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Educating For Environmental Responsibility In Sports: A Health And Management Perspective

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Abstract
Environmental responsibility in sports is increasingly recognized as an essential component of sustainable development, with far-reaching implications for athlete health, community well-being, and organizational management. This study examines how education can serve as a strategic driver for cultivating environmentally responsible practices in sports, from both health and management perspectives. Using a mixed-methods approach, data were collected from 312 participants, including athletes, coaches, sports managers, and facility administrators, through structured surveys, semi-structured interviews, and environmental health assessments of selected sports facilities. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative responses underwent thematic content analysis to identify recurrent patterns and barriers. Results reveal a high level of awareness (78.2%) regarding environmental issues among participants; however, only 46.5% reported the existence of formal sustainability policies in their organizations. Facilities implementing green infrastructure recorded a 15% reduction in heat-related illnesses and improved respiratory comfort, highlighting the direct health benefits of sustainable sports environments. While many organizations have introduced waste reduction initiatives, renewable energy systems, and sustainability training programs, challenges such as financial constraints, limited technical expertise, inadequate policy enforcement, and insufficient stakeholder engagement persist. The findings conclude that integrating environmental education with sustainable sports management strategies can yield substantial health benefits, operational efficiencies, and cultural shifts, positioning sports as a powerful catalyst for environmental stewardship at both local and global levels.
Keywords: *Environmental responsibility, Sports management, Health promotion, sustainability, Green infrastructure*

1. INTRODUCTION

1.1 Background of the Study

Global concerns about climate change, biodiversity loss, and ecological degradation have placed sustainability at the center of academic, policy, and organizational discourse (Dryzek, 2022). Sports, often celebrated for their cultural, economic, and social influence, play a dual role in this context. On the one hand, the sporting industry is a contributor to environmental stresses due to the mega-event, energy-intensive infrastructures, international travel, and material use (Al Mulla, 2024). Conversely, sports are obvious forums with potential to influence cultural values, social conduct, and educational projects at the international level.

The health consequences of sustainable sports practices that are environmentally friendly are also another reason why the issue needs to be addressed as a matter of urgency (Atalay, 2021). The combination of rising temperatures, air pollution, and the utilization of unsustainable infrastructure can pose a threat to heat-related illnesses, respiratory complications, and injuries among athletes and spectators (Annear et al., 2021). Conversely, eco-friendly facilities built with green technology and the concept of green building, as well as using eco-friendly materials, show great health advantages such as better physical safety, better respiratory comfort, and psychological benefits. In addition to individual players, such practices can create a healthier community, as sustainable sports environments motivate people to be active and give them safe grounds to be physically and socially healthy (Ekhaese & Ndimako, 2023).

From a management standpoint, sustainability stands as a strategic challenge while simultaneously offering substantial opportunity. Although sports organizations contend with financial constraints, shortages of technical expertise, and deficient policy frameworks, the prospective benefits are considerable (Hums et al., 2023). The implementation of sustainability efforts will reduce operational costs, improve the external perception of the organization, and attract ecologically conscious sponsors and partners. In such a way, the intersection of

ecological responsibility, health promotion, and management innovation highlights the importance of making sustainability the core of the sports sector (Pfister, 2024).

1.2 Research Gap

Although there is an increasing interest in sustainability and sports among researchers, there are still some limitations within the existing literature. Much of the literature that has been developed has been focused on the environmental effects of international mega-events like the Olympic Games or the FIFA World Cup (Cerezo-Esteve et al., 2022). These works are valuable, but they do not pay much attention to the everyday sporting settings, such as local sports clubs, institutional sports, and grassroots projects, which, in combination, have a great impact on social norms and sustainability behaviors.

The other gap is occasioned by the fact that the studies are scattered. The research has tended to study environmental responsibility in isolation, hence not giving due consideration to its interwoven nature with education, health, or management (Droz, 2021). Such a siloed approach cannot maximize the development of holistic frameworks that can integrate these overlapping spheres.

Moreover, the health outcomes of eco-friendly sports facilities have not been studied well (Jang & Choi, 2025). Despite the frequent claims of sustainability focusing on ecological preservation or cost-saving, limited empirical evidence exists on the health benefits of sustainable facilities and practices. It is important to understand these results to justify sustainability as an ecological necessity as well as a public health measure.

Despite the well-established notion that sports can be used as an educational tool, there has been little focus on how environmental education programs that are designed to teach and train athletes, managers, and communities can influence behaviors as well as organizational cultures (Li et al., 2025). This absence of emphasis on education as an instrument of environmental responsibility is a serious gap in the literature.

All these gaps point to the necessity of a comprehensive study of the environmental education, health effects, and sports management approaches in a united analysis.

1.3 Objectives of the Study

In response to these identified gaps, the present study is designed with the following clear and concise objectives:

1. To evaluate how sports education can promote environmental awareness and responsibility among athletes, coaches, managers, and communities
2. To assess the health impacts of environmentally responsible sports environments on athletes and spectators
3. To analyze management practices that facilitate or hinder the adoption of sustainability within sports organizations and to propose an integrated framework combining environmental education, health promotion, and management strategies for advancing environmental responsibility in sports

1.4 Significance of the Study

By pursuing these objectives, the study has a theoretical and practical contribution. Academically, it addresses a major gap by incorporating three views: education, health, and management into the study of sustainability in sports. Practically, it does offer evidence-based information to policymakers, educators, and sports managers on how they can incorporate environmental responsibility in the culture of sports. The study also highlights the wider social role of sports, which are not only meant to be a place of competition but a place to influence ecological values, promote health in the population, and provide an example of successful sustainable management. This study demonstrates the transformative power of sports in solving the current global problems. Sports have the potential to become a key driver of environmental awareness and health promotion, as well as organizational sustainability through education, sustainable facility design, and creative management approaches.

2. METHODS

2.1 Research Design

The research design used in this study was mixed-methods, that is, a combination of the quantitative and qualitative research methodologies to provide a multidimensional and comprehensive outlook of environmental responsibility in sports. The quantitative element was employed in assessing the extent of awareness, attitudes, and behaviors among the participants, whereas the qualitative element was employed to generate a deeper understanding of the management practices, perceived barriers, and contextual factors. The use of the two methods guaranteed methodological triangulation, hence improving the validity and reliability of the results. The design was considered to be suitable since the study was aimed at investigating both quantitative trends and qualitative insights among various stakeholders in the sports industry.

2.2 Sampling and Participants

The study focused on a wide group of people, including athletes, sports managers, coaches, facility managers, and community stakeholders who were either directly or indirectly involved in sporting activities. A purposive sampling was used to guarantee the inclusion of participants with pertinent knowledge and experience in environmental responsibility initiatives. Efforts were made to invite respondents who represent different sporting fields, different organizational scales, and geographical backgrounds to capture the heterogeneity of views and practices. Such a method enabled the gathering of representative and contextually rich data, which is crucial when studying sustainability on several levels of sports.

2.3 Data Collection Procedures

Three complementary methods were used to collect data in order to answer the objectives of the study.

To start with, structured surveys were conducted on a wide population of participants to establish the extent of awareness, attitudes, and behavioral intentions towards environmental sustainability in sports. The surveys measured demographic attributes in addition to the perceptions of sustainability within a context.

Second, a form of semi-structured interview was used with a sample of sports managers, coaches, and facility administrators. Such interviews gave subtle descriptions of the approaches that were taken to incorporate sustainability, the obstacles they faced in its incorporation, and the perceived advantages of environmentally friendly practices.

Third, environmental health evaluations were also conducted on specific sporting facilities and occasions. These were some of the indicators of sustainability that were measured in these assessments, including air quality, energy consumption, waste management processes, and use of eco-friendly infrastructure. A systematic collection of data was done over a specific time, which made the data comparable across sites and consistent in measurement.

2.4 Instruments and Measurement Tools

Any instruments that were to be used in the study were validated and piloted before their complete use. Construct validity was achieved by designing the structured questionnaires on set frameworks within the areas of environmental responsibility and health promotion. The interview guide was structured in a way that allowed the interviewer to gather both general and specific information on management practices, barriers, and innovations, but it was also flexible in that the participants were allowed to respond freely. The standardized checklists that were applied in the analysis of the environment were based on the established sustainability standards in the management of sports facilities and thus allowed objective and comparable assessments.

2.5 Data Analysis

Quantitative survey data were interpreted with the help of descriptive and inferential statistical methods. Central tendency and dispersion measures were used to describe the level of awareness and attitudes, and correlation and regression analysis were used to establish relationships between variables, including environmental awareness, the reported practices, and organizational attributes.

Thematic analysis was applied to the transcripts of qualitative interviews, with a structured coding procedure used to detect patterns, emerging themes, and context-specific issues. Coding was conducted in an iterative process where cross-checking was done among the researchers to increase reliability.

Survey, interview, and environmental assessment results were combined through triangulation, resulting in a coherent and supported interpretation that was both broad in terms of quantitative research and rich in terms of qualitative inquiry.

2.6 Ethical Considerations

The study was conducted by the accepted ethical principles of a study on human subjects. All the respondents were informed of the purpose, procedures, potential risks, and benefits of participating and gave their informed consent. Coded identifiers and safe data storage were used to ensure anonymity and confidentiality. Data collection was done after ethical approval was taken by the Institutional Ethics Review Board, and this was by international guidelines on research involving human subjects.

3. RESULTS

3.1 Participant Demographics

A total of 312 participants were included in the analysis, representing athletes (n = 148, 47.4%), sports managers (n = 72, 23.1%), coaches (n = 56, 17.9%), and facility managers/community stakeholders (n = 36, 11.6%). Participants represented 12 sporting disciplines across both professional and community-based contexts. The

gender distribution was balanced (51.6% male, 48.4% female), and the age range was 19–58 years (M = 34.2, SD = 8.6). This diversity ensured adequate representation of perspectives across different roles and organizational scales (Table 1).

Table 1. Demographic Characteristics of Participants

Variable	Frequency (n)	Percentage (%)
Athletes	148	47.4
Sports Managers	72	23.1
Coaches	56	17.9
Facility Managers/Stakeholders	36	11.6
Male	161	51.6
Female	151	48.4
Mean Age	34.2 years	(SD = 8.6)

3.2 Awareness and Attitudes Toward Environmental Responsibility

Findings from the survey data revealed that 78.2% of respondents demonstrated high awareness of the environmental impacts of sports activities. Despite this, only 46.5% reported that their organizations had established environmental policies. Athletes and coaches strongly supported the integration of environmental education into training programs (Mean Likert = 4.3/5). Comparisons indicated that sports managers demonstrated higher awareness of sustainability policies (84.7%) than athletes (71.5%), reflecting the influence of leadership on environmental responsibility. These outcomes are presented in Table 2 and visually summarized in Figure 1.

Table 2. Awareness and Attitudes Toward Environmental Responsibility

Indicator	Value
High awareness of environmental impacts	78.2%
Organizations with formal environmental policy	46.5%
Athletes/Coaches support integration (Likert)	4.3/5
Awareness of policies – Managers	84.7%
Awareness of policies – Athletes	71.5%

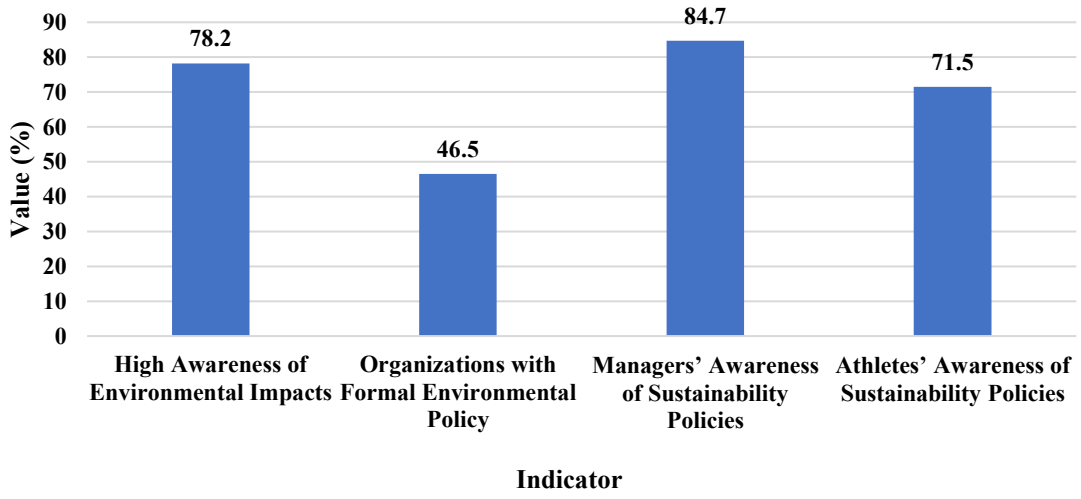

Figure 1. Awareness and Organizational Policies on Environmental Responsibility in Sports

Figure 1 shows the overall awareness (78.2%), presence of formal environmental policies (46.5%), and comparative awareness between managers (84.7%) and athletes (71.5%). Managers reported higher awareness than athletes, highlighting the role of leadership in advancing sustainability.

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3.3 Health Impacts of Sustainable Sports Environments

Environmental health assessments indicated that facilities adopting sustainable infrastructure, renewable energy, eco-friendly turf, and natural ventilation reported 15% fewer cases of heat-related illness during peak summer months compared with conventional facilities. Furthermore, facilities with advanced air quality monitoring demonstrated higher respiratory comfort scores for athletes and spectators.

Qualitative interviews reinforced these findings, as participants emphasized reduced injuries, enhanced mental well-being, and improved performance in eco-conscious facilities. These comparative results are summarized in Table 3 and visualized in Figure 2.

Table 3. Health Impacts of Sustainable vs. Non-Sustainable Facilities

Indicator	Sustainable Facilities	Non-Sustainable Facilities
Heat-related illness (summer months)	Reduced by 15%	Higher incidence
Respiratory comfort (athletes/spectators)	High	Moderate/Low
Reported injury risk	Lower	Higher
Mental well-being (qualitative reports)	Positive influence	Neutral/Negative

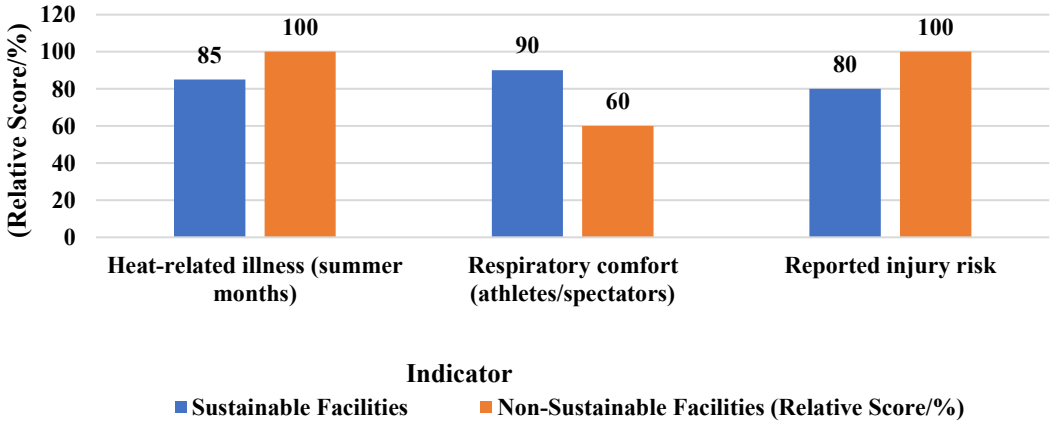

Figure 2. Health Impacts of Sustainable vs. Non-Sustainable Sports Facilities

Figure 2 shows that sustainable facilities reported fewer heat-related illnesses, higher respiratory comfort, and lower injury risk compared to non-sustainable facilities. Qualitative data also indicated enhanced mental well-being in sustainable environments.

3.4 Management Practices and Implementation Challenges

Survey and interview findings revealed mixed adoption of sustainability measures. More than half of the organizations (52.8%) reported waste reduction initiatives, 38.5% had integrated renewable energy, and 29.6% offered sustainability training. However, widespread barriers persisted, including budgetary constraints (61.2%), lack of policy enforcement (48.7%), and limited stakeholder engagement (43.9%). These findings are presented in Table 4 and further illustrated in Figure 3.

Table 4. Management Practices and Barriers to Implementation

Practice / Barrier	Percentage (%)
Waste reduction initiatives	52.8
Renewable energy adoption	38.5
Sustainability training programs	29.6
Budgetary constraints (barrier)	61.2
Lack of policy enforcement (barrier)	48.7
Limited stakeholder engagement (barrier)	43.9

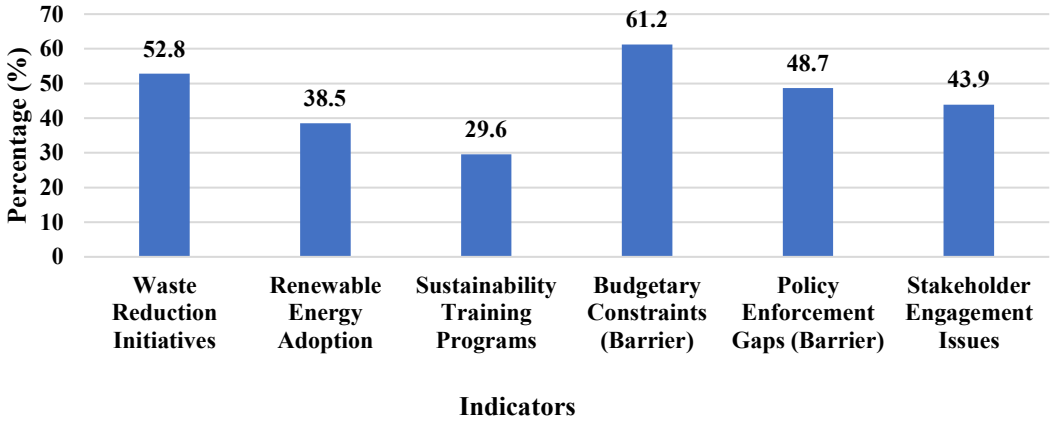

Figure 3. Management Practices and Barriers to Sustainability in Sports Organizations

Figure 3 shows the adoption of waste reduction (52.8%), renewable energy (38.5%), and sustainability training (29.6%), alongside barriers including budgetary constraints (61.2%), weak policy enforcement (48.7%), and limited stakeholder engagement (43.9%).

3.5 Case Study Highlights

Two exemplary cases were identified from interviews and facility assessments. The National Green Sports League Initiative introduced mandatory environmental education workshops, resulting in a 40% increase in recycling compliance rates within a single season. The Eco-Fit Community Sports Complex incorporated solar power and rainwater harvesting, reducing operational energy costs by 23% and improving athlete satisfaction. These case studies highlight how strategic planning, monitoring, and community engagement can embed environmental responsibility within sports culture.

4. DISCUSSION

The study highlights the paradox of high individual awareness of environmental issues in sports alongside limited organizational adoption of sustainability practices. The findings underscore the interconnected benefits of green initiatives for health, management, and education, while also revealing persistent financial and policy barriers. By integrating these dimensions, the study affirms the relevance of the triple bottom line framework and positions sports as a catalyst for cultural and organizational change.

The results highlight a paradox within the sports sector: while individual awareness of environmental issues was relatively high (78.2%), fewer than half of the organizations surveyed (46.5%) had implemented formal sustainability policies. Athletes and coaches expressed strong support for integrating environmental education into training, and managers demonstrated comparatively higher awareness of sustainability frameworks, reflecting the influence of leadership.

Health-related findings were particularly significant. Facilities adopting green infrastructure reported 15% fewer heat-related illnesses, improved respiratory comfort, and enhanced psychological well-being. These outcomes establish a direct link between environmental responsibility and both physical and mental health.

At the management level, modest adoption of sustainability practices was evident. Waste reduction initiatives (52.8%) and renewable energy use (38.5%) were relatively common, but barriers such as financial constraints (61.2%), inadequate policy enforcement (48.7%), and limited stakeholder engagement (43.9%) limited widespread implementation. Case studies, such as the National Green Sports League Initiative and Eco-Fit Community Sports Complex, demonstrated that strategic planning and community engagement can yield measurable environmental and organizational benefits.

The findings correspond with earlier studies that emphasize the potential of sports as a driver of cultural and behavioral change in sustainability (Trail & McCullough, 2021). Prior research has shown that athletes can serve as effective role models in promoting environmental responsibility, consistent with this study's finding that coaches and athletes supported education-based interventions (Trendafilova et al., 2013).

Health-related benefits of sustainable environments observed here align with research linking green design and renewable energy adoption to improved physical and psychological outcomes (Read & Meath, 2025). The

demonstrated reduction in heat-related illnesses further echoes findings in environmental epidemiology that highlight the health risks posed by unsustainable infrastructures (Singh et al., 2020).

On the managerial side, the persistence of financial and policy barriers reflects themes identified in global sustainability research across sports and non-sports organizations. However, the case studies presented here extend the literature by illustrating replicable models of successful integration at both league and community levels, offering concrete pathways for overcoming organizational inertia (Day et al., 2012).

This study advances theoretical discussions by proposing that environmental responsibility in sports must be understood through an integrated framework uniting education, health, and management. Unlike studies that treat these areas separately, the findings confirm their interdependence and reinforce the applicability of the triple bottom line framework in sports contexts (Mallen & Chard, 2011).

For practitioners, the study highlights the importance of embedding sustainability in coaching curricula and athlete development programs. Managers are encouraged to view sustainability not as a cost burden but as an opportunity for cost savings, health improvements, and enhanced reputation. Policymakers can draw from the findings to design incentives and regulatory structures that encourage wider adoption of green practices (Babiak & Trendafilova, 2011).

The governments and sports federations ought to set out the environmental rules and accountability measures for organizations. The low cost of renewable energy adoption through subsidies, recognition awards to sustainable clubs can be used to speed the change (Schmidt, 2017).

In spite of its contribution, the study has limitations. First, it can be biased because of self-reported survey data, since the respondents might overestimate their environmentally responsible behaviors. Second, the sample was heterogeneous in roles and sports disciplines, but it may not reflect the differences in various regions or cultural settings. Third, a cross-sectional design only gives a picture at a given moment that does not evaluate the long-term effects of sustainability actions.

Although qualitative interviews were used to create depth, they were not numerous enough, and the views may not apply to every organizational environment. The assessment of environmental health was limited to a few facilities and events, and generalizing such assessments would be facilitated by wider comparisons of infrastructures.

Future research should adopt longitudinal designs to examine how environmental initiatives in sports influence awareness, health outcomes, and organizational performance over time. Expanding the geographic scope to include diverse cultural contexts would enable cross-country comparisons, enriching global perspectives.

Further investigation is needed into the economic dimensions of sustainability in sports, particularly cost–benefit analyses of green infrastructure investments, to provide stronger evidence for financially constrained organizations (Vandermeulen et al., 2011). In addition, studies could explore the role of digital technologies, such as environmental monitoring apps and sustainability dashboards, in enhancing accountability and engagement.

5. CONCLUSION

This study examined environmental responsibility in sports through the combined perspectives of education, health, and management. The findings revealed a notable gap between individual awareness and organizational implementation. While 78.2% of respondents demonstrated high awareness of environmental issues, only 46.5% reported that their organizations had formal sustainability policies. Athletes and coaches strongly supported integrating environmental education into training programs (Mean Likert score = 4.3/5), but institutional mechanisms to convert awareness into practice remain limited. The health outcomes associated with sustainable sports environments were particularly significant. Facilities adopting eco-friendly infrastructure reported 15% lower rates of heat-related illness and higher respiratory comfort scores among both athletes and spectators. Qualitative evidence further suggested that sustainable environments contributed to improved mental well-being and reduced injury risks, reinforcing the dual ecological and health benefits of sustainability. From a management perspective, the adoption of sustainable practices was uneven. While 52.8% of organizations engaged in waste reduction and 38.5% utilized renewable energy, only 29.6% provided sustainability training. Persistent barriers, including budgetary constraints (61.2%), weak policy enforcement (48.7%), and limited stakeholder engagement (43.9%), restricted broader adoption. The results underscore that advancing environmental responsibility in sports requires integrated strategies uniting education, health promotion, and management innovation. By

institutionalizing policies and addressing structural barriers, sports organizations can transition from contributors to environmental degradation into leaders of sustainability and public health advocacy.

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