Beyond Medicine: Transforming Healthcare for a Sustainable Future

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KEYWORDS	ABSTRACT
Environmental, Social, Governance, Sustainability, healthcare, Indian hospital, Resources, Sustainable Procurement policies and value chain	**Aim:** To assess the integration of sustainability principles in the Indian health care sector, by gauging the impact of Environmental, Social and Governance (ESG) factors across the healthcare value chain, and to navigate their way towards a sustainable health care system. **Subjects and Methods:** A detailed literature review was done first, and different stakeholders were carried out in order to identify key sustainability issues. Data collection focused on ESG elements within hospitals. The study collected data from a range of healthcare professional by taking into consideration hospital size, complexity and organizational strategies. **Results:** The assessment pointed out the healthcare establishments' attitude towards sustainability, especially in the Economy & Governance, Environmental and Social domains. The hospitals had advantages, including but not limited to, information security, sustainable procurement strategies, as well as increasing women in managerial positions. At the same time, certain environmental challenges showed efficient waste disposal, possible improvement of carbon footprint management, particularly monitoring of GHG emissions. Social dimension, the hospitals focused on providing safe services to patients and training their personnel adequately, did not engage in child labor, and complied with minimum wage regulations in the country. **Conclusion:** The research underscores the importance of hospitals going beyond simple institutional commitments to sustainability and adapting practices to manage climate change risks and other environmental issues. The findings are intended to help policymakers adopt a more integrated perspective by promoting the adoption of sustainability in the Indian health system in terms of economic, environmental, and social dimensions.

Background

The healthcare industry in India is a dynamic and rapidly evolving landscape characterized by a diverse range of healthcare providers, from small clinics to large multi-specialty hospitals. With a population of over 1.4 billion people, the Indian healthcare sector faces unique challenges and opportunities in its pursuit of sustainability (Leal Filho et al, 2019, Mehra R et al, 2021).

Sustainability in today's healthcare landscape has emerged as a paramount concern. Healthcare organizations around the world are grappling with the need to balance the delivery of high-quality medical services with environmental responsibility and social accountability. Incorporation of sustainability metrics into healthcare systems is the need of the hour, and therefore it is important to underline key considerations and opportunities for achieving this integration (Hensher, M et al, 2020). At its core, integrating sustainability metrics into healthcare systems aims to enhance environmental performance while optimizing healthcare services. This delicate equilibrium is particularly pertinent in countries like India, where the healthcare sector is experiencing rapid growth and transformation(Wani, N. U. H et al., 2013).

Addressing energy efficiency, water conservation, waste management, emissions reduction, and compliance with environmental regulations is vital for sustainable healthcare facilities[Dion, H et al,2013, World Health Organization. (2020)]. Hospitals must adopt energy conservation programs, monitor water usage, implement efficient waste management practices, and reduce emissions to minimize their environmental impact. Staying compliant with evolving environmental regulations ensures adherence to established standards. These efforts not only reduce operational costs but also contribute to environmental preservation and a greener healthcare sector (Anuar, A. R et al., 2018). In an era of growing environmental concerns and resource constraints, sustainable healthcare practices are essential for both cost-effectiveness and responsible stewardship of resources.

Thus, to address the challenges faced by the Indian healthcare industry and keep up with its growth, the research landscape must expand beyond borders, encompassing studies conducted in diverse settings, such as Eastern Europe, Palestinian healthcare organizations, and hospitals in the United Arab Emirates (UAE) (Jakovljevic, M et al., 2021, Khan, M et al,2018, Hussain, M et al, 2016). These studies collectively offer a comprehensive understanding of the multifaceted nature of sustainability in healthcare.

At first, the concept of environmental sustainability, rooted in the 1987 UN report "Our Common Future," prioritizes current needs without jeopardizing the future. The SDGs offer a framework for global cooperation on economic, social, and environmental issues. An investigation of Eastern European countries and their attitudes, values, and the SDGs reveals varying trends in these countries' attitudes and values, highlighting the significance of incorporating both subjective questionnaire data and objective macroeconomic data when shaping sustainable development policies. The investigation also underlines the necessity of culturally tailored approaches to sustainability and suggests that understanding attitudes can shape the acceptance of sustainability strategies (Messerli, P et al., 2019, Desai, B.H., et al, 2022).

Similarly, the healthcare sector in the UAE, particularly in Abu Dhabi, has prioritized sustainability criteria within hospitals. Social dimensions, including patient and employee satisfaction, take center stage, aligning with the global emphasis on enhancing the well-being of healthcare stakeholders. Lean management and operational aspects, while crucial, are placed after the social dimension, challenging conventional wisdom and prompting a re-evaluation of sustainability priorities (Khan, M et al,2018, Hussain, M et al, 2016).

However, a plethora of studies have suggested that fostering a culture of sustainability is vital(Pereno A et al., 2020, Suriyankietkaew. S et al 2022, Upadhyay, D. et al, 2024). The insights from Eastern European, Palestinian, and UAE studies can be adapted for the same in the Indian healthcare sector. We can emphasize Green Human Resource Management practices and recognize their positive impact on economic,

environmental, and social aspects as pivotal. Adopting a similar prioritization strategy that places patient and employee satisfaction at the forefront can align Indian healthcare with global trends, emphasizing social well-being alongside operational efficiency.

Therefore, in the present study, we hypothesize that it is important to take into account global healthcare research to introduce a comprehensive framework for categorizing and prioritizing sustainability risks within India's healthcare sector. Sustainability practices in Indian hospitals vary across economic, environmental, and social dimensions. Larger, multi-specialty institutions often excel, while diverse levels of commitment suggest areas for improvement. Hospitals with written policies and proactive environmental practices positively impact the environment and comply better with regulations compared to ad hoc approaches. By reviewing sustainability factors, we aim to provide guidance for healthcare decision-makers and practitioners in India, fostering an understanding of healthcare sustainability with a particular focus on the social dimension, including patient and employee satisfaction.

Material and methods

The methodology comprises several sequential steps to comprehensively investigate sustainability in the Indian healthcare sector. Firstly, an in-depth literature survey was conducted, providing a robust foundation for the study. Following this, stakeholders in the healthcare value chain was meticulously mapped, and stakeholder engagement activities was undertaken to discern material issues critical for a sustainable healthcare sector.

As a subsequent step, Environmental, Social, and Governance (ESG) issues relevant to hospitals was identified, accompanied by stakeholder engagement with hospitals to recognize material issues. This process aimed us to enhance awareness among hospital professionals and analyze outcomes to formulate strategies for improved understanding and implementation of ESG practices in Indian hospitals.

However, based on the survey and literature review following are the sustainability issues under different heads were analysed (Economical, Environmental and social) related to the Healthcare sector (Figure 1, Table 1).

Table 1: Sustainability issues identified related to the healthcare section particularly related to economy, environmental and social.

	Economy/ Governance	Environmental	Social
1	Governance & Economic performance	Circular material	Employment
2	Anti-corruption, Anti-competitive practices	Energy & Carbon footprint	Diversity equal opportunity and discrimination
3	Information management	Water & Effluents	Patient Safety
4	Compliance	Waste	Occupational & Health Safety
5	Sustainable Financing	Emission	Training & Education
6	R&D/ Innovation	Infrastructure & Biodiversity	Child forced labour
7	Sustainable procurement	Environmental compliance	Security Practices
8	Circular economy	Supplier environmental performance	Compliance

9	Affordability	SCOPE 1,2 and 3 footprints	Social dialog
10			Privacy of Information
11			Supplier social performance
12			Gender equity, rural accessibility

Figure 1: The representative flow chart shows the process followed during collection of the data

Results
The stakeholders who participated from the healthcare sector value chain
46.5% of the participants represented the healthcare sector, with 20 professionals involved. Additionally, one participant each belonged to the transport sector and pharmaceutical manufacturing, two were suppliers to hospitals, four were manufacturers related to healthcare supply materials, five were from healthcare associations, two were professional associates, three were from the healthcare IT industry, and seven were associated with other associations (Figure 2).
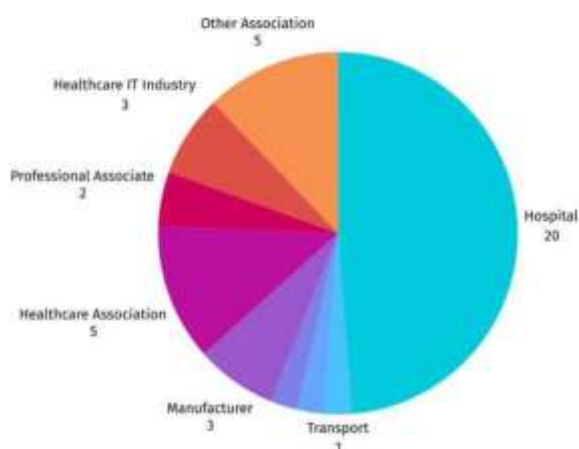
Figure 2: The representative pie-chart distribution shows the percent share of Stakeholders participation from healthcare value chain

In the professionals' profile, the majority of responses came from doctors, comprising 16 participants. Other respondents included 1 Healthcare Leadership professional, 4 Facility Management experts, 4 Business leaders, 9 Quality Professionals, 3 Administrative professionals from hospitals, 1 Healthcare IT professional, 7 Sustainability experts, 3 Research professionals, 3 Institutional professionals, 1 Regulatory Body representative, 1 Supply Chain professional, 1 Health care management professional, and 1 Healthcare Maintenance professional. In the second study, exclusively focused on hospitals, 44 hospitals participated, with the majority being Trust/society hospitals. Notably, 58% of the participating hospitals had a bed capacity exceeding 300 (Figure 3).

Figure 3: The representative graph shows the composition of different Professionals' participation in the healthcare value chain surveys.

Next, to evaluate the healthcare section under the environmental issues parameter, more than 90% of the participates from various hospitals were evaluated and as per them they agreed on the relevance of the ESG matters as necessary to hospitals (Figure 4).
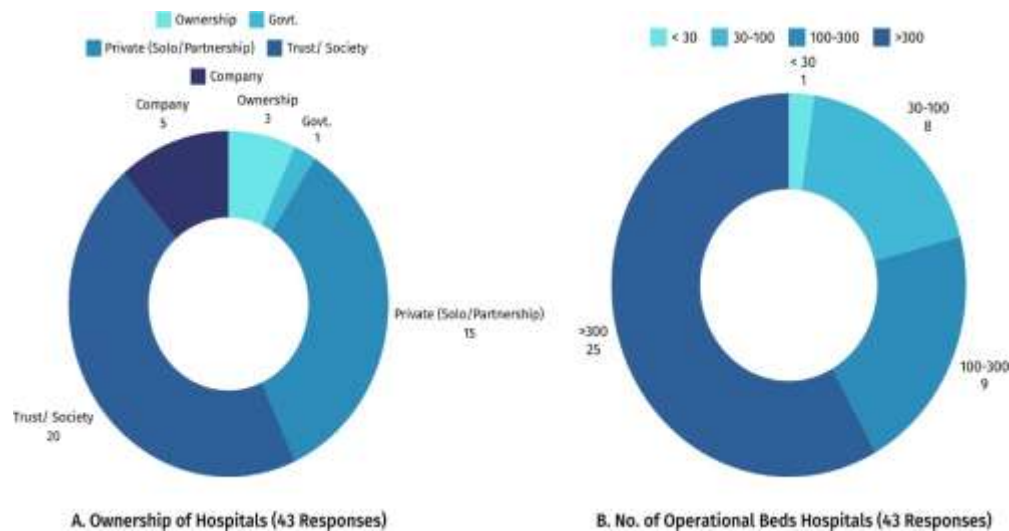

Figure 4: The representative bar graphs pie charts show (A) Types of hospitals considered for the study and (B) Shows number of beds in hospital considered for study.

Further, as per the ESG materiality I healthcare section for stakeholder engagement (Figure 5)showed that 78% of the respondents identified S3-Patient safety as the top material issue followed by 70% of them saying S4-Occupational Health and safety,

- EG-4 Governance related Compliance, E3-Water & effluent, S6-Child / Forced Labour, S5-Training and Education all had uniform responses of 68% and ranked third material issue,
- S9 - Social compliance scored 66%,
- E4 – Waste and E7 – Environmental Compliance ranked 5th with 63% of them,
- S2 – Diversity and Equal Opportunity follows with 61%,
- EG-7 Sustainable procurement, S1 Employment and S11 – Privacy of information were at 7th rank with 59% echoing it.

Among the 44 Indian Hospitals which were engaged into the study 10 out of 87 issues that were studied were identified as top performing sustainability issues. Reported as current good practices and relevant issues followed in the hospital.
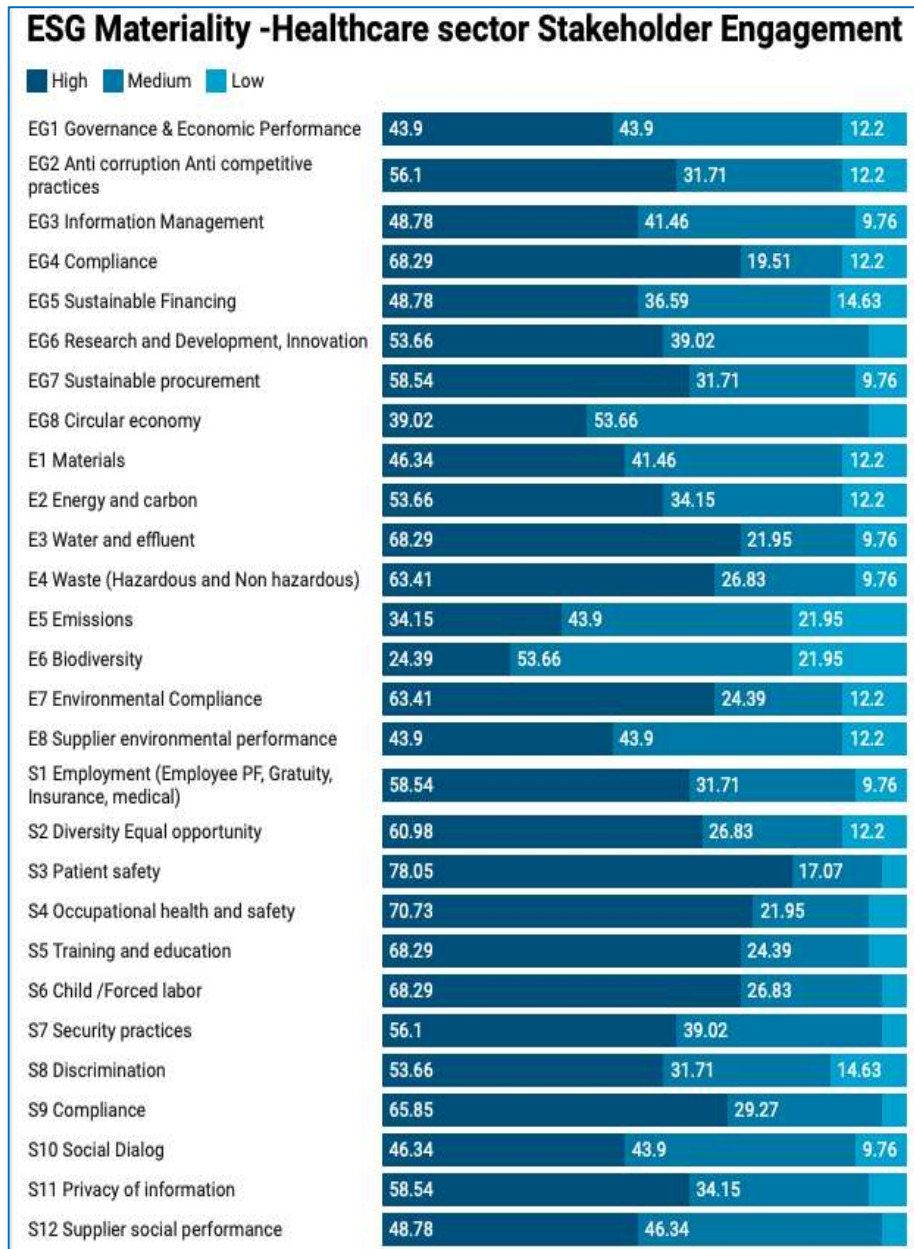
Figure 5: The representative analysis shows the collation of the outcome, analysis and strategizing the performance indicators.

Herein, we observed that under the sustainability stakeholder engagement outcome S3- Patient Safety ticks as the topmost priority issue, in addition S5 – training and education and S6 – Child /Forced labor are rated as top issues by 95% of the respondents followed by EG 1B – Operational risk, E5 – Emissions, S1-Employment, and S4-Occupational health and safety, Information security and Sustainable procurement also makes it to the top ten list (Figure 6).

Figure 6: Top performing Sustainability parameters in Indian Hospitals
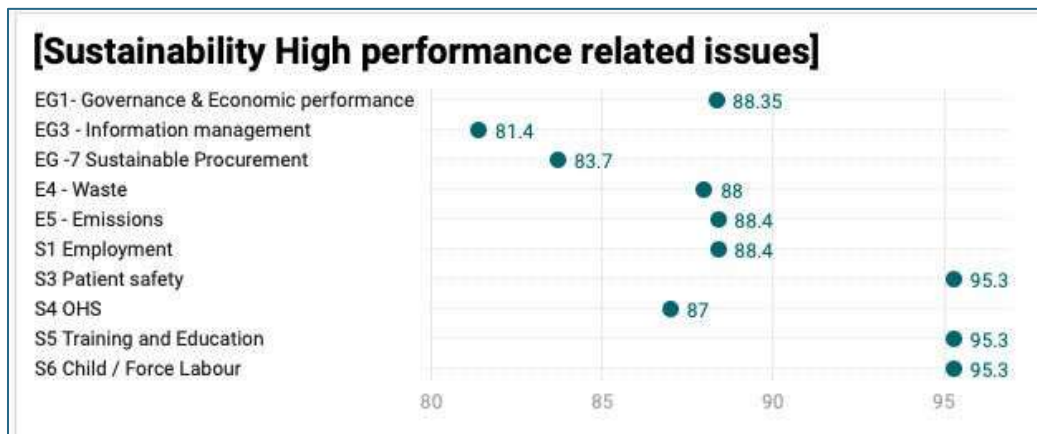
Results from the study revealed that the key practices in Indian hospitals related to Economy & Governance (EG), Environment (E), and Social (S) aspects are as follows:

Economy & Governance:
EG1: The presence of women on boards or in top management roles is recognized as a positive indicator for gender equality.
EG-1B: While hospitals have identified operational risks, there is a low score in understanding and addressing climate change risks, highlighting a need for increased awareness.
EG-3B: Hospital's report having documented information security policies, emphasizing the importance of implementing Information security and Data protection management systems
EG-7: Sustainable Procurement policies are acknowledged, but a deeper examination is required to align supply chain practices with sustainability goals.

Environment:
E4 and E5: Waste management (Biomedical waste, Solid Waste, Construction waste, E-waste, and Batteries waste) and emissions are identified as top environmental concerns, with compliance to applicable rules for waste disposal.
E5: While 88% of hospitals monitor emissions and air quality, there is a need to establish connections between emissions data and carbon footprint enumeration as well as compliance to equipment calibrations, analysis of emission data and related good practices.

Social:
S3, S5, and S6: Hospitals prioritize patient safety, provide regular training programs for employees, and contribute to efforts against child labor and forced labor.
S1: Hospitals demonstrate good compliance with local minimum wage regulations.
S4: In Occupational Health and Safety (OHS) criterion, hospitals implement third-party fire audits, conduct hazard risk assessments and controls, and provide training on emergency equipment use, such as Fire

Extinguishers, through mock drills.

Discussion

Sustainability-related issues are at the forefront of environmental, economic concerns as well as public consciousness. Unsustainable development has compromised the ability of ecosystems and social structures to support human life while also contributing to ecological degradation and human misery on a global scale (Flint , R.W., et al 2013). The impacts of this unprecedented ecological challenges are two- fold when it come of healthcare sector. While there is an urgent need to strengthen and expand the healthcare facilities owing to projected health impacts of climate change and at the same time to reduce environmental footprints of healthcare services, as the healthcare sector has also been implicated in environmental degradation and pollution. Therefore, it is imperative that health-care professionals lead the necessary change towards more sustainable practices of this important sector.

As mentioned before, several studies that aim to identify major sustainability concerns in the healthcare sector and have been recently reported globally. For example, a study carried out by the European Commission's Joint Research Centre, Sustainability Assessment Unit (JRC IES SA) identified the major pitfalls in the European healthcare system from a sustainability standpoint and provided insights into how these problems can be rectified (Nita, V. et al, 2013).

Through this study, we have also identified major sustainability challenges in the fast-growing Indian healthcare system and categorized them as issues pertaining to either economy and governance, environment or societal change. We have also ensured to cover a broad range of stakeholders from healthcare professionals to sustainability experts in this study which helps us to efficiently identify potential practices with room for improvement at all stages of the healthcare value chain (Walters, D. A et al 2001 & Pitta, D.A et al 2004). Furthermore, we have taken into consideration different types of healthcare facilities like government and private hospitals and institutions run by charities/ on donations each possessing a unique group of stakeholders and thereby posing a specific set of challenges. We believe that more studies to assess the sustainability of the Indian healthcare system are the need of the hour. With the help of more such studies we will be able to identify the lacunae that currently exist in the system and provide solutions that cater to problems specific to the Indian niche. For example, in the Indian scenario, more attention needs to be paid to reduce child/forced labor which could be achieved by an increase in the hiring of trained professional staff. Proper training for the staff behind hired is all paramount importance to ensure patient safety. The study also underlines that there is an important need for addressing the role that emissions from the healthcare institutions contribute to climate change. This highlights the need to increase awareness, interest and strategies to address the same. The individuals Involved in this study are of the opinion that this paper should be used as guidance to steer further research and development in industry, academia and policy in order to serve and support the decision-making processes regarding sustainability.

Conclusion

Interconnected ESG factors form a catalyst, where addressing one issue can pave the way for positive changes across the spectrum. Stakeholder engagement in the healthcare value chain aimed to identify crucial issues, laying the groundwork for strategic actions aligning the sector with Sustainable goals. This effort establishes a foundation for heightened awareness, fostering collaboration among stakeholders to contribute to the nation's Net Zero target by 2070, while sectors like railways have arrived at 2030 oil and gas have evolved 2047, healthcare sector also needs to come up with a target for becoming net zero in the country with its own national goals(Fadda, G et al 2023 & Chandel, T.A 2023). The intent is to formulate a framework for reducing ecological footprints and embracing sustainable practices considering all the ESG material issues relevant with the industry, emphasizing the significant impact of individual actions. Establishing country-level sustainability standards would provide a strong foundation and clear understanding of the healthcare sector. These standards would enable the sector to undergo transformative

changes on its path to achieving sustainability, becoming more than just a place of medication. It would become a place that promotes healing through its care for the planet, caregivers, and its operations guided by principles of governance.

Authors' Contribution: KS and NL –data collected, designed & performed the analysis of the results, and wrote the paper., VA and LJ- contributed in data access, interpretations, and discussions. All authors have read and agreed to the final version of the manuscript.

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