*, 2018).

Recently, the new global air quality guidelines were released by the World Health Organization (WHO), recommending to further reduce the levels of the main air pollutants, which in addition to bringing health complications, also contribute to climate change. This air contamination causes damages such as thousands of premature deaths each year, infections and worsening of respiratory pathologies, stroke, in addition to evidence of diabetes and neurodegenerative diseases (WHO, 2021).

Appropriation and discussion of the topic by PHC health professionals is important,

so that environmental practices that aim at promoting, preventing and recovering the health of communities exposed to these pollutants occur.

NOISE POLLUTION

Noise pollution is considered one of the major causes of pollution in the world, being one of the environmental problems that significantly affect human health, being present not only in occupational exposures, but in the daily lives of the majority of the population living in urban areas (WHO, 2018).). This category was identified in three articles (A15, A16, A18). Excessive noise directly interferes with the well-being of the population, which, in addition to affecting hearing, can trigger cardiovascular problems with increased morbidity and mortality, sleep disorders, psychological stress, and can lead to disability (CAI *et al.*, 2018; BRUNELLO JÚNIOR), DAYS and PELLI 2021).

Research by Dimakopoulou *et al* (2017) pointed to the relationship between exposure to aircraft noise and increased risk for high blood pressure, cardiac arrhythmia and stroke. In the study that evaluated two large European cohorts, pointed out the relationship between exposure to road traffic noise and changes in biochemical parameters, with changes in triglyceride levels, high-density lipoprotein (HDL) and fasting blood glucose (CAI *et al.*, 2017)

The WHO already recognizes noise pollution as a public health problem, with several harms to the population, and outlines guidelines for acceptable noise measures and standards to be adopted to avoid and minimize harmful health effects (WHO, 2018). In Brazil, it is common to find, in urban centers, several houses close to noise pollutants, whether traffic noise from busy avenues and highways, industries, airports, among others.

Therefore, it is important that nurses work

together with other PHC professionals, being attentive to this type of non-visible pollution, which causes damage to the population. For, as observed in the studies discussed, the problems of this pollutant go beyond hearing problems, and can even lead to chronic diseases.

ENVIRONMENTAL DISASTERS

Two articles were identified that addressed this theme (A06, A20). Human actions of unsustainable exploitation of resources, as well as the population's lack of knowledge about good environmental preservation practices, tend to progressively harm the environment, often being related to the occurrence of changes, which occasionally bring adverse health effects (SILVA; SANT'ANNA, 2021; DUPRAZ; BURNAND, 2021).

On the other hand, certain geographic areas are naturally more vulnerable to environmental disasters such as earthquakes, hurricanes, storms and others (LOWE *et al.*, 2019). Regardless of the nature of the phenomena, these situations cause immediate and long-term effects on the affected populations, increasing the demand for health services (BATISTA *et al.*, 2021).

One of the articles analyzed carried out a long-term follow-up of a group of Americans affected by two environmental disasters, Hurricane Katrina and the Deepwater Horizon oil spill, which together triggered economic, social and environmental impacts. The study concluded that participants who had experienced these disasters had a higher risk of adverse physical and mental health outcomes compared to a group that was not affected by the incidents, being more aggravated in the population that faced both disasters (LOWE *et al.*, 2019).

In Brazil, the most common natural environmental disasters in cities are rains and storms that cause flooding of rivers, floods

and landslides, which end up causing deaths, psychosocial and health problems. These events are sometimes related to environmental degradation, being frequent on the outskirts of large cities, in some cases, linked to the lack of urban environmental planning and clandestine constructions (CEPED UFSC, 2012; FREITAS *et al.*, 2014). However, other locations are also subject to these events, as in the case of the landslide caused by heavy rains in the mountainous region of Rio de Janeiro in 2011, considered the greatest natural disaster in Brazil (PINTO; FREITAS, 2012).

As for the environmental disasters directly caused by human action, three have attracted a lot of attention in Brazil in recent years. The one in Mariana in 2015, and the one in Brumadinho in 2019, were caused by the rupture of dams that contained mud with ore tailings. In addition to the lives lost during the accident, several environmental, social and health events were triggered, affecting several regions of the states of Minas Gerais and Espírito Santo, with contamination of rivers, reaching the ocean (SILVA, PEIXOTO and ASMUS, 2020; FREITAS *et al.*, 2019). The other was the oil spill that hit much of the Brazilian coast in 2019, also considered a disaster with a high environmental impact (PENA *et al.*, 2020, BRASIL, 2020).

The consequences of environmental disasters for the affected population are numerous, including, in addition to physical injuries, the emotional impact of the loss of friends or family, the evacuation of homes, psychological repercussions such as fear, post-traumatic stress, depression and anxiety (LOWE *et al.*, 2019).

Invariably, environmental disasters are situations to which humanity is exposed. In this sense, PHC professionals must both be aware of the environmental conditions in their area of coverage, intervening when necessary, and take care of the repercussions of disasters

for the health of the individuals affected by them (LOWE *et al.*, 2019; DUPRAZ; BURNAND, 2021).

Global warming has caused climate change with an increase in environmental disasters. Unsustainable actions linked to the means of production and consumption are responsible for the accelerated increase in terrestrial temperature (SOLOMON and LAROCQUE, 2019). Environmental education activities carried out with the population can produce changes in more sustainable habits to be adopted by the community, stimulating a chain of consumption and production aimed at sustainability practices.

Environmental education guidelines such as healthy eating, conscious consumption, rational use of medicines, environmental care of the territory, are practices that can be inserted in the nursing work with the community, capable of minimizing the degradation of the environment, contributing to public health.

CONCLUSION

Given the research question, this review evidenced as demands for nursing action, the integral care of the health needs of the community in different contexts. Publications show that several factors present in the environment influence the health of the population, such as inadequate housing and sanitation conditions, exposure to atmospheric and noise pollutants, urban violence, as well as the occurrence of environmental disasters.

In view of the aspects discussed, recognizing the intrinsic relationship between the environment and health and considering that the population is exposed, in general, to numerous environmental determinants, generating demands for nursing actions, the need for action becomes evident. of the nurse in this context.

In view of the results identified in this

article, it is concluded that the role of nursing in the field of environmental health is broad and heterogeneous. In order to promote the integral health of individuals, nurses in their daily work, perform the systematization of care, considering, in addition to the physiological elements, the health determinants to which the population is exposed. Therefore, it is necessary to insert itself in the daily lives of users, from home visits, collective actions, territorialization and work with the multi professional team. The importance of the interdisciplinary work of nurses involving other health professionals is highlighted, as well as the education of the population about environmental preservation measures, which are essential for health promotion.

The analysis of the 25 selected studies made it possible to identify a significant increase in scientific production on the subject

from 2018 onwards, constituting 88% of the articles included in this review. It should be noted that it is important to publish more studies in this area, to awaken and encourage nurses to work in environmental health. As a limitation of this review, the scarcity of studies that directly address the role of nurses in environmental health in the context of PHC is highlighted.

This study contributes to the improvement of nursing practices in PHC, as it points to an extremely relevant field of action for the well-being of the community, encouraging the practice of epidemiological and health surveillance actions, prevention and promotion of health and environmental education.

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