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Kaliwali as Shadow Infrastructure: Indigenous Social Capital and the Mitigation of Occupational Stress in a Pakistani Industrial Estate

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ABSTRACT

This paper examines how indigenous social capital—locally termed Kaliwali (village-based kinship networks)—functions as a shadow infrastructure that mitigates Zehni Bojh (occupational stress) among the industrial workforce at Gadoon Amazai Industrial Estate (GAIE), Swabi, Khyber Pakhtunkhwa, Pakistan. Drawing on qualitative case study methodology, this study presents findings from 30 in-depth interviews conducted with three occupational strata: unskilled labourers, skilled technicians, and managerial staff. Informed by Putnam's Social Capital Theory and House's Social Support Theory, the study demonstrates that Kaliwali operates as a stratified, functional support network that partially compensates for the institutional failures of formal industrial organisation. The analysis reveals that this reliance on Pashtunwali—the indigenous Pashtun code of life—is not uniform across the workforce hierarchy: it serves as a shield of survival for unskilled labourers, a negotiation tool for skilled workers, and a governance mechanism for managers. However, this protection carries a significant paradox: the very tribal network that buffers against institutional abandonment also imposes a social tax, role entrapment, and cyclical debt. The paper introduces the concept of Legal Pluralism on the factory floor, where tribal codes operate alongside—and at times supersede—formal organisational rules, arguing that industrial stability at GAIE rests not on rational-legal authority but on the moral economy of Pashtun kinship. These findings challenge universalist models of occupational resilience and call for culturally embedded frameworks in occupational sociology.

Keywords: *Kaliwali, Pashtunwali, indigenous social capital, occupational stress, moral economy, legal pluralism, Gadoon Amazai Industrial Estate, Pakistan, industrial sociology, shadow infrastructure*

INTRODUCTION

Occupational stress in the industrial workforces of the Global South is increasingly recognised as a product not only of physical labour conditions but of the deep structural tensions between modern industrial rationality and indigenous socio-cultural systems (Ungar, 2013). Yet mainstream occupational sociology has, for the most part, examined these tensions through Western psychological frameworks that emphasise individual coping resources and organisational interventions, often overlooking the role of informal communal systems in shaping how stress is experienced and managed (Boyden & Mann, 2005).

This paper addresses that gap by investigating the role of *Kaliwali*—indigenous village-based kinship bonds—in mediating occupational stress among Pashtun workers at the Gadoon Amazai Industrial Estate

(GAIE), Swabi, Pakistan. *Pashtunwali*, the overarching code of life governing Pashtun society, structures social relations through principles of *Nang* (honour), *Melmastia* (hospitality), *Badal* (reciprocity), and *Khpalwali* (kinship loyalty). At GAIE, these cultural principles do not remain outside the factory gates; they permeate the production floor, reshaping authority, discipline, conflict resolution, and financial safety nets in ways that formal HR policy cannot anticipate.

Established between 1986 and 1987 as a government initiative to provide alternative livelihoods to local Pashtun communities previously dependent on poppy cultivation, GAIE today comprises 92 functional industrial units across sectors including textiles, chemicals, steel, pharmaceuticals, and electronics (Azizullah et al., 2011; Khan et al., 2009). The estate represents a unique *geopolitical experiment* in which modern industrial reasoning and traditional tribal life coexist in sustained tension. This paper argues that this coexistence is not merely cultural colour but a structural condition that determines how workers survive the psychosocial demands of industrial labour.

The paper is structured as follows. Section 2 reviews the relevant literature on social capital, occupational stress, and Pashtunwali. Section 3 describes the qualitative case study methodology. Section 4 presents the empirical findings, organised by occupational tier and functional mechanism. Section 5 discusses the theoretical implications, and Section 6 concludes with recommendations for policy and future research.

LITERATURE REVIEW

Workplace Stress and Its Sources

Terms such as occupational stress, workplace stress, and job stress are conceptualized differently in the literature, yet all are fundamentally rooted in the same underlying concept: a mismatch between environmental demands and available resources (Larson, 2004; Reddy & Poornima, 2012). Occupational stress sources are multiple and vary widely across contexts (Donaldson-Feilder et al., 2011). Stressors are chronic conditions or environmental events that threaten employees' psychological and physical health (Grant et al., 2003) and may encompass environmental, psychological, sociological, and philosophical dimensions (Greenberg, 2002). These include role ambiguity, role conflict, lack of decision-making authority, work overload, absence of appraisal, low pay, and poor managerial support (Pandey, 2020).

A particularly influential model for understanding these dynamics is the Job Demand-Control-Support (JDCS) model (Karasek, 1979; Portoghese et al., 2020), which proposes that workplace strain is generated by the interaction between psychological demands and decision latitude. In the context of GAIE, this model requires extension: it is not only formal job demands and control resources that determine strain, but the informal cultural obligations of Pashtunwali that add a third, often invisible, layer of demand.

Social Capital and Occupational Resilience

Robert Putnam's conceptualisation of social capital distinguishes between bonding capital (tight ties within homogeneous groups), bridging capital (weaker ties across groups), and linking capital (vertical ties to institutions) (Putnam, 2000, 2001). Social capital has been shown to serve as a buffer against occupational stress by enabling access to emotional, informational, and instrumental support (Bourdieu, 1986; House, 1981).

However, the literature also documents a dark side of social capital. Villalonga-Olives and Kawachi (2017) demonstrate that dense, obligation-bound social networks can produce health costs through surveillance, coercion, and the enforcement of conformity. In tight-knit ethnic and kinship communities, high bonding

capital can simultaneously protect and constrain, producing what this paper terms the *Paradox of Belonging*.

Pashtunwali as Social Capital and as Stressor

Contemporary anthropological scholarship defines Pashtunwali as a comprehensive ethical code and social organisation governing Pashtun life (Khan & Shah, 2021; Rzehak, 2011). It functions as a form of indigenous social capital (Siddique, 2014) through its principles of mutual obligation, hospitality, and community solidarity. Multiple studies document a positive correlation between adherence to Pashtunwali and adaptive coping with stress, conflict, and adversity (Farahani et al., 2023; Mirzaei, 2016; Asghar & Zia Ur, 2023).

Nevertheless, the relationship between indigenous culture and workplace stress is dual and complex. Research demonstrates that the strict requirements of Pashtunwali, including the preservation of *Ghayrat* (honour) and mutual kinship demands, can also serve as significant stressors when they collide with formal organisational requirements (Akhlaqi et al., 2016; Collette & Miller, 2019; Yousaf, 2019; Kaufmann & Beehr, 1989; Pandey, 2020).

Gaps in the Literature

The existing literature reveals several significant gaps. First, most occupational stress studies in this region have employed quantitative methods that fail to capture the nuanced, context-specific mechanisms through which culture shapes stress and coping (Gök et al., 2017; Haque et al., 2016). Second, while organisational culture is often considered in models of stress, the role of external community culture and kinship networks is frequently ignored (Chang & Lu, 2007; MacGeorge et al., 2011). Third, the concept of resilience has been predominantly examined as a Western, individually-focused construct, with limited attention to community-based, culturally embedded resilience processes in non-Western contexts (Boyden & Mann, 2005; Luthar et al., 2000; Liebenberg & Theron, 2015).

This paper directly addresses these gaps by examining, through qualitative case study methods, how the indigenous social capital of Kaliwali functions as a stratified, functional shadow infrastructure within an industrial estate—a dimension invisible to standard occupational stress instruments and organisational policy frameworks.

Theoretical Framework

This study is theoretically anchored in the synthesis of Putnam's Social Capital Theory (2000, 2001) and House's Social Support Theory (1981, 1987). Putnam's framework explains the *who*: the GAIE workforce is not an atomised labour pool but a dense network of bonding capital built on kinship *(Kaliwali)* and tribal identity *(Pashtunwali)*, enabling collective resistance against external institutional pressures.

House's Social Support Theory explains the *how*: these networks operate through three support types—*emotional support* (empathy and reassurance in the Hujra), *instrumental support* (material aid through the Committee System), and *informational support* (guidance through the Jirga). Critically, this paper extends both theories by demonstrating that such social support is stratified by occupational position, that its benefits are not free of cost, and that it constitutes an informal institution operating in parallel to—and in competition with—formal organisational governance.

RESEARCH METHODOLOGY

Research Design

This study employed a Qualitative Case Study Design grounded in the Interpretivist Paradigm (Cresswell, 2013). The choice of methodology was deliberate: occupational stress at GAIE is not simply a biological variable to be measured but a socially constructed reality built upon the cultural codes of honour *(Ghayrat)* and reciprocity *(Badal)*. A quantitative approach would have failed to capture the cultural nuances and lived experiences that constitute this study's primary object of inquiry. GAIE was selected as a single-bounded case—a unique geopolitical experiment where modern industrial logic and traditional tribalism collide—enabling a thick description (Geertz, 1973) of their interaction.

Sampling and Participants

A total of 30 participants were recruited through a combination of purposive and snowball sampling (Patton, 2014; Sandelowski, 1995). Purposive sampling ensured vertical representation across three occupational strata: Tier I—Unskilled and Semi-Skilled Labourers (n=15); Tier II—Skilled Workers and Technicians (n=10); and Tier III—Managerial Staff (n=5). Snowball sampling was required to navigate the cultural barriers of a closely bonded tribal community distrustful of outsiders *(Parey)*, with trusted community members serving as gatekeepers. All participants were male, which reflects the cultural constraint of *Purdah* that limited access to female workers. All names used in this paper are pseudonyms.

Data Collection

Data were collected through 30 in-depth semi-structured interviews conducted in Pashto and Urdu, frequently held in *Hujras* (community guesthouses) and outside factory gates to avoid managerial surveillance. The interview guide was structured around five thematic sections: occupational experiences, sources of stress, role of community, coping strategies, and personal definitions of resilience. Oral informed consent was obtained, adapted for the local context of limited literacy and cultural suspicion of written documentation.

Data Analysis

Interviews were transcribed verbatim and analysed using Thematic Analysis following Braun and Clarke's (2006) six-step framework: familiarisation, initial coding, theme searching, theme reviewing, theme defining, and writing the analysis. All transcripts were coded using MAXQDA 2024. A hierarchical coding tree was developed integrating inductive (emergent from data) and deductive (theoretically informed) codes, stratified across three categories: Structural, Cultural, and Emergent themes. Data saturation was reached at interview 29–30, with labourers reaching saturation by interview 12 due to the homogeneity of somatic and financial narratives.

FINDINGS

The thematic analysis of the primary data shows that, like occupational stress itself, dependence on social capital at GAIE is heavily stratified. The role of *Kaliwali* alters with the position of the worker within the organisational hierarchy. The factory cannot be perceived only as a field of economic production guided by market rationality; it is simultaneously a complex social site with its own codes of *Pashtunwali*. These two parallel structures coexist: on the surface, a contemporary industrial organisation where authority flows from owner to manager to worker; and beneath it, an expansive underground organisation—the Tribe—whose authority is personal, inherited, and rooted in age, lineage, and *Nang* (reputation).

The findings are presented across three occupational tiers, followed by a cross-cutting analysis of four functional mechanisms through which Kaliwali operates as shadow infrastructure: the Therapeutic Community, the Parallel Constitution, the Psychological Function, and the Paradox of Belonging.

Unskilled Labourers: Pashtunwali as a Lifeline for Survival

For unskilled workers, workplace resilience at GAIE is primarily about the restoration of dignity and financial survival in deeply dehumanising settings. The data reveals three key mechanisms.

The Jirga as Trustworthy Bank

To meet the financial demands of their social obligations, unskilled labourers—finding neither adequate salary nor company protection—turned to the indigenous 'committee system': a rotating savings and credit association where informal groupings pool fixed contributions, with total sums distributed to members in need. One respondent (Rahim, 20s, Assembly Line Worker, Toy Manufacturing) described this as:

> *"The factory gives nothing in our financial needs, so we try to help ourselves with our own sources, but we also have fear sometimes if someone runs away with the money... so in that case, build a Jirga (Council of Elders) that enforces trust, if someone runs the jirga will deal with him, that fear of the jirga keeps the money safe."*

This system exemplifies Granovetter's (1985) concept of embeddedness: economic relations facilitated and constrained by ongoing social relations. The Jirga not only functions as a financial tool but restores the worker's locus of control, enabling future planning despite limited salary and absent organisational support.

Zakat and the Prah: Dignity-Preserving Aid

The data also reveals a culturally sophisticated form of mutual aid that explicitly protects face *(Prah)*. Respondent Saeed (30s, Packer, Pharmaceutical Packaging) recounted:

> *"Once, I needed some financial support for my child's health issues, and my fellow employees became aware of this, and I don't know where they collected an adequate amount of money with the help of our mosque committee, and the aid was given to me quietly to protect my face and honour (Nang), because in our culture receiving such charity can be a source of Sharam (shame), this will show us as incapable to provide for one's family."*

This form of aid represents a distinctive departure from both state welfare and organisational employee assistance programmes—it is materially functional and culturally protective simultaneously, operating within a framework of dignity that formal institutional support does not possess.

Ashar and Collective Effervescence

A third mechanism—collective physical labour—emerged from the case of Wahid (50+, Cleaner, Production Floor), who described being unable to complete a physically demanding task assigned by management due to deteriorating health:

> *"One of my managers gave me a very hard physical task to complete, and I was unable to do so. I used the communal labour method (Ashar) to manage this. My fellow Pashtun employees helped me collectively for days, until my health condition became normal. We*

> *worked together, and my workload is shared. This Ashar system is the collective and voluntary tradition we use for our difficult tasks."*

This tradition reflects Durkheim's concept of collective effervescence—moments in which a group moves in synchrony, generating unified energy that transcends the individual (Farhan et al., 2023; Shirzad et al., 2024). The *Ashar* system buffers somatic stress precisely where formal occupational health systems are absent.

Skilled Workers: Pashtunwali as a Tool of Negotiation

Among skilled technicians, *Kaliwali* shifts function: it becomes a negotiation tool for managing role overload and the kinship obligations that simultaneously support and constrain.

The Hidden Union: Azizwali and Badal

For some skilled workers, Pashtunwali operates as an informal union in the absence of effective formal ones. Junaid (20s, CNC Operator, Auto-Parts Factory) described this system:

> *"Sometimes when the machine becomes dysfunctional, or we face any other issue, we use our Azizwali (kinship ties) to cope with this issue. When the machine failed, my cousins saved my face by fixing the error before the management noticed. When our salaries got late, my tribes colleague of any tier provided me sometimes financial and human support, they even strike with me for my problems with management, although I am their supervisor. All this happens because of our culture's Badal system. I will then help them with their issues, too."*

In Western contexts, *Badal* is associated with revenge; in Pashtun society it fundamentally denotes reciprocal exchange—the return of a favour. This system fills the gap left by absent organisational safety policies and constitutes a form of Social Exchange Theory in practice (Alam, 2021), where cross-hierarchical coverage is traded for future reciprocal protection.

Nanawatay: Restorative Justice and the Social Tax

The data further documents the use of *Nanawatay* (the custom of seeking forgiveness) in workplace conflict resolution. Omar (50+, Boiler Operator, Industrial Dyeing Unit) described the double dimension of this custom—both its protective power and its financial cost:

> *"But for some employees, these customs create a high cost. When one of our section supervisors was fired for negligence on duty. He knows that this person's family is my community members. In the evening, he takes half a sheep and goes to his hujra. He was given forgiveness, which cost him half of his salary, which makes this custom very costly for him."*

The worker effectively pays a *Tax of Kinship*—a social sacrifice to maintain harmony. While culturally adaptive in the restorative justice sense, such customs are materially maladaptive, representing a significant barrier to capital accumulation for low-wage industrial workers.

Managerial Staff: Pashtunwali as Governance

At the managerial tier, *Kaliwali* transforms into a governance mechanism. Managers at GAIE function as Boundary Spanners (Beechler et al., 2017; Abadal & Potts, 2022), utilising the Pashtun cultural code to maintain order in an environment where formal HR tools are culturally ineffective.

The Elder in the Office: Mashar as Manager

Shahzad Khan (40s, Production Manager, Textile Mill) described his governance approach:

> *"In my experience at GAIE, the HR rule book does not work here. I mostly use the rules of our customs; it works for me as restorative justice that helps ease my stress."*

He further elaborated that normative pressure—the fear of losing face in the village—functions as a disciplinary mechanism more effective than formal written warnings or punitive HR measures. This transforms the Jirga system from a community conflict-resolution tool into an industrial management instrument, revealing a form of Legal Pluralism (Thornton et al., 2012) on the factory floor.

Cultural Delegation and the Line Elder

Another governance strategy—Cultural Delegation—was documented in the practice of delegating discipline to informal Line Elders. Liaqat (30s, Forklift Operator, Logistics Warehouse) described this:

> *"I make use of Masharan concept (Elders) to push the burden. Rather than screaming at a young worker face-to-face—which could result in a fight—I approach the older respected worker on the line (the Line Elder). I explain to him, Baba, this boy is slow. Talk to him, then I will not need to report him. I resolved the problem with the help of the internal cultural hierarchy. Elder talks to the boy in the Pashto language, employing cultural shame, and the boy hears. This 'Cultural Delegation' spares me the role of villain (dushman)."*

This strategy reveals a sophisticated manipulation of cultural codes in service of capitalistic efficiency: the formal supervisor retains relational standing whilst the Line Elder absorbs the social cost of discipline—a form of soft power unavailable to managers in non-kinship-based industrial environments.

The Phantom Boss: Externalization of Blame

A third managerial strategy involved the strategic performance of Pashtunwali to avoid the stigma of tribal betrayal. Supervisors personified unpopular decisions as originating from an unseen, remote authority figure—the 'Big Boss in Lahore'—thereby positioning themselves as fellow victims of an external system rather than its local enforcers. Omar (50+, Boiler Operator, Industrial Dyeing Unit) commented:

> *"When it becomes necessary to make a drastic rule, I explain to the workers, Brothers, I hate this rule as well. It is of the Big Boss in Lahore. I am just the messenger. I am with them against the remote, unseen owner."*

Cross-Cutting Mechanisms: The Shadow Infrastructure in Operation

Beyond the occupational tier analysis, the data reveals four overarching functional mechanisms through which Kaliwali constitutes a shadow infrastructure within GAIE.

The Therapeutic Community

Workers across tiers described their community life as a therapeutic community providing psychological support that the formal organisation entirely lacks. Omar (50+, Boiler Operator) specifically referred to the *Hujra* as a 'hospital of the mind,' while Tariq (20s, General Helper, Construction Material Yard) described the process of collective venting as making his problem shared rather than isolating. These findings align with the social cure perspective (Jetten et al., 2012) and Penić et al.'s (2021) concept of Collective Resilience, whereby stress is distributed across the group through communal coping. For these workers, *Identity Switching*—moving from the stigmatised role of factory labourer to the dignified identity of community member, tribesman, and father—is itself a survival strategy.

The Parallel Constitution

Several respondents described their tribal networks not as supplementary but as constitutionally primary in the workplace. The most striking example was the invocation of *Nanawatay* (asylum) as a veto on formal termination protocols. Faisal (30s, Production In-charge, Chemical Plant) noted explicitly that when a subordinate seeks forgiveness through the cultural network—'head bowed'—the manager is socially compelled to tear up the termination letter. This dynamic illustrates Thornton et al.'s (2012) theory of Competing Institutional Logics, where the Community Logic of forgiveness and protection dominates the Market Logic of efficiency, and the factory floor becomes a site of Legal Pluralism where power derives not from managerial position but from the mutual maintenance of *Ghayrat* (honour).

The Paradox of Belonging

The protective functions of *Kaliwali* carry a significant shadow: the Paradox of Belonging. Workers described their community simultaneously as a *Sanctuary* and a *Cage*. Qasim (20s, Quality Inspector, Garment Export Factory) reported that strict enforcement of professional duties caused him to be labelled a 'traitor,' leaving him 'trapped by his own blood.' Shahzad Khan (40s, Production Manager) noted that kinship obligations 'tied his hands,' making it impossible to discipline underperforming relatives. Farhad (30s, Night Security Guard, Logistics Warehouse) expressed that community pressure to maintain a 'secure job' actively blocked his professional mobility.

These accounts demonstrate that the tribal network, while providing essential protection, simultaneously imposes a social tax through cyclical debt (Badal obligations), role entrapment (Khpalwali pressures on managers), and panoptical surveillance. Ball's (2005) concept of Lateral Surveillance is operative here: the social density of the kinship network replaces digital monitoring, creating a transparency paradox in which workers are never truly off duty.

DISCUSSION

The findings of this study generate several significant theoretical contributions to occupational sociology, social capital theory, and the sociology of work in the Global South.

The Moral Economy of the Industrial Pashtun Workforce

The evidence presented in this paper supports a reconceptualisation of GAIE's industrial stability as resting not on Weberian rational-legal authority but on what Thompson (1971) and Scott (1976) term the *moral economy*: the governance of economic life through moral obligations and social relations rather than market logic (Marchi, 2013). The formal organisation exploits not only workers' physical labour but their cultural

capital. *Pashtunwali* effectively subsidises the production process by absorbing the shocks of industrial life—injury, poverty, conflict—that the estate's management does not formally address.

Stratified Social Capital: Beyond Putnam

The paradigm proposed by Putnam views social capital as a good at the community level, which produces generalised trust and collective action. The current results confound this by showing that the same stock of social capital yields qualitatively different effects across the occupational rank of the worker: a lifeline to the unskilled, a bargaining chip to the skilled and a system of checks and balances to the managers. This hierarchy of social capital--what this paper refers to as Hierarchical Social Capital--is a hypothetical extrapolation which the Putnam horizontal framework fails to capture, and which has far-reaching consequences to how resilience studies conceptualise the notion of community resources in the developing-country industrial world.

Legal Pluralism and the Limits of Formal HR

The functioning of Pashtunwali as a Parallel Constitution shows a deep legal pluralism on the GAIE whereby there is coexistence, interaction and competition of two normative systems, the formal Company Policy and the informal tribal code. The formal system does not merely go hand in hand with the informal one; in many cases, it is overridden. This questions a belief in the human resource management literature that formal policy is the main regulatory instrument in the industrial environment, and requires a theory of dual institutional regulation in situations where the workforce is kinship-filled.

The Dark Side Revisited

The Paradox of Belonging extends Villalonga-Olives and Kawachi's (2017) analysis of the dark side of social capital. While those authors focus on health costs of dense social networks (surveillance, norm enforcement), the present study reveals an additional dimension: the dark side operates *differently* at different levels of the occupational hierarchy. For unskilled workers, it manifests as cyclical debt; for skilled workers, as kinship tax and role conflict; for managers, as role entrapment and moral injury (Reamer, 2022). The dark side of social capital is therefore not a uniform phenomenon but a stratified burden.

CONCLUSION

This paper has demonstrated that *Kaliwali*—indigenous village-based kinship capital rooted in *Pashtunwali*—functions as a shadow infrastructure at Gadoon Amazai Industrial Estate, partially compensating for the institutional failures of formal industrial organisation. Where formal organisational structures do not provide secure financial support, the Committee System governed by the *Jirga* serves as a banking institution. Where the organisation provides no psychological counselling, the *Hujra* and the Mosque become therapeutic communities. Where the estate neglects worker safety nets, *Ashar* (collective labour) and *Nanawatay* (asylum) prevent biological and social breakdown.

Yet this reliance is neither free nor unconditional. The Paradox of Belonging reveals that the tribal network simultaneously protects and imprisons its members. The saviour culture is also a culture of limitation. Industrial peace at GAIE rests not on the rational-legal authority of the modern factory but on the moral economy of the Pashtun tribe—and the factory exploits that moral economy without acknowledging it, compensating it, or protecting it.

These findings carry implications beyond GAIE. In the Global South, countless industrial zones employ kinship-dense workforces whose informal community systems subsidise formal production processes.

Occupational sociology's continued reliance on Western psychological frameworks and formal organisational models renders this hidden infrastructure invisible—and therefore impossible to protect, support, or build upon. This paper calls for a culturally embedded occupational sociology that takes indigenous social capital seriously as both a resource and a responsibility.

Recommendations

Based on the findings of this study, the following policy-relevant recommendations are offered:

First, industrial management at GAIE and similar estates should formally recognise and institutionally support indigenous dispute resolution mechanisms such as the Jirga, rather than allowing them to operate exclusively in the informal shadow of HR policy.

Second, occupational health programmes should incorporate culturally appropriate mental health support that complements rather than displaces community-based therapeutic practices, including recognition of the Hujra as a legitimate psychosocial support space.

Third, financial protection mechanisms—such as formal rotating credit associations or employer-backed emergency funds—should be institutionalised to reduce workers' exclusive dependence on the kinship network for financial resilience, thereby alleviating the social tax imposed by Badal obligations.

Fourth, HR policy in kinship-dense industrial contexts should be designed with an understanding of Legal Pluralism, acknowledging that formal written regulations will always interact with—and sometimes be superseded by—informal community codes.

Limitations and Future Research

This study is subject to several limitations. The research was restricted to male employees due to the cultural constraint of *Purdah*, which limits access to female home-based and factory workers at GAIE, whose experiences of both stress and social capital may differ substantially. The single-site case study design, while enabling depth of analysis, limits direct generalisability, though analytical generalisability to similar contexts in Pakistan and the broader Pashtun belt is intended.

Future research should examine the experiences of female workers in home-based industrial settings adjacent to GAIE. Comparative studies across multiple industrial estates in Khyber Pakhtunkhwa would enable assessment of whether the mechanisms documented here are specific to GAIE or characteristic of the broader Pashtun industrial experience. Longitudinal research is also needed to examine how the Kaliwali infrastructure responds to urbanisation, generational change, and the weakening of tribal bonds that accompanies rapid industrialisation.

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