

Effect of Mobile Banking Awareness Pre and Post COVID-19

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Abstract:

The COVID-19 pandemic has significantly transformed the landscape of mobile banking adoption and development, especially in developing economies like India. This study examines how the pandemic has influenced customer behaviour regarding mobile banking services in the Varanasi district. The study utilises a structured questionnaire and feedback from 400 respondents to examine the shifts in awareness, frequency of use, intention to adopt, and types of services before and after the pandemic. To investigate four hypotheses, paired sample t-tests, Wilcoxon signed-rank tests, chi-square analysis, and multiple regression were utilised. The findings indicate a significant increase in both awareness and frequency of mobile banking usage following the COVID pandemic. Customers transitioned from basic banking services to advanced digital solutions such as UPI and QR code payments. Furthermore, the intention to utilise mobile banking was significantly influenced by perceived ease of use, security, and awareness, with awareness emerging as the most prominent predictor. The results demonstrate that the pandemic acted as a digital catalyst, pushing individuals towards digital financial services driven by necessity and convenience. This study enhances existing knowledge through a comparative analysis of pre- and post-COVID scenarios, highlighting strategic implications for policymakers and financial institutions aiming to advance digital financial inclusion.

Keywords: Mobile Banking, Covid-19, Adoption intention, Awareness and Digital Transactions

1 Introduction

The Indian government started a cashless economy and transactions during the preliminary phase of money demonetization. This has been a considerable attempt for Indians, who were once unaware to the adaptability of internet banking. India has emerged as one of the fastest-growing internet banking sectors in Asia. Customers may now monitor account variations, transfer assets, and execute electronic bill payments without the need of visiting a bank in person (Assistant & Hill, 2021). The computerized trading system has addressed clients' worries about liquid capital. Following digitization, the majority of clients transitioned to banks for mobile banking services, enhancing the overall convenience of the banking system. In March 2020, India had challenges in conducting its cash-related operations due to a stringent shutdown. Notwithstanding these obstacles, individuals managed to execute their fundamental roles and customary transactions. The detrimental effects of the coronavirus outbreak influenced several sectors of the economy, including manufacturing, automotive, retail, aviation, and healthcare. This has resulted in the development of complex installations associated with these areas.

Mobile banking is growing as a prevalent banking method in several established and developing nations, with India claiming around 13 million mobile banking customers. This expansion is driven by the substantial unbanked population and the pervasive use of mobile phones. Mobile banking enables consumers to access their bank accounts at any time and from any location using a mobile device and a mobile service like SMS. It eliminates spatial and temporal constraints on banking operations, including account balance inquiries and inter-account fund transfers (Deshwal, 2015). Internet banking provides users with continuous access to their financial institutions; nevertheless, it requires a personal computer with an internet connection, posing a considerable obstacle for developing nations such as India. Mobile banking mitigates this problem by necessitating just a mobile phone for consumer access. The banking sector, including India, has been at the forefront of mobile

technology adoption, using Information and Communication Technology (ICT) for efficient financial operations. Mobile banking technology-enabled financial information and services were launched in India in 1999, with ICICI Bank being the first provider of mobile banking facilities that year. Self-service technology innovations have transformed the scope and character of the financial sector, enabling it to transcend conventional saving and borrowing paradigms. Advancements in mobile technology have contributed to the popularity of m-banking services, which are essential components of m-commerce. The efficacy of m-banking is contingent upon the mobile network operator, m-banking technology provider, financial institution, and consumer. M-banking provides value-added services, information transformation, and decision-making support to enterprises.

During the COVID-19 epidemic, individuals have been restricted in their mobility owing to isolation and home quarantine protocols. Consequently, mobile banking has gained significant popularity, providing a convenient means to address everyday financial requirements. Mobile banking use in the USA has surged by 85%, with similar patterns seen in other nations. Numerous banks have introduced virtual banking systems for their clientele, transitioning from traditional banking to mobile banking (Amin & Nahiduzzaman, 2021). The transition in China and Italy has escalated from 10% to 20%. The monetary authorities of Hong Kong indicated an increase in mobile banking use during the epidemic. To enhance mobile banking, several banks are integrating their services with mobile banking systems, enabling consumers to move money to mobile banking. Social Islami Bank Limited (SIBL) in Bangladesh is urging clients to use banking applications rather than visiting offices for services such as Bkash money top-ups and payments to entities like Desco, Dpdc, Titas, and Wasa. Online banking solutions are enhancing mobile banking via their user-friendliness and accessibility.

1.1 Back ground of the study

Digital finance denotes financial services provided through digital infrastructures such as mobile devices and the internet, hence eliminating the need for currency and conventional bank offices. It enables people and enterprises to conduct smooth transactions among all parties. Recent technology improvements have allowed banks to engage with the marginalized through third-party agents or network managers like as M-PESA. Digital financial services may provide as foundational infrastructure for enhancing other goods and business models. Financial services enable people and enterprises to engage in daily economic activities such as saving, investing, and safeguarding against possible financial dangers. Nevertheless, growing nations such as India are grappling with the challenges of eradicating poverty and enhancing economic development via improved financial inclusion (Rajesh Kumar & Saha, 2019). The future of digital banking in India is expected to include the government, relaxed laws, and innovative service providers. Next-generation payment frameworks, including mobile wallets, payments banks, BharatQR, and electronic authentication, have established novel digital payment channels and service possibilities. The payment sector in India is undergoing significant transformations, with merchant payments at the forefront of the upheaval. Digital investment objectives are transitioning from user experience to customer engagement, with distributed ledger technology (DLT) influencing cross-border payments, securities, and the issue of digital currencies.

The COVID-19 epidemic has profoundly affected the globe, with India ranking as the second-largest nation in smartphone and internet users. The government has instituted social distancing measures and lockdowns to mitigate the transmission, resulting in significant alterations to individuals' behaviours. India has emerged as one of the fastest-growing nations in the digital and technological revolution, now ranking as the second-largest country for smartphone and internet users (Abhishek Kumar Singh, 2021). The government's initiative to advance "Faceless, Paperless, and Cashless" transactions has been effective to far. Recently, particularly during the COVID-19 pandemic, digital payments have gained increased prevalence among individuals in India. Governments have implemented several measures to promote digital payments, including the establishment of zero balance accounts under the Pradhanmantri Jan Dhan Yojana, issuance of debit cards to account holders, introduction of BHIM applications, incentivization of digital transactions, and the organization of awareness programs regarding digital payments. Businesses and retailers have developed digital payment options for consumers, including POS systems, UPI, and QR code readers at various locations. The digital payments initiative has accelerated, with almost all organizations, both commercial and public, engaged in the exchange of

products or services, providing digital payment choices. Rural regions have also seen an increase in digital payment acceptance, as street vendors have implemented QR code readers at their points of sale.

Financial inclusion has been a major emphasis for academic research and global institutions, such as the World Bank, International Monetary Fund, Alliance for Financial Inclusion, and Global Partnership for Financial Inclusion (Dluhopolskyi et al., 2023). It is essential for alleviating poverty and addressing economic inequality, and has been a focal point for several Sustainable Development Goals. The World Bank defines financial inclusion as the availability of inexpensive financial goods and services that satisfy the requirements of individuals and businesses. Before the COVID-19 outbreak, digital financial inclusion was largely undervalued. The pandemic influenced critical macroeconomic indices, such as GDP and employment rates, and adversely affected economic, social, and ecological development. The rapid development of digital technology, including online payment systems, online marketing, FinTech, and InsurTech sectors, has resulted in enhanced digital financial inclusion.

Digital financial services (DFSs) have seen substantial expansion in emerging and developing countries, with a marked increase in the value of digital payments and mobile point-of-sale systems. The COVID-19 epidemic has resulted in a reduction in digital payments in industries like airlines, tourism, hospitality, hotels, entertainment, e-commerce, and restaurants. The lockdown measures instituted by nations such as India have adversely affected the economy, as the country transitions into the unlocking phase and gradually reopens its economic activities (Beg, 2021). The pandemic has impacted international transactions, resulting in a decrease in the demand and supply of exports, imports, and foreign remittances. The infection may be spread via cash, prompting a transition to digital financial systems such as mobile wallets. Nonetheless, DFSs are not devoid of viruses, and transactions with debit and credit cards need physical contact, hence increasing the danger of infection (Arner et al., 2020). The COVID-19 pandemic has altered individuals' behaviour, resulting in a lasting transition to digital financial services as a habitual practice. The current digital infrastructure in an economy may facilitate the adoption of digital financial services by the population (Agur et al., 2020). The epidemic has presented issues for tiny industrial units and highlighted disparities in access to digital infrastructure. To address these challenges and enhance the utilization of DFSs, measures such as eliminating fees for peer-to-peer transactions, streamlining KYC regulations, abolishing transaction fees on wallets, supporting agent's/business correspondents, raising transaction limits, and facilitating access to digital credit may be implemented. In conclusion, while DFSs have shown potential in alleviating poverty and fostering economic development, they continue to encounter obstacles caused by the epidemic and disparities in access to digital infrastructure.

2 Literature review

(Garg et al., 2021) examined the transition from traditional banking to modern mobile banking, emphasizing governmental support of mobile wallets and the Reserve Bank of India's promotion of digital payments during the Covid-19 epidemic. The analysis indicates that mobile banking saw a 5% increase within three months, from January to March 2020, positioning it as the second-largest occurrence after demonetization. The study seeks to ascertain the expansion of mobile banking during the pandemic and analyze the significant function of online transactions throughout this timeframe.

(Keshari, 2025) examined the development and impact of financial services on financial inclusion in the Varanasi District. The objective is to evaluate inhabitants' awareness of financial services, their influence on the district's development, and to identify obstacles encountered by users. The research assesses the accessibility of financial services, including internet and mobile banking, digital payment systems, and traditional banking, to determine the extent of penetration and use across diverse demographic groups. The assessment seeks to ascertain the usefulness, cost, and accessibility of these services.

(Verma, 2022) investigated a preference towards cashless and online electronic transactions as a result of the COVID-19 epidemic. E-banking, enabling users to do financial transactions remotely, is a vital element in this transition. The research used primary data from surveys and secondary data from internet articles to examine the utilization of e-banking services in India during, during, and after to the epidemic. Findings indicate substantial

variations in the determinants influencing e-banking use throughout several stages of the epidemic. Banks have not only offered e-banking services but also enhanced loyalty to customers.

(Jaywant et al., 2023) examined the research related to M-banking and Virtual Banking as a preventive strategy against COVID-19. It employs an integrative approach and comparative examination of M-banking customers' satisfaction using the Kano Model. The research employs primary data from 900 consumers of SBI, HDFC, and Citi Bank, together with secondary data from public sources. The study employs statistical analyses, including Kolmogorov-Smirnov, Shapiro-Wilk, Cronbach's Alpha, descriptive statistics, and Chi-square, to assess data normality, reliability, and correlations.

(P. Vilhena & Navas, 2023) examined the digital transformation strategies of the banking industry and the influence of Covid-19 on its expansion. A questionnaire survey of 351 banking customers is used to assess their satisfaction with digital services. The results indicate that participants see the digital services of financial institutions as safe and choose home banking/mobile banking over conventional methods. The research emphasizes the need of adjusting to new paradigms and synchronizing management techniques within the digital ecosystem.

(Ruhshad Anklesaria, 2019) investigated the perceptions of individuals using mobile banking services in Ahmedabad, India. The study revealed that 96.6% of participants consider mobile banking services to be user-friendly, whilst 3.4% do not. More than 80% of participant's express satisfaction with the services provided. The research aids many societal sectors and assists banks in evaluating and enhancing mobile banking services for Indian consumers. With the increasing popularity of mobile banking services, it is essential to enhance awareness and implement corrective measures to resolve issues encountered in the industry.

(Gupta et al., 2023) examined India's resilience in the face of the Covid-19 outbreak, emphasizing the changes in banking habits among users and the consequent effects on online and mobile transactions. The investigation, using a paired sample t-Test and CAGR through SPSS software, revealed that Covid-19 had a favourable effect on banking transactions, resulting in growth and increased use of digital banking systems. The pandemic has facilitated the adaptation of other economies to similar circumstances.

(Muslim, 2022) examined the post-pandemic effects of COVID-19 on digital banking and consumer engagement. The COVID-19 epidemic has profoundly affected the global economy, forcing banks to reassess their operations and policies. This crisis offers a chance to reform the banking sector via digital transformation, modernization of financial services, enhancement of talent development, and cultivation of enduring customer connections. India has established itself as a frontrunner in the expansion of digital payments, with 85% of users intending to continue with digital banking moving forward.

(Bakar et al., 2017) examined the influence of technology on human communication and interaction, specifically on smartphones and tablets. Financial institutions are progressively implementing mobile banking services to provide a range of banking functionalities, including account detail access, cash transfers, balance queries, loan information, bill payments, and credit card services. Nonetheless, the use of mobile banking services remains limited. The study done at CIMB Kuala Terengganu revealed that security and privacy substantially affect mobile banking uptake, although perceived ease of use does not. The results underscore the need for efficient ways to address these difficulties.

(Matar et al., 2020) assessed the factors affecting customer use of mobile banking through the lens of the technology acceptance model (TAM). Data from 205 Jordanian mobile users was gathered and examined via structural equation modeling. The findings indicated that perceived ease of use, usefulness, awareness, bank credibility, and reference group influence positively affect mobile banking use. Banks have to consider these variables to enhance favourable attitudes of mobile banking among customers.

(Saputra & Yuwono, 2025) investigated the impact of customer experience, perceived ease of use, perceived utility, and perceived risk on the behavioral intention to use mobile banking among inhabitants of Batam City, Malaysia. The study included 258 participants and used purposive sampling along with PLS-SEM analysis. The

findings indicated that customer experience, perceived simplicity of use, perceived usefulness, and perceived danger substantially affect behavioral intention among people of Batam City.

(Pokhrel, 2022) analysed the frequency of mobile banking use during COVID-19. Data were gathered from 226 participants. The data were evaluated using the two-stage structural modelling approach using Partial Least Squares-Structural Equation Modeling (PLS-SEM). This research has shown a substantial beneficial influence of attitude towards mobile banking, subjective norms, and perceived behavioural control on behavioural intention. Adoption of mobile banking. The impression of danger associated with COVID-19 does not influence the inclination to embrace mobile banking. This study has both theoretical and practical consequences.

(Sciences et al., 2025) investigated the influence of the pandemic on user awareness and the uptake of mobile banking services through the lens of the Technology Acceptance Model (TAM). Data from 384 individuals were gathered via a standardized questionnaire. The research indicated that the pandemic favourably impacted awareness and use of mobile banking services, with perceived ease of use and intention to use significantly affecting adoption behaviour. The results provide significant insights for policymakers and financial institutions to create inclusive digital banking systems in the post-pandemic era. The COVID-19 epidemic has profoundly affected the worldwide economy, resulting in a trepidation about liquid currency and the increased utilization of mobile financial services. A research was performed in Kerala, including 268 participants who use mobile banking services. The data was (Nair et al., 2021) examined by percentage analysis, frequency distribution, pie charts, and the Chi-square test. The data indicate that mobile banking apps have substantially aided the epidemic by offering a convenient means for individuals to do transactions without visiting traditional banks.

2.1 Research gap

Despite several studies providing a complete overview of mobile banking usage during and after the COVID-19 epidemic, some research gaps remain. Many studies concentrate on national or metropolitan settings, often neglecting the distinct experiences of semi-urban or rural areas such as the Varanasi District. Moreover, while the impact of the pandemic on mobile banking use and awareness has been recognized, there exists a paucity of comparison studies regarding consumer awareness and behavioural intention pre- and post-COVID-19 within the same demographic group. Moreover, although most studies use the Technology Acceptance Model (TAM) to evaluate characteristics like as ease of use, usefulness, and customer satisfaction, few include these elements with socio-demographic aspects specific to Tier-2 cities like Varanasi. Current literature inadequately addresses security issues and digital literacy, which are often more evident in these places. Consequently, a localized comparison research, both pre-and-post pandemic, is necessary to assess changes in knowledge and use while examining obstacles, demographic variables, and institutional support that influence mobile banking uptake in the Varanasi District.

3 Methodology

3.1 Research design

The research design employed a quantitative analysis, using statistical empirical analysis to examine the Impact of COVID-19 on User Awareness and Adoption of Mobile Banking Services. A structured approach is used to systematically collect and analyse data from representative sample of 400 respondents to ensure statistical reliability and validity. Data collection is conducted using a standardized questionnaire that includes Likert-scale questions to assess respondents 'user awareness of mobile banking, perceived usefulness, perceived ease of use, trust in mobile banking systems, and adoption behaviour. The research used SPSS (Statistical Package for the Social Sciences) for data analysis, utilizing factor loadings, reliability analysis, and descriptive statistics to evaluate the dataset.

3.2 Conceptual frame work

3.3 Sample selection

The study employed a sample size of 400 respondents, ensuring a reliable and representative dataset for analysis. A stratified sample method was employed to encompass a wide range of mobile banking users who have adopted mobile banking service during the covid-19 pandemic.

3.4 Objectives

- To assess the level of awareness towards mobile banking services in Varanasi.
- To identify the key factors influencing the adoption of mobile banking.
- To compare services offered through mobile banking in the pre- and post-COVID-19 periods.
- To compare mobile banking usage trends before and after the pandemic.

3.5 Hypothesis

- H1: The level of awareness towards mobile banking services significantly increased in the post-COVID-19 period.
- H2: The intention to adopt mobile banking services is significantly influenced by perceived ease of use, security concerns, and awareness.
- H3: The frequency of mobile banking usage has significantly increased after the COVID-19 pandemic.
- H4: The types of services accessed through mobile banking significantly differ between the pre- and post-COVID-19 periods.
- H5: The nature of problems associated with mobile banking significantly changed in the post-COVID-19 period.

3.6 Data collection

This study utilizes a quantitative methodology, implementing systematic data gathering techniques to guarantee precision and dependability. The principal data gathering approach included a structured questionnaire aimed at assessing the user attitudes and behaviours related to mobile banking services in the covid-19. The questionnaire encompasses essential characteristics such perceived usefulness, perceived ease of use, trust in mobile banking systems, and adoption behaviour each evaluated through several Likert-scale statements to thoroughly capture respondent impressions. Participants were requested to assess factors like data transparency, user awareness of mobile banking, accessibility, and trust in mobile banking. The questionnaire was disseminated online by email, Google Forms, and fintech lending platforms to guarantee extensive participation and accessibility. In addition, interviews with digital banking executives and fintech analysts were performed to enhance the quantitative insights into institutional strategy and user engagement initiatives throughout the epidemic. Secondary data including banking reports, digital transaction volumes, and application use analytics were also utilized to corroborate results and enhance the study's overall validity. Moreover, interviews with fintech experts and loan officers were undertaken to acquire insights on the execution and efficacy of AI/ML-based credit scoring algorithms. Secondary data, comprising loan acceptance and rejection records, default rates, and performance metrics of AI models, were studied to corroborate findings and evaluate the real-world implications of AI-driven credit assessment systems.

3.7 Measures

Data has been gathered with the help of a structured questionnaire. Questionnaire has been prepared using Likert type scale where respondents will be asked to share their opinions regarding various research questions under study. Questionnaire has a set of both open ended and closed ended questions. Questions have been carefully crafted so as to gather meaningful information with respect to identified research variables. There are five categories of respondents in the survey and a separate questionnaire has been designed for each category of respondents.

Age

This variable indicates the respondent's geographical location, classified as either Urban or Rural. This evaluates disparities in mobile banking knowledge and use across urban and rural populations, potentially affected by infrastructure, digital literacy, and banking accessibility.

Education

Education level is a categorical variable including three categories: Secondary, Undergraduate (UG), and Postgraduate (PG). This variable assesses the correlation between advanced educational qualifications and heightened awareness and use of mobile banking services.

Income level

This variable indicates the monthly income of respondents, classified into three brackets: <10k, 10k–25k, and >25k. It facilitates the examination of how income affects digital banking behaviour, access to mobile devices, and the propensity to embrace technology.

Awareness Pre and post

This variable assesses mobile banking awareness before COVID-19 using a Likert scale ranging from 1 to 5, where 1 signifies little awareness and 5 denotes maximal awareness. Understanding the baseline digital preparedness prior to the pandemic is essential. This variable, similar to Awareness Pre, measures mobile banking awareness post-COVID-19, using a Likert scale from 1 to 5. It is used to evaluate awareness levels before to and during the pandemic to determine any alterations resulting from heightened digital reliance.

Usage Frequency Pre and post

This variable assesses mobile banking awareness before COVID-19 using a Likert scale ranging from 1 to 5, where 1 signifies little awareness and 5 denotes maximum awareness. Understanding the baseline digital preparedness prior to the pandemic is essential. This variable, similar to Awareness Pre, measures mobile banking awareness post-COVID-19, using a Likert scale from 1 to 5. It is used to evaluate awareness levels before to and during the pandemic to determine any alterations resulting from heightened digital reliance.

Services Used Pre and post

This multi-select variable defines the sorts of mobile banking services used before to the epidemic, including SMS and Balance Check. It facilitates the evaluation of users' functional involvement with mobile banking in its first phase and the services used post-COVID, including UPI, applications, and QR payments. It illustrates the diversification and advancement of service use resulting from digital transformations prompted by the epidemic.

Security Concern Pre and post

This measure evaluates pre-pandemic security concerns related to mobile banking using a Likert scale ranging from 1 to 5. A higher score indicates more worry. Understanding the trust concerns that may have impeded adoption prior to COVID is crucial. This score, assessed using the same Likert scale, reflects security worries post-pandemic. It assists in determining if heightened use has mitigated or exacerbated issues pertaining to mobile banking security.

Ease of Use

This Likert scale variable (1 to 5) assesses the perceived convenience of using mobile banking services. Higher ratings signify enhanced user-friendliness, a critical factor in the sustained use of digital banking services.

Adoption Intention:

This variable assesses the respondent's intention to persist in using mobile banking in the future, assessed on a Likert scale from 1 to 5. It is essential for forecasting enduring behavioural patterns and technological adoption.

Problems Pre

This category variable includes the challenges encountered by consumers before COVID, including network connection concerns, lack of knowledge, and subpar app user interfaces (UI). It clarifies the obstacles preventing earlier adoption.

4 Results

This section presents the findings of the study, aimed at evaluating the impact of the COVID-19 pandemic on the awareness, usage frequency, intention to adopt, and service preferences related to mobile banking in the Varanasi district. Data were collected from 400 participants through structured items utilising the Likert scale and categorical measures, employing statistical methods to evaluate the hypotheses. The results are organised thematically according to the study's objectives and hypotheses. Paired sample tests, regression analysis, Wilcoxon signed-rank tests, and chi-square tests were employed to analyse the differences observed before and after the COVID-19 pandemic. The findings provide empirical insights into how the pandemic has transformed consumer behaviour in digital financial services, highlighting notable shifts in awareness, usage frequency, and service adoption. The findings identify key factors such as usability, perceived safety, and sensitivity that significantly influence users' intention to engage with mobile banking in the post-pandemic context.

4.1 Demographic Information

Table 1 Demographic Variables

Demographic	Category	Frequency (n)	Percentage (%)
Gender	Male	210	52.50%
	Female	190	47.50%
Age Group	18–25 years	128	32.00%
	26–35 years	142	35.50%
	36–45 years	78	19.50%
	46+ years	52	13.00%
Area	Urban	260	65.00%
	Rural	140	35.00%
	Secondary	108	27.00%
Education Level	Undergraduate	186	46.50%
	Postgraduate	106	26.50%

The demographic analysis of the 400 respondents reveals a nearly equal distribution of gender, including 52.5% men and 47.5% females. The age distribution indicates that the majority of respondents are young people, with 32% in the 18-25 age range and 35.5% in the 26-35 age range, suggesting that mobile banking use is mostly among the youth. Respondents aged 36 to 45 years constitute 19.5%, while those aged 46 years and above account for 13%, indicating comparatively lower engagement among older individuals. The sample is geographically skewed, including 65% urban respondents and 35% rural respondents. This indicates enhanced accessibility and visibility of mobile banking in metropolitan regions, where infrastructure is often more developed. Regarding educational attainment, over half of the sample (46.5%) has an undergraduate degree, 26.5% have engaged in postgraduate studies, and 27% have completed secondary school. This indicates a rather well-educated demographic, consistent with the elevated digital literacy required for mobile banking use. The population structure reveals a youthful, urban, and moderately to highly educated user demographic, consistent with mobile banking adoption in emerging nations.

4.2 Hypothesis Outcome:

H1: The level of awareness towards mobile banking services significantly increased in the post-COVID-19 period

Table 2 Group Difference between Pre-Post

	Groups	N	Mean	t-value	Sig. P
Awareness	Pre	400	1.9525	-26.11	0.000
	Post	400	3.5075		

Table 2 presents the results of a paired sample t-test analysis conducted to examine the differences in awareness levels regarding mobile banking services before and after the COVID-19 crisis. The data comprises responses from 400 individuals, each of whom assessed their own awareness using a standardised Likert-scale instrument, likely ranging from 1, indicating very low awareness, to 5, indicating very high awareness. The average awareness rating before the pandemic was 1.95, indicating a relatively low level of familiarity or engagement with mobile banking services. The average score after the pandemic (Post-COVID) rose significantly to 3.51, indicating a notable enhancement in user knowledge and comprehension of mobile banking features. The size is substantial and holds statistical significance. The calculated t-value is -26.11, and the p-value is 0.000, significantly lower than the conventional threshold of 0.05 for significance. The evidence suggests that the variation in means is not merely due to chance but reflects a genuine shift in user awareness. The negative t-value indicates that post-COVID values exceed pre-COVID values when the difference is expressed as Pre – Post.

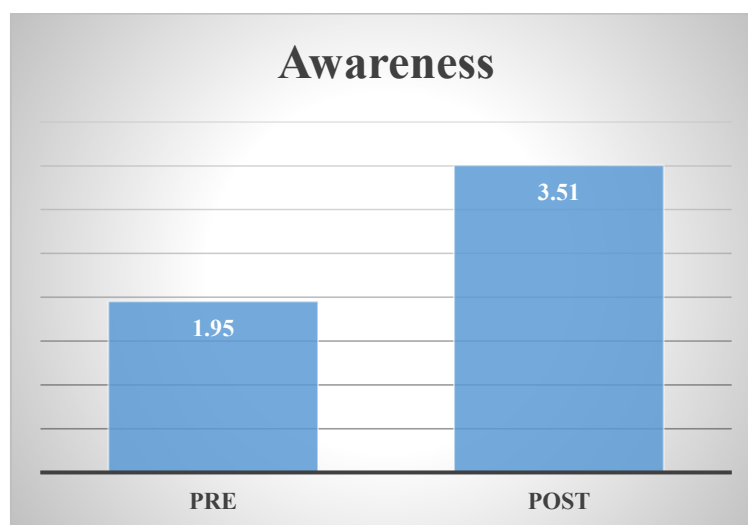


Figure 1 Pre vs Post

Figure 1 visually reinforces this statistical evidence. The visualisation presents a side-by-side bar chart that delineates the average awareness levels prior to and following the pandemic. The pre-COVID bar at 1.95 is significantly lower than the post-COVID bar at 3.51, and the numerical labels above each bar effectively emphasise this contrast. The noticeable visual gap illustrates the significant increase in mobile banking awareness, driven by external factors that emerged during the COVID-19 pandemic. Therefore, the statistical data and graphical representation provide strong support for Hypothesis H1, which asserts that COVID-19 served as a digital catalyst, prompting customers to investigate and utilise digital money tools, including mobile banking applications. The revolution can likely be attributed to lockdowns, restrictions on physical branches, the promotion of contactless payments, and the enhancement of banking apps. The notable increase in awareness may reflect broader trends in digital literacy, the proliferation of mobile devices, and proactive engagement

strategies employed by banks and other financial institutions throughout the pandemic. The findings from Varanasi district suggest that public health emergencies can serve as a catalyst for the adoption of financial technology, especially when digital solutions transition from being optional to essential. This result holds not only statistical significance but also practical implications for banks, policymakers, and fintech companies aiming to enhance digital financial inclusion in urban and semi-urban communities in India and other emerging economies.

H2: The intention to adopt mobile banking services is significantly influenced by perceived ease of use, security concerns, and awareness.

Table 3 Regression Effect

R-Square	Predictor	B	Std. Error	Beta	t	Sig.
0.512	Ease of Use	0.192	0.054	0.167	3.575	0.000
	Security Concern Post	0.363	0.054	0.322	6.696	0.000
	Awareness Post	0.404	0.061	0.333	6.582	0.000

a. Dependent Variable: Adoption Intention

A multiple linear regression was performed to examine the factors influencing the intention to adopt mobile banking services. The independent variables included Ease of Use, Security Concern Post-COVID, and Awareness Post-COVID, while Adoption Intention served as the dependent variable. The regression model yielded an R-square value of 0.512, indicating that approximately 51.2% of the variance in adoption intention is explained by the collective impact of the three predictor variables. This model demonstrates a reasonable fit and highlights the importance of these factors in elucidating users' mobile banking adoption behaviour.

The analysis revealed that all three predictors demonstrated statistical significance at the 0.001 level, confirming their distinct influence on users' intention to adopt mobile banking. Among the predictors, Awareness Post-COVID exhibited the highest standardised beta coefficient ($\beta = 0.333$) and a t-value of 6.582, establishing it as the most significant predictor in the model. The data suggests that an increase in awareness and familiarity with mobile banking features and benefits significantly enhances the likelihood of adoption. The second most significant predictor was Security Concern Post-COVID, exhibiting a beta value of 0.322 and a t-value of 6.696. This suggests that users who perceive mobile banking platforms as secure and equipped with sufficient safeguards are more likely to embrace these services. The factor of Ease of Use demonstrated a significant yet comparatively lesser impact ($\beta = 0.167$, $t = 3.575$), indicating that a design characterised by user-friendliness and functional simplicity contributes positively to the intention to adopt, albeit to a lesser degree. The unstandardised B coefficients were positive for each of the three predictors: $B = 0.192$ for Ease of Use, $B = 0.363$ for Security Concern, and $B = 0.404$ for Awareness. This suggests that increases in these variables correspond to proportional increases in the likelihood that users will adopt mobile banking services. The findings align with theoretical frameworks such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which suggest that perceptions of ease, usefulness, and trust influence behavioural intention. The findings strongly support Hypothesis H2, which suggested that "The intention to adopt mobile banking services is significantly influenced by perceived ease of use, security concerns, and awareness." The findings suggest that increased user awareness, confidence in security measures, and app usability are crucial factors that affect the intention to engage with mobile banking platforms. In conclusion, the regression analysis substantiates the hypothesis by demonstrating that awareness, security, and ease of use are not only statistically significant but also strategically essential for fostering the widespread adoption of mobile banking in regions such as the Varanasi district and other demographic settings.

H3: The frequency of mobile banking usage has significantly increased after the COVID-19 pandemic.

Table 4 Frequency of Mobile banking usage after the covid-19

Related-Samples Wilcoxon Signed Rank Test Summary	
Total N	400
Test Statistic	40922.000
Standard Error	1524.269
Standardized Test Statistic	11.238
Asymptotic Sig.(2-sided test)	.000

To determine if there was a significant difference in the frequency of mobile banking usage due to the COVID-19 pandemic, a Related-Samples Wilcoxon Signed Rank Test was conducted. Given that the variable representing frequency of use is ordinal, categorised as Never, Rarely, Sometimes, and Often, a non-parametric test was employed for analysis. A sample of 400 respondents participated in the test, providing responses regarding their mobile banking usage both before and after the pandemic outbreak. The test result indicated a Wilcoxon test statistic of 40922.000, a Standardised Z-value of 11.238, and an Asymptotic Significance (2-tailed) of 0.000. The p-value of less than 0.001 indicates a statistically significant difference in the frequency of mobile banking usage across the two timeframes. The direction and magnitude of the Z-score further substantiate that the variation in usage is unlikely to have occurred randomly.

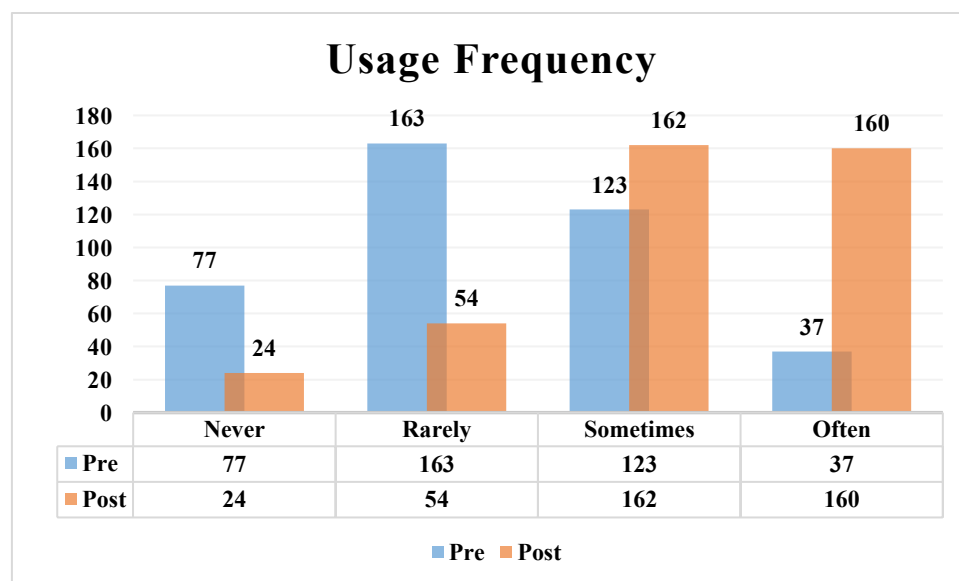


Figure 2 Comparing pre vs post user frequency

Figure 2 illustrates a significant shift in the frequency distribution when comparing pre- and post-COVID-19 periods. Before the pandemic, a significant portion of participants were infrequent users, with 77 individuals indicating 'Never' and 163 indicating 'Rarely' when it came to utilising mobile banking facilities. Conversely, these figures experienced a significant decline in the post-COVID-19 period, resulting in only 24 users categorised as 'Never' and 54 as 'Rarely.' In the meantime, the number of respondents who used mobile banking 'Often' increased significantly from 37 to 160, while those who selected 'Sometimes' rose from 123 to 162. This change signifies a clear shift in behaviour towards greater utilisation of mobile banking, likely influenced by pandemic-related lockdown restrictions, reduced physical interaction with bank branches, and a broader societal movement towards online transactions. The observed increase in frequency suggests that mobile banking has transitioned from being a supplementary option to becoming the primary method of financial transactions for

many individuals during and following the COVID-19 period. The analysis provides robust support for Hypothesis H3, stated as "The frequency of mobile banking usage has significantly increased after the COVID-19 pandemic." The data and visual representations clearly demonstrate that a notable portion of the population transitioned from infrequent or non-use of mobile banking services to consistent and regular usage. This transition can be attributed to the rapid advancement of digital literacy, the necessity-driven exploration of mobile channels during the pandemic, and the growing confidence in digital financial systems. The results underscore the significant impact of COVID-19 on digital banking behaviours, particularly in semi-urban and urban regions like the Varanasi district. This change in behaviour presents a strategic opportunity for fintech companies, banks, and policymakers to secure and sustain digital adoption by improving app performance, strengthening security measures, and ensuring equitable access to the digital economy. As mobile banking becomes more essential to daily financial activities, it is crucial to support users with strong infrastructure and targeted digital awareness initiatives.

H4: The types of services accessed through mobile banking significantly differ between the pre- and post-COVID-19 periods.

Table 5 Services Used Pre * Services Used Post Cross tabulation Chi-Square Test

Services Used Pre	Services Used Post				Total	Chi-Square	Sig. P
	All	Mobile App	QR Payment	UPI			
Balance Check	12	13	37	82	144		
Mini Statement	13	5	28	44	90		
SMS Alert	9	16	29	51	105	30.449	0.000
None	19	7	16	19	61		
Total	53	41	110	196	400		

To assess whether the nature of mobile banking services utilised by customers underwent significant changes due to the COVID-19 pandemic, a chi-square test of independence was conducted using cross-tabulated data on services employed before and after the onset of COVID-19. The services were categorised into Balance Check, Mini Statement, SMS Alert, and None (Pre-COVID), and into All, Mobile App, QR Payment, and UPI (Post-COVID). The total number of participants in the sample was 400. The cross-tabulation results revealed significant disparities in service usage before and after the pandemic. A significant proportion of users from the earlier Balance Check service transitioned to UPI (n=82) and QR Payment (n=37) following the Covid pandemic. Individuals who once relied on Mini Statements or SMS Alerts have transitioned to more advanced services such as UPI, Mobile Apps, and QR Payments. It is noteworthy that individuals who had previously reported no engagement with mobile banking services began utilising various categories of digital services following the onset of COVID-19. Specifically, 19 individuals adopted 'All' services, 7 opted for the Mobile App, while others engaged with UPI or QR codes as shown in figure-3. The chi-square test yielded a statistic value of 30.449 and a p-value of 0.000, indicating a highly significant relationship between the services consumed before and after COVID-19. The statistical outcome indicates that the pandemic influenced not only the adoption of mobile banking but also the manner and types of services utilised.

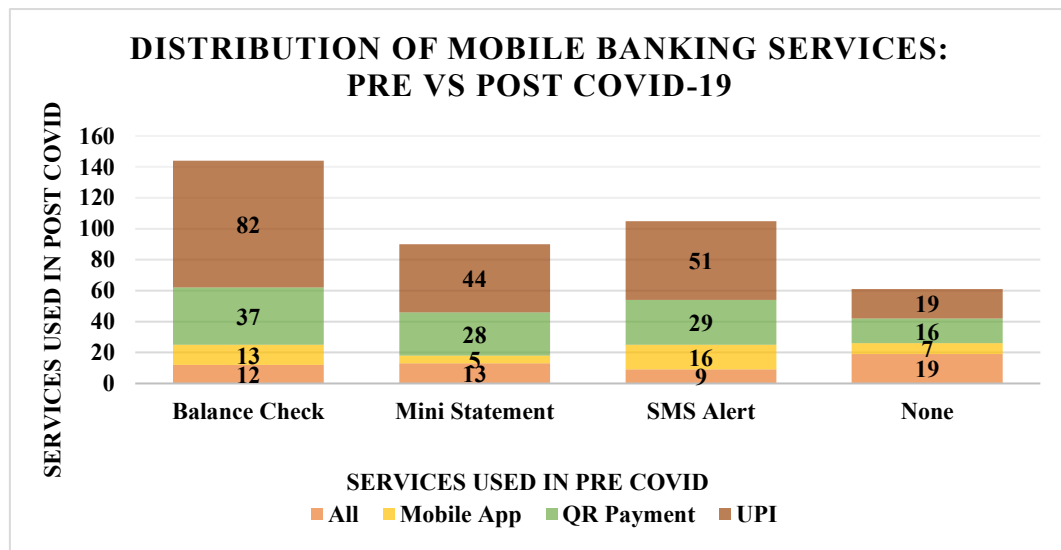


Figure 3 Comparing pre vs post covid in distribution of mobile banking services

Users transitioned from basic information-seeking services, such as balance enquiries and mini statements, to more engaging, transaction-focused options like UPI and QR code payments. Statistical evidence strongly supports Hypothesis H4, which asserts that "The types of services accessed through mobile banking significantly differ between the pre- and post-COVID-19 periods." The results indicate a notable transition from basic to advanced mobile banking services, driven by the pandemic and facilitated by increased awareness and technological progress. This change signifies a broader digital transformation in financial behaviour, where customers have not only become more frequent users of mobile banking but have also expanded the variety of services they utilise. The pandemic acted as a catalyst, accelerating the shift towards digital financial ecosystems. Financial institutions should take advantage of this opportunity to enhance their digital offerings, increase awareness of available services, and develop infrastructure that can accommodate high-volume transactions and diverse user needs. Understanding these changing usage patterns enables banks to refine their mobile banking strategies, improve customer experience, and promote sustained digital inclusion in areas like Varanasi and beyond.

4.3 Conclusion

This study examined how the COVID-19 pandemic has influenced mobile banking behaviour in the Varanasi district across four key dimensions: awareness, frequency of usage, intention for adoption, and types of services utilised. Findings from a study involving 400 participants revealed notable changes in consumer behaviour as a result of the pandemic. The findings demonstrated a significant increase in mobile banking awareness following COVID, supported by a substantial rise in average awareness levels and further reinforced by trend imagery. Similarly, the frequency of usage experienced a remarkable shift, as many individuals transitioned from "Never" and "Rarely" utilising mobile banking to "Sometimes" and "Often" in the aftermath of the pandemic. This change in behaviour reflects a broader movement towards digital financial participation that was sparked by the pandemic's restrictions on in-person banking. Furthermore, a robust prediction regarding the intention to utilise mobile banking services was found to be shaped by three primary factors: perceived security, ease of use, and post-pandemic awareness. The findings indicate that awareness stands out as the most significant predictor, with security and usability closely trailing behind. This aligns with the key constructs identified in the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM). Lastly, the study revealed a statistically significant change in the services utilised, indicating that users not only increased their frequency of use but also expanded the range of services accessed — transitioning from basic offerings like balance enquiries to advanced transaction capabilities such as UPI, QR code payments, and mobile app transactions. The findings collectively indicate that COVID-19 acted as a digital catalyst, fundamentally transforming how individuals interact with mobile banking services. The study demonstrates that

public health crises can drive digital inclusion, especially when physical access to services is limited. The implications of these findings are crucial for banks, fintech firms, and policymakers aiming to strengthen digital financial systems in both semi-urban and urban areas of India.

4.4 Discussion

The findings of this study align with and contribute to a significant collection of global studies examining the digital behavioural shifts prompted by the COVID-19 pandemic. Consistent with the findings of (Alalwan, A. A., Dwivedi, 2020), which highlighted the significant role of perceived usefulness and trust in predicting mobile banking adoption in Middle Eastern contexts, this study revealed that awareness and security concerns are key factors influencing adoption intention in the Indian context. This suggests that across various regions, the foundation of expanding mobile banking adoption lies in the creation of digital trust and the education of users. (Tam & Oliveira, 2017) emphasised that ease of use and awareness are crucial factors influencing user adoption of new banking technology. This study expands on existing evidence by showing that these constructs grew more important as the pandemic forced users to shift from traditional channels to digital ones due to mobility restrictions and heightened health concerns.

Furthermore, the investigation conducted by (Raza, 2021) demonstrated that during the COVID-19 pandemic, there was an increase in UPI, QR, and wallet payments across Asia, driven by concerns regarding the transmission of the virus through the handling of physical currency. The observation in the Varanasi context aligns with this, as the rise in UPI and QR payments appears to have occurred after the pandemic, indicating a simultaneous behavioural change in urban areas of India. The findings, viewed through a demographic lens, confirm the trends identified in (Koksal, 2016), indicating that mobile banking users are generally young, well-educated, and urban traits that are prevalent in the Varanasi sample. This study offers a novel empirical contribution by supplying pre- and post-COVID comparative data, a resource that many earlier investigations failed to deliver. This study adds to the body of India-focused research, including reports from NITI Aayog and NPCI, which documented a significant increase in digital financial inclusion during the COVID period, propelled by government policies, financial incentives, and widespread smartphone usage.

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