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Institutional Voids and Regulatory Ambiguity in Platform-Based Work

ABSTRACT

This study aimed to explore how gig workers in Iraq experience and navigate institutional voids and regulatory ambiguity in platform-based employment. A qualitative research design was employed, using semi-structured interviews with 29 platform-based workers from major cities in Iraq including Baghdad, Basra, Erbil, and Najaf. Participants were selected through purposive sampling to ensure sectoral diversity across ride-hailing, food delivery, and freelance digital services. Data collection continued until theoretical saturation was reached. All interviews were transcribed verbatim and analyzed using thematic analysis in NVivo software, following Braun and Clarke's six-step approach. The analysis focused on identifying recurring themes related to workers' legal status, institutional engagement, and adaptive strategies in the absence of formal protections. Three main themes were identified: navigating regulatory uncertainty, institutional disconnection, and adaptive work practices. Workers reported widespread legal ambiguity, including the absence of formal contracts, unclear tax obligations, and inconsistent enforcement by authorities. Participants also expressed mistrust in public institutions and described being excluded from unions, social protection systems, and formal financial services. In response, workers relied on informal networks, self-regulation, and algorithmic management tactics to cope with risk and optimize earnings. Emotional resilience and flexibility were key survival strategies, but often came at the expense of psychological well-being and job stability. The findings highlight that in fragile regulatory environments such as Iraq, platform-based workers operate within profound institutional voids that intensify their precarity. Regulatory ambiguity is not a temporary condition but a structural feature that benefits platforms while disempowering workers. Policy reform, institutional coordination, and platform accountability are urgently needed to support worker rights and stability in the gig economy.

Keywords: gig economy, platform work, regulatory ambiguity, institutional voids.

Introduction

The rapid proliferation of the gig economy across developing countries has brought to the fore critical questions about labor rights, institutional accountability, and the structural foundations of platform-mediated work. Defined by flexible, taskbased engagements facilitated by digital platforms, gig work has emerged as both a solution to chronic unemployment and a source of precarity in environments marked by weak regulatory oversight and fragile institutional systems [1, 2]. In Iraq, a country grappling with economic transitions, youth unemployment, and fragile governance, platform-based work has flourished in the absence of robust labor frameworks. However, this expansion has not been accompanied by adequate regulatory reforms or institutional support, creating significant challenges for workers navigating legal ambiguity and systemic gaps.

Globally, the gig economy is reshaping labor markets by redefining employment relationships and disrupting traditional forms of worker protection. While it promises flexibility, autonomy, and entrepreneurial opportunity, scholars have increasingly noted the emergence of "institutional voids"—gaps in formal structures that govern work, contracts, social

protections, and dispute resolution mechanisms [3-5]. These voids are particularly pronounced in developing and transitional economies where public institutions are often ill-equipped to address the fluid and decentralized nature of platform-based labor [6, 7]. Without clear labor classifications or legal recognition, gig workers in these contexts operate in a gray zone, often falling outside the protection of labor laws, social insurance systems, and institutional advocacy structures [8, 9].

Platform work in such environments is doubly precarious. On one hand, platforms themselves adopt language and structures that classify workers as "independent contractors," thereby bypassing the need to provide benefits such as health insurance, sick leave, or job security. On the other, governments either lack the regulatory capacity or the political will to bring these new labor arrangements into legal and institutional alignment [10-12]. The result is a workforce engaged in digitally mediated labor that is at once essential and invisible—contributing to economies without being counted, protected, or empowered [13, 14]. In Iraq, this dual exclusion is particularly evident. Economic fragility, post-conflict reconstruction efforts, and institutional disarray have created an ecosystem in which informal and precarious work is not only widespread but structurally embedded.

This study is situated within this landscape of ambiguity, seeking to understand how Iraqi gig workers interpret, navigate, and adapt to the institutional voids that shape their work. The regulatory ambiguity facing these workers is multifaceted. For instance, many are unsure whether their income should be taxed, whether they are legally recognized as workers, or whether accidents and injuries sustained on the job are covered by any formal liability system [15, 16]. These uncertainties are not merely administrative—they affect workers' decisions about participation, risk-taking, and long-term livelihood strategies. The absence of institutional clarity also means workers have little recourse in cases of wage theft, deactivation, or algorithmic unfairness, issues that are commonly reported in both emerging and developed gig economies [17, 18].

Existing scholarship offers valuable insights into how workers globally experience this regulatory ambiguity. In Indonesia, for instance, platform-based motorcycle taxi drivers have expressed confusion about employment status and legal protections, often resulting in self-regulated practices to reduce risk [15]. Similar patterns are observed in India, where gig workers navigate a patchwork of contradictory laws and informal norms, developing coping strategies such as collective WhatsApp groups and localized codes of conduct [1, 3]. In Hong Kong, gig workers face a different but equally complex challenge: being partially covered under some occupational safety laws but excluded from labor protections [17]. These comparative contexts reveal a common thread—regulatory ambiguity compels platform workers to rely on informal networks, self-learning, and community-based problem-solving in the absence of institutional support.

However, much of the literature remains underdeveloped in the context of fragile states, where institutional fragmentation and weak governance exacerbate the risks and uncertainties of platform work. Iraq represents a critical and underexplored case in this regard. While studies from South Asia, Eastern Europe, and East Asia have documented variations in legal responses and worker adaptations [7, 8, 19], the experience of Iraqi gig workers is shaped by a post-conflict economy characterized by limited infrastructure, low state capacity, and a large informal sector [5, 20]. In such a context, institutional voids are not anomalies but structural features of the labor market. Understanding how workers navigate these gaps is essential not only for labor policy but also for broader questions about economic inclusion, digital transformation, and state legitimacy.

The regulatory challenges are also shaped by the complex role played by platforms themselves. While these companies present themselves as neutral intermediaries, they exert significant control over worker behavior through algorithmic

management, opaque rating systems, and unidirectional communication channels [9, 14]. These power dynamics deepen the asymmetry between worker and platform, especially when institutional checks and balances are absent. In Iraq, where consumer protections and labor enforcement mechanisms are weak, platforms operate with minimal oversight, further marginalizing workers who lack legal literacy and organizational resources [4, 7]. Moreover, the lack of collective bargaining rights or institutional representation means that workers must develop individual strategies to cope with systemic uncertainty—often at significant personal and emotional cost [2, 8].

Adding to this complexity is the question of social inclusion and identity. Research indicates that platform work, while providing new forms of income generation, can also reproduce existing forms of inequality. Gender disparities, for example, remain prevalent in many gig economies, with women disproportionately excluded from high-paying or safer platform jobs due to structural biases and safety concerns [17, 21]. Similarly, older workers face barriers to entry and digital exclusion, which limit their ability to benefit from gig work [13]. In Iraq, these issues intersect with broader social and economic vulnerabilities, including youth disenfranchisement, limited education access, and geographic disparities. Understanding how platform workers experience and respond to these intersecting challenges can help illuminate the broader implications of gig work in structurally weak states.

Given these dynamics, this study aims to explore how Iraqi platform-based workers interpret and navigate institutional voids and regulatory ambiguity in their daily work experiences.

Methods and Materials

Study Design and Participants

This study employed a qualitative research design to explore the experiences and perspectives of platform-based workers operating within the context of institutional voids and regulatory ambiguity in Iraq. The research adopted an interpretive paradigm, aiming to understand how individuals make sense of the legal and institutional environment surrounding their work. Participants were selected using purposive sampling to ensure a diverse representation of platform-based workers across different sectors such as ride-hailing, food delivery, freelance digital services, and courier work. The sample consisted of 29 participants (19 men and 10 women), aged between 21 and 45 years, from various cities including Baghdad, Basra, Erbil, and Najaf. Recruitment continued until the point of theoretical saturation—when no new themes or insights emerged from subsequent interviews—was achieved, ensuring depth and richness in the data collected.

Data Collection

Data collection was conducted exclusively through semi-structured interviews, allowing for both consistency in key topics covered and flexibility to explore emerging themes. An interview guide was developed based on the preliminary literature and the conceptual framework addressing institutional voids, informal employment practices, and regulatory uncertainty. The guide included questions on participants' entry into platform work, interactions with digital platforms, perceptions of labor rights, experiences with governmental institutions, and adaptive strategies in the face of regulatory ambiguity. Interviews were conducted in Arabic or Kurdish, depending on participant preference, and each lasted between 45 to 70 minutes. All interviews were audio-recorded with participant consent and transcribed verbatim. Ethical approval was obtained from a university-affiliated research ethics committee, and informed consent was secured from all participants prior to participation.

Data analysis

The data were analyzed using thematic analysis, following Braun and Clarke's six-step approach. NVivo software (version 12) was used to facilitate the coding and organization of qualitative data. The analysis began with an initial phase of open coding, where each transcript was reviewed line by line to identify emerging patterns and categories. Codes were then grouped into broader themes related to the absence of institutional support, the informalization of labor protections, and individual navigation of legal ambiguities. Throughout the analysis, constant comparison techniques were used to refine categories and ensure consistency across data sources. Reflexivity was maintained through memo-writing and peer debriefing to account for researcher bias and enhance the credibility of the findings.

Findings and Results

The study sample consisted of 29 platform-based workers from various cities in Iraq, including Baghdad, Basra, Erbil, and Najaf. Of these, 19 participants were male (65.5%) and 10 were female (34.5%), ranging in age from 21 to 45 years. The majority of participants (n = 17; 58.6%) were single, while 12 participants (41.4%) were married. Regarding educational attainment, 10 participants (34.5%) held a university degree, 12 (41.4%) had completed secondary education, and 7 (24.1%) had only primary schooling. In terms of platform sectors, 11 participants (37.9%) worked in ride-hailing services, 9 (31.0%) in food delivery, 6 (20.7%) in freelance digital services, and 3 (10.4%) in courier or package delivery. Most participants reported platform work as their primary source of income (n = 21; 72.4%), while the remainder used it as a supplementary job alongside other informal employment.

Table 1

Categories, Subcategories, and Concepts Extracted from Semi-Structured Interviews

Category (Theme)	Subcategory	Concepts (Open Codes)
1. Navigating Regulatory Uncertainty	Absence of Legal Status	Lack of labor contract, No official recognition, Ambiguity in taxation, Undefined employment status, Fear of government inspection
	Confusion Over Legal Responsibility	Unclear platform-worker accountability, Contradictory messages from platforms, Disputed accident liability, Lack of legal guidance
	Inconsistent Enforcement Practices	Unequal treatment across cities, Arbitrary fines, Unpredictable regulatory actions, Corruption in enforcement
	Mistrust in Public Institutions	Negative perception of labor ministries, Doubts about legal protection, Perception of government neglect, Bureaucratic inefficiency
	Self-Regulation Strategies	Personal safety rules, Peer-based ethics, Informal dispute resolution, Volunteer documentation efforts
	Coping with Legal Ambiguity	Avoiding formal registration, Use of pseudonyms, Selective disclosure of income, Hesitation to engage with government platforms
	Platform Advice and Misguidance	Contradictory platform instructions, Platform avoiding liability, Limited legal help, Vague onboarding training
2. Institutional Disconnection	Lack of Labor Representation	No unions for gig workers, Isolation from traditional workforce, Exclusion from worker advocacy groups, Absence in labor negotiations
	Informal Problem-Solving Mechanisms	WhatsApp support groups, Peer networking, Informal mediation, Advice through YouTube influencers
	Limited Access to Social Protection	No health insurance, No pension contributions, No access to paid leave, Ignorance of eligibility
	Disconnect from Formal Economy	No bank transactions, Cash-based payments, Inability to secure loans, No financial identity
	Fragmented Institutional Support	Lack of coordination between government bodies, Overlapping responsibilities, Misaligned digital economy policies

3. Adaptive Work Practices	Algorithmic Management Tactics	Working around app glitches, Optimizing for ratings, Logging in/out tactically, Multiple app usage, Learning algorithmic patterns
	Risk Management and Safety	Avoiding night shifts, Personal safety tools, GPS manipulation, Avoiding unsafe neighborhoods
	Earnings Maximization Techniques	Surge hour focus, Strategic area selection, Client pre-screening, Avoiding low-rated customers, Accepting cash tips
	Building Informal Communities	Group chats with peers, Local language-based networks, Emotional support among workers, Shared customer blacklists
	Psychological Resilience	Redefining success, Emotional distancing, Focusing on autonomy, Accepting unpredictability
	Flexibility as a Survival Tool	Working multiple jobs, Adjusting hours daily, Job-switching flexibility, Prioritizing family obligations

Category 1: Navigating Regulatory Uncertainty

Many participants highlighted the *absence of legal status* in their work as platform-based workers, explaining that they lacked labor contracts and were not officially recognized by any labor or tax authority. This legal invisibility led to confusion and anxiety. One participant stated, "We don't have a job title on paper; we are nothing in the system." Workers feared inspections and operated without clarity on obligations or protections. Similarly, *confusion over legal responsibility* was a recurring concern. Participants described situations where responsibility for incidents, such as traffic accidents, was unclear. One interviewee explained, "If something happens, the platform blames the worker, and the worker has no one to defend him." This confusion was amplified by contradictory platform instructions and a lack of legal guidance.

Another key issue was *inconsistent enforcement practices* across regions and cities. Participants reported that government treatment varied arbitrarily, and some faced fines while others in identical circumstances did not. Corruption among enforcement officials was mentioned repeatedly, with one respondent saying, "Sometimes you pay a bribe and they let you go; other times they take your bike." These inconsistencies deepened a sense of injustice. The lack of faith in institutions was reinforced under the subcategory of *mistrust in public institutions*. Workers saw labor-related agencies as distant and inefficient. A participant noted, "The ministry doesn't even know we exist." This institutional detachment fostered apathy and avoidance.

As a result, many workers turned to *self-regulation strategies* for their operations. They developed informal safety rules, relied on peer ethics, and even created makeshift documentation to protect themselves. One respondent remarked, "I keep my own records because no one else will." Similarly, the subcategory *coping with legal ambiguity* revealed how workers avoided formal registration, used pseudonyms on apps, or hid parts of their income. One participant shared, "I told my family I was doing deliveries, but I didn't tell the government." Finally, in the subcategory *platform advice and misguidance*, participants expressed frustration at vague or misleading onboarding processes. Platforms avoided discussing liability and provided inconsistent information. As one interviewee said, "They tell you 'you're your own boss,' but they control everything and vanish when problems come."

Category 2: Institutional Disconnection

Participants consistently expressed frustration over the *lack of labor representation*. They noted they were excluded from unions and lacked the collective power to advocate for their rights. One worker shared, "If I were a taxi driver, I'd have a union. But as an app driver, I'm on my own." This sense of isolation was intensified by their status outside traditional workforce structures. To manage daily challenges, many relied on *informal problem-solving mechanisms*. These included WhatsApp groups, peer advice, and YouTube channels run by experienced gig workers. One participant stated, "I learned how to deal with clients from a Telegram group. No one else teaches you."

A significant barrier to worker well-being was *limited access to social protection*. Participants reported they had no health insurance, pension, or paid leave. Some did not even know whether they were entitled to any benefits. A respondent admitted, "If I get sick, I just don't work. That's it." Similarly, many participants felt a profound *disconnect from the formal economy*. They were paid in cash, avoided bank accounts, and could not access credit or loans. One explained, "They pay me cash because I don't have a bank account. No bank trusts gig workers." This exclusion restricted their financial mobility and added to job insecurity.

The subcategory *fragmented institutional support* described how different government bodies had overlapping or unclear responsibilities. Workers found it difficult to identify where to turn for help or information. A participant commented, "One office says go to the labor ministry, the other says talk to the platform. You just go in circles." This fragmentation eroded any remaining trust in formal institutions and led workers to rely more on informal systems of support.

Category 3: Adaptive Work Practices

In response to challenges, participants described sophisticated *algorithmic management tactics*. Many learned how to manipulate the app's logic—such as logging out and back in during off-peak times—to access better tasks or income opportunities. Others operated multiple apps simultaneously to maximize work. One participant stated, "I know when to switch apps and how to chase the algorithm. It's like a game." Personal safety also shaped work decisions, falling under the subcategory *risk management and safety*. Workers avoided unsafe neighborhoods, refused late-night deliveries, and used GPS modifications to reduce risk. As one person shared, "After 9 p.m., I don't accept any orders from certain areas—it's just not worth the danger."

Participants also actively employed *earnings maximization techniques*, including targeting surge pricing hours, avoiding low-rated customers, and accepting only high-tip routes. A driver explained, "You must work smart. Know where the rich customers are and when they order." These practices were vital for survival. In parallel, *building informal communities* emerged as a critical resource. Peer support networks through chats and neighborhood-based groups helped workers exchange tips, blacklist problematic clients, and provide emotional support. One participant said, "We have a group—if someone's in trouble, we all know and help."

The subcategory *psychological resilience* highlighted workers' internal coping strategies. Many reframed their experience by focusing on autonomy and redefining success. One noted, "It's not perfect, but at least no one yells at me. I'm free in a way." Others distanced themselves emotionally to maintain mental well-being. Finally, *flexibility as a survival tool* allowed workers to adjust to unpredictable demand. Participants juggled multiple roles, shifted working hours, or temporarily exited the platform economy to pursue other short-term gigs. A participant summarized this adaptability well: "One week I'm delivering food, the next week I'm fixing phones. That's just life now."

Discussion and Conclusion

The findings of this study reveal three interrelated themes that characterize the experiences of Iraqi gig workers operating within institutional voids and legal ambiguity: navigating regulatory uncertainty, institutional disconnection, and adaptive work practices. These themes illuminate how workers negotiate unclear legal boundaries, operate in the absence of formal protections, and develop informal strategies for survival in a structurally fragmented platform economy. The study highlights the complex interplay between worker agency and institutional absence in a fragile regulatory environment, showing that

while gig platforms may offer economic opportunities, they also expose workers to significant risks that are intensified by state inaction and regulatory opacity.

The first theme, *navigating regulatory uncertainty*, reflects the ways in which workers must interpret and respond to a legal environment that does not recognize them as formal employees. Participants described the absence of labor contracts, confusion over taxation and liability, and fear of enforcement actions, often coupled with contradictory guidance from the platforms themselves. These experiences resonate with previous findings that gig work operates within a "gray zone" of labor categorization where platforms claim neutrality, but exert managerial control without accountability [8, 10]. Workers' mistrust in public institutions and their turn toward self-regulation and selective disclosure mirror patterns identified in Indonesia and India, where drivers and delivery workers adopt informal risk mitigation strategies in the absence of clear legal frameworks [3, 15].

These regulatory ambiguities are not limited to developing contexts. Even in relatively institutionalized settings like Hong Kong or Romania, gig workers report similar confusion and a lack of recourse when facing platform decisions or public regulation [17, 19]. However, the Iraqi context demonstrates a deeper institutional void, where regulatory inconsistency is not only systemic but often compounded by corruption, contradictory enforcement, and bureaucratic inefficiency. This confirms observations by Hoff [5] and Wardhana et al. [4], who emphasize that platform economies thrive in contexts of legal ambiguity, exploiting regulatory gaps to minimize obligations. The Iraqi experience also echoes insights from Singh and Bisen [20], who argue that platform work in the AI-driven economy creates uncertainty not only due to algorithmic opacity but also because of the absence of institutional mechanisms to contest or appeal decisions.

The second theme, *institutional disconnection*, illustrates how gig workers are functionally excluded from formal labor structures, lacking representation, access to social protection, or integration into the financial system. Participants described an overwhelming reliance on informal problem-solving mechanisms such as WhatsApp groups or peer-led support channels. These findings align with prior research emphasizing how institutional voids push gig workers to substitute formal protections with community-based systems [1, 2]. The exclusion from unions, banks, and social insurance systems highlights the economic marginalization of platform workers, who often operate outside of the state's formal economic infrastructure [6, 7].

This institutional marginalization is not merely logistical—it produces a sense of invisibility that affects how workers view themselves and their future. Studies in Eastern Europe and South Asia have similarly shown that gig workers experience psychological detachment and social exclusion when denied access to basic labor institutions and rights [11, 13]. In this respect, the findings affirm the growing scholarly consensus that the gig economy not only restructures labor relations but also reconfigures how citizenship and state engagement are experienced in everyday economic life [9, 14]. Importantly, while some studies have focused on worker demands for regulation or unionization, this study finds that Iraqi workers have largely abandoned hopes of institutional support, choosing instead to adapt through informal, localized means.

The final theme, *adaptive work practices*, underscores the agency and ingenuity of workers operating in adverse institutional conditions. Participants described a range of strategies to navigate algorithmic control, maximize earnings, and ensure personal safety—from multi-app usage to informal blacklists of unsafe clients. These practices support the view that gig workers are not passive victims but active agents who learn to manipulate platform logics to their advantage [9, 14]. However, such adaptations are reactive and individualized, often placing emotional and physical strain on the worker. Psychological resilience and flexibility emerged as core coping mechanisms, yet these come at the cost of long-term stability,

career development, and well-being. This aligns with studies in Saudi Arabia and India, where platform workers emphasize autonomy and flexibility while simultaneously experiencing chronic instability [3, 22].

Moreover, the findings complicate the narrative that flexibility is inherently empowering. While some participants valued the ability to switch jobs or choose working hours, many acknowledged that this freedom was necessitated by risk and insecurity, not choice. This insight echoes critiques that challenge the celebratory discourse surrounding "freelance freedom" in the platform economy, noting instead the structural coercion that underlies much of this labor [8, 23]. Workers must constantly adapt to shifting algorithmic conditions and consumer expectations, often without clarity, feedback, or redress. As Hwang [18] and S. [1] argue, this dynamic turns workers into data-responsive actors who internalize platform logics while lacking bargaining power or institutional protection.

Gender and age dynamics also intersect with these themes. While the sample in this study was predominantly male, the barriers to women's participation in platform work were frequently mentioned—particularly in relation to safety concerns, social stigma, and platform discrimination. This reflects Vyas's [21] observations about the gendered contours of gig labor, where digital platforms reproduce offline inequalities under the guise of innovation. Similarly, older workers faced challenges adapting to platform technologies or being accepted by customers, confirming findings by Nioradze [13] that the gig economy can exclude as much as it includes, depending on the demographic and technological profile of workers.

The results of this study further support the argument that regulatory ambiguity is not simply a temporary or transitional condition—it is an embedded feature of platform capitalism in weak institutional settings. This ambiguity benefits platforms by reducing costs and responsibilities while shifting risk to individual workers. It also disempowers workers by making their status and rights contingent upon platform discretion and informal negotiation. As Singh [11] and Hux [12] note, the lack of consistent labor standards, accountability mechanisms, or enforceable rights in the gig economy undermines the foundational social contract of employment, especially in states with limited regulatory enforcement capacity.

In sum, this study adds to a growing body of research that problematizes the gig economy not merely as a technological shift in labor but as a fundamental reconfiguration of legal, institutional, and economic structures. By focusing on Iraq, it offers a rare glimpse into how these global transformations play out in fragile contexts, where workers are left to navigate not just platform policies but institutional abandonment.

While this study offers valuable insights into the lived experiences of platform workers in Iraq, several limitations must be acknowledged. First, the sample was limited to 29 participants, and while efforts were made to include a diverse group across gender, sector, and region, the findings cannot be generalized to all gig workers in Iraq or other countries. Second, the study relied solely on self-reported data through interviews, which may be affected by recall bias, social desirability, or selective disclosure. Third, the research focused exclusively on the worker perspective and did not include input from platform managers, regulators, or policymakers, which could have enriched the analysis and provided a more balanced institutional view.

Future research could expand this study in several directions. Comparative studies between gig workers in urban and rural areas in Iraq would be useful to understand geographic disparities in access to platforms and exposure to risk. Longitudinal research could also examine how workers' strategies evolve over time, especially in response to new regulations or platform changes. Including other stakeholders such as policymakers, platform representatives, and labor advocates could offer a more

holistic picture of the ecosystem. Additionally, future studies could explore intersectional dynamics, particularly how gender, age, and educational background shape the gig work experience in fragile or transitional economies.

Policymakers should prioritize the development of clear and inclusive legal frameworks that recognize and protect gig workers without undermining the flexibility that attracts many to platform work. Regulatory bodies must coordinate to ensure consistency in enforcement and eliminate ambiguity that leads to worker vulnerability. Platforms operating in fragile economies must be held accountable for transparent and fair labor practices, including clearer contracts, support mechanisms, and access to social protections. Worker-led associations and informal support networks should be encouraged and strengthened to give gig workers a collective voice and mechanism for advocacy. Training programs can also be developed to enhance workers' digital literacy, financial planning, and awareness of rights, equipping them to navigate the complex terrain of platform labor more effectively.

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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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