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Exploring Indicators of Adaptive Capability in Remote Leadership Practices

ABSTRACT

This study aimed to explore the behavioral, cognitive, and emotional indicators of adaptive capability in remote leadership practices among organizational leaders in Tehran. Using a qualitative research design, the study recruited 23 participants through purposive sampling from various sectors in Tehran, all of whom had at least one year of experience leading remote teams. Data were collected through in-depth semi-structured interviews and analyzed using thematic analysis with the aid of NVivo software. Interviews continued until theoretical saturation was achieved. Thematic coding was conducted through open, axial, and selective coding procedures, ensuring reliability through member checking and an audit trail of analytic decisions. Three main themes emerged from the data: cognitive flexibility in decision-making, relational adaptability and communication, and self-regulation and emotional resilience. Subthemes included rapid situation assessment, scenario-based thinking, empathetic listening, trust-building in virtual settings, feedback personalization, emotional self-awareness, and digital fatigue prevention. Leaders described iterative decision cycles, decentralized input gathering, and adaptive goal setting as critical to navigating ambiguity. They also highlighted relational strategies such as tone calibration, boundary awareness, and proactive emotional regulation as essential to maintaining team trust and performance in remote contexts. The findings underscore that adaptive capability in remote leadership is a multidimensional construct involving dynamic decision-making, relational agility, and self-regulatory practices. These adaptive behaviors are essential for effective leadership in distributed, uncertain, and technologically mediated environments. The study offers a contextually grounded framework that can inform leadership development, organizational design, and future research on virtual team effectiveness.

Keywords: Remote leadership, adaptive capability, virtual teams, emotional resilience, cognitive flexibility.

Introduction

The proliferation of remote work in the wake of global disruptions such as the COVID-19 pandemic has prompted a seismic shift in organizational leadership models. Remote leadership now demands a distinctive set of adaptive capabilities that transcend traditional leadership competencies. This transformation is not merely technological—it is cultural, behavioral, and strategic in nature, requiring leaders to recalibrate how they engage with distributed teams, manage uncertainty, and sustain performance across virtual environments. The evolution toward hybrid and remote workplace models has created new opportunities but also posed considerable challenges for leadership practices, particularly in environments where physical presence and conventional command structures are no longer viable [1-3].

Adaptive capability, in this context, refers to the leader's capacity to respond proactively and effectively to changing digital environments, shifting team dynamics, and emerging organizational needs. It incorporates cognitive flexibility, emotional resilience, and behavioral adaptability, particularly when leading through volatility and ambiguity. As companies pursue long-term digital transformation strategies, leaders are increasingly evaluated not just on their strategic vision but also on their

agility and responsiveness to disruption [4, 5]. These adaptive capabilities are now seen as core to virtual leadership success and directly influence team engagement, innovation, and productivity in remote contexts [6, 7].

Recent scholarship has emphasized the distinctiveness of remote leadership compared to traditional face-to-face settings. Remote leaders must manage performance, motivate employees, and coordinate workflows across geographically dispersed teams, all while navigating technological constraints and emotional distance [8, 9]. Research has also pointed to the critical role of digital trust and emotional intelligence in maintaining cohesion and clarity within remote teams [10, 11]. Unlike physical office settings where informal encounters can support relational maintenance, remote leaders must intentionally create virtual rituals, feedback loops, and communication rhythms to foster psychological safety and shared purpose [2, 12].

At the organizational level, leadership effectiveness in virtual environments has been closely linked to digital maturity, innovation culture, and the integration of flexible work policies. Organizations that support adaptive leadership tend to outperform others in periods of uncertainty by enabling rapid decision-making, decentralized communication, and agile project execution [4, 13]. A leader's personal adaptability—manifested through openness to change, resilience under pressure, and the ability to reframe problems—has emerged as a decisive predictor of success in digitally transformed workplaces [14, 15]. Furthermore, adaptive leaders are instrumental in fostering team learning and psychological engagement, particularly when roles are redefined or systems are restructured to accommodate remote operations [16].

Within the broader discourse on leadership in the digital era, there is growing recognition of the intersection between adaptive capability and innovation. Adaptive leaders are not merely reactive; they create conditions for experimentation, tolerate failure, and support iterative improvement processes that are vital in dynamic, unpredictable contexts [17, 18]. This innovative stance is particularly crucial in sectors undergoing rapid digitization, where workforce upskilling, automation, and new business models demand agile leadership at all levels. Leaders who embrace adaptability can better support collaborative decision-making, foster inclusive digital cultures, and drive sustainable performance outcomes [19, 20].

Despite increasing attention to adaptive leadership, empirical research into its specific behavioral indicators—especially in remote work settings—remains limited. Existing studies have often examined adaptability through generalized leadership frameworks without sufficiently disaggregating how remote leaders enact these capabilities on a day-to-day basis [3, 21]. Moreover, few studies explore the lived experiences of leaders navigating remote challenges, such as digital fatigue, role ambiguity, and emotional disconnection. As a result, there is a need to explore adaptive capability not as an abstract leadership quality but as a set of tangible, context-dependent practices that evolve through experience and reflection in remote leadership settings [22, 23].

Another critical gap in the literature concerns how remote leaders regulate their own emotions and behaviors while supporting the well-being and engagement of their teams. Emotional self-regulation, stress management, and boundary-setting have become increasingly relevant as leaders face heightened work-life integration and blurred personal-professional boundaries [1, 11]. The adaptive leader, therefore, is also a self-aware and emotionally resilient individual who models psychological agility for others. In practice, this involves not only strategic decision-making but also empathetic listening, inclusive communication, and the ability to manage virtual presence across multiple digital channels [5, 10].

Furthermore, leadership effectiveness in virtual environments often hinges on the ability to tailor communication styles, delegate responsibilities without micromanaging, and foster a sense of belonging among remote employees. The absence of physical co-presence requires leaders to recalibrate how they interpret nonverbal cues, offer recognition, and provide

feedback. Studies have shown that employees under adaptive virtual leaders report higher engagement, reduced turnover intention, and stronger alignment with organizational goals [9, 24]. These findings suggest that adaptive capability is not only an individual trait but a relational and contextual process mediated by digital tools and cultural expectations.

The evolving nature of work and the global spread of virtual leadership contexts call for a deeper understanding of how adaptive capabilities are enacted and experienced. There is a pressing need for qualitative insights into how leaders navigate these realities, especially within diverse organizational and national contexts. For instance, while much of the literature draws from Western or Anglophone corporate environments, less is known about how adaptive leadership unfolds in non-Western, emerging economies undergoing their own forms of digital transformation [16, 17, 20]. As such, this study aims to contribute to the literature by exploring the indicators of adaptive capability in remote leadership practices through the lived experiences of organizational leaders in Tehran, where economic, technological, and institutional conditions present unique challenges for remote management.

Methods and Materials

Study Design and Participants

This study employed a qualitative research design grounded in an interpretive paradigm to explore the indicators of adaptive capability in remote leadership practices. The purpose was to generate in-depth understanding of how remote leaders navigate and respond to challenges in digital environments. The study adopted a purposive sampling strategy to select 23 participants from various public and private sector organizations in Tehran who held leadership or managerial positions and had direct experience leading remote teams for at least one year. Participants were selected to reflect a range of industries, including education, technology, finance, and government administration, ensuring maximum variation in organizational context and leadership background. Recruitment continued until theoretical saturation was reached—when no new concepts or themes emerged from the data—confirming the adequacy of the sample size for qualitative inquiry.

Data Collection

Data were collected through in-depth, semi-structured interviews, which allowed for open-ended exploration of participants' lived experiences with remote leadership and their strategies for adaptation. An interview guide was developed based on the research objectives and relevant literature on digital leadership and organizational adaptability. Each interview lasted between 45 and 75 minutes and was conducted either in-person or via video conferencing platforms, depending on the participant's preference and availability. All interviews were audio-recorded with participants' consent and subsequently transcribed verbatim for analysis. To maintain ethical standards, informed consent was obtained from all participants, and their identities were anonymized using coded identifiers throughout the transcription and reporting processes.

Data analysis

Data analysis followed a thematic approach using NVivo software (version 12) to facilitate systematic coding and organization of qualitative data. The process involved initial open coding to identify key concepts, followed by axial coding to group these concepts into broader categories and subthemes. A constant comparative method was applied throughout the analysis to refine the emerging patterns and ensure internal coherence across data segments. Memo writing and reflective

note-taking accompanied the coding process to capture analytical insights and track the evolution of thematic structures. Trustworthiness was established through member checking, peer debriefing, and maintaining an audit trail of coding decisions and interpretations. The final thematic structure represents a comprehensive set of indicators reflecting adaptive capability as experienced and articulated by remote leaders in Tehran.

Findings and Results

The study included 23 participants, all of whom held leadership or managerial roles in organizations based in Tehran and had at least one year of experience leading remote teams. Of the participants, 14 were male and 9 were female. In terms of age, 5 participants were between 30–39 years old, 11 were aged 40–49, and 7 were between 50–59 years old. Regarding educational background, 6 held bachelor's degrees, 13 had master's degrees, and 4 had doctoral degrees. The participants represented diverse sectors, including education ($n = 6$), technology ($n = 5$), finance ($n = 4$), healthcare ($n = 3$), government administration ($n = 3$), and consulting services ($n = 2$). Most participants ($n = 16$) reported managing hybrid teams (a combination of remote and in-person), while 7 led fully remote teams. The average duration of remote leadership experience across participants was 3.8 years.

Table 1

Themes, Subthemes, and Concepts Related to Adaptive Capability in Remote Leadership

Main Category (Theme)	Subcategory (Subtheme)	Concepts (Open Codes)
1. Cognitive Flexibility in Decision-Making	Rapid Situation Assessment	quick scanning of team feedback, real-time interpretation of issues, prioritizing based on urgency, reliance on digital data, pattern recognition
	Scenario-Based Thinking	developing contingency plans, simulating remote risks, imagining outcomes, cross-functional scenario planning
	Reframing Problems	changing perspectives, avoiding tunnel vision, problem restatement, challenging initial assumptions
	Adaptive Goal Setting	revising goals frequently, splitting long-term plans into stages, re-aligning with team dynamics
	Managing Uncertainty	tolerating ambiguity, acting with incomplete information, confidence in temporary solutions, acknowledging knowledge limits
	Decentralized Input Gathering	collecting team insights, using polls and chats for input, rotating idea leaders, distributed ideation
2. Relational Adaptability and Communication	Iterative Decision Cycles	trial-and-error acceptance, agile workflows, evaluating feedback loops, updating plans dynamically
	Empathetic Listening	emotional attunement, asking clarifying questions, paraphrasing team concerns, active presence during check-ins
	Tone and Message Calibration	adapting tone by channel, formal/informal balance, sensitivity to timing, message brevity
	Cultural and Language Sensitivity	awareness of linguistic diversity, avoiding idioms, respecting regional expressions, adjusting communication for inclusivity
	Trust-Building in Virtual Settings	being transparent about challenges, consistency in responses, honoring commitments, creating psychological safety
	Boundary Awareness	respecting work-life separation, scheduling with flexibility, modeling off-hours behavior
3. Self-Regulation and Emotional Resilience	Feedback Personalization	tailoring feedback to personality, using private vs group settings, giving developmental cues, avoiding generic praise
	Stress Management Strategies	mindfulness routines, deep breathing, short virtual breaks, avoiding multitasking, scheduling digital detox
	Emotional Self-Awareness	recognizing stress signals, journaling mood fluctuations, accepting emotional highs/lows, using emotional vocabulary
	Coping with Isolation	proactive social check-ins, virtual informal gatherings, using humor to connect, acknowledging loneliness
	Digital Fatigue Prevention	rotating meeting formats, camera-optional policies, encouraging async communication, capping video calls duration
	Persistence in Goal Pursuit	pushing through setbacks, setting daily micro-goals, reframing failure as learning, modeling perseverance

Theme 1: Cognitive Flexibility in Decision-Making

One of the most prominent adaptive capabilities identified was the ability to engage in *rapid situation assessment*. Leaders described their need to constantly scan emerging issues within their teams and interpret feedback in real time. Several participants emphasized using digital dashboards or chat histories to pick up on subtle signs of disengagement or confusion. As one manager put it, “I look at how fast they respond and what words they use—it’s like reading between the lines to sense the temperature of the team” (P7). This quick interpretation was often used to reprioritize tasks dynamically throughout the day. Another essential practice was *scenario-based thinking*, which involved constructing alternative outcomes in uncertain situations. Leaders reported actively developing contingency plans for internet outages, employee burnout, or policy shifts. One interviewee noted, “I always have a Plan B and even a Plan C because remote work can flip on you anytime” (P13). These scenarios were often shared with cross-functional collaborators to preempt cascading failures.

In many cases, leaders displayed a strong ability for *reframing problems* to shift perspectives and foster creativity. Rather than seeing low engagement as a failure, they often interpreted it as a signal of misaligned goals or digital fatigue. “When someone zones out, I ask myself—not just what went wrong—but how else I can look at the situation. Maybe I didn’t explain things in the right way,” said one participant (P11). This was supported by *adaptive goal setting*, where long-term objectives were frequently broken down into flexible weekly targets. Participants described how they had to align these targets with rapidly changing team dynamics. “Every two weeks, I ask: does this still make sense? Remote leadership means updating goals, not just following through,” said another leader (P20). Furthermore, the theme of *managing uncertainty* emerged in many narratives. Participants discussed operating with limited information and still needing to make confident decisions. “You can’t wait for all the data—it’ll never come. Sometimes you make the best call and adjust later,” shared P3.

Another critical subcategory was *decentralized input gathering*, where leaders highlighted the value of democratizing decision-making in virtual environments. This included polls, shared documents, and rotating leadership in brainstorming sessions. “I often tell someone else to lead the next team check-in—it brings out voices that usually stay quiet,” noted one interviewee (P16). Finally, participants engaged in *iterative decision cycles*, describing their openness to trial-and-error approaches. Remote work, they explained, required agile adjustments and continuous revisions. “Nothing is final. I send something out, get feedback, and revise. That’s just how remote leadership works now,” commented P5.

Theme 2: Relational Adaptability and Communication

A defining element of adaptive capability was *empathetic listening*. Participants repeatedly described their efforts to be emotionally present, especially during check-ins and one-on-one meetings. “Sometimes I just ask how they’re doing and let them talk for ten minutes before getting into tasks,” said one respondent (P9). Leaders emphasized paraphrasing concerns and allowing space for emotion. Another relational skill was *tone and message calibration*. Leaders explained how they intentionally shifted the tone of messages depending on the medium—emails, chats, or video calls. “If it’s Slack, I try to keep it light. If it’s email, I’m more structured. And on video, I read facial cues before I speak,” noted P14. This sensitivity helped mitigate misunderstandings and foster trust.

The theme of *cultural and language sensitivity* was also evident, particularly in multicultural or bilingual teams. Several participants reported avoiding idiomatic expressions or colloquial humor. “I had to stop using sarcasm—it just didn’t translate well. Now I keep things clearer and more inclusive,” said one leader (P18). Closely tied to this was *trust-building in virtual settings*. Interviewees emphasized consistency, transparency, and small commitments as foundations for psychological

safety. “If I say I’ll send feedback by Tuesday, I do it—even if it’s just a line. That builds credibility,” remarked P4. They also described how frequent yet informal check-ins helped maintain connection.

Boundary awareness emerged as another critical subcategory. Leaders talked about respecting the work-life divide by modeling flexible schedules and encouraging team members to unplug. “I never schedule meetings after 5 PM. And when I log off, I announce it—so they feel free to do the same,” said P6. Many described their own evolution from expecting instant replies to embracing asynchronous collaboration. Additionally, the importance of *feedback personalization* was strongly emphasized. Leaders tailored their comments to match each team member’s personality, preferences, and emotional state. “Some people want public praise, others prefer quiet nudges. I learned to adjust—remote teams don’t work with a one-size-fits-all style,” noted P22.

Theme 3: Self-Regulation and Emotional Resilience

Participants consistently demonstrated strong *stress management strategies*, including mindfulness, structured breaks, and breathing techniques. “I take five minutes to breathe before every intense meeting—it keeps me grounded,” said P2. They also described limiting multitasking and protecting quiet time for strategic thinking. *Emotional self-awareness* was another central theme, with many leaders journaling or reflecting daily to process mood fluctuations. “I can’t lead others if I’m not aware of my own emotional temperature. Some days I just admit I’m off and that’s okay,” remarked P15.

Isolation coping strategies were frequently discussed. Leaders shared their efforts to maintain social connection through informal virtual gatherings and casual chat channels. “We have a Friday no-agenda coffee call—it’s the best part of the week,” said one participant (P17). Humor was also cited as a tool for bonding and lifting morale. At the same time, leaders addressed *digital fatigue prevention*. Many had introduced rotating meeting formats, camera-optional policies, and concise virtual sessions. “We banned hour-long meetings unless absolutely necessary—now we do 20-minute bursts and async updates,” said P1.

Lastly, *persistence in goal pursuit* surfaced as a marker of resilience. Participants emphasized daily micro-goals and learning from failure. “Even if the plan collapses, I find something to salvage and move forward. That’s what keeps us from burning out,” said P8. Leaders viewed setbacks as opportunities for iteration, modeling perseverance for their teams. Across all interviews, these emotional and behavioral strategies were seen as essential for sustaining effective remote leadership in dynamic, often unpredictable digital environments.

Discussion and Conclusion

This study aimed to explore the indicators of adaptive capability in remote leadership practices through a qualitative investigation of 23 organizational leaders in Tehran. The thematic analysis yielded three main categories: cognitive flexibility in decision-making, relational adaptability and communication, and self-regulation and emotional resilience. Each of these dimensions revealed critical subthemes and behaviors that demonstrate how leaders adapt to the complexity, volatility, and distance inherent in remote work settings.

Within the first theme—cognitive flexibility in decision-making—participants emphasized practices such as rapid situation assessment, scenario-based thinking, and reframing problems. Leaders reported constantly recalibrating their perceptions and shifting between short- and long-term thinking based on evolving digital inputs and team feedback. These findings align with previous research highlighting the importance of dynamic decision-making in virtual environments [12, 14]. As digital

workplaces become increasingly data-driven, leaders who can synthesize information quickly and pivot based on incomplete data are more effective at managing uncertainty and coordinating distributed tasks [4, 23]. The subtheme of adaptive goal-setting, for instance, demonstrated how leaders convert ambiguity into actionable strategies—an ability consistent with the conceptualization of agile leadership in rapidly changing environments [5, 17].

Another key subtheme under this category was iterative decision-making cycles, reflecting leaders' readiness to embrace trial-and-error and respond to feedback loops. This is consistent with digital transformation literature emphasizing the need for flexible leadership styles that accommodate real-time updates and shifting workstreams [7, 15]. Furthermore, participants' emphasis on decentralized input gathering echoes earlier findings that collective sense-making enhances remote decision-making efficacy and supports innovation in hybrid teams [13, 16]. The reliance on multiple perspectives and participatory ideation models illustrates the shifting power dynamics in virtual leadership, where influence is more distributed and authority more situational.

The second theme, relational adaptability and communication, underscored the necessity of intentional emotional and interpersonal strategies for maintaining team cohesion. Leaders described how empathetic listening and feedback personalization were fundamental to cultivating trust in virtual spaces. These behaviors reflect transformational and inclusive leadership practices that are increasingly necessary in geographically dispersed teams [1, 10]. Findings related to tone calibration and cultural sensitivity show that successful remote leaders are acutely aware of how digital communication can be misinterpreted and take proactive steps to tailor their message delivery—a dynamic also reported in studies of cross-cultural digital leadership [6, 25].

Trust-building emerged as a core adaptive capability in virtual leadership, confirming earlier research that identifies trust as a mediating factor in team performance and well-being in remote environments [18, 24]. Leaders in this study achieved this by being transparent, consistent, and supportive—qualities known to foster psychological safety and reduce team anxiety during periods of disruption [8, 11]. These findings reinforce the view that digital leadership is not merely about technological fluency but also about mastering emotional intelligence and socio-relational agility. The emergence of boundary awareness—particularly the respect for personal time and space—also validates recent calls for virtual leadership practices that actively prevent burnout and promote autonomy [20, 22].

The third and final theme, self-regulation and emotional resilience, offered insight into the intrapersonal strategies that support sustainable leadership in remote contexts. Participants reported using techniques such as mindfulness, journaling, and structured breaks to maintain their mental health and emotional availability. These behaviors align with growing evidence on the importance of leader self-care as a precondition for effective team support [1, 11]. Emotional self-awareness was not only critical for regulating stress but also for modeling vulnerability and authenticity—two characteristics often highlighted in adaptive and transformational leadership literature [2, 10].

Isolation coping strategies and digital fatigue prevention further emphasized the psychological toll of remote leadership and the need for proactive self-management. These findings resonate with prior studies showing that the sustainability of remote work hinges on leaders' ability to manage emotional depletion and reframe isolation as an opportunity for intentional reconnection [21, 25]. Moreover, the theme of persistence in goal pursuit illustrated the role of resilience in adaptive leadership. Leaders spoke of viewing setbacks as learning moments and maintaining commitment through micro-goals—findings that mirror broader resilience frameworks applied to leadership during digital transitions [4, 12].

Overall, the results of this study extend existing research by identifying a nuanced, multidimensional portrait of adaptive capability in remote leadership. While prior studies have discussed adaptability in general leadership contexts, this research reveals how such adaptability is practiced in real time by leaders managing virtual teams under fluctuating and often stressful conditions. The findings affirm the centrality of cognitive and emotional flexibility, as well as relational intelligence, in building adaptive capacity. They also offer empirical support for existing frameworks that link digital leadership to dynamic capabilities, psychological safety, and innovation outcomes [5, 9, 13].

Importantly, this study also adds to the limited body of knowledge on remote leadership in non-Western and emerging market contexts. Much of the existing literature has focused on corporate or educational organizations in Western countries, where infrastructure and cultural assumptions differ significantly. By situating this research in Tehran, the study responds to calls for more contextualized investigations of leadership in digital transformation across diverse economies and institutional settings [16, 17]. The findings indicate that, despite structural and cultural differences, adaptive leadership practices such as decentralized communication, relational trust, and emotional resilience are universally relevant—though they may be shaped by local norms, resource constraints, and organizational hierarchies.

This study also supports the view that adaptive capability is not a fixed leadership trait but a flexible, context-dependent process that evolves in relation to team dynamics, task complexity, and technological integration. The evidence from this research complements broader theoretical frameworks that conceptualize leadership as a dynamic interplay between individual cognition, social processes, and systemic environments [15, 23]. In remote settings, where physical cues are limited and uncertainty is heightened, leaders must cultivate awareness not just of strategy and outcomes but also of relational nuance and emotional context. This reinforces the importance of developing leadership development programs that go beyond technical skills and foster reflective, resilient, and relationally aware leadership mindsets [6, 19].

While this study provides rich insights into adaptive capability in remote leadership, several limitations should be acknowledged. First, the sample size was limited to 23 participants from Tehran, which, although sufficient for reaching theoretical saturation in qualitative research, may limit the generalizability of the findings. Second, the reliance on self-reported experiences in semi-structured interviews could introduce bias, as participants may have presented their leadership behaviors in a socially desirable manner. Third, the study focused exclusively on leaders, without including team members' perspectives, which could have offered a more balanced view of how adaptive behaviors are perceived and experienced within remote teams. Lastly, cultural and sectoral differences may influence the expression of adaptive leadership, and these factors were not systematically compared across subgroups in this research.

Future research should expand the geographical and organizational scope to include leaders from different cultural, economic, and institutional contexts to test the universality of the identified adaptive indicators. Comparative studies between hybrid and fully remote leadership environments could yield further insights into how context shapes adaptability. Additionally, incorporating the perspectives of team members or direct reports could help validate whether the adaptive behaviors reported by leaders are experienced as effective by their teams. Longitudinal studies are also recommended to examine how adaptive capabilities develop over time and in response to evolving remote work dynamics. Finally, future studies could explore the intersection of digital tools, AI integration, and adaptive leadership to better understand how technology supports or constrains adaptive capability in virtual teams.

Organizations should invest in leadership development initiatives that emphasize emotional resilience, relational awareness, and cognitive flexibility—skills that are now essential for leading in digital environments. Practical training modules that simulate uncertainty, promote mindfulness, and encourage adaptive decision-making can help prepare leaders for remote challenges. Regular peer reflection groups or coaching sessions may also support continuous learning and self-regulation. Moreover, HR and organizational development teams should work to embed adaptive capability as a core leadership competency in hiring, promotion, and evaluation frameworks. Finally, organizations must actively support digital trust-building, boundary-respecting work cultures, and inclusive communication practices to sustain leadership adaptability and overall team performance in remote contexts.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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