Epidemiological transition, aging and physiotherapy

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ABSTRACT
The epidemiological transition is characterized by changes in health and disease patterns over time. Thus, this chapter intends to reflect on the impact of the epidemiological transition on population aging, as well as the importance of physiotherapy for health promotion and disease prevention. A literature review was carried out using texts published between 1997 and 2023, in Portuguese and English with the keywords: epidemiological transition, aging, physiotherapy and elderly health. It was found, based on the literature consulted, that the increase in life expectancy must be accompanied by approaches that take into account the quality of life of these individuals, involving issues related to their health and limitations in their functioning that affect their daily actions and life goals. In this sense, the main health indicators of the elderly population must take into account their full functioning and the focus of health care must respond to real needs, such as the long-term management of chronic conditions, including, in particular, the expansion and strengthening of rehabilitation and its impact on functionality and disability. Thus, physiotherapy, as a health strategy, incorporating rehabilitation and prevention, becomes one of the main health strategies of the 21st century.

Keywords: Epidemiological transition, Aging, Physiotherapy, Health policies.

1 INTRODUCTION

The epidemiological transition is a phenomenon observed in many countries, characterized by changes in health and disease patterns over time. This process is associated with socioeconomic development, advances in medicine and demographic changes (OLIVEIRA, 2019). This chapter will present the main aspects of the epidemiological transition, including its phases, causes and consequences, considering its influence on the aging process and an approach on the role of physiotherapy in this context of transition and aging of the Brazilian population.

Thus, this chapter intends to reflect on the impact of the epidemiological transition on the aging of the population, as well as the importance of physiotherapy for health promotion and disease prevention. To this end, a literature review was made considering texts published between 1997 and

2023, in Portuguese and English with the key words: epidemiological transition, aging, physiotherapy and health of the elderly.

2 EPIDEMIOLOGICAL TRANSITION: AN INITIAL APPROACH

According to Schramm (2004), the epidemiological transition refers to a process in which the incidence and prevalence of diseases in a population change from patterns, characterized by high mortality rates from infectious and parasitic diseases, to patterns dominated by chronic non-communicable diseases, such as cardiovascular diseases, cancer and chronic respiratory diseases. Still strengthening this conceptualization, Omram (2001) and Santos-Preciado *et al.* (2003) understand by epidemiological transition the changes that have occurred over time in the patterns of death, morbidity and disability that characterize a specific population and that, in general, occur in conjunction with other demographic, social and economic transformations.

According to Vanzella (2019) this process is usually divided into three distinct phases: the first is marked by high rates of infant mortality and by infectious diseases such as pneumonia, diarrhea and tuberculosis being the main causes of death; in the second phase, there is a significant reduction in infant mortality and an increase in life expectancy, thanks to improvements in living conditions, basic sanitation and advances in medicine. In this phase, chronic non-communicable diseases, such as cardiovascular diseases and diabetes, begin to emerge as the main causes of morbidity and mortality. And finally, in the third phase, chronic non-communicable diseases become predominant, with an increase in the incidence of cancer, obesity, chronic respiratory diseases and mental health problems (VANZELLA, 2019).

The epidemiological transition reflects changes in the main causes of morbidity and mortality of a population over time, usually accompanied by urbanization, advances in medicine, population aging and changes in lifestyles (MURRAY *et al.*, 2020). Advances in medicine include the development of more effective vaccines, antibiotics, and treatments, which play an important role in reducing morbidity and mortality from infectious diseases. Omran (2005) points out that demographic changes, such as population aging and urbanization, also contribute to the epidemiological transition.

According to Vanzella (2019), this whole context carries several implications for health systems and public policies. With the rise of chronic non-communicable diseases, there is a growing demand for health services that specialize in the diagnosis and treatment of these conditions. Therefore, public health policies must adapt to changes in health and disease patterns, directing resources to priority areas and developing effective prevention strategies (VANZELLA, 2019).

As Ferreira (2021) treats, the process of epidemiological transition is a complex and multidimensional phenomenon that reflects the progress and development of a society. Understanding its phases, causes and consequences is fundamental for the formulation of effective health policies and

for the planning of health services that meet the changing needs of the population. As more countries go through this process, it is essential to learn from the experiences of other countries and adapt approaches according to the local context in order to achieve better health outcomes for the population (FERREIRA, 2021). With this, the next item will bring an approach to the context of epidemiological transition in Brazil and in the state of Espírito Santo.

2.1 HISTORICAL CONTEXTUALIZATION OF THE EPIDEMIOLOGICAL TRANSITION, AN APPROACH IN THE GOVERNMENTAL PUBLIC SPHERES

In Brazil, the process of epidemiological transition has been marked by several distinct phases over the last decades. To this end, a general summary of the epidemiological transition in the country will be presented, highlighting the main changes recorded.

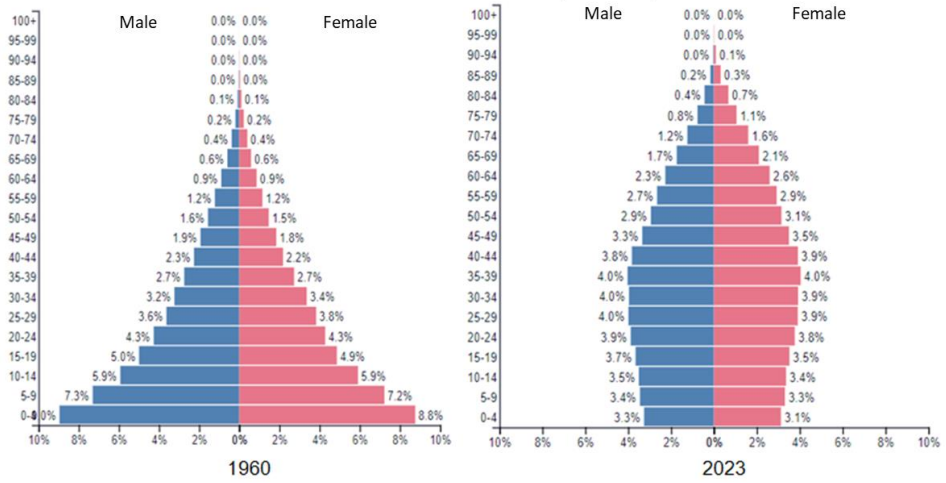
According to Chaimowicz (1997), in the mid-twentieth century, Brazil faced a high prevalence of infectious and parasitic diseases. Malaria, tuberculosis, yellow fever, Chagas disease, and other vector-borne diseases were common. The precarious conditions of basic sanitation and health contributed to the spread of these diseases (CHAIMOWICZ, 1997).

Duarte and Barreto (2012) state that, from the 1940s onwards, Brazil went through a rapid demographic transition, characterized by a sharp drop in mortality and birth rates. Access to better living conditions, advances in public health and improvements in basic sanitation have contributed to this change. Life expectancy increased significantly and the age structure of the population began to change (DUARTE; BARRETO, 2012).

Since the 1960s, the birth rate has decreased even more significantly, from 44 births per thousand inhabitants to 12.87 births per thousand inhabitants in 2020. At the same time, the number of people over 60 years of age increased from 3.3 million (4.7%) to 33 million (15.1%) in the same period (IBGE, 2023).

These data can be observed in the population pyramids of the years 1960 and 2023 (figure 1), where a change in its base can be observed, which over the years has become smaller, while its top has widened.

Figure 1 – Population pyramid of 1960 and 2023



Source: IBGE (2023)

Life expectancy in the country has increased steadily since 1940, when the estimate was 45.5 years, reaching 76.8 years in 2020. However, due to the Covid-19 pandemic, life expectancy in Brazil fell from 72.8 to 68.2 among men, and from 80.1 to 75.6 for women. It is also noteworthy that, from 2030, Brazil will present an overaging of the population, as is already verified in some European countries (CAMARANO, 2023).

Another factor that contributes to the epidemiological transition in Brazil is the nutritional transition. According to Omran (2005), Brazil also went through a nutritional transition, with significant changes in the dietary patterns of the population. There was an increase in the consumption of ultra-processed foods, rich in saturated fats, sugars and salt, while the intake of healthy foods such as fruits, vegetables and greens decreased. These inadequate dietary patterns contributed to the increase in Chronic Noncommunicable Diseases (OMRAN, 2005).

According to OMRAN (2005), with the process of accelerated urbanization, people began to live in denser urban environments, facing new challenges in relation to health. In addition, lack of physical activity, exposure to air pollution, urban stress and lack of green spaces negatively affected the health of the population. This has led to the emergence of lifestyle-related health problems such as obesity, cardiovascular disease and mental disorders (OMRAN, 2005).

In summary, Ferreira (2021) points out that the epidemiological transition in Brazil involved the reduction of parasitic infectious diseases, the increase in chronic non-communicable diseases and lifestyle-related problems. Improved socioeconomic conditions, advances in public health and urbanization were key factors in this process. However, it is important to highlight that the country still faces significant challenges in relation to health, such as the need to address chronic diseases, promote healthy lifestyles and ensure equitable access to health services (OMRAN, 2005).

In this sense, over the years a framework of legislation has been published that involves various sectors of society, among which can be mentioned the Cardiovascular Health Strategy (ECV),

instituted through Ordinance No. 3008/2021, which seeks to prevent and control cardiovascular diseases (CVD), through health education, screening, early diagnosis, treatment follow-up, with emphasis on risk factors (BRASIL, 2021); the National Policy for the Prevention and Control of Cancer (PNPCC), which aims to prevent, detect early and treat the disease, in order to reduce disability and mortality, reduce the incidence of some types of neoplasms and offer better quality of life to diagnosed patients (BRASIL, 2013). Also mentioned is the National Policy for the Reduction of Morbidity and Mortality from Accidents and Violence (PNRMAV), in 2001, which establishes systematic actions to prevent and reduce these diseases (BRASIL, 2001) and the National Food and Nutrition Policy (PNAN), aimed at combating maternal and child malnutrition through monitoring actions and ensuring food and nutritional security, as well as disease prevention and promotion of healthy lifestyles (BRASIL, 1999).

As in other parts of the country, Espírito Santo faced a period in which infectious and parasitic diseases were prevalent, malaria, yellow fever, dengue, leishmaniasis and other vector-borne diseases were common (FERREIRA, 2021), where the lack of adequate basic sanitation and poor health conditions contributed to the spread of these diseases (OLIVEIRA; SOGAME, 2023).

Over the last decades, Espírito Santo has undergone a demographic transition similar to that of the rest of the country, considering the reduction in mortality and birth rates, resulting in an increase in life expectancy and changes in the age structure of the population (DUARTE; BARRETO, 2012).

Data from the 2022 Census show that, in Brazil, 15.1% of the population is over 60 years old, while in Espírito Santo this percentage is 14%, presenting an increase of 5.5% compared to the 2010 Census, when it had 9.5% of the total population (IBGE, 2023). According to the Jones dos Santos Neves Institute (IJSN, 2015, p. 14), "the population of Espírito Santo has been going through a phase of demographic transition in which the population ceases to be predominantly young and begins to become progressively aged."

It is worth mentioning the challenges related to the lifestyle and the geographical and climatic characteristics of the state, some neglected tropical diseases have a significant impact on the health of the population of Espírito Santo, in addition to the lack of basic sanitation being another factor that deserves to be highlighted. (OLIVE TREE; SOGAME, 2023).

We corroborate with Oliveira and Sogame (2023) when discussing the challenges that Espírito Santo faces in the provision of health services, especially in the most remote and difficult to access regions. The lack of adequate infrastructure, the unequal distribution of health resources and the lack of medical professionals in some areas are important issues to be addressed in public policies involving health.

It is important to emphasize that government actions, improvements in health infrastructure, investments in prevention and health promotion are fundamental to face the challenges of the

epidemiological transition in the state of Espírito Santo. In addition, the awareness of the population about the importance of adopting healthy lifestyles and seeking appropriate medical care is also crucial to improve health indicators in the state (CHAIMOWICZ, 1997).

3 ACTIVE AGING AND PHYSIOTHERAPY

According to the Regional Council of Physical Therapy and Occupational Therapy (CREFITO, 2023), physiotherapy is a health profession that is dedicated to the prevention, evaluation and treatment of disorders of movement and functionality of the human body. It acts both curatively and preventively, seeking to improve the quality of life and promote the health of its patients and, with the increase in life expectancy of the population and the aging of society, plays a fundamental role in maintaining the functionality and autonomy of the elderly (CREFITO, 2023).

With the aging process, it is common for physical changes to occur, such as loss of muscle mass, decreased flexibility, changes in posture and decreased cardiovascular capacity (PÍCOLI *et al.*, 2011). Aging is characterized, according to Cordeiro *et al.* (2014), as a process where psychological, biochemical, morphological and physiological changes are observed that end up influencing the ability of the individual to adapt to the external environment.

Aging is accompanied by gradual changes in most body systems. In the skeletal system, there is loss of bone tissue, reducing the thickness of the bones; in the nervous system, there is neuronal loss, while in the cardiovascular system there is a marked reduction in functional capacity and the respiratory system suffers from a reduction in lung capacity (PORTO; PORTO, 2017).

The endocrine system is underfunctioning; the urinary system suffers atrophy, which leads to urinary incontinence, among other changes (PORTO; PORTO, 2017). Hearing loss and visual changes are common and, according to Freitas (2016), these functional changes compromise the independence of the elderly and they become more predisposed to falls.

However, according to Matos (2020, p. 87):

> In addition to physiological changes, emotional and psychosocial changes can also occur, understanding that aging is not only a scientific concept, but also a mental construction that acts on the cognitive system. Thus, the lives of the elderly can be influenced by their lifestyle, education, culture, perception and beliefs.

The physiological changes of the systems due to aging can cause a condition of frailty in the elderly, causing them to need greater attention. Such factors allied to the population aging evidenced in the country made health as a right was reinforced among the elderly population and, with this, public health policies needed to be reformulated and underwent several changes over the years (SILVA, 2022).

With the advances and constitutional achievements over the years, programs such as the National Health Policy for the Elderly (PNSI) were implemented, through an ordinance in 1999 and

later, in 2006, the National Health Policy for the Elderly (PNPI) was promulgated in order to ensure the effective participation of the elderly in society, providing autonomy and quality of life, with the promotion of health and dignity (SANGLARD; ABREU; SOGAME, 2019).

In this sense, Moura and Maciel (2020) emphasize that the performance of the physiotherapist contributes directly to an active aging, helping the elderly to remain independent, with quality of life and engaged in their daily activities. Through therapeutic techniques, physical exercises, guidance and individualized care, physical therapists aim to improve the quality of life and promote the autonomy of the elderly, contributing to a healthier and more functional aging process (VANZELLA, 2019). Physical therapy acts preventively, promoting the practice of adequate physical exercises, rehabilitating possible dysfunctions, and working to improve the functional capacity of the elderly (SIQUEIRA *et al.*, 2004).

The maintenance of a good functional capacity is recommended to promote a more active and healthy aging and prevent important complications, such as falls, which today represent one of the main causes of hospitalizations among the elderly. According to the Brazilian Longitudinal Study on Aging (ELSI-Brazil), conducted between 2019 and 2022, the prevalence of falls in the elderly population was 25% among residents in urban areas (LIMA-COSTA *et al.*, 2023).

Another study, developed by Gonçalves *et al.* (2022), found that there is an increase in deaths due to falls in the elderly of 5.45% per year and that these rates tend to increase with increasing age, highlighting the positive effects of behavioral interventions, such as physical activity, to assist these individuals.

Abreu *et al*. (2018) state that several bodily structures and functions are involved in the maintenance of the body and their proper coordination is essential. To avoid falls, the individual needs adequate vision to observe environmental challenges, such as uneven or slippery surfaces; proprioception; reaction time to respond to unexpected disturbances; and muscle strength to extend the legs against gravity, with extra capacity to allow a stronger activation to regain the vertical position in case of tripping (ABREU *et al.*, 2018).

The proper coordination of these functions allows the right muscles to be activated at the right times, with the right amount of force, to successfully perform tasks such as walking or climbing stairs (SOUZA, 2017). Proper cardiovascular and respiratory function also ensures the transport of oxygen to the muscles and brain to allow these functions to occur (SOUZA, 2017).

Many of these functions can be improved by physical therapy performance, particularly with the implementation of interventions through structured exercises (OLIVEIRA *et al*., 2017). Physical therapists can also play an important role in providing compensatory strategies and deciding when to try rehabilitation instead of compensation (OLIVEIRA *et al*., 2017).

Thus, in addition to contributing to active aging, physical therapy plays an important role in the epidemiological transition as it develops an essential role in prevention, treatment, and rehabilitation. It is also worth mentioning that, through education and guidance, physical therapists help people to adopt healthy lifestyles, including the regular practice of physical activities, weight control, posture improvement and injury prevention, physiotherapy promotes health and well-being, contributing to a better quality of life throughout the life cycle (LEÃO *et al.*, 2020).

Given the above, valuing and investing in physical therapy are essential to face the challenges posed by the epidemiological transition and improve the health of the population.

4 FINAL CONSIDERATIONS

The aging of the population and the epidemiological transition, with a higher incidence of chronic and non-communicable diseases, will continue to have a profound impact on societies around the world, putting more pressure on health systems to respond to the needs of these people. Thus, the increase in life expectancy must be accompanied by approaches that consider the quality of life of these individuals, addressing the issues related to their health and the weaknesses in their functioning that affect their daily actions and life goals.

Physical therapy is inserted in this scenario as a profession that contributes to facing the challenges arising from the process of epidemiological transition and population aging through the implementation of preventive and curative interventions in this population, allowing a higher quality of life for the elderly.

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