













SHORT COMMUNICATION

## Risk factors in epidemiology and the intervention of nurses specializing in community nursing

### Factores de riesgo en epidemiología y la intervención de los enfermeros especializados en enfermería comunitaria

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#### ABSTRACT

**Introduction:** identifying risk factors is an essential step in epidemiological surveillance and allows targeted intervention to improve quality of life and prevent disease. Public health nurses have the skills to design the necessary interventions to reduce and prevent risk factors.

**Objective:** to reflect on the importance of epidemiological surveillance in identifying risk factors in the Portuguese community and the intervention of specialist nurses in community nursing and public health.

**Method:** a bibliographic search was carried out in official databases, documents and websites and a critical-reflective analysis was performed.

**Results:** the concept of risk associated with epidemiology has evolved in close collaboration with the concept of causality, from the perspective of the relationship between exposure to the risk factor and the health consequences. In this context, the importance of the intervention of specialist nurses in community nursing in the area of public health is highlighted. **Conclusions:** the global burden of disease in Portugal, as well as worldwide and in Europe, is dominated by non-communicable diseases, with the main cause being risk factors in the behavioral domain. In Portugal, cerebrovascular disease is the main cause of death and disability, and the risk factor with the greatest impact on the development of preventable diseases is diet.

**Keywords:** Risk Factors; Risk; Epidemiology; Public Health Nursing.

#### RESUMEN

**Introducción:** la identificación de los factores de riesgo es un paso esencial en la vigilancia epidemiológica y permite realizar intervenciones dirigidas a mejorar la calidad de vida y prevenir enfermedades. La enfermera especialista en salud pública tiene las habilidades para diseñar las intervenciones necesarias para reducir y prevenir los factores de riesgo.

**Objetivo:** reflexionar sobre la importancia de la vigilancia epidemiológica en la identificación de factores de riesgo en la comunidad portuguesa y la intervención de la enfermera especialista en enfermería comunitaria y salud pública.

**Método:** se realizó investigación bibliográfica en bases de datos oficiales, documentos y sitios web y análisis crítico-reflexivo.

**Resultados:** el concepto de riesgo asociado a la epidemiología ha evolucionado en estrecha colaboración con el concepto de causalidad, desde la perspectiva de la relación entre la exposición al factor de riesgo y la consecuencia para la salud. En este contexto, se destaca la importancia de la intervención de enfermeras especialistas en enfermería comunitaria en el área de la salud pública.

**Conclusiones:** la carga global de enfermedad en Portugal, así como a nivel mundial y en Europa, está dominada por enfermedades no transmisibles, siendo la principal causa los factores de riesgo del ámbito conductual. En Portugal, la enfermedad cerebrovascular es la principal causa de muerte y discapacidad, y el factor de riesgo con mayor impacto en el desarrollo de enfermedades prevenibles es la dieta.

**Palabras clave:** Factores de Riesgo; Riesgo; Epidemiología; Enfermería de Salud Pública.

## INTRODUCTION

Epidemiology is a discipline that allows the study, through quantitative methods, of the occurrence of diseases in populations and the definition of preventive and control interventions. The identification of risk factors is essential, as intervention in the reduction or elimination of a certain risk factor can reduce the incidence of a certain disease, and thus contribute to the improvement of quality of life.<sup>(1)</sup> Risk factors are considered to be personal characteristics or environmental exposures, associated with an increased probability of occurrence of a disease or health condition in a population.<sup>(1,2)</sup>

For decision-making and planning processes in health, it is essential to know the global burden of diseases and their risk factors. From this perspective, the DALY (Disability-Adjusted Life Year) was introduced in 1990 as a measure to quantify the global burden of disease, injuries, and risk factors. It represents the total years lost due to health conditions, disability, or premature death.<sup>(3)</sup> The data on this measurement can be consulted on the website of the Institute for Health Metrics and Evaluation (IHME), where the risk factors are categorized as behavioral, environmental/occupational, and metabolic.<sup>(4)</sup> The Global Health Observatory and the STEPwise approach to surveillance program are other relevant databases made available by the World Health Organization (WHO). The Global Health Observatory provides access to and facilitates the analysis of data on diseases and risk factors from approximately 190 countries. Meanwhile, the STEPwise approach to surveillance program enables the examination and dissemination of data on key risk factors for chronic non-communicable diseases, allowing for the assessment of their prevalence over time within a specific country.

From a public health perspective, in the health-disease process it is essential to identify the risk factors and their prevalence and consequent prioritization in the planning of strategies. In this context, the nurse specialist in community health and public health has an increased responsibility in epidemiological surveillance and intervention planning<sup>(5)</sup>; thus justifying the relevance of this article.

This paper aims to systematize on the importance of epidemiological surveillance in identifying risk factors in the Portuguese community and the intervention of specialist nurses in community nursing and public health.

## METHOD

This short communication is underpinned by a theoretical-reflective methodology, framed within a qualitative and narrative design. A bibliographic search was conducted in April 2024 across the PubMed, SciELO and Google Scholar databases, using the descriptors “risk factors”, “epidemiology”, “nursing”, and “health”. In addition to peer-reviewed scientific literature, official documents from the World Health Organization and national and international statistical data sources were included to ensure a comprehensive and up-to-date perspective.

The analysis followed a documentary and conceptual approach, aiming to explore and interpret key epidemiological concepts in relation to the scope of practice and core competencies of nurses specializing in community and public health nursing. The selected documents were subjected to thematic content analysis, enabling a structured reflection on how epidemiological risk factors inform and intersect with the roles, responsibilities and interventions of community health nurses. This approach facilitated the development of a theoretically grounded discussion aligned with current professional and scientific frameworks.

## DEVELOPMENT

The concept of risk, associated with epidemiology, has undergone numerous transformations and improvements over the years. The first reference to this concept appears in the nineteenth century, with John Snow, cited by Barata<sup>(6)</sup>, relating disease and exposure as a measure of risk, giving the idea of causality. In the twentieth century, Bradford Hill associated the variable time to calculate incidence measures, and in the middle of the same century, risk reflects the operationalization of epidemiological inference into measurable terms.<sup>(2)</sup>, which is intrinsically linked to mathematical measures that estimate the association between exposure to a factor and the development of a health condition. According to Celentano e Szklo<sup>(2)</sup>, e Barata<sup>(6)</sup>, risk in epidemiology

is a quantitative measure of probability and can be expressed as the proportion of individuals who develop the event in question, within a population at risk, during a given time interval.

The concept of risk assumes centrality, both in the study of the distribution and determinants of diseases in human populations, as well as in the establishment of causality between exposure and health consequences.<sup>(6)</sup>

The concept of epidemiological risk is essential for modern epidemiology, allowing the identification, quantification and management of factors that contribute to the occurrence of diseases in human populations.

<sup>(6)</sup> Risk factors are thus closely linked to causality, i.e., factors that can cause disease. They can be categorized into three main types: environmental and occupational, behavioral and metabolic. Environmental and occupational risks refer to hazards present in the environment (air pollution, outdoor temperature, sanitation) and in the workplace (exposure to toxins), while behavioural and metabolic risks are related respectively to lifestyle habits and individual characteristics that affect health.<sup>(4)</sup>

Although this classification provides clarity for intervention planning, it may oversimplify complex interdependencies among the determinants.

Behavioural risk factors—such as tobacco use or sedentary lifestyles—are frequently framed as individual choices, but are deeply embedded within socioeconomic structures and cultural norms. Consequently, individual-focused interventions risk being insufficient without addressing upstream determinants.

There are risk factors associated with several diseases, such as low socioeconomic status, as well as certain diseases associated with various factors, such as stroke. It should be noted that the presence of risk factors, by itself, is rarely enough to cause a disease, but it does increase the risk of developing it.<sup>(1)</sup>

Moreover, while risk factor epidemiology has advanced our understanding of causality, it is not without limitations. The presence of a risk factor does not equate to deterministic causation; instead, it increases susceptibility in a probabilistic manner <sup>(1)</sup>. This nuance is often lost in public discourse and even in some health promotion strategies, where messaging may inadvertently shift responsibility from systems to individuals. A more critical interpretation is needed, particularly when applying these concepts to real-world community health practice.

### **Risk factors of current Portuguese communities**

Epidemiological studies allow the planning of actions in the field of public health, in the improvement of the health of the population by identifying factors that interfere with morbidity, mortality and reduction of quality and years of life.<sup>(1)</sup> According to IHME data, non-communicable diseases represent the main cause of disability, loss of quality of life and death, worldwide, in Europe and in Portugal, as well. Non-communicable diseases (compared to communicable, maternal, neonatal and nutritional diseases and injuries) are mostly related to behavioral risk factors, especially lifestyle changes.<sup>(6)</sup>

In Portugal, cerebrocardiovascular pathology is the main cause of death and disability.<sup>(4)</sup> This scenario is mainly due to behavioral risk factors, namely, diet, addictive behavior (alcohol and tobacco) and sedentary lifestyle.

<sup>(7,8)</sup> One of the factors with the greatest impact on the development of preventable diseases is eating habits, which include inadequate diet, malnutrition, overweight, and obesity. Inadequate nutrition includes excessive consumption of red meat, salt and sugar, combined with reduced consumption of fruits, vegetables and cereals.

<sup>(8)</sup> Yet, food choices are shaped by accessibility and affordability. Recent reports on poverty and social exclusion in Portugal reveal that the cost of essential goods, particularly food, has increased disproportionately, further limiting healthy food choices for economically vulnerable populations. Hence, the call for “healthy lifestyles” must be matched with systemic strategies that enable such lifestyles.

Regarding addictive behaviors, smoking habits are another public health problem, contributing to millions of deaths annually, both of active smokers and passive smokers. Despite the downward trend in consumption, it remains the main risk factor for chronic respiratory diseases.<sup>(7)</sup>

Another addictive behavior is the consumption of alcohol, which is considered the psychoactive substance most consumed by the Portuguese and easier to access, and the data indicate an increase in its consumption.

<sup>(7)</sup> Alcohol consumption, despite extensive public health campaigns, remains high and culturally normalized, posing a persistent challenge.

Regarding the practice of physical exercise, only 34% of the Portuguese practice it regularly, indicating a low adherence to physical activity in the general population.<sup>(7)</sup> These findings reinforce the necessity of shifting from individualized behaviour-change models to community and policy-level interventions.

The Poverty and Social Exclusion report states the worsening of the living conditions of the Portuguese and, consequently, the loss of purchasing power of essential goods, such as food, energy and housing (and the inherent expenses). Food products were the most expensive.<sup>(9)</sup> In this sense, facilitating and economical access to healthy foods is considered a priority area of intervention.<sup>(8)</sup>

### **Contribution to practice**

The nurse specialist in community nursing in the area of public health has in-depth knowledge about the

health determinants that infer in the health-disease process. Using the methodology of health planning and assessment of the health status of the community, the specialist nurse performs the diagnosis of the population, groups and communities. It prioritizes and implements interventions aimed at solving the identified health problems, based on the best scientific evidence and integrated into the strategic guidelines, defined by the National Health Plan 2030 and specific programs. However, while policy documents such as the National Health Plan 2030 formally recognize their role, in practice, structural limitations often constrain their autonomy and impact.

From a public health perspective, nurses empower groups and communities to carry out collective health projects and adopt behaviors for prevention, protection and promotion of health and general well-being and must participate in the management of epidemiological surveillance systems, namely identifying, evaluating and managing risk factors. Yet, such empowerment requires adequate institutional support, intersectoral collaboration, and consistent investment—conditions that are not always met within the current healthcare framework.

It is therefore up to the specialist nurse to carry out and monitor epidemiological surveillance, through the monitoring and production of health indicators relevant to decision-making, such as vaccination rates, the incidence of infectious diseases and other public health events.<sup>(5,10)</sup>

The intervention of the specialist nurse is essential to reduce the impact of cerebrocardiovascular diseases, specifically in the mitigation of behavioral risk factors, previously analyzed, contributing to a healthier population with a higher quality of life. However, the effectiveness of nursing interventions depends on their integration within broader public health policies. Nurses must not only be executors of these policies but active contributors to their design and evaluation. In doing so, they act as agents of structural change—advocating for equitable access to resources, supporting legislative measures on tobacco and alcohol control, and promoting environments conducive to physical activity and healthy nutrition. Positive changes in lifestyle and favoring living conditions are determinants of health, potentially modifiable. Nurses are agents of change capable of directly influencing health policies that promote the well-being of the community.

In summary, the identification and management of epidemiological risk factors remain essential for improving population health. However, a shift from individual-centred interventions to systemic, policy-driven strategies is imperative. Community nurses, equipped with specialized knowledge and a holistic perspective, are strategically positioned to lead this transformation, provided that adequate institutional and political support is ensured.

## CONCLUSIONS

Understanding epidemiological risk is crucial for developing health policies and intervention strategies aimed at promoting health and preventing disease. Through active and continuous epidemiological surveillance, nurses can work to mitigate risks and ensure an effective response to adverse events that may affect community health. It was identified that, in the overall burden of disease in Portugal (as well as at European and global level), non-communicable diseases prevail, with the main cause being risk factors in the behavioral domain, factors that are mostly modifiable. Thus, through health promotion, health policy planning, and the empowerment of groups and communities, nurse specialists in community and public health play a fundamental role in reducing the incidence of risk factors and consequent adoption of healthy behaviors.

Despite the existence of several programs aimed at mitigating risk factors in the community, it is essential to highlight the lack of research found in this field. In-depth studies would be essential to assess the real impact of these initiatives and consider necessary adjustments to achieve the established goals.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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