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Assessing the Influence of Digital Payment Systems and Financial Literacy on Consumer Expenditure Patterns in Mumbai

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Abstract

This study analyses the relation between the use of UPI, financial literacy and the spending behavior among different age groups and genders in Mumbai. The study shows a rise in the usage of UPI, which links to expenditure. The study is based on the primary data, collected through a questionnaire from 301 respondents residing in Mumbai. Various descriptive statistical tools were used to analyze the data. The results show that payment methods vary among different age groups, irrespective of their gender. Other findings show that by using the chi-square test, there is a significant relationship between age group and preferred mode of payment. By correlation analysis, there is no significant correlation between income and frequency of UPI usage, whereas no significant correlation between monthly expenditure and UPI usage of an individual. The study shows a non-significant relation between an individual's financial literacy and UPI usage. According to the analysis, the majority of people use Google Pay for UPI transactions. Overall, the study helps to understand how digital payment affects these factors and whether they are dependent or not.

Keywords: Unified Payment Interface (UPI), Financial Literacy, Spending Behavior, Mumbai, India

1 Introduction

Unified Payments Interface (UPI) is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. It also caters to the "Peer to Peer" collect request, which can be scheduled and paid as per requirement and convenience. (*NPCI*, n.d.) It was launched in 2016 by the National Payments Corporation of India (NPCI). (*Government of India Press Information Bureau*, 2025) UPI is quick, secure, and designed for everyday use. It has led to a change in the way transactions occur across India. It is now possible to transfer money in seconds with only a phone number or VPA (Virtual Payment Address) without needing a person's bank account number or IFSC code. UPI was promoted by apps like Google Pay, PhonePe, Paytm, etc. when it was first introduced. However, when covid hit, it became highly popular to its feature of contactless payments. UPI payments rose at an unprecedented rate and were being used by everyone, everywhere for everything. Today, UPI has become an indispensable part of the way Indians transfer money. This makes it important to assess the relation between UPI usage and consumer behaviour as well as the demographic of UPI users. Previously, similar studies were conducted in regards to card users. Their findings pointed to card users spending more money than cash

users (Feinberg, 1986). It is important to find whether a similar pattern can be seen in people who use digital payment technologies versus those who use cash. Digital payment technologies are the least transparent payment method, whereas cash is the most transparent (Soman, 2003). Thus, there is a higher probability of individuals overspending through digital payment technologies than through cash.

UPI has made it possible for people to pay using various apps that offer this service such as Google Pay, PhonePe, Paytm. It becomes important to understand their market share, as well as their user base and popularity. India has emerged as the country with the most digital transactions across the globe (Mukherjee & Banerjee, 2023). Thereby, it becomes necessary to understand the demographic of people availing this service. In this study, we analyse the demographic of UPI users in Mumbai and find out any correlation between the age, gender, income, expenditure and financial literacy of a person and their frequency of UPI usage. We also compare the findings of this study to similar studies done in the past or recent years in other parts of the country or in other countries.

2 Literature review

The government had played an important role in promoting digital payments across India, which has reduced dependency on cash and also improved internet access in semi-urban and rural areas. With the growing use of smartphones, digital payment systems have become a regular part of everyday mode of transactions (Anil et al., 2023).

Multiple study and prediction by Kumar et al. (2022), Sorkin (2001), Bhatia & Shete, (2024) show that UPI is user-friendly and the key factors that affect the adoption of UPI are speed, convenience and transparency. It keeps a record of payment history, which can help us to keep track of our daily financial expenses and so it became an integral part of people's daily lives.

Various sources used by Uifalean (2024) shows that men are more inclined towards long-term investments, preferably those with high risk whereas women prefer safer investments which in other word also means that financial behavior differs between genders in terms of risk factors and investment choices. Similar results can be seen in the study of Suchak & Pimplapure (n.d.) that the majority of people in India prioritize saving more, around 49.9% of the population and hence Indian households generally prefer low-risk investments.

R. Gupta et al. (2025) through his studies drives our focus towards economically less capable who may not be able to bear the cost for switching to online payments which comes with extra cost such as smartphones, internet charges, etc. So, the government should make policies for people with less financial resources to ensure that they are benefited. A major shift can be seen in retailers towards digital payments (Bhat & Singh Chauhan, 2023)

Dev et al. (2024) observes that how a cash-driven economy has significantly transformed by digital payments. Events like Demonetization and COVID-19 have led to overspending through digital modes of payment, which have left individuals with less savings. Another study by Seldal & Nyhus (2022) also states that more frequent use of UPI can increase financial risk in terms of savings, loans and debt.

Vîrjan et al. (2025) states that financial education helps to distinguish between wants and needs, to become more rational in managing purchases and to manage budget efficiently, and to prevent from falling into the trap of impulse spending. The findings of Tamrakar & Lakra (2025) suggest that spending can be influenced by UPI usage and it may also lead to mindful spending and issues related to budget

management. Hence, this creates a mixed outcome and this dichotomy suggests opportunities for enhancing UPI's features for better financial planning and management among users.

The increase in use of digital payment systems can be credited to various factors. One such factor has been COVID-19 which increased the use of this technology due to its feature of contactless payments especially in specific sectors (Utomo et al., 2025). Demonetization is another factor that played a significant role in increasing mobile payments. Government reforms have emphasized on cashless transactions (Indoria & Devi, 2021).

In making India digital, the role of Gen Z cannot be undermined as they form a large percentage of the student and working population. Thus, their digital payment behaviour will decide the future financial ecosystem of India (Thakkar et al., 2025). A study conducted in Ahmedabad (Sakhiya et al., 2024) suggested that older people prefer cards because of routine and trust in conventional banking systems. Another study by Ghani et al. (2023) proposed that the elderly and women need to be imparted training on UPI by the government to make digital India a success.

The study by Mukherjee & Banerjee (2023) shows that start-ups started developing and they got integrated into UPI solutions for a seamless experience across digitization platforms. Razor pay, CRED, PhonePe and Paytm are among popular companies. PhonePe emerged as a leading platform in the UPI market share in the year 2022.

Due to rapid growth of UPI, there are many risk factors involved such as identity theft, money loss while making transactions etc and therefore, security is one of the major concerns. However, Google Pay and PhonePe provide better security than other payment apps. Also, the findings of S. B. Gupta & Yadav (2020) shows the monthly active users (MAU's) of Google Pay have increased from 40 million to 67 million, MAU's of PhonePe have increased from 23 million to 55 million and MAU's of Paytm have increased from 80 million to 140 million in 2018 and similarly this increment can be seen in merchant partners too. Hence, payment apps are very popular among people and apps are being used regularly for payment purposes and switching from the cash payment system to online system in a big way.

1. Objectives

- To analyse the usage of UPI over cash and other modes of payment across different age groups and gender in Mumbai.
- To study the relationship between the frequency of UPI usage and an individual's monthly income.
- To analyse how UPI usage is associated with an individual's monthly expenditure.
- To observe whether financial literacy affects the adoption and usage of UPI.
- To identify the most commonly used UPI apps.

2. Methodology

- For this study, data have been collected via a survey. The sample has primarily been taken from the citizens of Mumbai, through convenience sampling.
- The sample size is 301, and the type of data collected is primary.
- Chi-square test, T-test for correlation coefficient and Spearman's Rank Correlation are the tools that have been used for data analysis.
- A graphical representation has been done for comparing the data and for visual clarity.

3 Data analysis

2.1. Demographic Profile of the Respondents

Table 1: Profile of the respondents

Gender	Frequency	Percentage
Male	169	56.15%
Female	132	43.85%
Age Group	**Frequency**	**Percentage**
Under 18	17	5.65%
18-25	98	32.56%
26-35	45	14.95%
36-45	66	21.93%
46-55	61	20.27%
55+	14	4.65%
Income Level	**Frequency**	**Percentage**
Under ₹1000	31	10.30%
₹1000 - ₹5000	70	23.26%
₹5000 - ₹10,000	22	7.31%
₹10,000 - ₹25,000	23	7.64%
₹25000 - ₹50000	44	14.62%
₹50,000 - ₹1 lakh	53	17.61%
₹1 lakh - ₹3 lakh	37	12.29%
₹ 3 lakh+	21	6.98%
UPI Usage	**Frequency**	**Percentage**
Yes	258	85.71%
No	43	14.29%

2.2. Association Between Demographic Factors and Payment Preferences

To examine the relation between age and Unified Payment Interface (UPI) usage, a chi-square test of independence was conducted. Variables: Age, Genger and Preferred mode of Payment. The results (χ^2= 19.21, p = 0.037) showed a significant association, indicating the frequency of UPI varies across different

age groups. Younger respondents showed a dominant preference for UPI, whereas older respondents showed a higher dependence on cash. Middle-aged respondents showed a balanced pattern using online modes of payment and also relying on cash payments. However, this test also showed that gender did not have a significant preference for UPI use. Negligible difference was observed between male and female respondents. This shows that age plays a more significant role than gender in the adoption of UPI.

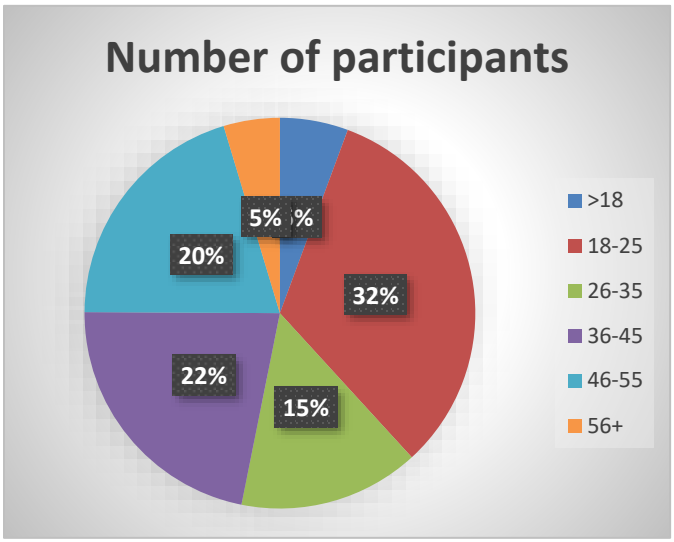

Figure 1: Preference of Online Payment method usage across different age groups

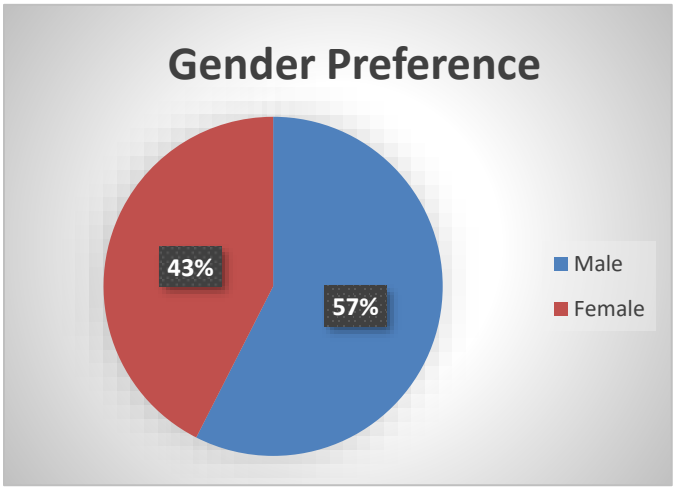

Figure 2: Preference for online mode of payment across gender

2.3. Impact of Monthly Income on UPI Usage Frequency

There was a negligible correlation (r = 0.081) between monthly income and frequency of UPI usage. This shows that income does not affect usage of UPI, and the rate of usage is fairly similar in people from different financial backgrounds, suggesting that UPI usage and adoption are not determined by financial condition.

2.4. Analysis of Expenses and UPI Spending Habits

Upon analysis, it was found that there is no significant correlation between UPI usage and monthly expenses, indicating that as monthly expenses increase, UPI usage increases slightly. On further analysis of spending, it was found that higher UPI usage has no significant correlation with non-essentials purchased, meaning frequent UPI users do not spend more on non-essentials; as a matter of fact, these users were slightly less likely to spend more on non-essential purchases. Variables: Monthly Expenses vs UPI Usage Frequency and UPI Usage vs Non-Essential Spending.

2.5. Relationship Between Financial Literacy and UPI Adoption

The findings show no significant correlation between UPI usage and financial literacy. Participants with a moderate level of financial literacy recorded the highest frequency of UPI usage and its adoption. This implies that a basic understanding of financial structure increases UPI usage. On the contrary, participants with a higher level of financial literacy showed higher UPI adoption but a lower number of UPI transactions. Participants with very low financial literacy utilised UPI payment methods comparatively less, indicating that it is not a predominant mode of payment in this group. Variables: Financial Literacy Level vs UPI Adoption, UPI Usage Frequency

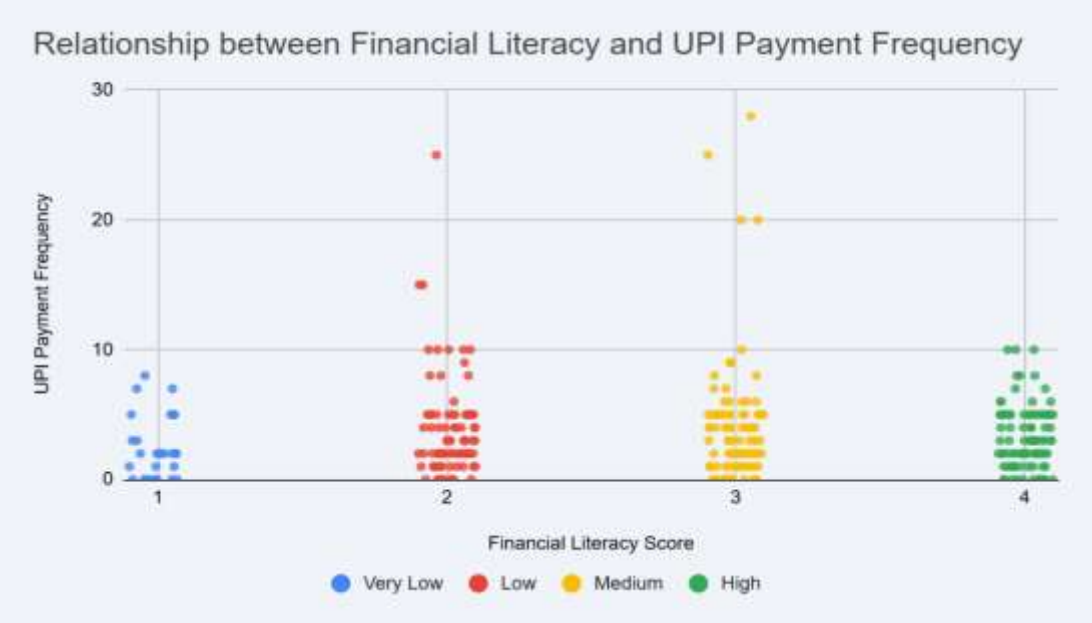

Figure 3: Financial Literacy v/s UPI Frequency

2.6. Market share of UPI Applications

In terms of sheer number of users, Google Pay is the most widely used app among respondents, holding the largest market share by a substantial margin. Phone Pe shares the position of second with other bank-owned applications; however, the gap between usage remains prominent. Despite other payment platforms, Google Pay plays a dominant role in the UPI market.

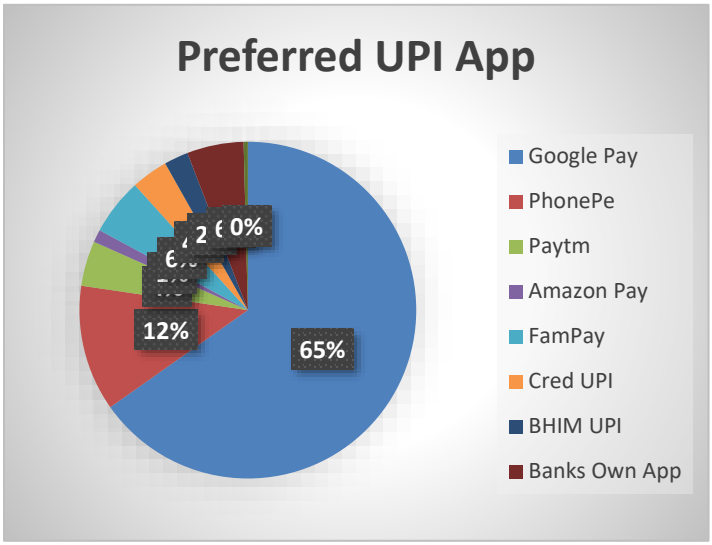

Figure 4: Preferred UPI Apps

4 Result

Table 2: Result Table

Null Hypothesis	**P-value**	**Decision (α=0.05)**	**Statistic**	**Relationship**	**Test**
There is independence between age and preferred mode of payment	0.037	Reject H_0	$\chi^2 = 19.21$	Dependent	Chi-square
There is independence between gender and preferred mode of payment	0.286	Accept H_0	$\chi^2 = 2.50$	Independent	Chi-square
There is no significant relationship between monthly	0.16	Accept H_0	$r = 0.081$ $t = 1.412$	No Significant Relation	Spearman's Rank Correlation, T-test for

income and UPI usage frequency					correlation coefficient
There is no significant relationship between expenditure and UPI usage	0.944	Accept H_0	r = -0.004 t = -0.069	No Significant Relation	Spearman's Rank Correlation, T-test for correlation coefficient
There is no significant relationship between financial literacy and UPI usage	0.893	Accept H_0	r = 0.007 t = 0.134	No Significant Relation	Spearman's Rank Correlation, T-test for correlation coefficient

5 Discussion

As per the data analysis performed, we found that younger people use UPI more than older people. This finding has been replicated almost uniformly across countries. It is in alignment with studies done in both India (Ghani et al., 2023) as well as USA and Norway (Seldal & Nyhus, 2022). On the other hand, gender and UPI usage showed almost no significant correlation. This result in contrary to some studies (Ghani et al., 2023) but in line with others (Padma Kiran & Vedala, 2025). Thus, from this we can conclude that relation between UPI usage and gender differs from sample to sample. Since nearly 75% of our respondents were either gen Z or millennial, it may have played a role in the lack of significant correlation between gender and UPI usage (Bhatia & Shete, 2024).

There seemed to be almost no correlation between income and UPI usage. This implies that people of all income groups use UPI equally. This is in alignment with the study by (Ghani et al., 2023). Reasons for this result include COVID-19 and demonetization, both of which increased the use of UPI and made it a more preferential method of payment than cash for a lot of people. However, it is important to note that smartphones are the major capital cost involved to use digital payment technologies like UPI. Most if not all of the respondents of this study had a smartphone since it was circulated through social media. Another reason is the introduction of Jan-Dhan accounts along with Aadhar cards which has led to increased financial inclusion in India (Mukherjee & Banerjee, 2023). Thus, we see identical financial behaviour pertaining to UPI across income groups. UPI usage having no correlation to a person's expenditure is another finding of this study.

In this study, we measured an individual's financial literacy by grasping their understanding of common financial terms. Upon further analysis, we found no correlation between a person's financial literacy and UPI usage. This result in alignment with another similar study done in Maharashtra by (Patnaik et al., 2023). However, it varies from other such studies done in different regions (Haque et al., 2025), (Seldal &

Nyhus, 2022). Thereby, the correlation between a person's understanding of finances and their UPI usage depends on the region from which sample is taken.

Through the data collected we also found that Google Pay is the most preferred app to perform digital transactions. It has the largest user base and thus dominates the market. Another app with a significant user base is PhonePe. This is contrary to the studies conducted around COVID-19 (S. B. Gupta & Yadav, 2020) which found PhonePe to be the most popular UPI app. But it aligns with studies conducted in more recent years (Ghani et al., 2023). From this we determine that the popularity of Google Pay has greatly increased since COVID-19 while that of PhonePe has remained more or less stagnant. Hence, new adopters of UPI prefer using Google Pay over any other app. Apps apart from Google Pay and PhonePe have an extremely small market presence.

6 Conclusion

The results of this study reveals that UPI usage varies across different age groups, while other factors such as gender does not have a significant difference on usage of digital payments. Younger individuals (18-26) years of age were found to use UPI more frequently whereas older respondents still tend to rely more on offline mode of transactions. The study also found no significant relationship between financial literacy and UPI usage. Respondents with different levels of financial knowledge showed similar patterns of UPI usage. Hence, there was no significant relationship between financial literacy and UPI usage. Likewise, there was no significant relationship between an individual's expenditure and usage of UPI. Also, the study states that among the various digital payment applications, Google Pay emerged as the most preferred platform with around 65.12% of respondents choosing it for day-to-day transactions. PhonePe was the second most popular app, whereas other digital payment platforms such as Amazon Pay, BHIM UPI and Cred had comparatively lower usage.

However, the study has certain limitations too. The data was collected mainly from respondents residing in Mumbai, which may affect the findings in other regions. In addition, the questionnaire was distributed through social media so most respondents were smartphone users. As a result, the individuals without smartphones were not involved in the study. The data used is primary, and it may involve data that is biased. Also, the type of sampling conducted was convenience sampling which may again increase the probability of getting data that is biased. Further research can explore more on other modes of payment, such as credit and debit cards, which can be considered for a more detailed analysis. Overall, the findings provide valuable information on how demographic factors, financial literacy, and spending behaviour shape the adoption and use of digital payment systems.

7 Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

8 Author Contributions

S.P. supervised the study, guided the research design and methodology, and provided critical revisions to the manuscript. S.P., J.A., S.K., D.M., and S.G. contributed to the development of the survey instrument, data collection, data preparation, and preliminary analysis. S.P., J.A., S.K., D.M., and S.G. contributed to

the interpretation of the results and the writing of the manuscript. All authors discussed the findings, reviewed the final manuscript, and approved its submission for publication.

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11 Data Availability Statement

The data that support the findings of this study are available from the Department of Statistics, Ramnarain Ruia Autonomous College, Mumbai. Due to institutional and participant confidentiality considerations, the dataset is not publicly available but may be made available by the corresponding author upon reasonable request and with permission from the Department.

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