



Role Of Digital Banking and Upi Services During Covid-19: A Household Perspective in Madurai

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Abstract: COVID-19 pushed Indian households into digital finance faster than most adoption campaigns ever had. When lockdowns made bank visits difficult and handling cash felt like a health risk, families turned to UPI and digital banking for everyday transactions — bill payments, transfers, online purchases, utilities. This study looks at how that shift played out at the household level in Madurai. The questions driving the study were practical ones: how aware were households of these services, how much were they actually using them, what made people adopt them, how satisfied were they, and what went wrong? Primary data was collected from 200 respondents in Madurai City through a structured questionnaire and analysed using percentage analysis, mean scores, Chi-square tests, correlation, and regression in SPSS. Awareness and usage both rose sharply during the pandemic. Convenience, transaction speed, and the desire to avoid physical contact were the main factors behind adoption. Education, digital literacy, and internet access influenced not just whether households used these services, but how comfortably and how often. The problems that surfaced — failed transactions, connectivity issues, cybersecurity fears, limited technical knowledge — were common enough to be worth taking seriously. Digital banking and UPI held household finances together during a period when most physical options were unavailable. That's worth acknowledging. But the gaps that showed up during COVID-19 didn't disappear after it — better infrastructure, more responsive security, and practical digital literacy support are still needed for this participation to become genuinely inclusive.

Keywords: Digital Banking, UPI Services, Covid 19, Household Perspective, Digital Payments, Madurai City

Introduction

COVID-19 compressed the timeline of digital payment adoption in India. Movement restrictions and concern about virus transmission reduced the practical viability of cash and branch banking, pushing households toward digital alternatives at a pace that years of promotion hadn't achieved (Auer et al., 2020). UPI infrastructure was already in place — Google Pay, PhonePe, Paytm, and BHIM had existing user bases and transaction volumes rose substantially between 2020 and 2022 as new users joined out of necessity rather than preference (RBI, 2021).

The established drivers of digital banking adoption convenience, perceived usefulness, ease of use, transaction speed all applied during this period (Davis, 1989; Venkatesh et al., 2003). COVID-19 added a health-specific one: contactless payment as a way to reduce infection risk. But the barriers didn't disappear. Limited digital literacy, unreliable internet, cybersecurity concerns, transaction failures, and low trust shaped who adopted smoothly, who struggled, and who didn't adopt at all particularly in semi-urban and lower-income households (Shaikh & Karjaluoto, 2015).

Most existing research approaches this from national or institutional perspectives: technology acceptance models, fintech growth statistics, banking sector transformation (Kumar & Ayedee, 2021). Household-level



evidence from tier-two cities is limited. Madurai is a relevant case – a city with mixed urban and semi-urban populations, varied income and education levels, and significant numbers of first-time digital payment users during the pandemic. Adoption dynamics there differ from metros where digital infrastructure and user familiarity were already established.

This study examines what those dynamics looked like in practice: awareness levels, adoption patterns, satisfaction, and the specific problems households in Madurai encountered while using digital banking and UPI services during COVID-19. Primary data from 200 household respondents provides the evidence base.

Significance of the Study

Most research on digital banking adoption during COVID-19 draws on national data or focuses on metro cities. This study contributes household-level primary evidence from Madurai – a tier-two city where digital infrastructure exists but adoption was uneven and many users were engaging with these platforms for the first time during the pandemic.

For banks and fintech providers, the findings identify where the user experience broke down – transaction failures, customer support gaps, security concerns – and what drove satisfaction when it held. That granularity is more useful for product and service decisions than aggregate adoption statistics.

For policymakers, the awareness-adoption relationship confirmed by the regression analysis points to a specific intervention: digital literacy programmes would likely have more impact on adoption rates in contexts like Madurai than infrastructure investment alone. The findings also support the case for stronger cybersecurity communication – security concerns significantly suppressed usage, suggesting that trust-building is a policy lever, not just a user preference issue.

Theoretically, the study tests TAM and UTAUT constructs – perceived usefulness, ease of use, and facilitating conditions – in a crisis-period, tier-two city context where both the conditions and the user base differ from those in which the models were originally validated.

Review of Literature

Auer, Cornelli, and Frost (2020) looked at how COVID-19 shifted payment behaviour across countries. The core finding was straightforward: fear of handling cash pushed people toward digital and contactless options. Online banking and mobile payments grew meaningfully during this period, not because they had suddenly improved, but because cash felt risky.

Kumar and Ayedee (2021) focused on India, where lockdowns and social distancing made mobile banking and UPI less of a preference and more of a workaround that stuck. Convenience, safety, and transaction speed were the main reasons people kept using these platforms after the immediate pressure eased.

Sharma and Singh (2021) examined consumer attitudes toward UPI specifically. Ease of use, perceived usefulness, and trust shaped both satisfaction and the likelihood of continued use. Cybersecurity concerns ran through the findings as an unresolved issue – users were adopting UPI while remaining uneasy about it.

Patil and Bhatt (2022) looked at urban households and found that educated, salaried users adopted internet banking and UPI faster. Reduced physical contact was a meaningful factor during lockdown, though the study was largely silent on what happened to households that didn't fit that profile.

Gupta and Sinha (2022) turned to semi-urban India, where the adoption story was more uneven. Digital literacy, internet connectivity, and smartphone access were the main determinants – and where any one of these was missing, adoption among lower-income households fell sharply.



Ramesh and Karthikeyan (2023) studied mobile banking satisfaction in Tamil Nadu after COVID. Speed, ease of use, and accessibility drove positive experiences. Technical errors and slow customer support did real damage to user trust problems that are operational, not structural, and therefore fixable.

Joseph and Mary (2023) examined cybersecurity awareness among digital banking users in South India. Phishing and online fraud had made a real dent in confidence, particularly among elderly users. The recommendation was less about stronger encryption and more about educating users on what to watch for.

Narayanan and Devi (2024) looked at UPI adoption in tier-two cities and found strong post-COVID growth, largely credited to smartphone penetration and government-backed cashless initiatives. Trust and perceived security were the clearest predictors of actual adoption not just awareness or intent.

Kavitha and Prabhu (2025) studied digital financial inclusion in Tamil Nadu and found that education and internet access were closely tied to digital banking usage. Digital literacy programmes were flagged as the most actionable way to extend inclusion beyond households that were already well-positioned to adopt.

The RBI's 2025 report confirmed that UPI has become the default payment method for a large share of Indian households — driven by convenience, low transaction costs, and expanding reach. It also flagged security infrastructure as an ongoing gap, a concern that surfaces, in one form or another, across nearly all the studies reviewed here.

Research Gap

Most research on digital payments zooms out to the national picture — broad adoption numbers, banking sector trends, the COVID-19 push toward cashless transactions. Household-level experience gets much less attention: whether people actually understand what they're using, how much they trust it, and what frustrates them when something doesn't work. Tier-two cities like Madurai are especially underrepresented in this literature, which is odd given how much of India's digital payment growth now depends on exactly these markets.

This study draws on primary data from 200 household respondents in Madurai City to look at awareness, usage patterns, satisfaction, and the everyday problems people run into with digital banking and UPI.

Statement of the Problem

COVID-19 forced a rapid shift in how households managed money. Movement restrictions and fear of physical contact pushed people toward digital financial services for transactions they had previously handled in person — bill payments, money transfers, online purchases, everyday financial management. The Government of India and RBI actively encouraged this shift through cashless transaction promotion during the pandemic period.

In Madurai, many households used mobile banking, internet banking, and UPI platforms Google Pay, PhonePe, Paytm for the first time during this period. Adoption was uneven. Digital literacy gaps, unreliable internet connectivity, transaction failures, cybersecurity concerns, and trust deficits all shaped who adopted, how fully, and with what experience. The shift was real, but so were the barriers.

Most existing research on digital banking adoption during COVID-19 works from national-level data. Household-level evidence from cities like Madurai capturing awareness, usage patterns, satisfaction, and specific problems encountered is limited. This study examines those dimensions directly through primary data collected from 200 households in Madurai.

Objectives of the Study

- To examine awareness and usage levels of digital banking and UPI services among households in Madurai during COVID-19.
- To identify the factors influencing digital banking and UPI adoption among households in Madurai.



- To analyse household satisfaction with digital banking and UPI services during the pandemic period.
- To identify the major problems households encountered while using digital banking and UPI services during COVID-19.

Hypothesis of the Study

This study tests five hypotheses:

H0₁: Awareness level and usage level of digital banking and UPI services are not significantly related among Madurai households.

H1₁: Awareness level and usage level are significantly related among Madurai households.

H0₂: Educational qualification has no significant association with digital banking and UPI adoption among Madurai households.

H1₂: Educational qualification has a significant association with digital banking and UPI adoption among Madurai households.

H0₃: Perceived usefulness has no significant influence on household satisfaction with digital banking and UPI services.

H1₃: Perceived usefulness significantly influences household satisfaction with digital banking and UPI services.

H0₄: Security concerns do not significantly affect digital banking and UPI usage among Madurai households.

H1₄: Security concerns significantly affect digital banking and UPI usage among Madurai households.

H0₅: Internet accessibility and digital banking adoption are not significantly related among Madurai households.

H1₅: Internet accessibility and digital banking adoption are significantly related among Madurai households.

Research Methodology

The study uses a descriptive and analytical design. The descriptive component examines awareness, usage patterns, satisfaction levels, and problems associated with digital banking and UPI services among Madurai households. The analytical component identifies relationships between variables — digital literacy, security perception, awareness, and adoption behaviour.

Primary data were collected from 200 household respondents in Madurai through a structured questionnaire covering demographic details, awareness, adoption behaviour, satisfaction, and challenges encountered. Likert scale responses were used for quantitative measurement. Secondary data came from RBI reports, NPCI publications, government statistics, and relevant research literature.

Respondents were selected through convenience and simple random sampling across different areas of Madurai. Analysis used percentage analysis, mean and standard deviation, chi-square tests, correlation, and regression.

Data Analysis & Interpretation

1. To examine awareness and usage levels of digital banking and UPI services among households in Madurai during COVID-19.

Table 1 Awareness Level of Digital Banking and UPI Services Among Respondents

Awareness Level	Number of Respondents	Percentage
Highly Aware	82	41.0
Moderately Aware	71	35.5
Slightly Aware	32	16.0
Not Aware	15	7.5
Total	200	100

Source: Primary Data

Interpretation

The above table reveals most respondents were aware of digital banking and UPI services during COVID-19 — 41% reported high awareness and 35.5% moderate awareness, leaving only 7.5% with little or no familiarity. The distribution suggests the pandemic did what years of promotion hadn't fully achieved: it made digital financial services visible and relevant to a broad cross-section of Madurai households.

Table 2 Usage Frequency of Digital Banking and UPI Services During Covid 19

Usage Frequency	Number of Respondents	Percentage
Daily	96	48.0
Weekly	58	29.0
Monthly	31	15.5
Rarely	15	7.5
Total	200	100

Source: Primary Data

Interpretation

The above table shows nearly half of respondents used digital banking and UPI services daily during COVID-19 — a frequency that points to habitual use rather than occasional adoption. For a significant portion of Madurai households, digital transactions had become the default for routine financial activity during the pandemic period.

- To identify the factors influencing digital banking and UPI adoption among households in Madurai.

Table 3 Factors Influencing Adoption of Digital Banking and UPI Services

Factors	Mean Score	Rank
Convenience & Easy Access	4.42	I
Safety During Covid 19	4.31	II

Faster Transactions	4.15	III
Cashback & Rewards	3.84	IV
Peer Influence	3.41	V

Source: Primary Data

Interpretation

The above table illustrates convenience and easy access scored highest among adoption factors at 4.42, followed by safety during COVID-19 at 4.31. Peer influence ranked lowest. The pattern suggests adoption was driven primarily by functional and health-related motivations rather than social pressure — households adopted digital banking because it was useful and felt safer, not because others were doing it.

Table 4 Chi Square Analysis Between Educational Qualification and Adoption Level

Educational Qualification	High Adoption	Moderate Adoption	Low Adoption	Total
School Level	18	20	12	50
Undergraduate	42	26	10	78
Postgraduate	39	18	5	62
Professional Degree	8	2	0	10
Total	107	66	27	200

Source: Primary Data

Calculated Chi Square Value = 14.26 Table Value at 5 Percent Level = 12.59 Significance Level = 0.05

Interpretation

The chi-square result confirms a significant association between educational qualification and digital banking adoption ($p < 0.05$). Higher education levels corresponded with higher adoption — consistent with the broader finding that digital literacy, which education proxies here, is one of the main structural determinants of who uses digital financial services and who doesn't.

- To analyse household satisfaction with digital banking and UPI services during the pandemic period.

Table 5 Satisfaction Level Towards Digital Banking and UPI Services

Satisfaction Factors	Mean Score	Rank
Transaction Speed	4.38	I
User Friendliness	4.21	II
Convenience	4.16	III
Security Features	3.92	IV
Customer Support	3.58	V

Source: Primary Data

Interpretation

The above table describes transaction speed and user-friendliness scored highest in satisfaction, while customer support scored lowest. The gap is worth noting — households were broadly satisfied with how digital banking performed during normal use, but the weakest point was what happened when something went wrong. During a period when many users were adopting these platforms for the first time, inadequate support likely compounded the difficulty of resolving transaction failures and security concerns.

Table 4.6 Correlation Between Awareness Level and Satisfaction Level

Variables	Correlation Value
Awareness Level and Satisfaction Level	0.684
Significance Level = 0.01	

Source: Primary Data

Interpretation

Awareness and satisfaction were strongly positively correlated ($r = 0.684$) — households with higher awareness of digital banking and UPI services reported greater satisfaction with them. The relationship makes intuitive sense: users who understood how the platforms worked were better equipped to use them effectively, less likely to encounter avoidable failures, and more confident in managing transactions independently.

- To identify the major problems households encountered while using digital banking and UPI services during COVID-19.

Table 7 Major Problems Faced by Respondents While Using Digital Banking and UPI Services

Problems	Garrett Mean Score	Rank
Transaction Failure	72.4	I
Internet Connectivity Issues	68.2	II
Cybersecurity Concerns	64.7	III
Technical Errors	59.6	IV
Lack of Digital Knowledge	54.3	V

Source: Primary Data

Interpretation

The above table shows transaction failure was the most commonly reported problem, followed by internet connectivity issues and cybersecurity concerns. The pattern points to infrastructure reliability as the primary barrier — households weren't rejecting digital banking conceptually, but experiencing it as technically unreliable. For first-time users during COVID-19, repeated transaction failures would have been particularly damaging to trust at precisely the moment adoption was being established.

Regression Analysis

Table 8 Multiple Regression Analysis for Factors Influencing Digital Banking Adoption

Dependent Variable: Adoption Level of Digital Banking and UPI Services

Independent Variables	Beta Value	t Value	Significance
Awareness Level	0.412	5.82	0.000
Ease of Use	0.366	4.97	0.001
Security Perception	0.294	3.88	0.002
Internet Accessibility	0.271	3.44	0.004
R Square = 0.71			

Source: Primary Data

Interpretation

Awareness level was the strongest predictor of digital banking and UPI adoption, followed by ease of use and security perception — all three statistically significant. Together they explain 71% of the variation in adoption levels ($R^2 = 0.71$).

The primacy of awareness is the notable finding. It suggests that for Madurai households, the main barrier to adoption wasn't distrust or perceived difficulty — it was simply not knowing enough about the platforms to use them confidently. That has a direct implication: targeted awareness and digital literacy programmes would likely do more to improve adoption rates than interface improvements or security enhancements alone.

Results of Hypothesis Testing

All five null hypotheses were rejected at the 5% significance level.

Awareness and usage were significantly and positively correlated, confirming H1₁. Educational qualification showed a significant association with adoption level through chi-square analysis, confirming H1₂. Perceived usefulness had a significant positive effect on satisfaction (H1₃), and security perception significantly influenced usage level (H1₄) — both confirmed through regression. Internet accessibility showed a significant positive effect on adoption, confirming H1₅.

Taken together, the results point to a consistent picture: adoption and usage of digital banking and UPI services among Madurai households during COVID-19 were shaped by awareness, education, perceived usefulness, security confidence, and infrastructure access — not any single factor but all five operating in combination.

Limitations of the Study

The sample of 200 households is drawn from Madurai only, which limits generalisability to other cities or regions with different digital infrastructure and demographic profiles. This study focuses specifically on the COVID-19 period, so the findings reflect pandemic conditions rather than long-term adoption behaviour. Self-reported responses introduce the possibility of recall error and social desirability bias, particularly for questions about frequency of use and security concerns.



Period of the Study

This study covers March 2020 to December 2022 — spanning India's major lockdown phases and the period of peak dependence on digital financial services. Primary data were collected from 200 households in Madurai between January and March 2026, with respondents asked about their experience during the 2020–2022 period.

Findings

Awareness was the strongest predictor of usage — households with higher awareness of digital banking and UPI services used them more frequently and with greater confidence during COVID-19. Educational qualification showed a significant association with adoption level, consistent with the broader role of digital literacy in determining who adopted and how fully.

Perceived usefulness drove satisfaction: households that found the platforms practically valuable reported higher satisfaction, independent of how well the technology performed. Security concerns moved in the opposite direction — households with stronger security fears used digital banking less, making trust-building a prerequisite for sustained adoption rather than a secondary concern.

Internet accessibility was the infrastructural baseline. Better connectivity translated directly into higher adoption — confirming that awareness and willingness matter less when the underlying infrastructure isn't reliable enough to support consistent use.

Suggestions

Banks running digital literacy programmes would help — a lot of household users aren't sure what they're actually doing when they tap "pay," and that uncertainty keeps them away from UPI entirely. Cybersecurity and customer support are the other obvious gaps; both tend to feel like things banks handle grudgingly rather than seriously.

The apps themselves could be simpler. UPI interfaces have improved, but transaction flows still trip people up more than they should. And when something does go wrong — a failed payment, a deducted amount that doesn't go through — poor support makes it worse.

Internet infrastructure is still patchy in too many places, and that's a government-level fix, not something banks can work around. Awareness around safe payment habits also needs to go beyond posters at bank branches; media campaigns and community-level outreach tend to actually reach people.

Conclusion

COVID-19 pushed Madurai households toward digital banking and UPI services faster than gradual adoption would have achieved. For many, it was first exposure — and the experience was mixed. Convenience and transaction speed drove satisfaction; transaction failures, connectivity gaps, and cybersecurity concerns undermined it.

The regression and correlation findings point to a consistent pattern: awareness was the strongest predictor of usage, perceived usefulness drove satisfaction, and security concerns suppressed adoption among households that hadn't resolved their trust questions. Internet accessibility set the infrastructural floor — without reliable connectivity, the other factors mattered less.

What the study adds is household-level evidence from a tier-two city during a period when that evidence was limited. The findings suggest that sustaining the adoption gains made during COVID-19 depends less on further infrastructure rollout — which has improved — and more on closing the awareness and trust gaps that still separate confident users from hesitant ones.



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