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7. Strategic Drivers and Institutional Challenges in Implementing Sustainable Practices in the United Arab Emirates (UAE) Healthcare

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Abstract

This study examines the impact of knowledge, perceived barriers, and enabling resources on the adoption of sustainable healthcare practices among professionals in the United Arab Emirates (UAE). Employing a mixed-methods design, quantitative data from 512 healthcare workers were analyzed using descriptive statistics, ANOVA, chi-square tests, and multiple regression models. A qualitative case study of a mid-sized accredited hospital provided contextual depth. Findings indicate that awareness of sustainability principles ($\beta = 0.41$, $p < 0.001$) and leadership visibility ($\beta = 0.36$, $p = 0.002$) are strong predictors of engagement, yet implementation is hindered by limited technical expertise, weak institutional coordination, and resource constraints, particularly in private-sector units lacking formal policy structures. Chi-square analysis confirmed a significant association between training availability and adoption ($\chi^2(4, N=512) = 26.47$, $p < 0.001$), while ANOVA revealed significant differences in adoption across institutional types ($F(2, 509) = 8.62$, $p < 0.001$). Despite this, 56.3% of professionals reported no formal participation in sustainability initiatives. Leadership visibility and departmental context significantly moderated these relationships, with structured leadership involvement, role-specific training, and dedicated sustainability positions identified as critical enablers. The case study further highlights disparities in analytical capacity and the influence of recognition systems on staff behavior. Drawing on SEST, RBV, TPB, and

Kotter's Change Model, this research proposes the Sustainable Reported Outcomes Measure for Healthcare Sustainability (SROMS), a conceptual framework to guide institutions within a Value-Based Healthcare model. The Swiss Business School Research Advisory Board granted ethical approval. The findings contribute to international sustainability discourse and provide actionable guidance for advancing sustainable practices in healthcare institutions. They informed the development of the Sustainability Reported Outcomes Measure for Healthcare (SROMS), a sector-specific framework that integrates sustainability with quality and safety, offering a practical pathway for adoption in UAE healthcare and beyond.

Keywords**:** *UAE healthcare system; Sustainable healthcare, Healthcare professionals, Organizational readiness, Leadership support, Value-based healthcare, sustainability adoption.*

7.1 Introduction

Healthcare is paradoxical in its mission and footprint: while dedicated to healing, it contributes an estimated 4–5% of global greenhouse gas emissions, alongside substantial water, energy, and material use and significant waste generation (Health Care Without Harm & Arup, 2023; Karliner et al., 2020; Lenzen et al., 2020). Hospitals, in particular, are among the most energy-intensive commercial buildings worldwide, often consuming more than twice the energy per square meter of office buildings due to the need for continuous climate control, advanced equipment, and round-the-clock operations (U.S. Environmental Protection Agency, 2021). These facts position the sector as both a significant resource consumer and a crucial actor in promoting environmental sustainability.

Against this global backdrop, the United Arab Emirates (UAE) has amplified its commitment to sustainability through initiatives such as the Net Zero by 2050 strategy, Vision 2021, and the Green Agenda 2030. The country's hosting of COP28 further catalyzed cross-sector alignment around climate action. Yet, the UAE health system operates in a resource-intensive climatic context: extreme temperatures necessitate high energy use, while healthcare waste generation per occupied bed remains substantial, imposing both environmental and financial burdens (Health and Environmental Statistics UAE, 2021; Sustainable Healthcare UAE Report, 2022).

Despite a supportive policy environment and regulator attention (e.g., Dubai Health Authority, Department of Health–Abu Dhabi), the translation of sustainability commitments into consistent practice remains limited. Barriers include institutional inertia, financing constraints, competing clinical priorities, and gaps in governance and data infrastructure. At the professional level, limited technical knowledge, role-specific training, and recognition mechanisms restrict meaningful engagement (Radwan et al., 2021). Existing research from the region largely emphasizes macro-level policies and environmental metrics, leaving practice-level determinants, such as healthcare professionals' knowledge, perceptions, and access to resources, underexplored (Alkhaldi et al., 2023).

This study addresses this critical knowledge gap by examining the factors that facilitate or impede the adoption of sustainable practices among healthcare professionals in the UAE. Specifically, it investigates three domains: knowledge, perceived barriers, and enabling resources. Using a mixed-methods design, this study combines a quantitative survey of healthcare professionals with a qualitative case study of a mid-sized, accredited hospital, exploring how leadership visibility, departmental context, and institutional coordination influence engagement. The analysis is guided by theoretical lenses including the Socio-Ecological Systems Theory, the Resource-Based View, the Theory of Planned Behavior, and Kotter's Change Model, which together situate sustainability adoption as a function of capability, motivation, opportunity, and context.

The study aims to generate actionable, context-appropriate recommendations for healthcare organizations and policymakers in the UAE. Empirically, it provides evidence on the links between awareness, barriers, and engagement, while identifying institutional moderators such as leadership visibility and departmental culture. Practically, it highlights levers, including role-specific training, sustainability-focused positions, leadership routines, and data-driven resource stewardship. Policy-wise, the findings align with the UAE's Net Zero 2050 strategy and the Sustainable

Development Goals by linking environmental performance to healthcare quality, resilience, and cost efficiency.

By centering healthcare professionals as agents of change within multi-level systems, this study contributes both locally and globally to understanding how awareness can be transformed into action, and how sustainability can be operationalized in healthcare as an achievable, measurable, and scalable priority.

7.2 Critical Literature Review

7.2.1 Introduction

Healthcare sustainability refers to the integration of environmental, social, and economic principles into health systems to ensure long-term viability, equitable access, and minimal ecological impact (Khan et al., 2018). Globally, healthcare accounts for 4–5% of greenhouse gas emissions—comparable to the aviation sector—while consuming substantial volumes of energy, water, and raw materials (Karliner et al., 2020; Health Care Without Harm, 2022). In the United Arab Emirates (UAE), the sector's footprint is amplified by rapid urbanization, climate extremes, water scarcity, and reliance on imported supplies (Radwan & Khalil, 2021).

> Although the UAE has introduced national frameworks, such as Net Zero by 2050 and Vision 2071, as well as commitments made at COP28, the environmental impact of healthcare remains underexplored. This review synthesizes global and regional scholarship, highlights barriers and enablers, and situates the UAE context within an integrated theoretical lens.

7.2.2 Theoretical Perspectives

To interpret the adoption of sustainability in healthcare, three complementary frameworks are applied. Socio-ecological systems theory (SEST) emphasizes interactions across policy (macro), organizational (meso), and individual (micro) levels (Ostrom, 2009). The Resource-Based View (RBV) emphasizes how internal resources, leadership, human capital, and infrastructure collectively shape an institution's capacity (Barney, 1991). Kotter's Change Model offers a roadmap for overcoming resistance and embedding change (Kotter, 1996). Together, these perspectives encompass external structures, internal capacities, and behavioral processes, providing a multidimensional foundation for understanding the sustainability of UAE healthcare.

7.2.3 Sustainability in Healthcare

Concept and importance. Sustainability in healthcare encompasses minimizing environmental impact while safeguarding equity and efficiency (Kruk et al., 2019). It aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 3 (health) and SDG 12 (responsible consumption). Globally, most studies emphasize energy efficiency, waste reduction, or carbon neutrality (Lenzen et al., 2020). In the UAE, however, research remains limited and largely descriptive, focused on infrastructural greening and policy statements (Radwan & Khalil, 2021).

Dimensions:

- *Environmental sustainability*: Hospitals worldwide are energy-intensive; examples in the UAE include solar-powered extensions and efficiency retrofits (Radwan & Khalil, 2021). Yet systematic monitoring remains nascent.
- *Social sustainability*: Early programs, such as mobile clinics and outreach, reflect progress; however, unlike the UK's NHS or Singapore's healthcare systems, equity has not yet been mainstreamed into the UAE's healthcare systems.
- *Economic sustainability*: Initiatives like SEHA's centralized electronic health record system have achieved 15% cost savings, but integrated cost–qualit models are still in development.

7.2.4 Adoption in UAE Healthcare

In some UAE institutions, pilot initiatives in green buildings, advanced waste management, sustainable procurement, and telemedicine have been introduced. Leadership examples include the Cleveland Clinic Abu Dhabi Green Team and the solar power adoption at Sheikh Khalifa Medical City. However, most of these efforts remain isolated pilots rather than systemic strategies

7.2.5 Barriers and Facilitators

7.2.5.1 Key barriers

A central barrier was the lack of internal resources—both financial and human. Staff repeatedly reported insufficient funding streams, limited allocation of time, and absence of sustainability-dedicated roles, which constrained implementation. Another barrier was fragmented coordination between departments, with sustainability often siloed under quality or risk management rather than embedded in organizational strategy. Leadership support was inconsistent: while verbal endorsements existed, these were rarely translated into tangible policies, protected time, or resource allocation. Knowledge gaps were also evident. Many clinical and support staff equated sustainability solely with recycling or energy reduction, reflecting a superficial understanding of broader system-level initiatives. These findings are consistent with prior research highlighting resource constraints and weak accountability structures as recurring obstacles in healthcare sustainability (Radwan et al., 2021)

7.2.5.2 Facilitators

Despite persistent barriers, several facilitators are supporting the gradual integration of sustainability into UAE healthcare:

- Targeted training and awareness programs have shown promise. For example, initiatives in Dubai Healthcare City included energy conservation projects and staff engagement campaigns that contributed to measurable cost and energy savings (Sharaf DG Energy, 2020). While formal evaluation of training impact remains limited, these examples suggest potential for replication.

- Leadership commitment has emerged as a visible enabler. Cleveland Clinic Abu Dhabi has publicly reported sustainability milestones, including reductions in greenhouse gas emissions and water usage, which are supported by facility retrofits and the implementation of solar technology. Such leadership signals strengthen institutional culture and legitimize sustainability as part of the core strategy.
- Government-led initiatives provide an enabling environment. National and emirate-level agencies, such as the Dubai Health Authority, have adopted advanced green building standards and implemented energy-efficiency retrofits, aligning with broader UAE strategies, including Net Zero 2050 and Green Agenda 2030.
- Cross-sector collaboration and accreditation frameworks act as additional facilitators. Partnerships with industry and academic stakeholders have enabled the development of LEED-certified healthcare facilities and the early integration of sustainability themes into curricula. International accreditation systems, including JCI, also encourage hospitals to formalize environmental practices as part of quality and safety governance.

Together, these facilitators illustrate how training, leadership, policy, and cross-sector engagement can create momentum for sustainability in healthcare. However, most initiatives remain localized pilots rather than system-wide strategies, underscoring the need for broader institutionalization and standardization.

7.2.6 Gaps in Literature

However, despite this progress, critical gaps persist (see Table 1), highlighting the need for stronger institutionalization, standardized reporting, and alignment with the UAE's Net Zero 2050 targets.

Table 1: Literature Gaps in Sustainability in Healthcare

Type of Gap	Description
Thematic	Overemphasis on social/economic dimensions; limited focus on environmental strategies like carbon auditing.
Population	Frontline professionals (nurses, technicians, administrators) are underrepresented; focus remains on students or senior leaders.
Conceptual	Few studies integrate a theoretical framework to analyze behaviors as SEST, RBV, or Kotter's Change Model.
Methodological	Reliance on perception surveys; lack of mixed methods or longitudinal designs.
Policy Integration	Weak analysis of how national strategies (Vision 2071, Green Agenda 2030) translate into institutional practice in UAE.

Literature synthesis underscores that while UAE healthcare institutions have piloted promising initiatives, systemic adoption remains limited by structural, cultural, and resource barriers. Facilitators such as leadership engagement, targeted training, and supportive policy frameworks

show potential but require consolidation and scaling. Table 2 summarizes the key insights from the literature review, providing a structured overview of the barriers, facilitators, and gaps that will guide the current study.

Table 2: Summary of Key Insights from the Literature Review

Category	Theme	Description
Barriers	Lack of Awareness & Training	Insufficient knowledge among healthcare staff on sustainability practices.
	Resistance to Organizational Change	Entrenched workflows and cultural resistance to new practices.
	Resource Constraints	Deficiencies in funding, infrastructure, or human capital.
	Cultural & Policy Misalignment	Cultural perceptions and a lack of clear local policy mandates on sustainability.
Enablers	Leadership & Institutional Support	Senior leadership commitment anchors sustainability in strategy.
	Technology Integration	Tools like Electronic Health Records (EHRs), Emergency Medical Services (EMS), and waste-tracking systems support ecological efficiency.
	Education & Capacity Building	Training initiatives enhance awareness and readiness for practice.
	Collaboration & Partnerships	Cross-sector collaboration fosters innovation and resource sharing.
Gaps	Environmental Focus Underdeveloped	Lack of attention to ecological metrics like carbon emissions or energy use.
	Limited Frontline Research	Minimal engagement with nurses, admin staff, and on-the-ground implementers.
	Inconsistent Empirical Findings	Conflicting conclusions on awareness, commitment, or practice effectiveness.
	Methodological Weaknesses	Heavy reliance on self-reported data and limited use of triangulation.

7.2.7 Conclusion

The literature demonstrates that healthcare sustainability in the UAE is a national priority but still in an early, fragmented stage. A strong policy intent exists, but awareness gaps, cultural perceptions, and resource constraints hinder its practical adoption. Facilitators such as leadership, training, and partnerships offer promise but remain unevenly applied. Addressing these gaps requires rigorous, context-specific research and frameworks that link macro-level strategies with meso- and micro-level adoption.

7.3 Methodology

7.3.1 Study Design

This study employed a mixed-methods design, combining a cross-sectional survey with a qualitative case study. The survey provided breadth by capturing perceptions across a large, diverse sample, while the qualitative phase offered contextual depth through interviews and document analysis.

Ordinal logistic regression identified predictors of adoption. Key assumptions (normality, multicollinearity) were checked and satisfied. The qualitative phase involved a case study of a mid-sized, accredited hospital, which included semi-structured interviews with 12 department heads and document analysis. This triangulation integrated numerical breadth with contextual depth.

7.3.2 Quantitative Phase

7.3.2.1 Sampling and Participants

A total of 512 healthcare professionals from public, private, and semi-government institutions participated. The sample comprised clinicians (45%), administrators (32%), and sustainability officers (23%). Stratified recruitment through professional networks and institutional outreach ensured representation across roles and facility types.

7.3.2.2 Data Collection

A structured online questionnaire, adapted from validated instruments (Bulatovic & Iankova, 2021; Radwan et al., 2021), measured:

- sustainability awareness,
- attitudes and behavioral intentions,
- leadership and organizational support, and
- perceived barriers and enabling resources.

Most items used 5-point Likert scales; pilot testing with 15 participants confirmed clarity and cultural appropriateness.

7.3.2.3 Data Analysis

Data were analyzed with IBM SPSS v27.

- Descriptive statistics summarized demographics and baseline variables.
- Inferential tests included ANOVA, Chi-square, Pearson correlations, and regression models (linear, multinomial logistic, and ordinal logistic) to examine predictors of adoption.
- Statistical assumptions (e.g., normality, multicollinearity) were met.

7.3.3 Qualitative Phase

To contextualize survey findings, a case study was conducted in a mid-sized accredited hospital. Semi-structured interviews with seven key stakeholders, representing strategic and operational levels of the organization, explored leadership commitment, training practices, and resource allocation. In addition, institutional documents and sustainability reports were reviewed. Thematic analysis identified patterns aligned with the theoretical framework.

7.3.4 Integration

Findings from both phases were triangulated, allowing numerical trends to be interpreted in conjunction with institutional insights. This integration strengthened validity and provided a richer understanding of barriers and facilitators of sustainability adoption.

7.3.5 Ethical Considerations

The study received approval from the Research Advisory Board of the Swiss Business School (SBS) and complied with UAE Ministry of Health and Prevention (MOHAP) regulations and the Declaration of Helsinki. Participants provided informed consent electronically; responses were anonymous, stored securely, and aggregated for reporting purposes.

7.3.6 Summary

This mixed-methods approach combined the breadth of survey data with the depth of case study insights, ensuring both statistical robustness and contextual relevance in assessing how UAE healthcare professionals perceive and adopt sustainability practices.

7.4. Results and Findings

7.4.1 Quantitative Results

A total of 512 healthcare professionals participated in the survey: clinicians (45%), administrators (32%), and sustainability or quality officers (23%). Respondents represented both public and private healthcare institutions across the UAE.

Awareness and Knowledge

Overall, 64% of participants reported familiarity with sustainability, yet only 39% linked the concept to healthcare beyond recycling or energy efficiency. Awareness was significantly higher among administrators than clinicians ($p < 0.05$).

Attitudes and Engagement

While 72% expressed positive attitudes toward integrating sustainability into healthcare quality, only 41% reported being actively involved in related initiatives. A moderate, positive correlation was observed between awareness and engagement ($r = 0.45$, $p < 0.05$).

Barriers

Respondents highlighted several obstacles to adoption:

- Lack of time (61%)
- Limited institutional resources (57%)
- Insufficient training opportunities (54%)
- Low leadership visibility (48%)

Chi-square tests confirmed significant associations between training availability and adoption ($\chi^2(4, N = 512) = 26.47, p < 0.001$).

Enablers and Predictors

Regression analyses further clarified the key predictors of adoption:

- Awareness ($\beta = 0.41, p < 0.001$) and leadership visibility ($\beta = 0.36, p = 0.002$) were the strongest predictors.
- Resource availability ($\beta = 0.22, p = 0.018$) showed a moderate effect.
- Together, these factors explained a substantial proportion of variance in adoption rates.

ANOVA indicated significant differences across institutional types ($F(2, 509) = 8.62, p < 0.001$), with public hospitals outperforming private clinics. Ordinal logistic regression revealed that professionals with over 10 years of experience were nearly twice as likely to adopt sustainable practices compared to their peers with fewer years of experience ($OR = 1.82, p = 0.009$).

Despite these predictors, 56.3% of respondents reported no formal engagement in sustainability initiatives, highlighting systemic gaps between positive attitudes and practical adoption.

7.4.2 Case Study Results

To complement the survey, a case study was conducted in a mid-sized accredited UAE hospital. Seven department heads were interviewed, and institutional documents were reviewed.

Organizational Context

Sustainability efforts (e.g., waste segregation, partial digitalization, minor energy upgrades) were present but peripheral, framed as a support function rather than a strategic priority. Leadership often expressed verbal support but delegated responsibility to quality or risk departments, with limited integration into the core strategy.

Thematic Findings

1. Barriers: Staff consistently cited resource shortages, low interdepartmental coordination, and inconsistent leadership engagement as barriers.
2. Leadership and Priorities: Leadership endorsement was visible in principle but weak in follow-through, aligning with broader evidence that sustained managerial commitment is crucial for cultural change.
3. Role of Accreditation: International standards such as JCI served as external motivators for sustainability adoption, rather than internal strategic vision.
4. Knowledge Gaps: Staff often equated sustainability with recycling or energy-saving initiatives, lacking a broader understanding of systemic sustainability goals.

5. Training Impact: Departments with regular, role-specific training showed higher engagement.
6. Recognition: Informal recognition (praise, newsletters) boosted morale but did not translate into long-term engagement without formal integration into performance systems.
7. Departmental Variability: Facilities and administrative units demonstrated stronger sustainability practices compared to clinical teams, where patient care priorities dominated.
8. Resource Constraints: Time and budget limitations framed sustainability as an "add-on" rather than embedded into workflows.
9. Technical Competency: Even staff supportive of sustainability reported difficulty applying technical tools such as emissions tracking or waste quantification.

7.4.3 Integration of Findings

The quantitative and qualitative phases converged on three critical insights:

- Leadership visibility, training, and resources are the strongest enablers of adoption. Regression models quantified their predictive power, while case study interviews showed how their absence weakens staff engagement and departmental consistency.
- Accreditation as a driver: Both datasets highlighted reliance on external standards (e.g., JCI) as catalysts for adoption, reflecting a compliance-driven rather than strategy-driven approach.
- Systemic gaps: Despite favorable attitudes, more than half of respondents (56.3%) reported no formal engagement. The case study revealed that this disconnect stems from resource shortages, competing clinical demands, and uneven departmental priorities.

Together, these findings reinforce that sustainability adoption in UAE healthcare remains fragmented: awareness and motivation are present, but structural integration, capacity-building, and leadership accountability are lacking.

7.5 Discussion

7.5.1 Interpretation of Key Findings

The results of this study provide compelling evidence that awareness, leadership visibility, and training are the most powerful predictors of sustainability adoption in healthcare settings. Regression analysis showed that awareness ($\beta = 0.41$, $p < 0.001$) and leadership visibility ($\beta = 0.36$, $p = 0.002$) significantly predicted adoption, while resource availability ($\beta = 0.22$, $p = 0.018$) contributed moderately. The case study reinforced these findings by illustrating how leadership presence, role-specific training, and structured recognition systems increase engagement, whereas resource constraints, fragmented departmental priorities, and inconsistent governance dilute momentum.

These results are consistent with prior research that highlights the centrality of leadership and resources in shaping sustainability culture (Radwan et al., 2021). They also align with behavioral theories such as the Theory of Planned Behavior, which emphasizes that intention alone is

insufficient without perceived control and enabling structures (Ajzen, 1991). The UAE case adds specificity: despite positive attitudes, 56.3% of respondents reported no formal engagement, revealing a persistent gap between policy ambition and frontline adoption.

7.5.2 The Sustainable Healthcare Adoption Framework

The first conceptual contribution of this research is a **healthcare-specific model for** sustainability adoption (Figure 1). Empirically grounded in survey and case study data, the Sustainable Healthcare Adoption Framework integrates five interrelated components:

1. Knowledge and Awareness – familiarity with sustainability principles and their relevance to healthcare.
2. Perceived Barriers – technical, organizational, and resource-related obstacles limiting adoption.
3. Enabling Resources – leadership visibility, training programs, and infrastructural support.
4. Organizational Readiness – the extent to which policies, governance structures, and cross-departmental coordination are aligned with sustainability objectives.
5. Contextual Moderators – sector type (public vs. private), organizational culture, and professional role.

This framework functions as a diagnostic tool for managers and policymakers. It explains why adoption occurs unevenly across departments and institutions, and it highlights intervention points where leadership, training, and resource allocation can convert awareness into action.

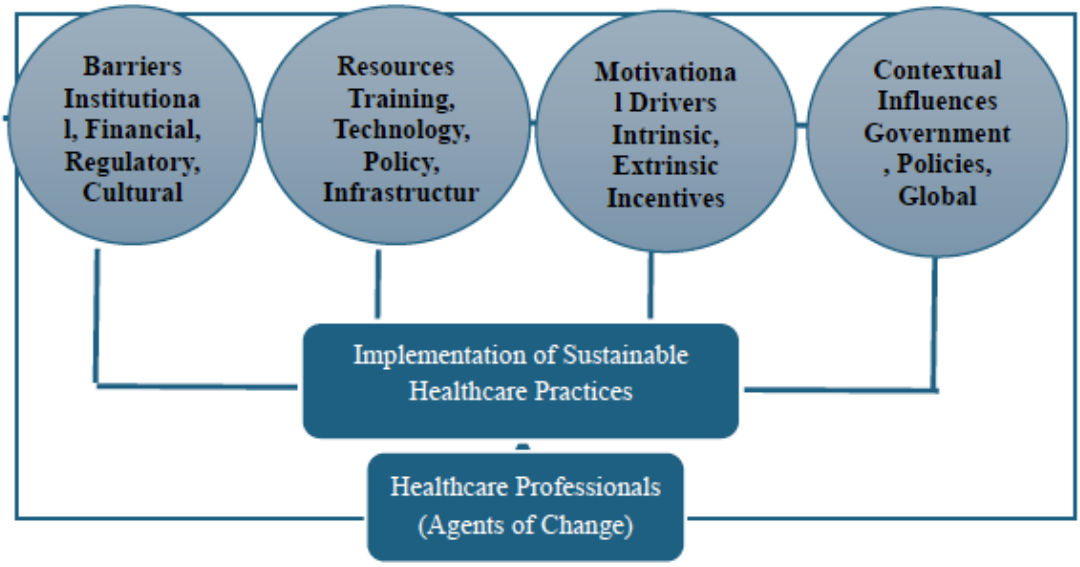

Figure 1. *Sustainable Healthcare Adoption Framework*

7.5.3 The SROMS Framework: A Model for Sustainable Healthcare Integration

A second theoretical and practical contribution of this study is the proposal of a healthcare-specific sustainability reporting framework, the Sustainability Reported Outcomes Measure

for Healthcare (SROMS) (Figure 2).

Unlike generic ESG models, SROMS is purpose-built for the healthcare industry, integrating sustainability with non-negotiable commitments to patient safety and quality of care. It introduces measurable outcomes directly relevant to healthcare delivery, including:

- Carbon emissions per patient bed-day
- Accuracy of clinical waste segregation
- Reduction in single-use plastics without compromising sterility
- Staff engagement in sustainability initiatives
- Patient trust and satisfaction with environmentally safe care environments

The SROMS framework emphasizes five domains:

1. Knowledge: specialized staff training and awareness.
2. Enabling Resources: safe green procurement, infrastructure, and visible leadership support.
3. Organizational Readiness: accreditation-linked policies and governance structures.
4. Moderating Variables: sector, department type, and leadership visibility.
5. Sustainability Outcomes: healthcare-specific, measurable indicators tied to Value-Based
6. Healthcare (VBHC) models.
7.

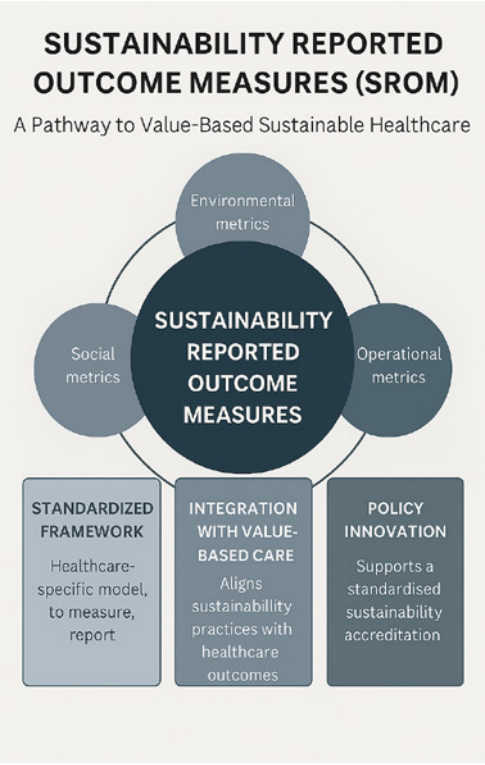

Figure 2. Sustainability Reported Outcomes Measure (SROMS) Framework

By linking sustainability outcomes to VBHC reimbursement and accreditation, SROMS reframes sustainability as a recognized and rewarded outcome rather than a compliance burden. This creates institutional incentives for proactive investment in sustainable practices while safeguarding patient safety and clinical quality.

7.5.4 Alignment with UAE and Global Strategies

These conceptual models respond to both local and international imperatives. At the macro level, the UAE's Net Zero by 2050, Green Agenda 2030, and COP28 commitments establish clear expectations for healthcare to reduce its environmental footprint. Globally, organizations such as the WHO and ISQua are increasingly advocating for sustainability to be integrated into accreditation, reporting, and patient safety frameworks (WHO, 2021).

The Sustainable Healthcare Adoption Framework offers a diagnostic approach for UAE institutions to assess their readiness and identify gaps. At the same time, SROMS offers a prescriptive reporting mechanism to operationalize national goals at the institutional level. Together, they address the persistent "policy-to-practice gap" by offering tools that integrate sustainability into the strategic DNA of healthcare.

The findings highlight knowledge, leadership visibility, and training as the strongest predictors of sustainability adoption. Regression analysis confirmed that awareness and leadership significantly increase engagement, while organizational context mediates outcomes. These insights justify the introduction of SROMS as a reporting framework that connects sustainability with VBHC incentives. By framing sustainability outcomes as measurable and tied to resource allocation or institutional recognition, SROMS provides leaders with a structured mechanism to benchmark progress. The UAE's macro-level strategies (Net Zero 2050, Green Agenda) provide direction, yet local implementation remains uneven. SROMS provides a framework for standardizing reporting, facilitating meaningful comparisons, and ensuring that sustainability is integrated into institutional accountability.

7.5.5 Contribution to Theory and Practice

This research makes three distinct contributions:

- Theoretical: It advances sustainability scholarship by contextualizing existing theories (TPB, RBV, Kotter's Change Model, SEST) within a UAE healthcare setting and by proposing the Sustainable Healthcare Adoption Framework.
- Methodological: It integrates quantitative and qualitative data to validate predictors of adoption and illustrate practical barriers, demonstrating the value of mixed-methods research for healthcare sustainability.
- Practical/Policy: It introduces the SROMS framework as a sector-specific reporting model that aligns sustainability with value-based healthcare, accreditation, and incentive structures.

Together, these contributions support a shift from symbolic sustainability efforts to systemic, measurable, and strategically integrated practices in healthcare.

7.6. Conclusion and Recommendations

7.6.1 Conclusion

This study demonstrates that, in the United Arab Emirates (UAE) healthcare sector, knowledge is necessary but insufficient for the adoption of sustainability. Awareness alone does not translate into practice. Sustainable behavior becomes routine only when leadership engagement is visible, responsibilities are formalized, resources are tangible, and performance is systematically measured and reviewed.

Findings highlight that private facilities face steeper constraints in embedding sustainability, largely due to resource limitations and the absence of binding policy frameworks. Regulatory standards and incentive mechanisms are therefore essential to bridge this gap and to ensure equitable sustainability integration across healthcare systems.

The proposed Sustainability Reported Outcome Measures (SROM) framework provides a healthcare-specific solution. By introducing measurable, comparable, and improvable outcomes, SROM reframes sustainability as a core component of value-based healthcare, directly linked to quality, safety, and institutional performance.

7.6.2 Actionable Recommendations

For Providers (Hospital and Clinic Level)

- Appoint accountable owners. Designate a sustainability lead (0.2–0.5 FTE) and establish a cross-functional "green team." Embed sustainability objectives in job descriptions and appraisal KPIs.
- Provide role-specific training. Develop continuing professional development (CPD) modules tailored to clinical care (e.g., waste segregation, low-impact pathways) and operations (e.g., energy/water environmental management systems, procurement). Target departments with lowest engagement first.
- Ensure data visibility. Publish unit-level dashboards monthly (e.g., kWh/patient-day, water/bed-day, waste generation, recycling rates, % staff trained). Review alongside safety and quality indicators in departmental huddles and morbidity and mortality (M&M) meetings.
- Protect time and recognize contributions. Allocate protected rota hours for sustainability-related tasks. Establish recognition mechanisms (e.g., certificates, annual awards, intranet badges) and provide small improvement grants to translate staff ideas into pilots.
- Green procurement defaults. Standardize specifications for low-impact consumables, extend equipment lifecycles, and enable vendor take-back programs. Use enterprise resource planning (ERP) systems to track the "green spend ratio."
- Embed sustainability in routines. Integrate sustainability checks into new project charters, capital approval processes, and clinical pathway redesigns (i.e., a "green gate" in quality improvement templates).

For Regulators and Payers

- Set minimum standards. Integrate sustainability criteria into licensure and accreditation

requirements, aligned with ISO 14001/26000 and Joint Commission International (JCI) sustainability standards. Require board-approved sustainability plans and annual reports.

- Introduce outcome-based incentives. Pilot rebates or recognition tiers for verified reductions in kWh/patient-day, waste generation, and scope 1 and 2 emissions relative to baseline.
- Develop shared analytics platforms. Establish a national or sector-level hub to provide standardized emission calculators, benchmarking data, and support for smaller facilities.
- Send clear market signals. Update group purchasing agreements to prioritize low-impact products and circular services. Publish a national "green formulary" for high-volume consumables.

7.6.3 Implementing SROM (Sustainability Reported Outcome Measures)

The SROM framework proposes a structured approach to measuring sustainability outcomes in healthcare.

Pillars:

- Environmental: kWh/patient-day, water/bed-day, kg waste/bed-day, recycling rate.
- Social: percentage of staff trained, staff perceptions, patient education reach.
- Operational: leadership rounding frequency, proportion of spend on green items, and number of units with dashboards.

Application:

Use for internal quality improvement, external benchmarking, and eligibility for incentives or accreditation tiers. Pilot SROM in high-impact departments (e.g., surgery, pharmacy) before scaling institution-wide.

7.6.4 Future Research Directions

Future studies should aim to track outcomes longitudinally to assess the pre- and post-intervention effects of targeted initiatives, such as training programs, sustainability dashboards, and recognition mechanisms. Comparative research is also needed to evaluate the effectiveness of protected-time and recognition bundles against training-only interventions, thereby identifying the most impactful strategies for sustaining engagement. Furthermore, additional validation of the SROM framework across both public and private healthcare institutions is necessary, with refinements to benchmarks tailored to facility type and organizational context.

Sustainability in healthcare is not a peripheral add-on but a strategic imperative, inseparable from quality, safety, and resilience. By operationalizing the Sustainable Healthcare Adoption Framework and embedding SROM within accreditation and value-based care models, the UAE can establish itself as a regional and global benchmark.

The transformation of healthcare into a sector that heals both people and planet is no longer aspirational—it is both possible and necessary. While this study is grounded in the UAE, its findings offer a replicable roadmap for healthcare systems worldwide, contributing both theoretically and practically to the global sustainability agenda.

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