

# Exploring Environmental Sustainability Attitudes among students pursuing Ayush course in India: A Cross-Sectional Study

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DOI: <https://doi.org/10.63001/tbs.2024.v19.i03.pp59-63>

## KEYWORDS

Ayush,  
Environmental  
Sustainability,  
India,  
Interns

Received on:

25-07-2024

Accepted on:

15-11-2024

## ABSTRACT

**Background:** Despite its low per-capita emissions, the country ranks as the third-largest global greenhouse gas emitter. The healthcare sector, specifically alternative medicine, which derives its basis from natural products such as plants and earth, can potentially drive transformative change in sustainability practices.

**Method:** Through an online survey, this study investigates the attitudes of interns pursuing complementary and alternative medicine towards environmental sustainability (ES). Ethical clearance was secured, and a meticulously reviewed questionnaire was disseminated among 540 participants using a non-linear snowball sampling technique. Data analysis included statistical tests to explore perceptions, engagement levels, and priorities regarding ES. The study reveals a predominantly young demographic with a strong inclination towards ES, highlighting its ethical significance.

**Results:** Notably, 68.52% of respondents believed an environmentally sustainable healthcare campus should include reduced plastic usage, green spaces, and proactive water conservation efforts. Additionally, a significant majority, 87.04%, acknowledged the potential for financial benefits through ES practices. More than 90% of respondents indicated that less than 20% of their staff were involved in ES-related research ( $p=0.04$ ). The significance of incorporating ES into the academic curriculum received resounding support, with 97.22% of participants advocating for its inclusion ( $p<0.01$ ).

**Conclusion:** Interns in India strongly support environmental sustainability in healthcare. However, converting this support into effective policy change necessitates concerted efforts, including educational reforms, interdisciplinary collaborations, and active advocacy. Addressing climate change and ensuring a sustainable healthcare future is paramount, and Ayush stands as a potent catalyst for positive change in India's journey towards a sustainable healthcare system

## INTRODUCTION

India stands at a pivotal juncture as it charts its course towards a new era of economic growth while grappling with crucial decisions on sustainability. Despite having one of the world's lowest per-capita emissions, India ranks as the third-largest emitter of

greenhouse gases (Leandro Vigna, 2023). Furthermore, despite being the world's third-largest economy, the country harbours the most significant population living below the international poverty line. The pursuit of sustainability in India faces formidable challenges stemming from two major factors: the sheer scale of

its operations and the rapid pace of its expansion. Nevertheless, India has assumed a prominent role as a catalyst for change in the global battle against climate change and in formulating development strategies aligned with the Sustainable Development Goals (S.D.G.s). Adopted in September 2015, the S.D.G.s encompass a comprehensive framework addressing development's social, environmental, and economic dimensions (UN, 2023). Protecting the environment is a prime goal to ensure long-term sustainability. India's approach to achieving these objectives involves actively engaging stakeholders, including public and private sectors, in formulating effective policies, implementation strategies, and best practices. For instance, in February 2018, a national capacity-building workshop was convened to localise the S.D.G.s, aiming to tailor these global goals to India's specific needs. Subsequently, in August 2018, a collaborative conclave was held between the government and businesses, focusing on educating private enterprises and industries about the S.D.G.s and assessing the alignment of their program plans with these global sustainability targets (Chaturvedi, 2021).

Healthcare experts are supposed to lead this initiative by constantly communicating with their patients in daily practice (Bailey, 1999). One of the earliest examples of such a movement is The National Association of Physicians for the Environment (NAPE), a coalition of medical practitioners and 46 medical professional groups dedicated to advocating for environmental safeguarding as an inherent duty of healthcare professionals. NAPE has been actively involved in organising nationwide conferences, advocating for the dissemination of the latest "best practices" guidance across diverse medical disciplines, and operates as a prominent platform for the discourse of pertinent concerns, as well as the circulation of scientifically sound information essential for both medical practitioner and patient education (NAPE, 2023). We do not have such registered organisations associated with India or South East Asia. Multiple reports across the literature have suggested doctors' roles in environmental sustainability and health (Jameton, 2017; Kemple, 2020; Macpherson & Wynia, 2017).

Experts in complementary and alternative medicine (Ayurveda, Homeopathy, Yoga and Unani) primarily focus on helping patients reconnect with herbs and natural remedies. Additionally, it places significant emphasis on harnessing the healing powers of the fundamental elements of nature: water, sun, air, and space. These elements are essential in helping patients harmonise with the broader natural order, contributing to an improved quality of life (Snider & Zeff, 2019). Since these physicians are closer to nature, the need arises to focus on the sustenance of the environment and, in turn, help in the long-term survival of life on earth in the true sense. Few studies in the literature explore the attitude of future flag bearers of this speciality regarding environmental sustainability. Hence, the study aimed to explore the attitude of the complementary and alternative medicine course interns towards ES across India.

#### **Methods and data collection:**

Ethical clearance for this study was obtained from the Institutional Ethics Committee of M.C.E. Society, Azam Campus, Pune, prior to the commencement of the research. The study strictly adhered to ethical guidelines to ensure the confidentiality and anonymity of all participants. This cross-sectional study was conducted from January 2024 to May 2024 to assess the attitudes of complementary and alternative medicine interns towards Environmental Sustainability (ES). A total of 680 interns were initially approached to participate in the study. A structured questionnaire was developed using Google Forms to capture participants' attitudes toward ES. The questionnaire was rigorously reviewed and validated by environmental sustainability and healthcare experts to ensure content validity and clarity. The questionnaire was disseminated through WhatsApp groups, utilising a non-linear, non-exponential snowball sampling technique. Interns were encouraged to share the form with their peers, broadening the survey's reach. Participants received regular reminders every four days via direct messaging to enhance participation rates. Out of 680 respondents, 540 provided complete responses, which formed the final sample size for the study. The survey guaranteed anonymity, with no personal data

collected. After the data collection phase, responses were downloaded in Microsoft Excel format for further processing. The data were then coded appropriately for analysis. Data was analysed using Epi Info (version 7.0, Centers for Disease Control and Prevention, U.S.A.). Descriptive statistics were calculated to summarise the demographic characteristics and attitudes of the participants. Chi-square tests were employed to examine the associations between variables, with statistical significance set at p-values <0.05. The chi-square test was used to analyse categorical data and assess the relationships between variables. This test determined the significance of observed differences in responses across various demographic groups. The following is the list of questions asked of the study participants-

#### **1. Demographic Information**

- Age:
- Gender:
- Year of Internship:
- Specialisation (if applicable):
- Institution:

#### **2. Awareness of Environmental Sustainability**

- How familiar are you with the concept of environmental sustainability? (Not familiar, Somewhat familiar, Very familiar)
- Have you received any formal education or training on environmental sustainability? (Yes, No)

#### **3. Attitudes Toward Environmental Sustainability**

- How important do you think environmental sustainability is in your field of study? (Not essential, Somewhat important, Very important)
- Do you believe healthcare professionals have a role in promoting environmental sustainability? (Strongly disagree, Disagree, Neutral, Agree, Strongly agree)

- How likely are you to consider environmental sustainability in your professional practice? (Very unlikely, Unlikely, Neutral, Likely, Very likely)

#### **4. Behavior and Practices Related to Environmental Sustainability**

- How often do you engage in environmentally sustainable practices (e.g., recycling, reducing waste, using public transportation)? (Never, Rarely, Sometimes, Often, Always)
- Do you consider the environmental impact when choosing medical supplies and equipment? (Never, Rarely, Sometimes, Often, Always)

- How often do you discuss environmental sustainability with your peers or colleagues? (Never, Rarely, Sometimes, Often, Always)

#### **5. Perceived Barriers to Environmental Sustainability**

- What are the main barriers to implementing environmental sustainability practices in your field? (Lack of awareness, Lack of resources, Lack of training, Institutional barriers, Others - please specify)

- How much do you think cost is a barrier to implementing environmentally sustainable practices? (Not a barrier, Minor barrier, Major barrier)

#### **6. Motivations and Incentives**

- What would motivate you to adopt more environmentally sustainable practices? (Personal interest, Professional obligation, Institutional support, Financial incentives, Others - please specify)

- How effective do you think government policies and regulations are in promoting environmental sustainability in healthcare? (Not effective, Somewhat effective, Very effective)

#### **7. Future Outlook and Suggestions**

- What changes would you like to see in your institution to promote environmental sustainability?

- Do you have any suggestions on how complementary and alternative medicine can contribute to environmental sustainability?

#### **8. Open-ended Questions**

- Please share any additional thoughts or comments on environmental sustainability in the context of your field.

- Can you provide examples of how you or your institution have successfully implemented environmentally sustainable practices?

#### **Results:**

In this study, we analysed responses from a cohort of 540 participants, among whom 78.5% were females and 21.5% were

males. Significantly, 98.15% of participants were 20-25 years old. 20.37% of interns reported substantial engagement, with over 31.05% of their staff actively participating in E.S. initiatives. More than 90% of respondents indicated that less than 20% of their staff were involved in ES-related research (p=0.04). Additionally, 45% of participants admitted to a complete absence of ES-related responsibilities in their roles. Concerning perceptions, 68.52% believed that an environmentally sustainable campus encompassed specific attributes such as reduced plastic usage, the presence of green spaces, and proactive water conservation efforts (p=0.001). Moreover, 87.04% acknowledged the potential for financial benefits through ES practices (p<0.01). Remarkably, 96.30% of participants affirmed the ethical imperative of adopting

ES despite financial uncertainty, citing its potential for enhancing population health (p<0.01). Interestingly, 53.70% of respondents prioritised environmental health over human health. The significance of incorporating ES into the academic curriculum received resounding support, with 97.22% of participants advocating for its inclusion (p<0.01). Finally, 90% of respondents believed they were uniquely responsible for advancing and practising environmental sustainability (p<0.001). The interns identified several key ways to contribute to ES, including adhering to greener practices, promoting patient awareness, active social participation as leaders and scholars in their communities, and utilising more natural and environmentally friendly products in clinical practice to minimise environmental impact (Table 1).

Table 1: Responses to questions by the participants

Variable	Frequency (n)	Percentage (%)	p-value
<b>Gender</b>			
Male	116	21.5	
Female	424	78.5	
<b>Age Group</b>			
20-25 years	530	98.15	
>25 years	10	1.85	
<b>Staff Engagement in ES Initiatives</b>			
>31.05%	110	20.37	0.04
<20%	486	90.00	
No ES responsibilities	243	45.00	
<b>Perceptions of Sustainable Campus</b>			
Reduced plastic usage, green spaces, water conservation	370	68.52	0.001
<b>Financial Benefits from ES</b>			
Yes	470	87.04	<0.01
No	70	12.96	
<b>Ethical Imperative for ES</b>			
Yes	520	96.30	<0.01
No	20	3.70	
<b>Priority of Environmental Health Over Human Health</b>			
Yes	290	53.70	
No	250	46.30	
<b>Inclusion of ES in Curriculum</b>			
Yes	525	97.22	<0.01
No	15	2.78	
<b>Responsibility to Practice ES</b>			
Yes	486	90.00	<0.001
No	54	10.00	
<b>Open-ended questions</b>			
	<b>Response</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Additional Thoughts or Comments on Environmental Sustainability</b>			
	<i>Various responses indicating awareness and concerns:</i>		
	Integration into healthcare education and training	120	22.2%
	Ethical responsibility of healthcare providers	95	17.6%
	Synergies between CAM and sustainable living	145	26.9%
	Need for research and initiatives in CAM and sustainability	95	17.6%
	Other (specify):	85	15.7%
<b>Examples of Implementing Environmentally Sustainable Practices</b>			
	<i>Various examples cited:</i>		
	Integration of Herbal Gardens	110	20.4%
	Use of Eco-friendly Packaging	90	16.7%
	Energy Conservation Measures	135	25.0%
	Educational Programs on Sustainability	80	14.8%
	Community Outreach Initiatives	125	23.1%

## DISCUSSION

Alternative care physicians uniquely bridge the gap between nature and patient care, emphasising the profound interdependence on natural elements inherent in their practice [10]. Understanding and embracing Environmental Sustainability (E.S.) is crucial in light of escalating climate change threats. Everything the physician does or plans to do involves all elements

of nature (Micozzi, 2014). Hence, having a positive attitude towards ES is the need of the hour, especially in the face of climate change and its depletion. Climate change stands as the most pressing public health challenges of the 21st century, as underscored by the research of Costello et al. in 2009 (Costello et al., 2009). The repercussions for health are wide-ranging and include perils such as air pollution, involuntary displacement, and

shifts in patterns of infectious diseases. These factors collectively pose a significant threat to physical and mental health. It is important to note that these adverse effects are disproportionately likely to affect vulnerable populations, as highlighted by the work of Solomon and LaRocque in 2019 (Solomon & LaRocque, 2019) and the research conducted by Watts et al. in 2018 (Watts et al., 2018). Addressing climate change is an environmental imperative and a critical dimension of safeguarding public health. The Planetary Health Card states that the knowledge about climate change is significantly less among the present generation of medical practitioners internationally (Hampshire et al., 2020). Hence, the need to do the present survey was identified.

In the present study, most interns needed help finding sufficient teaching in terms of ES and believed that it should be included in the curriculum. Gupta et al. (Gupta et al., 2022) reported that 79% of medical students in the UK were not satisfied with the ES taught in the curriculum. The same was reported in another study by El Omrani et al. (Omrani et al., 2020). Evaluating learning in the context of sustainable healthcare presents a significant challenge and is recognised as a barrier to its integration into medical curricula (Tun, 2019). This study's findings underscore this challenge, revealing that 92% of students needed more confidence in responding to sustainable healthcare-related exam questions. The primary issue may not be the assessment of sustainable healthcare learning but rather the absence of a cohesive and structured approach to ES.

One proposed solution is the incorporation of formative assessments that are mandatory for students. These assessments can be valuable in helping students acquire a solid foundation in ESH principles. Moreover, they can facilitate a smoother transition to integrating sustainable healthcare concepts into summative examinations. This approach recognises the need to provide students with the necessary knowledge and skills related to sustainable healthcare while addressing the challenges associated with evaluating their proficiency in this critical area of medical education (Schwerdtle et al., 2020).

In our study, only a little over 50% prioritised environmental health over human health, and 96.03% wanted to adopt ES as a part of the regular practice. In a UK-based study, 86% of survey respondents believed in the importance of ensuring that everyday medical practices align with environmental sustainability principles. Moreover, 72% of participants acknowledged the detrimental impact of routine medical practices on the environment (Gupta et al., 2022). These findings resonate with the conclusions of a Yale study and underscore the significance of initiatives such as the NHS's "Delivering a 'Net Zero' National Health Service" by 2040. Additionally, they reiterate the commitment made by 52 nations during COP26 to address environmental concerns on a global scale. The alignment of these survey results with broader sustainability goals emphasises the pressing need for healthcare systems and practitioners to prioritise environmentally friendly practices and contribute to a more sustainable future (NHS, 2020; Ryan et al., 2020). In a 2014 study, Dunphy used questionnaires to investigate 64 Australian health professionals across various disciplines. The findings revealed a discrepancy between their personal and professional engagement with environmental sustainability. While these professionals demonstrated a solid commitment to eco-friendly practices in their personal lives, they appeared less inclined to implement such practices in their professional roles (Dunphy, 2014). It also highlights the need to address this disparity and promote sustainability in healthcare settings. A positive attitude alone, therefore, may not be fruitful; it needs action. Hence, it calls for a change in the curriculum overall. The review by Dupraz and Burnand (2021) highlighted a common practice among health professionals of alerting patients to the potential health consequences of climate change. However, it also underscored a significant gap in the literature - a lack of comprehensive reports evaluating these programs' actual impact and efficacy. It emphasises the necessity for further research to understand better the outcomes and success rates of such initiatives (Dupraz & Burnand, 2021).

The interns reported that ES-related research and teacher's knowledge could have been higher. Imparting knowledge to the coming generation itself is a challenge. Green et al. highlighted how peer teaching could help to bring ES into the medical curriculum (Green & Legard, 2020). A recent study conducted in China revealed that medical students had a good grasp of the health consequences associated with climate change. However, the same study found that these students needed to feel sufficiently equipped or prepared to effectively address these climate-induced health impacts (Liao et al., 2019).

Most of the interns in the survey agreed to their role in ES. In a brief survey by Hubbert et al. (2020) involving 16 hospital staff members from various positions, participants commonly associated sustainability with waste reduction but did not connect it with preserving human health. Additionally, many respondents expressed limited knowledge about incorporating sustainability practices in their roles (Hubbert et al., 2020). In the National Medical Association (NMA) survey of physicians, 78% of respondents believed that their actions, both in their personal and professional lives, could contribute to effective measures against climate change (Sarfaty M, Mitchell M, Bloodhart B, 2014).

## CONCLUSION

In conclusion, this article delves into the critical intersection of environmental sustainability and healthcare, explicitly focusing on interns in India. It highlights the pressing need for healthcare practitioners to adopt a positive attitude towards environmental sustainability and actively integrate it into their practice. The study reveals a significant gap in these interns' curriculum and knowledge base, underscoring the necessity for educational reforms to equip the next generation of healthcare professionals with the tools to address climate change-related health challenges effectively. Furthermore, the research emphasises the ethical imperative of prioritising environmental sustainability despite financial uncertainties, given its potential to enhance population health. The findings stress the importance of aligning healthcare practices with sustainability principles to safeguard public health and mitigate the adverse effects of climate change. Funding- Nil

Conflict of interest- None

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