

Sustainability In The Healthcare Sector And Health Education

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Introduction

It is universally accepted that Earth's resources are not limitless. The question of whether the irresponsible utilization of these finite resources could push humanity toward an irreversible crisis highlights the essential nature of sustainability. Essentially, sustainability is about creating strategic plans and implementing measures to guarantee that the planet's limited resources remain available for generations to come. The word "sustainability" originally comes from forestry science (Kuhlman & Farrington, 2010). Its application has since broadened, making it a topic of discussion across nearly all areas of life, including health, education, and economics. The necessity for humanity to adopt sustainable practices is driven by a deep sense of responsibility and concern for the welfare of those who follow (Kuhlman & Farrington, 2010).

The Interconnectedness of Development and Sustainability

Is sustainability a mandatory foundation for human well-being, prosperity, and development? The answer is definitely affirmative. Sustainability acts as a critical basis for human advancement and quality of life (Kuhlman & Farrington, 2010), making it indispensable for a flourishing future. Just as natural ecosystems require equilibrium to survive, the pathways of national development must also be sustainable. Thus, sustainable development has become a globally paramount concept. Development is often defined as a positive shift in a nation's key performance indicators (Tolunay & Akyol, 2006), evaluated through three main lenses: economic growth, social progress, and human development (Tolunay & Akyol, 2006). These elements show that development is a complex process with interwoven aspects of societal life.

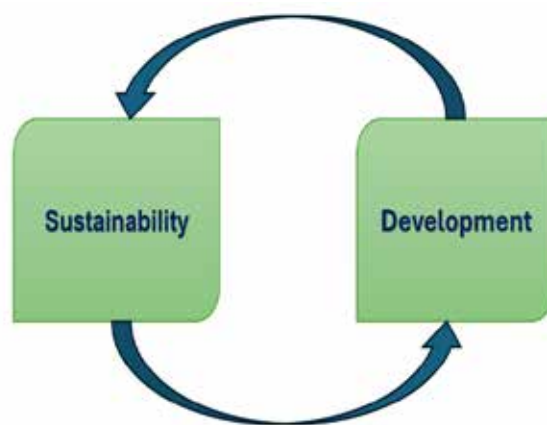
The development approach, heavily focused on consumption after World War II (Ozmehmet, 2008), resulted in significant ecological harm, with negative environmental effects becoming clear by the late 1960s (Ozmehmet, 2008). Factors like uncontrolled industrialization, rapid population increase, the spread of chemicals, and unplanned urban growth have worsened this environmental damage (Demir, Babaoğlu, & Pehlivan, 2022). This degradation has led to a surge in health issues linked to the environment (Demir et al., 2022), with cumulative effects now seriously threatening future generations

(Demir et al., 2022). Climate change, along with air, water, and soil pollution, is are direct causes of various diseases (Demir et al., 2022). The ongoing, unsustainable depletion of natural resources risks causing even more serious challenges in the future, creating a major obstacle to achieving sustainability (Demir et al., 2022). Nations must use resources with peak efficiency to guarantee long-term prosperity and well-being (Tolunay & Akyol, 2006). Consequently, sustainability is just as vital as development itself. Ultimately, irresponsible resource consumption endangers the very continuation of future development. The relationship between sustainability and development is reciprocal: global resources must endure for development to occur, and sustainable practices are essential to guarantee the longevity of those resources.

Recognizing the connection between sustainability and development is crucial. It is highly unlikely that sustainable development for the entire planet can be achieved through the isolated efforts of just a few nations. Therefore, global sustainable development requires coordinated international action. The concept was popularized worldwide by the 1987 United Nations report “Our Common Future” (the Brundtland Report) from the World Commission on Environment and Development, which helped establish a global perspective (Gedik, 2020). The successful implementation of sustainable development relies on having a healthy population and skilled human capital (Boyacıoğlu & Taşkın, 2012). Health’s pivotal role underscores the necessity for sustainability within the health sector, its services, and the education of its personnel.

Figure 1

The relationship between sustainability and development concepts



Embedding Sustainability in the Healthcare Sector

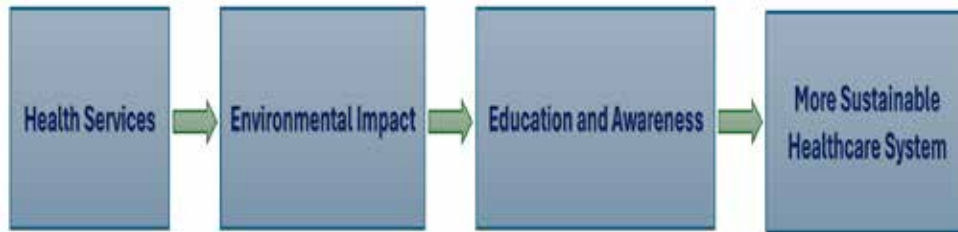
The promotion of sustainability within healthcare is critical for safeguarding public health (Tamer, 2020). Global pandemics, such as COVID-19, have clearly underscored the importance of this integration. However, the adoption and understanding of sustainability principles in healthcare currently trail significantly behind industries like

manufacturing (Tamer, 2020). This gap is partly due to the complex and multifaceted nature of the sustainability challenges inherent to healthcare.

The environmental footprint of the healthcare sector is considerable, marked by an exceptionally high usage of water, energy, hazardous chemicals, and cleaning agents compared to many other industries (Tamer, 2020). This intense resource consumption makes pursuing sustainability in healthcare a global necessity. Sustainability initiatives in healthcare can offer significant economic advantages (Tamer, 2020) and positively contribute to environmental preservation. However, this path is challenging. Healthcare relies on essential resources—including single-use materials, electricity, pharmaceuticals, and water—all of which must be managed sustainably. This means reducing water and energy use, maximizing recycling efforts, and ensuring the safe disposal of chemicals, all while preserving the effectiveness and quality of service for both current and future generations. Achieving this balance demands comprehensive and sophisticated strategies.

Innovation and technology are crucial factors in enabling sustainability strategies in healthcare (Tamer, 2020). For instance, switching from paper-based patient records to digital archiving not only decreases paper consumption but also speeds up operations and access to information, illustrating how technology supports sustainability goals. While sustainability-aligned actions in healthcare can have broad social, economic, and environmental impacts, some measures may be met with resistance, even as others gain widespread support. Furthermore, the rapid evolution of healthcare introduces constant challenges for sustainability (Tamer, 2020). Despite these difficulties, sustainable development in health remains vital for public health (Tamer, 2020).

Environmental sustainability is a necessary precursor for a sustainable healthcare sector (Aslan, Zeybek, Zengin, Kavşur, & Güler, 2023). A forward-thinking approach involves adopting the “green hospital” concept right from the initial planning stages of healthcare facilities (Aslan et al., 2023). Another serious concern is the sector’s role in contributing to greenhouse gas emissions. Healthcare services, especially those provided in hospitals, are a major source of these emissions (Aslan et al., 2023). Regulatory frameworks are needed to limit the carbon footprint of healthcare delivery (Aslan et al., 2023), and the broad implementation of such regulations can lead to substantial financial savings (Aslan et al., 2023).

Figure 2*Sustainability cycle in the healthcare sector*

Green Hospitals and Environmental Stewardship

A “green hospital” is defined as an environmentally responsible, energy-efficient facility whose design and operation are guided by sustainability principles (Aslan et al., 2023). Such facilities provide considerable economic and environmental advantages, with their contribution to sustainability being a core benefit. The sustainability model in green hospitals can be analyzed through three essential areas: architectural, mechanical, and electrical (Aslan et al., 2023). The architectural component emphasizes efficient water use, sustainable building materials, and thoughtful land utilization. The mechanical and electrical systems focus on integrating renewable sources, such as solar power, and prioritizing energy conservation (Aslan et al., 2023). Green hospitals are also instrumental in reducing operational inefficiencies, carbon emissions, and waste generation (Gümüş & Solak, 2025). As a result, they offer a highly effective blueprint for advancing sustainability within healthcare institutions.

Sustainability Awareness Among Healthcare Staff

A crucial query remains: how aware are healthcare personnel regarding the implementation and adoption of these sustainability efforts? Unfortunately, a deficit in sustainability awareness among staff presents a major barrier to sustainable development within the sector (Aslan et al., 2023). Therefore, boosting this awareness is essential. However, concentrating only on healthcare workers is insufficient. Hospitals serve a diverse population, including all staff, patients, and visitors. For sustainability initiatives to be truly successful, awareness efforts must also encompass patients and their families.

Figure 3*Sustainability Elements in Hospitals*

Integrating Sustainability into Health Education

Achieving sustainable development goals requires educating people who are equipped to contribute to those goals (Yapıcı, 2003). This necessitates the development of specialized curricula and educational programs (Yapıcı, 2003). A significant problem is the lack of programs in most national education systems that adequately convey the philosophy of sustainable development (Yapıcı, 2003). While national initiatives to incorporate sustainability-focused content into education systems are important, they are not sufficient on their own. Sustainable development requires a collective global awareness and perspective. Consequently, the integration of sustainability into educational curricula must be a worldwide undertaking.

Incorporating sustainability into the education of healthcare professionals is an imperative with many facets. Considering the significant financial investment in training healthcare workers, ensuring the continued supply of this workforce is critical. Furthermore, sustainability in healthcare is vital for global sustainability, making it essential for all practicing healthcare professionals to possess a strong ethical commitment to sustainability.

A key question is whether the training processes for nurses, doctors, physical therapists, midwives, and other health professionals sufficiently cover sustainability. Research indicates substantial variability in the sustainability education offered by medical schools in the UK (Bevan et al., 2023). Another UK study suggests that academics themselves may lack the necessary knowledge to effectively teach sustainability within medical education (Tun, 2019). Similarly, a Canadian study identified a specific need for sustainable health education within medical school curricula (Luo et al., 2021).

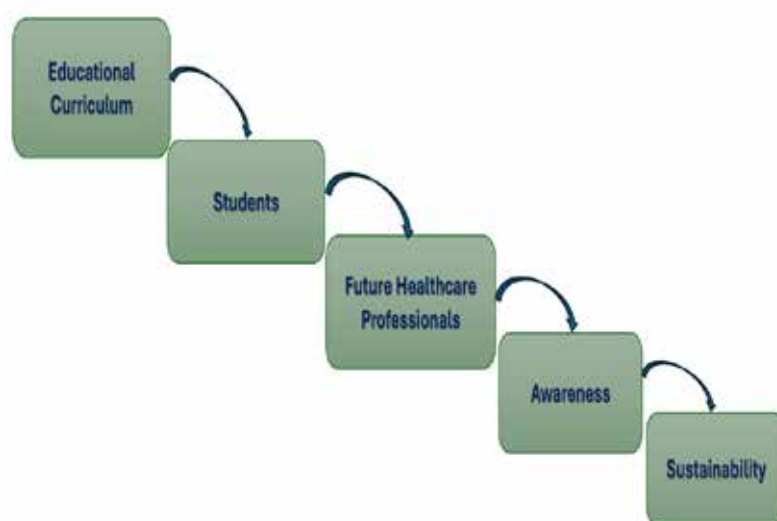
Integrating sustainability into the learning objectives and curricula of medical students is

paramount. Today's students are tomorrow's doctors, and given their respected standing in society, their actions and approaches can serve as powerful examples (Demir et al., 2022). Therefore, fostering sustainability awareness in medical students is critical for their future professional practice and their potential to positively impact society. Nurses are also crucial, as their professional framework inherently connects the environment, people, and health (Katı et al., 2025). They must be prepared to be stewards of natural resources while promoting human health (Katı et al., 2025). Analyzing the curricula and sustainability awareness of nursing students is therefore as important as it is for medical students.

One study found that nursing students' attitudes towards sustainability were above average, yet it still recommended the formal inclusion of practical applications and dedicated sustainability courses in nursing curricula (Katı et al., 2025). Research involving students in the health sciences faculty revealed that their grasp of sustainability was often superficial, highlighting the need for more effective teaching methods to cultivate deeper understanding (Gürgeç Şimşek et al., 2024). Taken together, these findings demonstrate that the skills and knowledge related to sustainability among future healthcare professionals are inconsistent. A persistent recommendation across these studies is the need for a more deliberate and structured integration of sustainability into educational curricula. Improving sustainability education is a direct means of boosting professional awareness, thereby strengthening the overall sustainability of the healthcare sector.

Figure 4

The relationship between health education and sustainability



Conclusion

Sustainability is a holistic concept that requires a comprehensive approach across all

aspects of life, going beyond purely ecological or economic concerns. Given its high resource consumption, the healthcare sector bears a major responsibility for protecting both the environment and public health. Key strategies for improving sustainability include:

- Adopting environmentally sound hospital designs.
- Restructuring existing facilities.
- Implementing broad sustainability training for healthcare personnel.
- Making necessary adjustments to educational curricula.

To guarantee the quality of life for future generations and maintain the continuous delivery of healthcare services, it is absolutely essential to fully embed the principle of sustainability into the educational and operational foundations of the healthcare sector.

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