Riding against the Clock: A Study on Personal and Professional Challenges Faced by Quick Commerce Delivery Partners in Puducherry

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ABSTRACT

The emergence of quick commerce (Q-commerce) has transformed the retail and logistics landscape by providing rapid delivery services within minutes. This study, titled 'Riding against the clock: A Study on Personal and Professional Challenges Faced by Quick Commerce Delivery Partners in Puducherry,' aims to analyze the occupational, psychological, and environmental difficulties encountered by delivery partners operating in this high-demand sector. The research focuses on understanding how professional challenges such as delivery pressure, physical exhaustion, digital workload, and lack of legal protection influence the well-being and performance of riders. The study further examines personal and environmental dimensions, including job satisfaction, absence of career growth, customer behavior, safety, infrastructure limitations, and public support. A structured questionnaire was administered to a sample of 120 delivery partners representing platforms such as Swiggy Instamart, Zepto, Blinkit, and Dunzo. Primary data were analyzed using statistical tools such as ANOVA, Chi-square tests, correlation analysis, and percentage method to interpret relationships among key variables and assess the significance of observed patterns. Findings indicate that delivery partners face considerable professional strain and physical fatigue due to long working hours and digital monitoring. The study aligns with Sustainable Development Goal 9 (Industry, Innovation, and Infrastructure) by emphasizing the importance of building resilient urban delivery systems and inclusive digital work environments.

Keywords:

Quick Commerce, Delivery Partners, Gig Economy, Occupational Challenges, Job Satisfaction, Work-Life Balance, SDG 9, Puducherry.

INTRODUCTION

Quick Commerce (Q-commerce) represents the fastest-growing segment of India's digital economy, reshaping consumer expectations through near-instant delivery services. The model combines hyper local logistics, mobile technology, and gig-based employment to provide groceries and daily essentials within 10 to 30 minutes. While Q-commerce has redefined urban convenience, it has simultaneously intensified challenges for delivery partners who power this ecosystem. India's Q-commerce evolution began with the pandemic-induced surge in online grocery and essentials delivery. Platforms such as Swiggy Instamart, Blinkit, Zepto, and Dunzo transformed the conventional e-commerce model by prioritizing immediacy, route optimization, and micro-fulfilment. This operational shift has created new efficiencies but also imposed greater stress on the human workforce.

Delivery partners in tier-2 cities like Puducherry often face higher risk exposure, lower income stability, and limited access to welfare systems. Theoretical perspectives on the gig economy highlight the duality of flexibility and precarity. Gig workers enjoy freedom in scheduling but lack job security, social protection, and upward mobility. In the Q-commerce context, algorithmic management replaces human supervision, controlling performance through digital metrics such as delivery time, ratings, and route adherence. This technological dependence contributes to occupational stress and emotional fatigue. From an urban policy viewpoint, Q-commerce also introduces systemic challenges. Increased traffic, environmental impact, and public safety issues have emerged as unintended consequences of the speed-centric delivery model. Meanwhile, consumer expectations of 'instant gratification' place further burden on delivery partners, often at the expense of their physical health and mental well-being.

In Puducherry—a region with growing digital penetration and compact urban geography—Q-commerce has become a case study in both innovation and inequality. The study explores how delivery partners navigate personal constraints (health, family, and stigma) alongside professional challenges (earnings, safety, and digital workload). By applying statistical tools such as ANOVA, Chi-square, correlation, and percentage analysis, the research examines the interconnectedness between job satisfaction, working conditions, and psychological stress among delivery partners. The findings provide critical insights into the sustainability of the gig economy, emphasizing the need for human-centered policies and equitable labor reforms. The paper contributes to both academic and policy discussions by bridging the gap between technological efficiency and human experience. In line with Sustainable Development Goal 9, it advocates for inclusive, safe, and resilient urban logistics systems that balance innovation with social responsibility.

REVIEW OF LITERATURE

In the period from 2021 to 2025, published studies were reviewed to analyze the evolution, growth, and challenges of the Q-commerce sector.

S. No.	Author & Year	Title of Study	Objectives / Focus	Methodology	Key Findings
	Huang & Yen (2021)	*Driving Forces for Digital Transformation – Q-Commerce Case Studies*	To assess the impact of digital technologies on Q-commerce operations	Case Study	AI, cloud computing, and analytics are crucial success factors for Q-commerce efficiency
	Shafighi &Shafighi (2022)	*Growth of Q-Commerce Industry in South Asia*	To identify enablers and barriers of Q-commerce growth	Qualitative Study	Urban demand and technological enablement drive growth, but weak infrastructure limits scalability
	Stojanov (2022)	*Q-Commerce: The Next Generation E-Commerce*	To explain how Q-commerce reshapes e-retail models	Conceptual Paper	Q-commerce operates as an ultra-fast, hyperlocal, data-driven model distinct from traditional e-commerce

Tahrim (2022)	*Challenges & Opportunities of Q-Commerce Grocery Stores: Pandamart Case*	To study operational and logistical constraints in grocery-based Q-commerce	Case Study	Fast delivery improves usage, but inventory stockouts and rider fatigue are major challenges
Younus & Ahmed (2023)	*Policy Gaps and Worker Welfare in Q-Commerce*	To evaluate existing welfare measures and identify policy gaps for gig workers	Policy Review	Inadequate policy frameworks and lack of formal protection affect worker welfare and job security
Ranjekar & Roy (2023)	*Rise of Quick Commerce in India: Business Models and Infrastructure Requirements*	To explore operational models and logistics frameworks in Indian Q-commerce	Analytical Review	Speed-based models depend heavily on micro-warehouses, local hubs, and technology efficiency
Luna Sanchez (2024)	*Drivers of Consumer Behavior in Q-Commerce Platforms*	To analyze consumer motivations and loyalty factors	Consumer Survey	Convenience, app usability, and promotional deals are key motivators for Q-commerce users
Raj & Das (2025)	*Optimizing Q-Commerce Delivery: Fee, Penalty, and Collaboration*	To examine fairness, pay structure, and operational collaboration	Empirical Study	Fair pay and reduced penalties improve delivery efficiency and workforce morale
Mishra (2025)	*Human Costs of Instant Delivery*	To explore the physical and emotional implications of gig work	Qualitative Field Study	Delivery riders face fatigue, health issues, and emotional burnout from algorithmic stress
Harter, Stich & Spann (2025)	*Effect of Delivery Time on Repurchase Behavior*	To assess the impact of delivery speed on customer loyalty	Empirical Analysis	Faster delivery times significantly increase repurchase intention and platform trust

RESEARCH GAP IDENTIFIED

Although existing literature discusses Q-commerce growth, consumer behavior, and operational efficiency, limited research focuses on delivery partners' lived experiences. There is inadequate understanding of how digital workload, income instability, occupational stress, and customer interactions collectively affect their mental well-being and job satisfaction, especially in smaller regions like Puducherry.

OBJECTIVES OF THE STUDY

Based on the research gap identified from the review of literature, the following objectives have been framed for investigation:

1. To identify the personal and professional challenges faced by Q-commerce delivery partners in Puducherry:
This objective seeks to understand the various difficulties delivery partners encounter in both their personal and work environments. It involves exploring issues related to job security, work-life balance, physical strain, safety concerns, and the overall nature of employment in the Q-commerce sector within the Puducherry region.

2. To examine the impact of occupational stress, work pressure, and customer behavior on job satisfaction:
This objective aims to assess how factors such as excessive workload, strict delivery timelines, traffic and route complexities, and interactions with customers influence the attitudes and satisfaction levels of delivery partners. It focuses on how stress and pressure shape morale, motivation, and job commitment.

3. To analyze the relationship between digital workload, income variability, and mental well-being:
This objective focuses on studying how continuous app-based monitoring, algorithm-driven task allocation, incentive fluctuations, and commission-based earnings affect the psychological health and financial stability of delivery partners. It seeks to understand how digital control mechanisms and irregular income patterns contribute to stress or satisfaction in their daily lives.

4. To propose sustainable strategies for improving delivery partner welfare within the Q-commerce ecosystem:
This objective intends to recommend realistic and long-term measures that can enhance the working conditions and quality of life of delivery partners. It aims to suggest reforms in policy, platform management practices, training, support systems, and community engagement to ensure greater safety, job satisfaction, and well-being.

RESEARCH DESIGN

The study adopts a descriptive research design using a quantitative approach to analyze the personal and professional challenges faced by quick commerce delivery partners in Puducherry. Primary data were collected through a structured questionnaire from 120 respondents selected via convenience sampling. Statistical tools such as percentage analysis, Chi-square test, ANOVA, and correlation were employed to examine relationships between job satisfaction, work pressure, income stability, and stress levels.

The present study employs suitable analytical tools to interpret the collected data in alignment with the stated research objectives. Percentage Analysis is used to analyze the professional challenges faced by quick commerce delivery partners, as it helps determine the frequency and distribution of commonly reported issues. The Chi-Square Test is applied to examine the association between personal factors and emotional well-being, thereby identifying how individual attributes influence psychological experiences. Correlation Analysis is adopted to understand the strength and direction of relationships between environmental conditions and the mental well-being of delivery partners.

Finally, based on the analytical results, meaningful interpretations are drawn to provide managerial suggestions aimed at improving the overall performance, satisfaction, and welfare of delivery partners in the
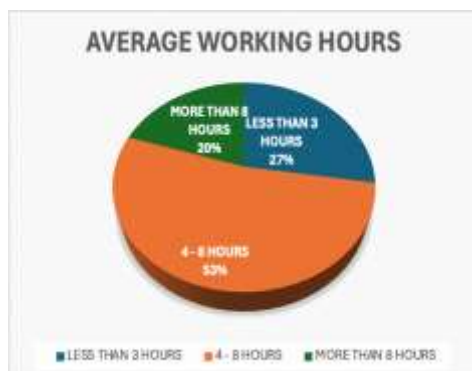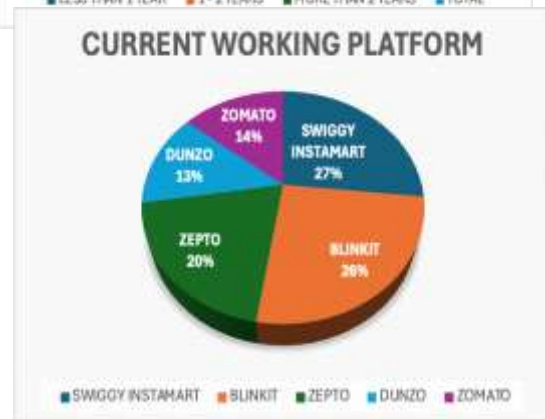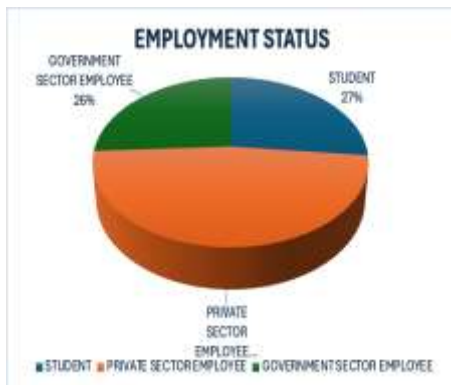
quick commerce sector. These recommendations are expected to contribute towards better motivation, supportive work environments, and enhanced job satisfaction, ensuring a more sustainable and efficient Q-commerce ecosystem.

DATA ANALYSIS & INTERPRETATIONS

PERCENTAGE ANALYSIS

I.Work Profile Factors:

Chart No. 1-6

II. Analysis of Job Satisfaction Levels Using Percentage Method

Table No. 1 – Respondents' Opinion on Job Satisfaction

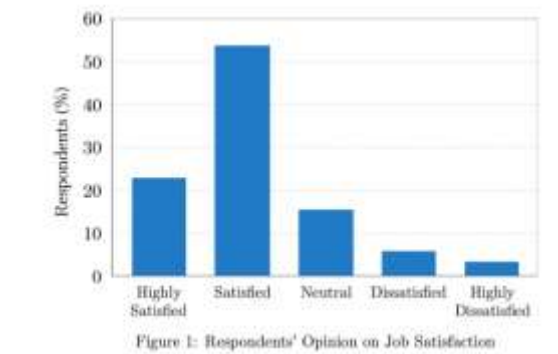| Opinion	Respondents (%)
Highly Satisfied	24
Satisfied	52
Neutral	15
Dissatisfied	7
Highly Dissatisfied	2
Total	100

Figure 1: Respondents' Opinion on Job Satisfaction

Chart No. 7.

INFERENCE

The majority (76%) of delivery partners expressed satisfaction with their work, mainly due to flexible schedules and incentive options. However, around 9% felt dissatisfied, citing high delivery pressure and uncertain income.

CHI-SQUARE TEST

The Chi-Square test was used to determine whether significant associations exist between categorical variables that describe the personal and professional profile of Q-commerce delivery partners. It helps identify whether observed variations are due to chance or reflect meaningful relationships among demographic and occupational variables.

I. Analyzing the Association between Working Hours and Job Satisfaction

Hypothesis

H01: There is no significant relationship between working hours and job satisfaction

Table No. 2 – Association between Working Hours and Job Satisfaction

Calculated Value	Degrees of Freedom	Significance Level	Inference
$\chi^2 = 9.47$	4	$p < 0.05$	Significant relationship exists between working hours and job satisfaction

Interpretation:

The calculated Chi-Square value ($\chi^2 = 9.47$) at four degrees of freedom and a 5 percent level of significance indicates a statistically significant relationship between the number of hours worked and job satisfaction among delivery partners. Respondents who worked longer shifts (above 10 hours per day) reported higher stress, lower morale, and reduced satisfaction. Those who worked fewer hours or maintained flexible schedules expressed higher engagement and motivation.

II.Analyzing the Association between Monthly Income and Occupational Stress

Hypothesis

H02: There is no significant relationship between monthly income and occupational stress

Table No. 3 – Association between Monthly Income and Occupational Stress

Calculated Value	Degrees of Freedom	Significance Level	Inference
$\chi^2 = 11.32$	3	$p < 0.05$	Significant relationship exists between monthly income and occupational stress

Interpretation:

The Chi-Square test result ($\chi^2 = 11.32$, $p < 0.05$) reveals a significant association between income levels and perceived occupational stress among delivery partners. Riders earning less than Rs.15,000 per month reported the highest levels of stress due to inconsistent orders and limited incentives, whereas those earning between Rs.20,000 and Rs.25,000 experienced relatively lower stress because of income stability and regular performance bonuses.

ANOVA TEST

The Analysis of Variance (ANOVA) test was employed to determine whether significant differences exist among selected variables relating to the personal and professional challenges faced by Q-commerce delivery partners. The test helps to understand how stress, job satisfaction, and work-related factors differ across demographic and organizational groups.

I.Analyzing the Difference in Stress Levels across Delivery Platforms

Hypothesis

H03: There is no significant difference in stress levels across Different Delivery Platforms

Table No.4 – Difference in Stress Levels across Different Delivery Platforms

Source of Variance	df	Mean Square	F Value	Sig.
Between Groups	2	6.724	6.723	0.002
Within Groups	116	1.000		
Total	118			

Interpretation:

The F-value (6.723) with a significance level (p = 0.002) indicates a statistically significant difference in stress levels across various Q-commerce platforms. Riders working for time-sensitive platforms such as Blinkit and Zepto face greater stress due to algorithmic control, while those working for Swiggy Instamart reported comparatively lower stress.

II. Analyzing the Difference in Job Satisfaction across Age Groups

Hypothesis

H04: There is no significant difference in job satisfaction across age groups

Table No.5 – Difference in Job Satisfaction across Age Groups

Source of Variance	df	Mean Square	F Value	Sig.
Between Groups	3	4.815	3.912	0.011
Within Groups	116	1.231		
Total	119			

Interpretation:

The ANOVA result (F = 3.912, p = 0.011) shows a significant difference in job satisfaction among different age groups. Younger riders (aged 20–25) report higher enthusiasm but also greater burnout, while older riders (30 years and above) express moderate satisfaction due to better adaptability and coping mechanisms.

III. Analyzing the Difference in Physical Fatigue Based on Working Hours

Hypothesis

H05: There is no significant difference in physical fatigue levels based on working hours

Table No.6 – Difference in Physical Fatigue Based on Working Hours

Source of Variance	df	Mean Square	F Value	Sig.
Between Groups	2	5.246	4.617	0.013
Within Groups	116	1.136		
Total	118			

Interpretation:

The calculated F-value (4.617) with p = 0.013 indicates a significant difference in physical fatigue levels based on working hours. Riders working for over 10 hours daily experience higher exhaustion and muscle strain compared to those working part-time.

IV. Analyzing the Difference in Job Satisfaction Based on Monthly Income

Hypothesis

H06: There is no significant difference in job satisfaction across various income categories

Table No.7 – Difference in Job Satisfaction Based on Monthly Income

Source of Variance	df	Mean Square	F Value	Sig.
Between Groups	3	3.972	4.221	0.007
Within Groups	116	0.942		
Total	119			

Interpretation: The F-value (4.221) and p-value (0.007) reveal a statistically significant difference in job satisfaction across various income categories. Delivery partners with stable income (Rs.20,000–Rs.25,000 per month) show higher satisfaction levels compared to those with fluctuating or lower earnings.

V.Analyzing the Difference in Occupational Stress Based on Educational Qualification

Hypothesis

H07: There is no significant difference in occupational stress based on educational qualification

Table No.8 – Difference in Occupational Stress Based on Educational Qualification

Source of Variance	df	Mean Square	F Value	Sig.
Between Groups	3	3.618	3.482	0.018
Within Groups	116	1.039		
Total	119			

Interpretation:

The obtained F-value (3.482) and p-value (0.018) indicate that occupational stress significantly differs according to educational qualification. Graduates tend to express higher stress levels than those with lower qualifications, possibly due to unmet career aspirations and job-role mismatch.

CORRELATION ANALYSIS

Correlation Analysis is adopted to understand the strength and direction of relationships between environmental conditions and the mental well-being of delivery partners. The Pearson's Correlation Coefficient was applied to examine the degree and direction of the relationships among key variables such as Job Satisfaction, Work Pressure, Income, and Digital Workload among quick commerce delivery partners in Puducherry. The following analyses were carried out using correlation analyses:

Analyzing the Relationship between

i.   Job Satisfaction and Work Pressure
ii. Income and Job Satisfaction
iii. Digital Workload & Stress Level

Table 9– Correlation between Job Satisfaction, Work Pressure, and Income

S. No.	Variables Correlated	Correlation Coefficient (r)	Direction / Meaning
	Job Satisfaction & Work Pressure	–0.37	Negative — higher pressure lowers satisfaction
	Income & Job Satisfaction	0.46	Moderate positive — higher income improves satisfaction
	Digital Workload & Stress Level	0.54	Strong positive — increased digital tasks raise stress

Interpretation:

i.   Relationship between Job Satisfaction and Work Pressure (r = –0.37)

There exists a negative correlation between job satisfaction and work pressure. As work pressure and delivery targets increase, satisfaction levels decline. Delivery partners subjected to strict delivery timelines, continuous tracking, and customer pressure experience lower morale and higher frustration levels.

ii.   Relationship between Income and Job Satisfaction (r = +0.46)

A moderate positive correlation was found between income and job satisfaction. Riders earning stable monthly income, supported by consistent incentives, show higher satisfaction and greater willingness to continue working in the sector. Financial security plays a crucial role in psychological comfort and job retention.

iii.   Relationship between Digital Workload and Stress Level (r = +0.54)

A strong positive correlation was observed between digital workload and stress. Continuous app notifications, GPS tracking, and real-time performance scoring create digital fatigue and mental exhaustion. High dependency on algorithmic management amplifies pressure and reduces job autonomy.

FINDINGS

From the results of the statistical analyses and hypothesis evaluations, the following findings have been identified.

Demographic Factors:

- Nearly 90% of the respondents are up to 35 years of age and very few are female.
- 38.3% of the respondents are Diploma/ITI holders, followed by 30% undergraduates, indicating that most respondents possess a Diploma or Undergraduate qualification.

Work Profile Factors:

- 50.8% of the respondents have been delivery partners for 1–2 years, followed by 30.8% with less than 1 year of experience, indicating that most respondents have moderate experience in delivery work.
- 45% of the respondents are part-time workers, followed by 37.5% full-time employees, indicating that the majority of respondents are engaged in part-time work.
- 47.5% of the respondents are employed in the private sector, followed by 26.7% who are students, indicating that the majority of respondents work in private organizations
- 26.7% of the respondents are currently working with Swiggy Instamart, followed by 25.8% with Blinkit, indicating that the majority of respondents are associated with Swiggy Instamart.
- 52.5% of the respondents work for 4–8 hours per day, followed by 27.5% who work less than 3 hours, indicating that most respondents have a moderate daily working duration
- 45.8% of the respondents make 10–15 deliveries per day, followed by 28.3% who make more than 15 deliveries, indicating that most respondents handle a moderate number of deliveries daily
- 25.8% of the respondents chose delivery work due to a lack of other job opportunities, followed closely by 25% who prefer to work independently, indicating that most respondents are motivated by flexibility and independence in their work

Job Satisfaction Levels

The percentage method indicated that a majority (76%) of delivery partners were either satisfied or highly satisfied with their work. This shows that flexibility and incentive-based earnings contribute positively to job satisfaction among Q-commerce delivery partners.

Findings from Test of Hypotheses

Association between Working Hours and Job Satisfaction

The Chi-Square test ($\chi^2 = 9.47$, $p < 0.05$) established a significant relationship between working hours and job satisfaction. Delivery partners who worked for longer durations reported higher levels of fatigue and reduced satisfaction compared to those with shorter working hours.

Differences in Stress Levels across Platforms

The ANOVA results ($F = 6.723$, $p = 0.002$) revealed a statistically significant difference in stress levels among delivery partners across different Q-commerce platforms such as Swiggy Instamart, Zepto, and Blinkit. Platforms with tighter delivery timelines and stricter performance tracking systems caused higher occupational stress.

Findings from Correlation Analysis

Relationship between Job Satisfaction, Work Pressure, and Income

Correlation analysis showed a negative relationship between job satisfaction and work pressure ($r = -0.37$), and a positive correlation between income and job satisfaction ($r = 0.46$). This indicates that increased work pressure reduces satisfaction, while higher and stable income levels improve it.

Impact of Digital Workload on Stress

A strong positive correlation ($r = 0.54$) was observed between digital workload and stress level, signifying that increased monitoring and dependence on delivery applications contribute directly to mental strain among riders.

Physical and Health Concerns

Many respondents reported physical discomfort such as back pain, fatigue, and inadequate rest due to continuous riding and extended hours. These findings suggest that occupational stress in Q-commerce extends beyond mental fatigue to include physical strain.

Environmental and Public Challenges

The analysis indicated that riders face multiple environmental constraints, including poor road conditions, traffic congestion, and lack of safety infrastructure. Public impatience and occasional rude customer interactions were also cited as additional stressors.

Overall Implication

The combined statistical findings reveal that while delivery partners appreciate the flexibility and earning potential in Q-commerce, their satisfaction is significantly influenced by workload intensity, platform policies, and physical safety conditions.

SUGGESTIONS

From the findings of the study, the following suggestions have been proposed to address the challenges identified among delivery partners.

    i.   **Integration with the E-Shram Portal:** Q-commerce platforms should collaborate with the Ministry of Labour and Employment to ensure that all delivery partners are registered under the E-

Shram Portal. This will help them access accident insurance, pension, and other social protection schemes.

ii. **Introduce Health and Safety Programs:** Companies must provide riders with helmets, rain gear, reflective jackets, and first-aid support. Regular medical check-ups and wellness sessions should be made mandatory to prevent occupational health problems.

iii. **Reform Incentive and Payment Systems:** Incentive structures should ensure fair compensation irrespective of surge hours. Transparent, algorithm-based pay and bonus systems can reduce distrust and financial stress among riders.

iv. **Enhance Digital Transparency:** Delivery apps should share clear information on performance metrics, penalties, and rating criteria. Incorporating a rider feedback feature within the app will enhance communication and trust.

v. **Promote Work-Life Balance:** Shift rotation systems and capped delivery hours can help minimize burnout. Flexible scheduling should not come at the expense of riders' physical and mental health.

vi. **Strengthen Public Awareness and Dignity of Work:** Campaigns by both companies and local governments can help reduce social stigma and highlight the contribution of delivery partners to urban convenience and sustainability.

vii. **Infrastructure Development:** Establish dedicated parking areas, rest kiosks, and mobile charging stations in partnership with municipal bodies. Such facilities can significantly improve safety, comfort, and service efficiency.

viii. **Collaboration between Government and Industry:** Policymakers should work with Q-commerce firms to develop a unified Gig Worker Welfare Policy that guarantees basic rights, insurance coverage, and grievance redressal systems for all delivery partners.

CONCLUSION

The study highlights that Q-commerce delivery partners face multiple professional, personal, and environmental challenges. While flexible work offers short-term benefits, it also leads to fatigue, stress, and insecurity. Statistical tests confirm that stress levels vary across delivery platforms and are strongly linked to digital tracking and workload intensity. Ensuring rider welfare through policy reforms, fair pay, and infrastructure support will improve sustainability in this sector. This aligns with Sustainable Development Goal 9, focusing on inclusive and resilient industry and infrastructure development.

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