SUSTAINABILITY IN HEALTH AND HEALTHCARE PROVISION

Shivani Tyagi[1*], Rakhi Mishra[1], Rupa Mazumder[1], Avijit Mazumder[1]

[1] Noida Institute of Engineering and Technology (Pharmacy Institute)

Knowledge Park-2, Plot 19, Greater Noida 201306

Corresponding Author

Shivani Tyagi

Noida Institute of Engineering and Technology (Pharmacy Institute), Greater Noida

tyagishivii333@gmail.com

8882111344

INTRODUCTION

Sustainability plays a crucial role in the efficient operation of healthcare systems. Scholars from various disciplines have been engaged in a protracted and vigorous debate about sustainability, the sustainable use of resources, and related topics. The sustainability of the nation's health care systems is under threat from ageing populations, complicated systems, rising rates of chronic disease, rising expenses of new medical technologies, and growing demands of those receiving medical [1, 2]. Policymakers must ensure that health care systems are financially sustainable without compromising the primary goals of the system due to rising health care costs and resource limitations. In order to address this issue, many European nations have implemented patient cost-sharing (also known as patient expenses) for publicly funded healthcare services. By systematically reviewing publications on healthcare-related topics within the context of sustainability, the study investigates the range of sustainability practises in healthcare. Future research findings are offered as conceptual models that illustrate the breadth of sustainability practices in healthcare, based on the recognized expanding elements of sustainability research as well as practices. This could improve comprehension of the literature and encourage academics to broaden their studies of sustainability in healthcare to include a more comprehensive and all-encompassing viewpoint in order to assure the development of service excellence for business sustainability [3, 4]. There are numerous factors that affect health and disease that are inherently linked, such as social and economic position, education, employment, housing, and exposures to physical and environmental factors. These variables interact to produce health disparities and inequities across and within nations as well as the overall health and disease burden of people

and populations. Biomedical approaches to healthcare diminish harmful effects of disease, but are insufficient to effectively improve individual and group health and advance health equity [5].

The Health Care Triangle

The provision and financing of health care can be reduced to an exchange or transfer of resources: the providers transfer resources for the patients' medical care, and the patients or third parties transfer resources for the providers' financial needs. Direct payment is the most basic type of transaction for an item or service. In exchange for the good or service, the consumer (the first party) pays the provider (the second party) directly as shown in **Figure 1**. There are now health care systems that provide a community with financial protection against the danger of being sick. A public or private organization could be the third party. The third party must obtain funds directly or indirectly from the population it covers (which could be the entire population or just a subgroup, like those who are employed), in order to pay for health care services. The patient or the provider is subsequently compensated with this money [6].

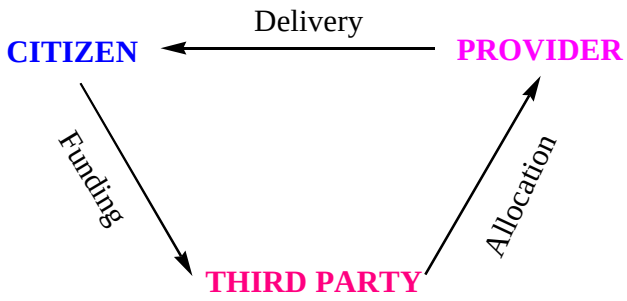

Figure 1: The Trifecta of Health Care

Since the 1960s, there has been a cost crisis in Western countries due to the development of new health techniques and technology (including pharmaceuticals), an aging population, higher expectations, and higher relative pricing of health care inputs. Efforts to mitigate the issue have become more intense. Likewise, up until the 1990s, many health care organizations and systems ignored production-related inefficiencies that exacerbated sustainability problems due to the possibility of matching rapidly rising costs with increases in funding. With additional public resources dedicated to the National Health Systems (NHS) or higher insurance premiums, sustainability difficulties and the inefficiencies of health care delivery were nevertheless significantly addressed throughout the 1980s [7].

According to official World Health Organization (WHO) data, the rate of elderly people receiving independent care in Western and European countries is a topic of great interest. These surveys also indicated that older individuals favor receiving informal care at patients' homes as opposed to official care at hospitals. These motivations drive Home Health Care (HHC) to support a broad array of care services in clients' residences by employing a team of carers [8].

Any healthcare system's sustainability indicates how likely it is to continue carrying out its regular operations in the future. When analyzing the literature on the sustainability of healthcare systems, financial sustainability is the first factor examined. Despite this, there are multiple indicator-based metrics and indicators, such as healthcare revenue, expenditure, services, etc. that are used to assess whether the healthcare system is financially sustainable. There are no universally accepted standards for assessing the financial sustainability of healthcare systems [9].

Medical innovation and the sustainability of health systems:

The sustainability of healthcare systems in various nations is being questioned by new medical technology. Since the turn of the 20th century, medical advancement has not only fostered a potent "biomedical imagination," but it has also shaped the current, expensive healthcare system. Medical devices, which include a variety of diagnostic and therapeutic goods like electrocardiographs (ECGs), infusion pumps, and hip implants, although not the only cost-driver, do contribute to the rise in health spending [10]. Three issues are affecting healthcare in the modern world: a lack of medical professionals, aging populations, and high overall healthcare costs. The World Health Organization (WHO) reported that in 2013, there were 60.4 million people who needed access to healthcare globally and 43 million people who actually worked in the field. By 2030, these numbers will rise to 81.8 and 67.3 million, respectively. As a result, the problem of a severe medical staff shortage remains unresolved [11].We contend that route dependency has been created as a result of the financing, design, and commercialization practices used to support medical innovation since the 1950s, which exacerbates the current sustainability issues facing healthcare systems.

More accurate and frequently used measurement methods are required for sustainability study. In addition to published bibliographies and a web-based collection of measures for sustainability drivers and outcomes, the discipline needs systematic assessments of the measures now in use. Overall, it is necessary to more thoroughly understand that investments in knowledge-based innovation "are inherently collective, cumulative, and uncertain" in order to build a medical innovation ecosystem that can support universal and sustainable health systems. We think new forms of collaboration must be encouraged in order for innovation to better promote the sustainability of health systems. Within the social sciences, where civic responsiveness is emphasized, alternatives to the biomedical industry-oriented approach may be discovered.

Health Care Performance and Quality Improvement

There have been countless innovations in both health and technology during the last 20 years. However, the health care system's performance in terms of guaranteeing patient safety and meeting patient needs is still well below what is considered appropriate. Despite the complexity of the medical field, doctors mainly rely on paper instruments, memory, and hard work to provide better patient care. However, using conventional approaches makes it difficult to create

improvements in health care that are dependable and long-lasting. Physicians must systematically address quality-of-care issues in order to improve the quality and safety of care, comply with external accreditation criteria, and fulfil customer expectations [12]. Patient access, prices, efficiency, and other characteristics of health services may be included in "performance" measurement and reporting in the healthcare industry, but in recent years, the usage and reporting of clinical and service quality indicators has skyrocketed. Promoting accountability and enhancing the performance of the health system are the two fundamental objectives of any performance measurement tool in the healthcare industry. Various stakeholders with a variety of needs are served by performance and quality measurement: Governments, regulators, funders, buying groups, provider groups, medical professionals, patients, and citizens. There are four possible ways that reporting performance metrics can result in improvement and change: change, where providers alter their methods in response to information; selection, when customers or clients change providers as a result of information; pay-for-performance, in which service providers are compensated monetarily for exceptional performance as measured; as well as reputational harm, or "naming and shaming" of substandard performers [13].

The Environmental Sustainability of Health Care

Organizations that provide healthcare ought to promote sustainability on all three fronts—economic, social, and environmental—in order to establish benchmarks for Corporate Social Responsibility. To accomplish this and ensure sustainable development, they ought to strike a balance between care and economic necessity. All waste classes are produced exclusively by health care organisations (HCOs), and 20% of this waste is hazardous due to its infectious, poisonous, or radioactive nature. Therefore, improper handling of hospital waste can put people, the environment, and the spread of infectious illnesses at risk. Due to the significant environmental consequences, HCOs in Spain have only recently started to add environmental management to their strategic goals [14]. Ironically, the health sector is a major contributor to greenhouse gas emissions, which exacerbates the health effects that it will need to control. Modern healthcare uses a lot of energy, water, and other natural resources, and it generates waste that is polluting in terms of chemicals, pharmaceuticals, plastics, and other materials. Sustainability in the health sector is crucial for both long-term commercial profitability and ethical legitimacy, as well as for environmental health. The study of the effects of the environment on health, the effects of healthcare on the environment, and solutions that advance sustainability and population health are all covered in health professional curriculum on environmental sustainability. The need to purify wastewater in order to achieve a certain level of quality makes it practically essential. To achieve this, it is necessary to research further effective wastewater treatment methods [15, 16].

Healthcare emissions research

International initiatives to assess and reduce healthcare-related environmental emissions are increasing, with a focus on greenhouse gases. Initially disclosing its National Health Service

(NHS) England greenhouse gas emissions in 2009, the United Kingdom Sustainable Development Unit now publishes updates every two to three years. According to NHS England, it is on pace to meet immediate objectives and is working towards the United Kingdom Climate Change Act of 2008's mandate of an 80% reduction in emissions by 2050. Pharmaceutical and medical device upstream production, use, and disposal account for sizable portions of the health sector's environmental emissions. For doctors and health administrators to make evidence-based decisions, life cycle assessments (LCAs) of the emissions connected with these items are necessary. The goal of the industrial ecology framework is to create plans and methods for reducing waste and pollution in human systems, preserving materials and goods, and regenerating or renewing natural systems [17].

Health Care Sustainability Reporting: Emerging Lessons

Achieving workplace sustainability has emerged as one of the most important subjects, particularly in industrialised nations where people are more concerned about the working environment. The governments of several developing nations have created their long-term development plans, such as subscribing to the Sustainable Development Goals (SDGs), which has led to an increase in awareness of sustainable workplaces in these nations as well. Since the Sustainable Development Goals (SDGs) were announced by the United Nations Development Programme (UNDP) in 2017, the importance of sustainable development has grown dramatically among corporate organisations. Some of these SDGs, like attempts to combat climate change and create decent workplaces, have a direct bearing on businesses [18]. The process of organizing and publishing data about a company's sustainability practices, its performance, and the "triple bottom line" is known as sustainability reporting, sometimes known as corporate responsibility reporting. In a recent study on South African businesses, it was shown that sustainability reporting has been gradually institutionalized. Similar to this, using South Africa as the primary empirical context, researchers discovered evidence of an analogous tendency in regard to reporting and auditing practices [19]. According to a recent report, India's oil and gas sector is anticipated to generate US$139,814.7 million by 2015 (IBEF, 2014). The need for oil and gas is anticipated to increase due to India's growing economy, which would lead to greater expansion chances for investment. The Indian government has proposed a number of measures to accommodate the rising demand, including allowing 100 percent foreign direct investment in refineries, natural gas, and petroleum products. In the industrial supply chain, equity, child labour, bonded labour, education, wages, housing, charity, and ethics are the main social issues [20].

Sustainability in healthcare facilities and evidence-based design

In order to adapt sustainable practices for this building type, the U.S. Green Building Council (USGBC) introduced the Leadership in Energy and Environmental Design (LEED) for Healthcare in 2011. Evidence-based design (EBD), which promotes thoughtful decision-making

about many parts of the physical environment to maximze health, safety, and economic results, is another contemporary trend addressing social, economic, and health-related issues. The advantages of coordinated sustainable strategies are documented by EBD research. According to research, green healthcare facilities—in particular, those with a LEED certification—are more likely than conventional healthcare facilities to run smoothly, with lower staff turnover, higher levels of satisfaction among patients, and shorter lengths of stay. To improve healthcare facilities, evidence-based and sustainable healthcare design and construction can coexist [21, 22].

CONCLUSION

The measurement and reporting of health care sustainability lags by 20 years behind initiatives to increase the quality of healthcare through measurement. Health systems must quickly embrace the most recent research from decades of quality assessment and reporting in order to achieve significant sustainability improvements. Health services desiring to establish a programme for disinvestment can replicate or alter the model for sustainability in healthcare by successfully allocating resources, and academics can test it to validate, disprove, or better understand the processes involved. Each healthcare practitioner should have as a goal and objective assuring an innovation's sustainability, ensuring an improvement and preservation of beneficial outcomes over time. Numerous factors, such as social and economic standing, housing, education, and exposure to the environment, determine one's level of health and sickness. Therefore, societal participation and intersectoral action are required to improve population health and health equity.

REFERENCES

1. Harris C, Allen K, Waller C, Brooke V. Sustainability in health care by allocating resources effectively (SHARE) 3: examining how resource allocation decisions are made, implemented and evaluated in a local healthcare setting. BMC health services research. 2017 Dec;17(1):1-21.
2. Borgonovi E, Adinolfi P, Palumbo R, Piscopo G. Framing the shades of sustainability in health care: pitfalls and perspectives from Western EU countries. Sustainability. 2018 Nov 27;10(12):4439.
3. Sherman JD, Thiel C, MacNeill A, Eckelman MJ, Dubrow R, Hopf H, Lagasse R, Bialowitz J, Costello A, Forbes M, Stancliffe R. The green print: advancement of environmental sustainability in healthcare. Resources, Conservation and Recycling. 2020 Oct 1;161:104882.
4. Polese F, Carrubbo L, Caputo F, Sarno D. Managing healthcare service ecosystems: Abstracting a sustainability-based view from hospitalization at home (HaH) practices. Sustainability. 2018 Oct 30;10(11):3951.
5. de Andrade LO, Pellegrini Filho A, Solar O, Rígoli F, de Salazar LM, Serrate PC, Ribeiro KG, Koller TS, Cruz FN, Atun R. Social determinants of health, universal health coverage, and sustainable development: case studies from Latin American countries. The Lancet. 2015 Apr 4;385(9975):1343-51.
6. . Mossialos E, Thomson SM. Voluntary health insurance in the European Union: a critical assessment. International journal of health services. 2002 Jan;32(1):19-88.
7. Lega F, Prenestini A, Spurgeon P. Is management essential to improving the performance and sustainability of health care systems and organizations? A systematic review and a roadmap for future studies. Value in Health. 2013 Jan 1;16(1):S46-51.

8. . Fathollahi-Fard AM, Govindan K, Hajiaghaei-Keshteli M, Ahmadi A. A green home health care supply chain: New modified simulated annealing algorithms. Journal of Cleaner Production. 2019 Dec 10;240:118200.
9. Kilci EN. A study on financial sustainability of healthcare indicators for Turkey under the health transformation program. The International Journal of Health Planning and Management. 2021 Jul;36(4):1287-307.
10. Lehoux P, Roncarolo F, Rocha Oliveira R, Pacifico Silva H. Medical innovation and the sustainability of health systems: A historical perspective on technological change in health. Health Services Management Research. 2016 Nov;29(4):115-23.
11. Chui KT, Alhalabi W, Pang SS, Pablos PO, Liu RW, Zhao M. Disease diagnosis in smart healthcare: Innovation, technologies and applications. Sustainability. 2017 Dec 18;9(12):2309
12. Varkey P, Reller MK, Resar RK. Basics of quality improvement in health care. InMayo Clinic Proceedings 2007 Jun 1 (Vol. 82, No. 6, pp. 735-739). Elsevier.
13. Hensher M, McGain F. Health Care Sustainability Metrics: Building A Safer, Low-Carbon Health System: Commentary examines how to build a safer, low-carbon health system. Health Affairs. 2020 Dec 1;39(12):2080-7.
14. Carnero MC. Assessment of environmental sustainability in health care organizations. Sustainability. 2015 Jun 29;7(7):8270-91.
15. Schwerdtle PN, Maxwell J, Horton G, Bonnamy J. 12 tips for teaching environmental sustainability to health professionals. Medical Teacher. 2020 Feb 1;42(2):150-5
16. . Hassaan MA, El Nemr A, Hassaan A. Health and environmental impacts of dyes: mini review. American Journal of Environmental Science and Engineering. 2017 May;1(3):64-7.
17. Sherman JD, Thiel C, MacNeill A, Eckelman MJ, Dubrow R, Hopf H, Lagasse R, Bialowitz J, Costello A, Forbes M, Stancliffe R. The green print: advancement of environmental sustainability in healthcare. Resources, Conservation and Recycling. 2020 Oct 1;161:104882.
18. Zahid M, Martins JM, Rahman HU, Mata MN, Shah SA, Mata PN. The interconnection between decent workplace and firm financial performance through the mediation of environmental sustainability: Lessons from an emerging economy. Sustainability. 2021 Apr 20;13(8):4570.
19. Massa L, Farneti F, Scappini B. Developing a sustainability report in a small to medium enterprise: process and consequences. Meditari Accountancy Research. 2015 Apr 13;23(1):62-91.
20. Mani V, Agrawal R, Sharma V. Supply chain social sustainability: A comparative case analysis in indian manufacturing industries. Procedia-Social and Behavioral Sciences. 2015 May 15;189:234-51.

21. Zadeh RS, Xuan X, Shepley MM. Sustainable healthcare design: Existing challenges and future directions for an environmental, economic, and social approach to sustainability. Facilities. 2016 Apr 4;34(5/6):264-88.
22. Campion N, Thiel CL, Focareta J, Bilec MM. Understanding green building design and healthcare outcomes: Evidence-based design analysis of an oncology unit. Journal of Architectural Engineering. 2016 Sep 1;22(3):04016009.