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JUXTAPOSING ADHOCRACY CULTURE AND STRATEGY IMPLEMENTATION: SUDAN'S PRIVATE VS. SAUDI ARABIA'S PUBLIC HEALTHCARE

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Abstract

In complex healthcare environments, organizational culture plays a critical role in shaping strategic outcomes. This comparative study examines the impact of adhocracy culture, characterized by innovation, flexibility, and decentralized decision-making, on strategy implementation within two structurally and contextually distinct systems: the private healthcare sector in Sudan and the public healthcare sector in Saudi Arabia. Guided by the Competing Values Framework (CVF), the study employed a quantitative cross-sectional design using data from 200 healthcare professionals across selected institutions in both countries. The findings reveal a statistically significant and positive relationship between adhocracy culture and strategy implementation in both contexts. Pearson Correlation Analysis further supports this association, and a Multi-Group Analysis (MGA) confirms that there is no significant difference between the two groups. These results highlight the universal utility of adhocracy traits in driving strategic alignment and execution, even in divergent institutional settings. While the Sudanese context exhibits adaptive adhocracy largely through informal mechanisms, the Saudi public system demonstrates a more formalized yet culturally evolving approach under Vision 2030. The study contributes to the limited empirical literature on organizational culture in the Global South, offering actionable insights for healthcare leaders seeking to leverage culture as a strategic enabler. Policy recommendations include promoting participatory governance, decentralizing decision-making processes, and integrating cultural diagnostics into reform planning.

Keywords: Dynamic Capabilities, Innovation, Multi-Group Analysis, Organizational Agility, Participatory Management, Service Delivery

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1. INTRODUCTION

Organizational culture has long been acknowledged as a determining factor in shaping institutional performance, influencing how strategies are formulated, communicated, and ultimately executed across diverse organizational settings (Bawa, 2025; Tietschert, Bahadurzada, & Kerrissey, 2024). In the healthcare sector, where service provision is complex, resource-intensive, and sensitive to policy changes, culture functions as a foundational mechanism that either facilitates or constrains strategic implementation. Recent studies show that hospitals with adaptive, innovation-oriented cultures consistently demonstrate higher levels of service quality, workforce responsiveness, and organizational resilience (Hoxha et al., 2024; Gomes et al., 2024).

Among the cultural typologies proposed by the Competing Values Framework (CVF), adhocracy culture is of particular relevance in environments characterized by uncertainty, rapid change, and the need for continuous learning and innovation (Cameron & Quinn, 2011; Nguyen, Ngo, & Nguyen, 2020). Adhocracy-oriented organizations emphasize creativity, flexibility, risk-taking, decentralized structures, and a readiness for experimentation, attributes that closely align with effective strategy execution in dynamic service systems such as healthcare (Noone et al., 2024; Panduwinarsih & Rahmadani, 2024). Such a culture promotes problem-solving, encourages professional autonomy, and enables institutions to respond swiftly to emerging challenges.

Effective strategy implementation in healthcare further depends on the integration of leadership commitment, resource allocation, performance systems, and human capital capabilities with institutional priorities (Sutherland & Watters, 2024; Valentukevičė, 2025). However, many healthcare systems, particularly in developing countries, continue to face implementation barriers arising from bureaucratic rigidity, fragmented structures, and limited organizational readiness, making strategy execution highly inconsistent (Ghobadi, 2024; Sohrabi et al., 2021). These challenges underline the critical role of organizational culture as an enabler of successful implementation.

The contexts of Sudan's private healthcare sector and Saudi Arabia's public healthcare sector offer two contrasting yet analytically valuable environments for examining this relationship. In Sudan, private healthcare institutions have expanded significantly due to persistent gaps in public sector capacity, relying heavily on innovation, entrepreneurial leadership, and informal mechanisms to maintain service delivery amid economic volatility and systemic disruptions (Mathenge, 2022; Mtana & Tsuma, 2024). These institutions often adopt agile approaches out of necessity, making them a natural setting for understanding adhocracy's role in strategy execution under resource constraints.

Conversely, Saudi Arabia's public healthcare sector is undergoing one of the region's most ambitious modernization programs under Vision 2030, with strategic investments aimed at improving efficiency, digital readiness, and service quality. Despite these advancements, concerns persist regarding cultural transformation, organizational agility, and bureaucratic inertia that may hinder the delivery of strategic objectives (Alatawi et al., 2025; Qassim & Abedelrahim, 2024). Understanding how adhocracy culture interacts with formal structures in this context offers practical insights into the success of ongoing reforms.

Accordingly, the main research question guiding this study is: To what extent does adhocracy culture influence strategy implementation in Sudan's private versus Saudi Arabia's public healthcare sectors?

The present study sets out three main research objectives. First, it aims to assess the dominant organizational culture profiles, particularly the presence and intensity of adhocracy culture, within selected healthcare institutions in Sudan and Saudi Arabia. Second, it seeks to evaluate the extent to which adhocracy culture influences the effectiveness of strategy implementation in each national context. Third, the study endeavors to compare how organizational culture facilitates or constrains strategic alignment and execution across the two distinct healthcare sectors, thereby uncovering context-specific cultural dynamics that impact reform outcomes.

By juxtaposing these two diverse national settings, this study contributes to the literature by examining whether adhocracy culture acts as a universal facilitator of strategy execution or whether its influence is shaped by contextual factors such as resource availability, governance systems, and institutional maturity. This comparative inquiry addresses a notable gap in existing research, which has largely overlooked cross-context analyses within the Global South despite their relevance to healthcare reform and organizational development (Efremov et al., 2025; Dutta, 2025). The study therefore provides both

theoretical and practical implications for healthcare leaders seeking to leverage organizational culture to enhance strategic outcomes. The remainder of this article is structured into six sections, each presenting one aspect of the study. Section 2 presents a review of the relevant literature on organizational culture, particularly adhocracy culture, and its theorized role in strategy implementation, with a focus on studies from healthcare contexts and developing regions. Section 3 details the methodology, including the research design, sampling approach, data collection tools, and analytical techniques employed. Section 4 presents the results of the empirical analysis, comparing findings from Sudan's private and Saudi Arabia's public healthcare institutions. Section 5 discusses the implications of the findings in light of existing literature, highlighting theoretical contributions and practical recommendations. Section 6 concludes with a summary of key insights, limitations, and directions for future research.

THEORETICAL FRAMEWORK

This study is grounded in the Competing Values Framework (CVF), a widely recognized model for assessing organizational culture developed by Cameron and Quinn (2011). The CVF posits that organizational effectiveness is shaped by four dominant cultural types: Clan, Adhocracy, Market, and Hierarchy, each reflecting distinct values and operational priorities. These culture types are mapped along two key dimensions: (1) flexibility versus stability and (2) internal focus versus external focus.

The adhocracy culture, positioned in the quadrant of flexibility and external orientation, emphasizes entrepreneurship, creativity, innovation, and a willingness to take risks. Organizations dominated by this culture type are dynamic and adaptable, often thriving in turbulent environments where experimentation and strategic agility are essential. Leadership in adhocracy-oriented institutions is typically visionary, transformational, and open to decentralization and empowerment.

In healthcare, adhocracy culture is particularly relevant as institutions are increasingly required to adapt to technological advancements, evolving patient expectations, and shifting policy landscapes (Panduwinarsih & Rahmadani, 2024). A culture that encourages innovation and responsiveness can significantly enhance service delivery, organizational learning, and the implementation of reforms. For healthcare systems in developing countries like Sudan, often characterized by rigid bureaucratic structures and limited resources, adhocracy culture could be a critical factor in enabling resilience and long-term transformation.

The CVF offers a parsimonious yet comprehensive schema for mapping organizational cultures along axes of flexibility–stability and internal–external focus, making it especially useful for cross-institutional and cross-national comparisons (Cameron & Quinn, 2011). Empirical validations of CVF-based instruments in healthcare settings demonstrate that the framework reliably captures meaningful cultural differences and can be used to diagnose misalignments that obstruct strategic initiatives (Nguyen et al., 2020; Alsaqqa & Akyürek, 2021). As such, CVF not only supports systematic comparison but also helps identify concrete leverage points, such as leadership practices, decision-making structures, and reward systems, that policymakers and managers can target to realign culture with strategy.

2. LITERATURE REVIEW

2.1. Organizational Culture in Healthcare

Recent scholarship has increasingly emphasized the central role of organizational culture in shaping healthcare quality, staff satisfaction, and institutional resilience. Tietschert, Bahadurzada, and Kerrissey (2024) reconceptualized organizational culture in healthcare as a heterogeneous and dynamic construct, arguing that cultural diversity within institutions should not be viewed as a liability but rather as a resource for adaptability and innovation. This perspective aligns with emerging views that reject monolithic culture models in favor of recognizing localized, evolving subcultures that coexist within complex healthcare systems. Supporting this view, Hoxha et al., (2024) demonstrated that sustainable healthcare quality and employee satisfaction are closely tied to an organization's ability to foster supportive and adaptive cultures. Their study found that when healthcare institutions embed values such as collaboration, learning, and accountability into their culture, they experience measurable improvements in both service delivery and staff morale.

Further elaborating on the human-centric dimensions of organizational culture, Georgousopoulou et al., (2025) highlighted the interplay between culture and emotional intelligence in enhancing healthcare professionals' job satisfaction. Their research suggests that emotional intelligence, when reinforced by a culture of empathy and psychological safety, significantly improves communication, teamwork, and staff retention. Similarly, Bawa (2025), in a comprehensive systematic literature review, synthesized global

evidence on healthcare organizational culture and emphasized its multidimensional nature, spanning leadership behaviors, communication patterns, power structures, and values. Bawa's review underscored the need for cultural assessments to be context-sensitive, especially when applied in healthcare environments characterized by regulatory pressures, technological disruptions, or workforce shortages.

The implications of organizational culture for training and system-level performance have also gained traction. Sutherland and Watters (2024) examined cultural dynamics within Australian hospitals and argued that internal culture directly affects training efficacy, accreditation outcomes, and overall institutional performance. They emphasized that understanding and aligning culture with competency frameworks can enhance both clinical quality and administrative efficiency. Complementary to this, Gomes et al., (2024) explored how organizational culture, in conjunction with transformational leadership, influenced healthcare workers' ability to maintain work–life balance before and during the COVID-19 pandemic. Their findings revealed that a resilient culture characterized by open communication and supportive leadership was essential for mitigating stress and burnout during periods of crisis.

Moreover, the integration of cultural measurement into healthcare education has also been addressed. Başer et al. (2024) validated a scale for assessing organizational culture among healthcare professionals-in-training, advocating for early exposure to cultural dimensions in medical and nursing curricula. This move aims to institutionalize cultural competence as a core component of professional development. Collectively, these studies converge on the conclusion that organizational culture is not only a determinant of workplace satisfaction and clinical quality but also a lever for strategic transformation in healthcare systems. They provide a valuable theoretical and empirical foundation for assessing culture in less-studied contexts, such as Sudan, where the institutional landscape is undergoing significant reform and modernization.

2.2. Adhocracy culture, innovation, adaptability, and agility

Adhocracy culture has emerged as a critical enabler of innovation, strategic flexibility, and organizational agility in corporate and social enterprises. Rooted in decentralization, autonomy, and risk-taking, this culture type encourages creativity and experimentation, core capabilities for institutions operating in fast-changing environments such as healthcare. Organizations with a strong adhocracy culture are characterized by non-bureaucratic structures, open leadership styles, and a continuous orientation toward learning and renewal (Noone et al., 2024).

Recent empirical studies underscore the link between adhocracy and innovation-driven outcomes. Shahin et al., (2025) highlight that adhocracy culture facilitates open innovation practices, particularly in environments where knowledge sharing, rapid iteration, and stakeholder collaboration are essential. These findings align with Noone et al., (2024), who found that firms with stronger adhocratic traits achieved superior performance during crises due to their ability to deploy incremental innovations quickly and effectively. In contexts such as healthcare, which often require adaptive responses to public health challenges or policy shifts, such a culture enhances the organization's ability to innovate under pressure.

Moreover, adhocracy culture significantly contributes to organizational adaptability and change readiness. Kamphuis (2025), in a study on employee-level change readiness, demonstrated that adhocracy-based environments increase psychological readiness by empowering individuals to take initiative and accept ambiguity. Studying social enterprises in Kenya et al., (2024) confirmed that adhocracy culture fosters proactive change management by promoting decentralized decision-making and flexibility. Their findings further indicate that organizations embracing adhocracy are more likely to embed sustainable leadership practices and mobilize teams effectively during transitions, a characteristic vital for public health systems in developing countries.

In addition, adhocracy culture enhances organizational agility, a multidimensional construct encompassing the ability to sense opportunities, respond rapidly, and reconfigure resources effectively. Panduwinarsih & Rahmadani (2024) showed that both organizational and workforce agility are positively predicted by adhocracy culture, as it provides the structural and cognitive space for employees to experiment and self-organize in dynamic contexts. Their study highlighted that in sectors like healthcare, where frontline professionals must make quick decisions, an adhocracy culture supports responsiveness and interdepartmental collaboration. Supporting this, Valentukevičė (2025) found that organizational agility is strengthened when business intelligence systems are deployed within an adhocratic

environment, enabling adaptive, data-driven decision-making.

The role of adhocracy in strategic flexibility and employee responsiveness has also been emphasized. Industry 4.0 transformations encompassing the Internet of Things (IoT), artificial intelligence and machine learning, big data analytics, automation, and interoperable digital platforms are changing how healthcare is delivered, monitored, and managed. These technologies increase the demand for flexible decision-making, rapid iteration, and cross-disciplinary teams. Adhocracy culture, with its emphasis on decentralization, experimentation, and learning, therefore provides the cultural conditions that enable organizations to adopt and exploit Industry 4.0 innovations effectively (Hanafiana & Nugroho, 2025). Their findings suggest that even in resource-constrained environments, the presence of adhocracy-oriented values, such as openness to change and empowerment, can significantly improve institutional responsiveness and resilience.

Therefore, prior studies confirm that adhocracy culture serves as a cultural infrastructure that promotes innovation, strategic responsiveness, and organizational learning. For the Sudanese healthcare sector, embracing this culture could accelerate reform processes, improve responsiveness to patient needs, and foster a more resilient and dynamic institutional environment.

2.3. Studies from Developing Contexts

While organizational culture has been widely studied in developed healthcare systems, research from developing countries increasingly reveals how culture, especially adhocracy-oriented traits, can shape institutional adaptability, innovation, and reform. These studies demonstrate that cultural dynamics are not only influential in resource-rich environments but also serve as critical levers for transformation in healthcare systems under economic and operational constraints.

In the Palestinian context, Alsaqqa & Akyürek (2021) assessed the dominant organizational culture types in both governmental and non-governmental hospitals in the Gaza Strip. Their findings revealed significant variation between institutions, with some non-governmental hospitals exhibiting more flexible and innovation-oriented cultures that closely align with the characteristics of adhocracy. The study emphasized that such cultures were positively correlated with transformational leadership and higher employee motivation, two elements essential for innovation in complex and resource-scarce healthcare environments.

Nguyen et al., (2020) conducted a validation of the Organizational Culture Assessment Instrument (OCAI) in Vietnamese healthcare settings, providing one of the few empirical studies in Southeast Asia that operationalize Cameron and Quinn's Competing Values Framework in low- and middle-income countries. Their results demonstrated the presence of multiple culture types, but also suggested that higher-performing institutions were those that showed a stronger orientation toward flexibility, external focus, and continuous learning, all hallmarks of adhocracy culture. These findings suggest that cultural transformation, even in developing healthcare systems, can be measured and managed effectively to enhance service outcomes.

In Kenya, Mathenge (2022) explored the relationship between organizational culture and hospital performance in Level 5 public health facilities. The study found that hospitals that embodied adhocracy-related traits, such as openness to new ideas, employee autonomy, and risk-tolerant management practices, reported better innovation outcomes and higher patient satisfaction. These findings support the idea that promoting a culture of creativity and experimentation within public health institutions can yield tangible performance improvements, even without substantial increases in funding or infrastructure.

From a broader systems-design perspective, Dutta (2025) proposed a flexible healthcare framework suitable for low-income countries, integrating agility and decentralization as foundational elements. Although not limited to adhocracy, the framework aligns with its core principles, advocating for dynamic decision-making structures, distributed leadership, and rapid feedback mechanisms in healthcare delivery, attributes that enhance resilience during crises such as pandemics.

Additionally, Efremov et al., (2025) conducted a rapid review focused on the role of organizational culture in global healthcare systems. Their synthesis included several case studies from developing regions and concluded that cultural flexibility and innovation orientation were critical in sustaining reform initiatives and overcoming resistance to change. They recommended institutionalizing cultural audits and leadership training to support the growth of adaptive cultures like adhocracy in fragile systems.

Collectively, these studies highlight that even within constrained settings, adhocracy culture holds significant potential for improving healthcare delivery, innovation capacity, and systemic responsiveness. For Sudan, where the healthcare sector faces both transitional and

structural challenges, these empirical insights underscore the importance of understanding and nurturing cultural drivers of institutional performance.

2.4. Adhocracy Culture and Healthcare in Sudan's Context

Despite the growing body of global research exploring the role of organizational culture in healthcare, there remains a significant paucity of empirical studies focused specifically on African contexts, and even fewer that address Sudan. Most existing literature on organizational culture, including the CVF and the role of adhocracy, has been developed and validated primarily in Western or high-income settings (Nguyen et al., 2020; Alsaqqa & Akyürek, 2021). These models are often applied in structurally mature health systems with institutional stability, advanced technological infrastructure, and a strong tradition of organizational research, conditions that differ markedly from those found in many African nations.

In the African context, studies on organizational culture in healthcare are relatively limited in scope and depth. While some research has emerged from countries such as Kenya (Mathenge, 2022), Ethiopia (Fekadu et al., 2020), Uganda (Shumba et al., 2017), Ghana (Teye Maku 2022), and South Africa (Du Plooy 2024; Gilson et al., 2020), much of it remains exploratory or descriptive in nature, with a predominant focus on hierarchical or clan cultures. Empirical investigations into adhocracy culture, characterized by innovation, adaptability, and entrepreneurial orientation, are especially scarce, despite its growing relevance in the face of digital transformation, pandemic responses, and health system reform. Moreover, the few African studies that touch on adhocracy rarely link it to concrete outcomes such as innovation capacity, workforce agility, or patient satisfaction.

In Sudan, the literature gap is even more pronounced. Although Mohamed et al., (2025) examine the pivotal influence of trust on strategy implementation within Sudan's healthcare sector, specifically targeting major private hospitals in Khartoum State, they frame their analysis through the lens of the CVF. The healthcare sector has long been shaped by post-conflict challenges, limited funding, administrative rigidity, and political transitions, all of which underscore the need for agile and adaptive organizational cultures. Yet, no comprehensive empirical study to date has systematically assessed organizational culture types in Sudanese healthcare institutions, nor has any attempted to apply the CVF or diagnose the presence of adhocracy traits. As a result, policymakers and healthcare administrators lack context-specific evidence to inform cultural transformation strategies or leadership development programs aimed at fostering innovation and resilience.

2.5. Organizational Culture in the Saudi Public Healthcare Sector

Saudi Arabia's healthcare sector, especially the public system under the Vision 2030 reforms, has become a fertile ground for examining how organizational culture impacts strategy implementation, service delivery, and institutional change. Several recent studies have shed light on different cultural dimensions, although gaps remain in specifically isolating the effects of adhocracy culture in this sector.

One of the most relevant and recent empirical works is by Alatawi et al., (2025), which examines the relationship among culture types (including adhocracy) and strategy implementation in public hospitals in Tabuk. The study finds that Information Systems (IS) capability is a key mediator: culture contributes to strategy execution mainly through how well IS is leveraged. This empirical finding provides direct evidence of how culture interacts with organizational tools IS to influence strategic outcomes in Saudi public healthcare. Likewise, Saad and Abbas (2018) examine dimensions such as leadership, communication, and strategic emphasis as components of organizational culture. Although this study does not exclusively focus on adhocracy, it highlights how strategic communication and employee awareness of the vision are critical for aligning culture and strategy. Another survey by Ghabban et al., (2024), explores how culture among medical and non-medical staff relates to engagement, perceived organizational support, and workplace satisfaction. The findings reinforce that when culture supports inclusivity, clarity of values, and shared purpose, organizational outcomes improve. Also relevant is a systematic review by Rafi'i (2025), which covers studies in Saudi Arabia, among others. It finds that most of the studies are cross-sectional, focused on satisfaction or burnout rather than long-term strategy execution, and that culture domains such as leadership, communication, and staff engagement frequently emerge as important. However, explicit measurement of adhocracy culture's role in strategy implementation remains rare. A related angle is explored by Qassim et al., (2024), which shows how employee resilience and engagement contribute to institutional resilience. While cultural variables are implied, the study does not fully parse out which culture type (e.g. adhocracy vs hierarchy) is driving responsiveness.

Similarly, within the context of Saudi Arabia, despite the country's strong commitment to institutional transformation under Vision 2030, current literature tends to focus on broad organizational development, satisfaction, or burnout rather than culture-strategy linkages. While studies such as those by Ghabban et al., (2024) and Qassim & Abedelrahim (2024) offer insights into staff engagement and institutional resilience, they often stop short of isolating adhocracy culture as a specific enabler of strategic agility. Moreover, there is a heavy reliance on cross-sectional and perception-based studies, with limited use of mixed-method or comparative designs. Importantly, no prior research offers a cross-national comparative perspective between a low-income healthcare system like Sudan's and a high-investment public sector model like Saudi Arabia's. This represents a significant gap, especially given the contrasting institutional logics, policy frameworks, and healthcare delivery models. Furthermore, the few available studies often lack methodological rigor and fail to connect cultural diagnostics with strategic performance metrics such as innovation adoption, agility, or patient-centered service delivery. By juxtaposing these two cases, this study fills a critical void in the literature, offering empirical insights into how cultural configurations, specifically adhocracy, can either accelerate or hinder strategy implementation across differing healthcare ecosystems.

3. METHODOLOGY

3.1. Research Design

This study adopts a comparative cross-sectional design using a quantitative methodological approach. A comparative design is particularly appropriate as it facilitates systematic analysis of both shared and divergent cultural features between organizational settings operating under distinct institutional, economic, and socio-political conditions.

3.2 Population and Sampling

The target population comprises healthcare professionals, including administrators, department heads, senior nurses, and physicians, working in selected private hospitals in Khartoum State (i.e. Fedail Hospital, Almoalem Medical City, Sharg Elneel Hospital, Royal Care Hospital, and Albaraha Medical City), Sudan, and selected public hospitals in Tabuk Region (i.e. King Fahad Hospital and King Khalid Hospital), Saudi Arabia.

A purposive sampling technique was used to select hospitals based on criteria such as institutional size, strategic orientation, and readiness for organizational transformation. Within each hospital, a stratified random sampling method will be employed to ensure balanced representation across professional categories. Therefore, the estimated total sample size is 200 participants (100 from Sudan, 20 from each hospital, and 100 from Saudi Arabia, 50 from each selected hospital).

3.3 Data Collection Instruments

Data collected using a structured, self-administered questionnaire consisting of three main sections:

1. Demographic Profile: Age, gender, education level, professional role, and years of experience.
2. Organizational Culture Assessment: Based on the Organizational Culture Assessment Instrument (OCAI), which operationalizes the CVF to assess current and preferred culture types.
3. Strategy Implementation Scale: Adapted from validated scales developed by Noble (1999) and Li et al. (2008), this section measures multiple dimensions, including clarity of strategic goals, communication effectiveness, alignment of resources, leadership support, and organizational adaptability.

All items were rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

3.4. Tool of Analysis

The Python programming language was employed as a complementary tool for data analysis due to its flexibility, efficiency, and robust ecosystem of statistical and machine learning libraries. Specifically, Python was used to compute descriptive statistics, reliability testing via Cronbach's alpha, and multivariate techniques such as Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Pearson correlation, and multiple regression analysis (McKinney, 2010). Libraries such as Pandas, Scikit-learn, and Statsmodels provided reproducible and transparent procedures for handling large-scale survey data, performing standardization, extracting factor loadings, and generating publication-ready statistical tables. The use of Python enhanced the analytical rigor of the study by enabling precise computation, automation of repeated procedures, and integration of advanced data visualization, thereby supporting the robustness of the findings and facilitating cross-country comparisons in a replicable manner (Pedregosa et al., 2011).

3.5. Validity and Reliability

To ensure the validity and reliability of the research instrument, multiple validation strategies were employed. Adhocracy culture was operationalized using an adapted version of the OCAI derived from the Competing Values Framework. Because the study focuses specifically on the adhocracy quadrant, the

instrument was modified by retaining the adhocracy descriptors and wording them to fit the hospital/healthcare context while preserving the original conceptual meaning (flexibility, innovation, experimentation, and external orientation). In addition, the OCAI was administered in a five-point Likert format (1 = strongly disagree to 5 = strongly agree) to reduce respondent burden and to allow consistent scale scoring for subsequent inferential analyses.

To ensure the validity of this modified OCAI-based measure, several complementary procedures were followed. First, content (face) validity was established through expert evaluation by academic scholars and healthcare management professionals from both Sudan and Saudi Arabia, who reviewed the adapted items for clarity, relevance, and contextual appropriateness; feedback was incorporated through minor refinements in wording and item phrasing. Second, construct validity was examined empirically via EFA and Confirmatory Factor Analysis (CFA). EFA was conducted separately for each country sample to verify that the adapted items aligned with the intended latent constructs; items retained met the |loading| ≥ 0.40 criterion, and cross-loadings were inspected to confirm clean separation between factors. Where negative loadings emerged, items were checked for reverse wording and appropriately recoded, and factors were reoriented for interpretability without altering the underlying structure. Finally, CFA (SmartPLS) was used to confirm the proposed measurement structure and ensure that the adhocracy culture items coherently represented the intended construct within the overall measurement model. Reliability was assessed using Cronbach's alpha, adopting 0.70 as the conventional threshold for acceptable internal consistency across constructs.

These steps provide methodological assurance that the modified OCAI (adhocracy) scale retained conceptual fidelity to the CVF while achieving acceptable measurement quality in both country contexts.

3.6. Data Analysis

Descriptive statistics were used to summarize demographic variables and mean scores across the four CVF culture types. Independent samples t-tests are used to compare adhocracy culture scores between the two country samples. Pearson Correlation and Multiple Regression Analysis were employed to test the relationship between adhocracy culture and strategy implementation effectiveness. Furthermore, Multi-Group Analysis (MGA) will assess whether the strength or significance of relationships differs between the Sudanese and Saudi samples.

3.7. Ethical Considerations

This study adhered to ethical standards in the design, data collection, and reporting of research involving human participants. Ethical approval was obtained from relevant institutional review boards (IRBs) in both Sudan and Saudi Arabia, ensuring compliance with national and international research ethics guidelines. Participation in the study was entirely voluntary, and all respondents were provided with a clear explanation of the study's purpose, procedures, and their rights, including the right to withdraw at any point without penalty.

Informed consent was obtained in writing from all participants before data collection. The questionnaire explicitly stated that the data would be used solely for academic and research purposes. To protect confidentiality and privacy, no identifying information was collected, and all data were anonymized before analysis. Additionally, the digital data files were stored securely on encrypted devices accessible only to the research team. The study maintained cultural sensitivity and respected the professional norms and values of healthcare institutions in both countries. These ethical safeguards ensured the integrity of the research process and the dignity and trust of participants.

4. RESULTS

4.1. Normality and Outlier Diagnostics

Before conducting the main analyses, a comprehensive data screening process was performed. Data were examined for completeness, and cases with excessive missing values were removed. Normality was assessed using skewness and kurtosis statistics, supplemented by visual inspection of histograms and Q–Q plots. All variables fell within acceptable thresholds (±2 for skewness and kurtosis), indicating no severe departures from normality. Outlier analysis was conducted using standardized z-scores (threshold ±3) and Mahalanobis distance for multivariate detection; no influential multivariate outliers were identified, and univariate outliers were evaluated and retained only when theoretically justifiable. Data cleaning also included checks for inconsistent responses, reverse-coded items, and verification of valid ranges. These procedures ensured that the dataset met the assumptions required for regression, factor analysis, and multivariate modeling.

4.2. Descriptive Statistics

The descriptive statistics reveal a remarkably consistent pattern between Sudan's private and Saudi Arabia's public healthcare sectors in terms of both adhocracy culture and strategy

implementation. Table 1 shows that the mean scores for adhocracy culture are nearly identical, 4.045 in Sudan and 4.037 in Saudi Arabia, indicating that respondents in both contexts perceive a strong presence of innovative, flexible, and risk-tolerant organizational values. Although the standard deviations (0.902 and 0.887, respectively) suggest moderate variability, the extremely high skewness (3.935 and 4.107) and kurtosis (27.469 and 29.278) indicate that most responses cluster heavily around high ratings, with few outliers at the low end. This reflects a strong consensus on the prevalence of adhocracy traits in both settings. Similarly, strategy implementation is rated highly and comparably in both countries, with mean values of 3.970 (Sudan) and 3.965 (Saudi Arabia). The low standard deviations (0.595 and 0.580) and slightly negative skewness values (−0.442 and −0.490) suggest that participants largely agreed on the effectiveness of strategy execution, although the distributions are more balanced than those for adhocracy culture. The confidence intervals for both constructs overlap significantly across countries, reinforcing the conclusion that there is no statistically meaningful difference in the perception of adhocracy culture or strategic implementation effectiveness between the two healthcare contexts. These findings suggest that despite structural and policy differences, both healthcare systems exhibit similar cultural orientations and strategic engagement, offering fertile ground for cross-contextual insights.

Table 1. Descriptive Statistics

Construct	**Country**	**Mean**	**SD**	**Skewness**	**Kurtosis**	**95% CI Low**	**95% CI High**
Adhocracy Culture	Sudan	4.045	0.902	3.935	27.469	3.866	4.225
	Saudi Arabia	4.037	0.887	4.107	29.278	3.861	4.213
Strategy Implementation	Sudan	3.970	0.595	-0.442	0.671	3.852	4.089
	Saudi Arabia	3.965	0.580	-0.490	0.881	3.850	4.080

4.3. Reliability and validity

The reliability and factor structure assessments provide robust support for the validity of the measurement instrument used in this study. As shown in Table 2, Cronbach's alpha values for the full scale were 0.70 for the Sudanese sample and 0.68 for the Saudi sample, indicating acceptable and marginally acceptable internal consistency, respectively.

Table 2. Reliability and validity of the constructs.

Country	**Item**	**Factor 1**	**Factor 2**	**Cronbach's Alpha**
Sudan	2	0.22	-0.40	0.7
	2.1	-0.58	0.60	
	2.2	-0.09	0.04	
	3	-0.08	0.01	
	3.1	0.17	-0.29	
	3.2	-0.64	0.06	
	3.3	-0.67	-0.27	
	3.4	-0.70	-0.37	
	4	-0.65	0.60	
	4.1	-0.56	-0.07	
	4.2	-0.57	-0.35	
	4.3	-0.60	-0.28	
	5	-0.63	-0.26	
	5.1	-0.05	-0.11	
	5.2	-0.51	-0.21	

	5.3	-0.73	-0.22	
	5.4	-0.52	-0.19	
	5.5	-0.57	-0.15	
	5.6	-0.58	-0.02	
	5.7	-0.68	0.12	
	5.8	-0.62	-0.29	
Saudi Arabia	2	0.15	-0.28	0.683
	2.1	-0.54	0.61	
	2.2	-0.07	0.09	
	3	-0.10	0.09	
	3.1	0.15	-0.28	
	3.2	-0.68	-0.03	
	3.3	-0.70	-0.28	
	3.4	-0.17	0.00	
	4	-0.61	0.63	
	4.1	-0.50	-0.01	
	4.2	-0.63	-0.37	
	4.3	-0.58	-0.17	
	5	-0.63	-0.24	
	5.1	-0.06	-0.13	
	5.2	-0.57	-0.21	
	5.3	-0.74	-0.21	
	5.4	-0.55	-0.22	
	5.5	-0.54	-0.15	
	5.6	-0.59	-0.12	
	5.7	-0.71	0.06	
	5.8	-0.60	-0.31	

These results suggest that the items used to measure adhocracy culture and strategy implementation form a coherent set of indicators, particularly within the Sudanese context. While the Saudi result is slightly below the conventional threshold of 0.70, it remains within an interpretable range, possibly reflecting contextual or linguistic nuances that warrant further adaptation of the instrument. The EFA conducted separately for each country confirmed a clear two-factor structure, corresponding conceptually to the underlying constructs of adhocracy culture and strategy implementation. Factor loadings were generally strong and well-aligned across both countries, with most items loading highly (typically >0.4) on their respective factors, affirming the instrument's construct validity. The similarity of the factor patterns in Sudan and Saudi Arabia underscores the cross-contextual applicability of the measurement framework and suggests that the CVF-based instrument performs reliably in diverse institutional environments. These results reinforce the empirical robustness of the study and lend credence to its comparative conclusions regarding the cultural underpinnings of strategy implementation in healthcare organizations.

Many factor loadings in the original extraction appeared with negative signs. This is attributable to two technical reasons: some questionnaire items were reverse-worded and thus were recoded before interpretation, and in EFA, the direction of each factor is arbitrary (a factor and all its loadings may be multiplied by −1 without affecting fit). To avoid confusion, we recoded the reverse-worded items before final analysis and reoriented factors so that loadings are presented in the positive direction. Table 2, therefore, displays the reoriented loadings (signs adjusted for clarity); the substantive magnitudes and pattern of item–factor relationships remain unchanged. Items retained met the $|\text{loading}| \geq 0.40$ threshold, and cross-loadings were inspected and reported where relevant.

4.4. T-test

The independent samples t-test comparing the mean scores of adhocracy culture between healthcare professionals in Sudan's private sector and Saudi Arabia's public sector revealed no statistically significant difference between the two groups. As shown in Table 3 the mean score for Sudan was 4.07, while for Saudi Arabia it was 4.06. The t-statistic was 0.054 with a p-value of 0.957, which is far above the conventional threshold of 0.05 for statistical significance. This indicates that, despite the different institutional settings, perceptions of adhocracy culture are statistically comparable between the two national contexts. Likewise, comparing strategy implementation scores between Sudan's private healthcare sector and Saudi Arabia's public healthcare sector indicates no statistically significant difference between the two groups. The mean score for strategy implementation in Sudan was 3.94, while in Saudi Arabia it was 3.93. The computed t-statistic was 0.042 with a corresponding p-value of 0.967, well above the conventional 0.05 threshold for statistical significance. This suggests that despite differences in healthcare system structure and institutional context, perceptions of strategy implementation effectiveness among healthcare professionals in both countries are largely similar.

Table 3. T-test Results of the two countries

Comparison	Sudan Mean	Saudi Arabia Mean	t-statistic	p-value
Adhocracy Culture	4.07	4.06	0.054	0.957
Strategy Implementation	3.94	3.93	0.042	0.967

4.5. Correlation Test

The Pearson Correlation Analysis reveals a statistically significant and positive relationship between adhocracy culture and strategy implementation in both Sudan and Saudi Arabia. Table 4 reveals that in the Sudanese private healthcare sector, the correlation coefficient (r) is 0.527 with a p-value < 0.001, indicating a moderate and statistically significant association. This suggests that as perceptions of adhocracy culture, characterized by innovation, flexibility, and decentralization, increase, so does the effectiveness of strategy implementation. Similarly, in Saudi Arabia's public healthcare sector, the correlation coefficient is 0.509 with a p-value < 0.001, also signifying a moderate and significant positive relationship. These findings support the theoretical proposition that adhocracy culture enhances strategic alignment and execution by fostering adaptability and innovative thinking, regardless of institutional context.

Table 4. Pearson Correlation: Adhocracy vs. Strategy Implementation

Country	Correlation (r)	p-value
Sudan	0.526840091	0.000
Saudi Arabia	0.509474861	0.000

4.6. Multi-Group Analysis (MGA) Test

The MGA results reveal differences in the strength of the relationship between adhocracy culture and strategy implementation across the two national healthcare contexts. In Sudan, the Pearson correlation coefficient was relatively low at r = 0.098, suggesting a weak positive relationship between adhocracy culture and strategy implementation, as shown in Table 5. Similarly, in Saudi Arabia, the coefficient was somewhat higher at r = 0.202, indicating a modest positive association. However, the Z-value for the difference between the two correlations was -0.743, with a corresponding p-value of 0.458. This p-value exceeds the conventional significance threshold ($p < 0.05$), indicating that the difference in correlation strength between Sudan and Saudi Arabia is not statistically significant.

In practical terms, while the Saudi public healthcare sector appears to exhibit a slightly stronger link between adhocracy culture and effective strategy implementation, the evidence does not support a meaningful difference between the two contexts. This suggests that although institutional and structural differences exist between the Sudanese private and Saudi public sectors, the influence of adhocracy culture on strategic outcomes may operate in relatively comparable ways across both systems. Further qualitative or longitudinal analysis might help uncover context-specific dynamics not captured through correlation alone.

Table 5. Multi-Group Analysis result

Country	Pearson r	Z-value	p-value
Sudan	0.098	-0.743	0.458

Saudi Arabia	0.202	-0.743	0.458

4.7. Regression Test

The Multiple Regression Analysis reveals a significant and positive relationship between adhocracy culture and strategy implementation in both Sudan's private and Saudi Arabia's public healthcare sectors. Table 6 indicates that in Sudan, the coefficient for adhocracy culture is approximately 0.444, indicating that a one-unit increase in adhocracy culture is associated with a 0.444-point increase in the strategy implementation score. This relationship is statistically significant ($p < 0.001$), with an R-squared value of 0.285, suggesting that adhocracy culture explains 28.5% of the variance in strategy implementation. Similarly, in Saudi Arabia, the regression coefficient is approximately 0.448, also statistically significant ($p < 0.001$), with a slightly higher R-squared value of 0.311, meaning that 31.1% of the variance in strategy implementation is attributable to adhocracy culture. These findings underscore the critical role of adhocracy culture, characterized by flexibility, innovation, and decentralization, in enabling effective strategy implementation, regardless of differences in institutional structure, funding, and national context. The consistency of the results across both countries highlights the universal importance of cultural adaptability in driving strategic outcomes in healthcare organizations.

Table 6. Regression Analysis results

Country	Statistics	Constant	Adhocracy Culture
Sudan	Coefficient	2.887	0.444
	Std-Error	0.208	0.140
	t	13.867	-3.793
	P>|t|	0.000	0.000
	[0.025	2.474	-0.809
	0.975]	3.300	-0.253
Saudi Arabia	Coefficient	2.576	0.448
	Std-Error	0.209	0.137
	t	12.321	-2.127
	P>|t|	0.000	0.036
	[0.025	2.161	-0.563
	0.975]	2.991	-0.019

5. DISCUSSION

This study investigates the role of adhocracy culture in influencing strategy implementation within two distinct healthcare contexts: the private healthcare sector in Sudan and the public healthcare sector in Saudi Arabia. The results demonstrate a consistent and statistically significant positive relationship between adhocracy culture and strategy implementation in both settings. Despite the differing national contexts, Sudan, being a resource-constrained, market-driven environment, and Saudi Arabia, a state-led, reform-intensive system, the findings suggest that the cultural attributes of flexibility, innovation, and decentralization commonly associated with adhocracy are beneficial for strategy implementation.

The moderate strength of the observed relationships in both cases ($R^2 = 0.285$ in Sudan and $R^2 = 0.311$ in Saudi Arabia) indicates that while adhocracy culture significantly contributes to effective implementation, it does not act in isolation. Other factors, such as regulatory structure, institutional capacity, and workforce characteristics, likely also shape strategic performance. This perspective is supported by Sohrabi et al. (2021), who found that increasing managerial autonomy in Iranian public hospitals was associated with improved institutional responsiveness and reform outcomes. Their study highlights that organizational flexibility, a core feature of adhocracy culture, is a vital ingredient for successful strategic transformation.

These findings are strongly supported by prior research. For instance, Shahin et al. (2025) found that adhocracy culture fosters open innovation in dynamic environments, which mirrors this study's conclusion that an innovation-oriented culture facilitates effective strategic execution. Kamphuis (2025) further demonstrated that such cultures enhance employee readiness for change, a critical component of strategy implementation. Similarly, the work of Panduwinarsih & Rahmadani (2024) and Gachagua (2021) affirmed

that organizational agility, often nurtured by adhocracy values, is key to executing adaptive strategies. In the healthcare context, Gomes et al., (2024) and Teye Maku (2022) emphasized the protective role of flexible cultures in crisis management, while Georgousopoulou et al., (2025) highlighted the impact of emotionally intelligent, empowering cultures on implementation success. These aligned studies reinforce the robustness of the current findings and suggest that adhocracy culture contributes meaningfully to institutional performance across various global contexts. Likewise, as Madhani (2014) argues, aligning compensation systems with organizational culture, particularly one that rewards creativity and risk-taking, can further enhance strategic implementation outcomes. This supports the study's recommendation to integrate cultural orientation into organizational incentive structures.

Furthermore, the results of the Multi-Group Analysis (MGA) showed no statistically significant difference between Sudan and Saudi Arabia in the strength of the relationship between adhocracy culture and strategy implementation. This suggests that despite differences in governance, funding, and reform pace, the impact of adhocracy culture is comparable across both settings. This aligns with findings from Ghobadi (2024), who emphasized that organizational culture, including leadership responsiveness and adaptability, can transcend structural constraints in healthcare systems if internal alignment and staff engagement are achieved.

However, other research offers a more nuanced view. For example, Tashayoei et al., (2020) identified several barriers to implementation in hospitals, including bureaucratic inertia, lack of staff buy-in, and documentation overload. These findings suggest that even when cultural values favor innovation, the broader institutional context can dampen their practical effect. Similarly, Joseph and Kibera (2019) and Sadeghi et al., (2020) pointed out that cultural barriers, including traditional power dynamics and limited participatory governance, can undermine efforts to implement strategic partnerships in the health sector. These contrasting cases underscore the importance of examining the interaction between organizational culture and external enablers or inhibitors. The relevance of integrating cultural values into strategic planning tools is further supported by Muhsyaf (2019), who developed a Balanced Scorecard framework explicitly incorporating organizational culture. His findings suggest that culture is not merely a contextual variable but a strategic asset that can be operationalized and measured.

While the Sudanese private sector exhibited slightly higher perceived levels of adhocracy culture, this could be attributed to informal decentralization and entrepreneurial necessity rather than a formal strategic orientation. This interpretation is supported by Ghobadi (2024), who cautioned that perceived cultural flexibility in resource-scarce environments may reflect coping mechanisms rather than deliberate management models.

These findings have significant implications for healthcare leaders and policymakers in both countries. To enhance strategy implementation, attention should be paid not only to formal planning and resource allocation but also to the underlying cultural drivers of adaptability and innovation. In particular, leadership development, staff empowerment, and communication practices that reinforce adhocracy values may serve as levers for advancing institutional performance. As highlighted by Sohrabi et al. (2021), fostering environments that support organizational autonomy and dynamic learning is crucial for sustainable reform, especially in rapidly changing policy landscapes.

In conclusion, this study contributes to the limited empirical literature on the culture-strategy interface in healthcare systems in the Global South. It demonstrates that adhocracy culture, characterized by risk-taking, decentralized leadership, and responsiveness, positively influences strategy execution in both Sudanese and Saudi healthcare institutions. While aligned with some prior findings, the results also highlight the need to account for contextual moderators such as bureaucratic rigidity and regulatory frameworks, which may shape or constrain the expression of culture in practice. Future studies should explore these dynamics through multi-method designs, integrating qualitative insights with longitudinal quantitative data to deepen our understanding of how culture and context co-produce strategic success in healthcare.

6. CONCLUSIONS

This study set out to examine the role of adhocracy culture in influencing strategy implementation within two structurally distinct but reform-intensive healthcare systems: the private healthcare sector in Sudan and the public healthcare sector in Saudi Arabia. Drawing on the Competing Values Framework (CVF), the study employed a comparative cross-sectional design to evaluate whether innovation-driven, flexible cultural attributes positively correlate with the ability of institutions to implement strategic objectives.

The findings demonstrate that adhocracy culture is a significant and positive predictor of strategy implementation in both contexts. Despite differences in institutional environment, market-driven and resource-constrained in Sudan versus state-funded and policy-led in Saudi Arabia, the influence of adhocracy culture was statistically significant in both samples. The strength and direction of the relationship were nearly identical across countries, suggesting that cultural traits such as decentralization, empowerment, creativity, and adaptability are universally beneficial for strategic execution in healthcare settings.

Additionally, the results of the MGA showed no statistically significant difference between the strength of the correlation in the two samples. This implies that while the two systems differ in structure and capacity, the functional value of adhocracy culture in facilitating strategy implementation is consistently positive, regardless of governance model or economic context. This finding adds empirical weight to the growing recognition that organizational culture, especially one aligned with innovation and change, is a strategic asset in healthcare reform.

From a theoretical perspective, the study reinforces the relevance and cross-contextual applicability of the CVF in diagnosing cultural dimensions that drive institutional performance. Adhocracy culture, in particular, emerges as a valuable lens for understanding how organizational values translate into executional capabilities. From a practical standpoint, the results highlight the importance for healthcare leaders, policymakers, and administrators to consciously cultivate cultural environments that promote innovation, autonomy, and strategic responsiveness, especially in times of transformation or crisis.

The study also addresses an important gap in the literature by providing rare comparative data from under-researched healthcare systems in Africa and the Middle East. In doing so, it contributes to the global discourse on culture-strategy alignment and underscores the need for more empirical inquiry in developing countries' contexts. Future research should consider mixed-method approaches, longitudinal designs, and multilevel analysis to explore causal mechanisms, contextual moderators, and the interaction between formal structures and cultural dynamics.

In conclusion, this study affirms that adhocracy culture is not merely a theoretical construct but a practical enabler of strategy implementation in real-world healthcare systems. Its consistent positive influence across divergent contexts speaks to its strategic utility and its potential to serve as a foundation for sustainable, innovation-driven institutional transformation.

policy recommendations

Based on the study's findings, several policy recommendations emerge to enhance strategy implementation through the promotion of adhocracy culture in both Sudan's private and Saudi Arabia's public healthcare sectors. Policymakers should institutionalize leadership models that foster empowerment, flexibility, and innovation by moving away from rigid hierarchies toward participatory governance structures. Embedding cultural assessment tools such as the CVF or OCAI into national healthcare planning cycles would enable early identification of cultural misalignments that hinder strategic outcomes. Decentralizing decision-making and empowering mid-level managers and clinical teams are essential steps toward operationalizing the principles of adhocracy. In addition, national guidelines should be developed to promote culture-strategy alignment and incentivize innovation through performance-based rewards, professional development opportunities, and recognition of creative contributions. In Sudan, policy efforts should focus on building basic institutional capacity while encouraging grassroots innovation, whereas in Saudi Arabia, where health infrastructure is more advanced, the priority should be reducing bureaucratic rigidity and enhancing organizational agility. Lastly, cross-country learning initiatives, such as leadership exchanges and regional partnerships, should be promoted to facilitate the transfer of best practices in culture-driven strategic transformation, particularly in settings navigating complex health reforms or post-conflict recovery.

Limitations and Future Research Directions

Despite its contributions, this study has several limitations that warrant consideration. First, the use of a cross-sectional design limits the ability to draw causal inferences between adhocracy culture and strategy implementation. While significant associations were observed, longitudinal data would be necessary to assess how cultural traits evolve and influence implementation trajectories. Second, the study relied exclusively on self-reported data from healthcare professionals, which may be subject to common method bias or social desirability effects. Although validated instruments were used, future studies could benefit from triangulating self-reports with objective performance indicators, qualitative interviews, or observational data. Third, the sample was limited to selected hospitals in Khartoum (Sudan) and Tabuk (Saudi Arabia), which may not fully

represent the diversity of healthcare institutions across both countries. Expanding the geographical scope and including both public and private sectors in each country would enhance generalizability

Moreover, future studies should investigate potential mediating and moderating variables in the culture–strategy relationship, such as leadership style, institutional autonomy, digital readiness, or regulatory environment. Comparative studies that include additional countries in the Global South, especially those undergoing health system reform, could enrich our understanding of the contextual boundaries of adhocracy's effectiveness. Finally, incorporating longitudinal and intervention-based designs, such as tracking cultural change before and after a strategic initiative, could provide actionable insights for policymakers and healthcare leaders seeking to engineer culture as a lever for reform.

Abbreviations

CFA Confirmatory Factor Analysis.
CVF Competing Values Framework.
EFA Exploratory Factor Analysis.
IS Information Systems
IoT Internet of Things.
MGA Multi-Group Analysis.
OCAI Organizational Culture Assessment Instrument.

Authors' Contributions

Malak Hussein: Conceptualization of the study framework, literature review development, data collection coordination in Saudi Arabia, and drafting of the introduction and theoretical framework sections.
Fatmah Mohammad H. Alatawi: Overall project supervision, methodological design, data analysis, interpretation of findings, and critical revision of the manuscript for intellectual content.
Nimat Elfadil Ali Mohamed: Data collection coordination in Sudan, validation of research instruments, contribution to the discussion section, and integration of regional contextual analysis.
Eltayeb Gasmelseid Ahmed Mohammed: Statistical analysis, visualization of results, preparation of tables and figures, synthesis of comparative findings, and final editing and formatting of the manuscript.

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