



Trends and Structure of Digital Payments in India: A Non-Parametric and Post Hoc Analysis

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ABSTRACT

This study uses a non-parametric and post hoc analysis approach to look at the patterns and structure of digital payments in India. Using extensive datasets over a long period of time, the study explores how digital transactions are changing in one of the fastest-growing economies in the world. The study covers a wide range of factors, such as regional distribution, digital payment instrument kinds and volumes, adoption rates among various demographic groups, and adoption rates.

The results show a dynamic trajectory in digital payment systems, driven by government initiatives, technology improvements, and changing consumer preferences, marked by rapid expansion and diversification. Additionally, the research provides detailed insights into the architecture of digital payments and illuminates variables affecting adoption trends and usage habits. This research contributes to a deeper understanding of the digital payment ecosystem in India by using rigorous analytical techniques and empirical evidence. It also informs policymakers, industry stakeholders, and researchers about emerging trends and opportunities for further innovation and development in the financial sector.

Keywords: Digital Payment, India, non-parametric analysis.

INTRODUCTION

Over the last decade, India's digital payment landscape has undergone significant changes due to advancements in technology, shifts in consumer behavior, and legislative reforms. With a growing middle class and being the world's second-largest country by population, India presents an interesting case study for understanding the impact of digital payments on the economy. This study uses a non-parametric, post-hoc analysis to examine the structure and patterns of digital payments in India.

Non-parametric analysis is a useful tool for exploring complex phenomena like digital payment patterns because it allows relationships to be explored without making rigid assumptions about the underlying data distribution. Furthermore, post-hoc analysis goes beyond descriptive statistics to uncover insights and hidden patterns from the data. Simultaneously, the widespread use of mobile phones, the emergence of fintech companies, and the growing prevalence of the internet have further accelerated the shift towards cashless transactions.

The rise of digital payment methods can be attributed to technological advancements, particularly the rapid growth of e-commerce, which has necessitated the development of novel, convenient, and secure payment mechanisms (Bećirović, 2014). According to Sardana & Singhania (2018), the digital business era has disrupted the business landscape, introducing new and distinct methods of conducting business. Technology has had a profound impact on the operations of most corporate organizations and our daily lives, including the banking industry.

Digital banking refers to various banking services that are delivered and consumed through technology, including accessing banking services through the internet. Examples of digital banking services include online and mobile banking, phone and mobile banking, automated teller machines, plastic cards, electronic fund transfers, and electronic clearing services. Digital banking is becoming increasingly important in India, where it is replacing the traditional banking system. The Indian government passed the IT Act in 2000 to enable online banking. This research examines different aspects of digital payments, including transaction volumes, transaction types (such as peer-to-peer and peer-to-merchant), preferred payment channels (such as cards, wallets, and UPI), geographic distribution, demographic factors, and the impact on the banking, e-commerce, and retail industries. The research uses state-of-the-art analytical tools to identify underlying trends, important factors influencing the use of digital payments, and evaluate the effects on consumers, companies, and governments. The findings of this research can be used to create efficient policies, help companies that want to benefit from the digital payments movement, create better laws, and provide customers with insights into their payment habits and preferences.



LITERATURE REVIEW

Varda Sardana, Shubham Singhania(2018)

The tremendous advancements in digital technology have completely transformed the way banks operate, leading to the emergence of innovative and unique ways of doing business. One of the most recent outcomes of this disruption is digital banking. Over the years, digital banking technologies have evolved, offering a vast range of products such as deposits, ATMs, debit cards, mobile payments, and more.

Elena Vighi, Romain Sacchi (2018)

As our society becomes more digitized, we now have the potential to combine data in new ways. This study aims to provide information on digital expenses available from bank accounts, along with LCA-like data. This will allow for the calculation of personalized and consumer-specific environmental footprints based on consumption patterns. In Denmark, most purchases are made with credit cards, which means this information is readily available from consumers' bank accounts. They have matched this data with the categories of the Multi-Regional Input-Output database EXIOBASE through different conversion tables for Danish and European industrial classifications (DB07, NACE1-2) using an automated process. This matching allows them to calculate the carbon footprint of each specific consumer. In theory, this information could be used to make people aware of the impacts of their consumption

habits and encourage them to make more environmentally-friendly choices. However, there are still several challenges to overcome, such as data aggregation, privacy, and communication issues.

Shobha B.G (2020)

Digital payments are an important aspect of digitalization as they have numerous benefits for both a country and its individuals. In India, digital payment has provided an opportunity to empower its citizens and overcome the limitations of the traditional banking system. The Reserve Bank of India (RBI) has taken various measures to encourage people to use digital payment platforms, thereby improving financial inclusion. However, it's crucial to assess the current status of digital payment and address any shortcomings. This study analyzed the current status of various digital payments using secondary data and found a significant increase in their usage in the last five years.

M. R. Suji Raga Priya, Siddharth Misra (2011)

This paper analyzes India's progress towards becoming a cashless economy. We present a hypothetical regression model that examines payment method preferences of buyers and sellers for receiving cashless payments. We then use data from surveys conducted between 2006 and 2019 to evaluate the amount of cashless transactions prevalent in India and identify the changes in the macroeconomic factors. Our research suggests that India's transition towards a cash-free economy is on the right path. It contributes to the growth and development of the Indian economy by promoting digital transactions. Keywords: Demonetization, digitalization, GDP, FDI.

Priyank Chandra, Vaishnav Kameswaran (2018)

In November 2016, the Indian Government banned most of the banknotes in circulation in a process known as 'demonetization'. This decision was made to combat issues such as corruption and terrorism and to promote the use of digital transactions. A study conducted on 200 shopkeepers in Mumbai and Bengaluru revealed that a shortage of cash led to an increase in the adoption of digital payment methods. However, after new banknotes became available, the use of digital payment methods decreased. The adoption of digital payment methods was influenced by the type of product sold, the nature and scope of transactions, as well as personal factors specific to business owners such as their familiarity and comfort with other digital technologies and online transactions. By examining market and information behavior theories, we concluded that the shift towards digital payments should be viewed as part of a broader technological modernization initiative rather than just being considered for their efficiency or productivity gains.

RESEARCH METHODOLOGY

RESEARCH GAP:

Research on digital payment trends in India lacks comprehensive analysis of socio-economic factors influencing adoption and usage patterns. Understanding the long-term impact of policy interventions and technological advancements on payment systems evolution is also limited. Additionally, analysis techniques for insights into the dynamics of digital payments in India remain understudied.

NEED FOR THE STUDY:

Studying digital payment trends in India is crucial for understanding its evolving financial landscape. Policy makers, businesses and financial institutions need to understand usage behaviors and preferences of demographics to develop targeted solutions. Socio-economic factors and policy interventions can inform effective measures to promote financial inclusion and digital literacy. Findings can enhance the efficiency, security and accessibility of digital payment systems, fostering economic growth in India.

\OBJECTIVE OF THE STUDY:

- 1) To analyze the current trends and structure of digital payments in India, examining factors such as adoption rates, usage patterns, and preferred payment methods across different demographic segments.
- 2) Assess the prevalence of digital wallets, UPI, mobile banking, and other payment platforms within the existing digital payment infrastructure.

RESEARCH DESIGN

The study's research design will use a mixed-methods approach, combining quantitative analysis of digital payment data with qualitative exploration through interviews or surveys.

Methods of Collecting Data:

Primary Data: The surveys and interviews will be designed to be comprehensive, covering a wide range of topics related to digital payments.

Secondary Data: This will involve collecting data from government reports, industry publications, and academic studies to supplement and validate the findings.

QUESTIONNAIRE:

A well-structured questionnaire with straight forward questions is employed for the data gathering. Multiple choice questions are used for findings.

SAMPLE SIZE: 38

SAMPLE UNIT: Kukatpally

TOOLS USED: Google forms, Microsoft Excel, Charts, Bar graphs and Chi-square test.

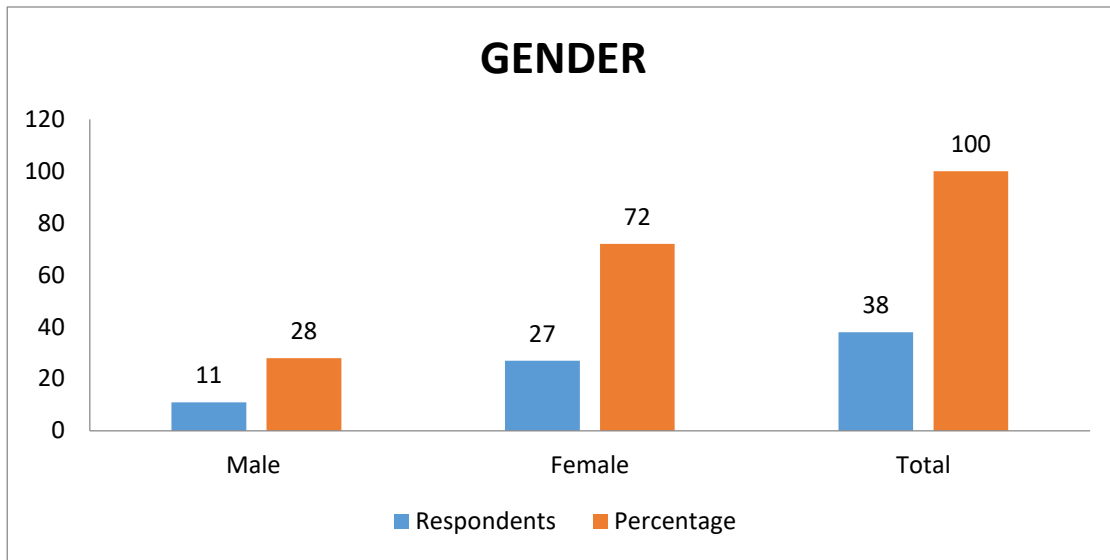
HYPOTHESIS

H0: There is no significant difference between experienced of frauds and unauthorized activity with Digital Payments

H1: There is significant difference experienced of frauds and unauthorized activity with Digital Payments

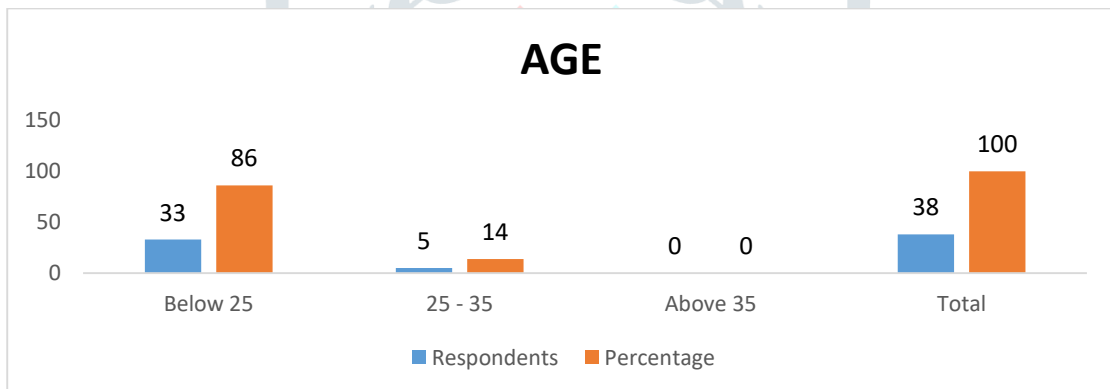
DATA ANALYSIS

Gender	Male	Female	Total
Respondents	11	27	38
Percentage	28	72	100



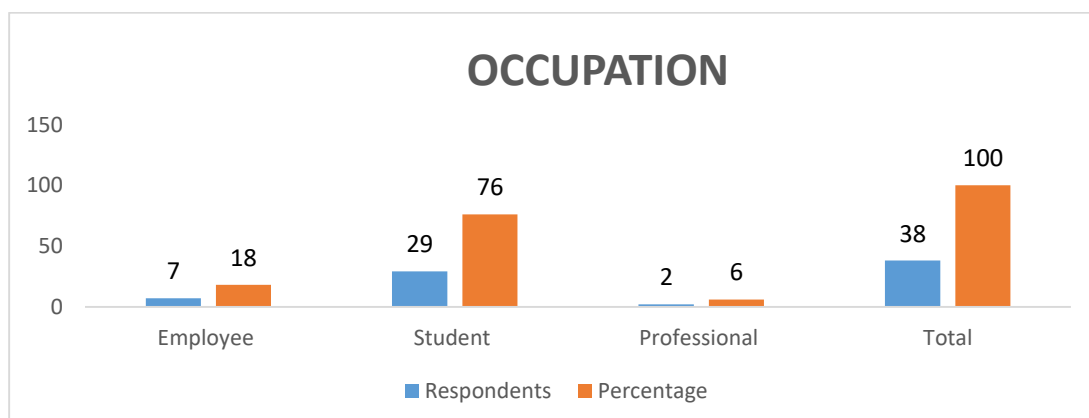
Interpretation: The total respondents are 38 out of which are male 11% and 27% are female.

Age	Below 25	25 - 35	Above 35	Total
Respondents	33	5	0	38
Percentage	86	14	0	100



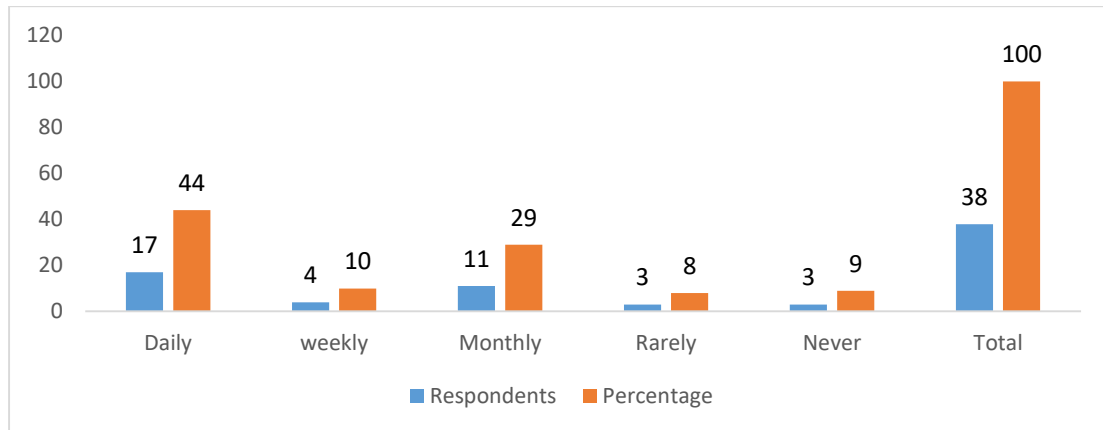
Interpretation: It is observed that the majority of the respondents followed Below 25 with 86%.

Occupation	Employee	Student	Professional	Total
Respondents	7	29	2	38
Percentage	18	76	6	100



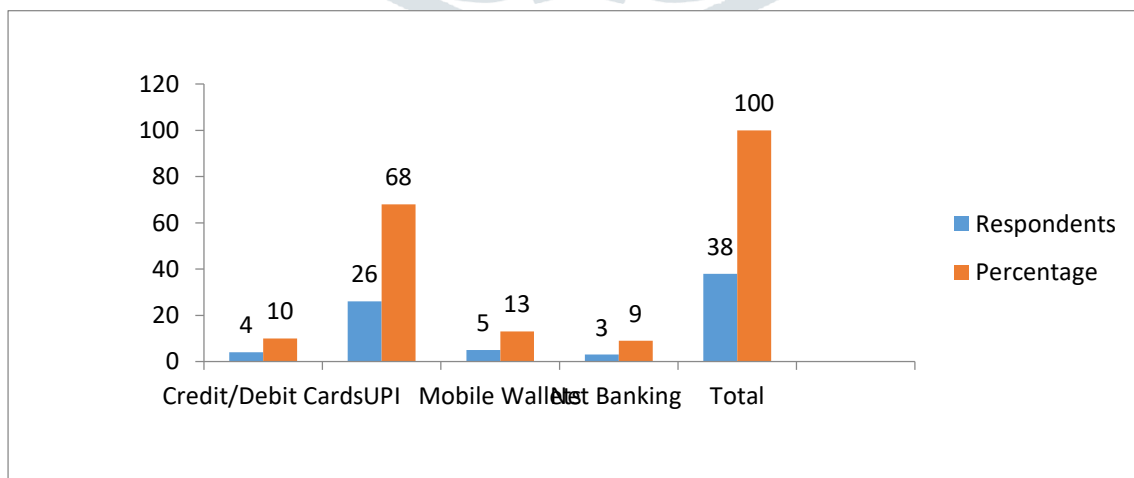
Interpretation: most of the respondents are Students with 76% and next follows Employees of 29%.

How often do you use digital payment methods?	Daily	weekly	Monthly	Rarely	Never	Total
Respondents	17	4	11	3	3	38
Percentage	44	10	29	8	9	100



Interpretation: 44% of the respondents are using the Digital Payments Daily and 29% are using Monthly and 10% are using weekly and 3% are using rarely and 3% are not using the Digital Payments.

Which digital payment methods do you use?	Credit/Debit Cards	UPI	Mobile Wallets	Net Banking	Total
Respondents	4	26	5	3	38
Percentage	10	68	13	9	100



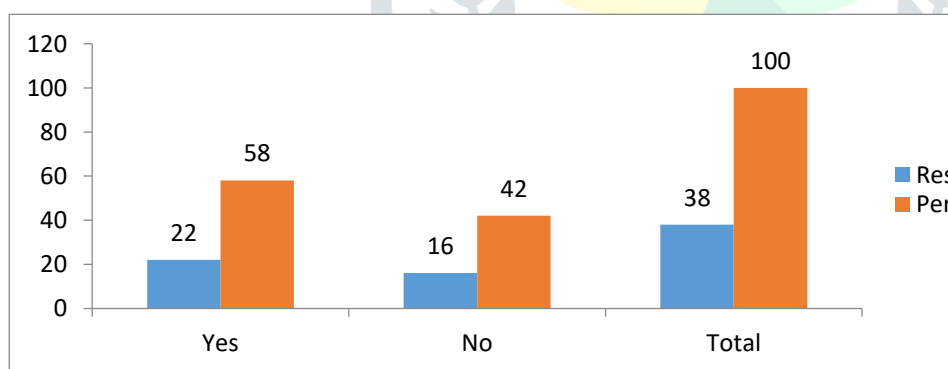
Interpretation: 68% respondents are using the UPI Payment and 13% are using Mobile Wallets and 10% are using Credit/Debit Cards and 9% are using the Net Banking Payments.

What is your primary reason for using digital payments?	Convenience	Speed	Security	Rewards	Total
Respondents	18	9	9	2	38
Percentage	47	24	24	5	100



Interpretation: 47% respondents are using the Digital Payments for Convenience and 24% are using for Speed and 24% are using for Security and 5% are using Digital Payments for Rewards.

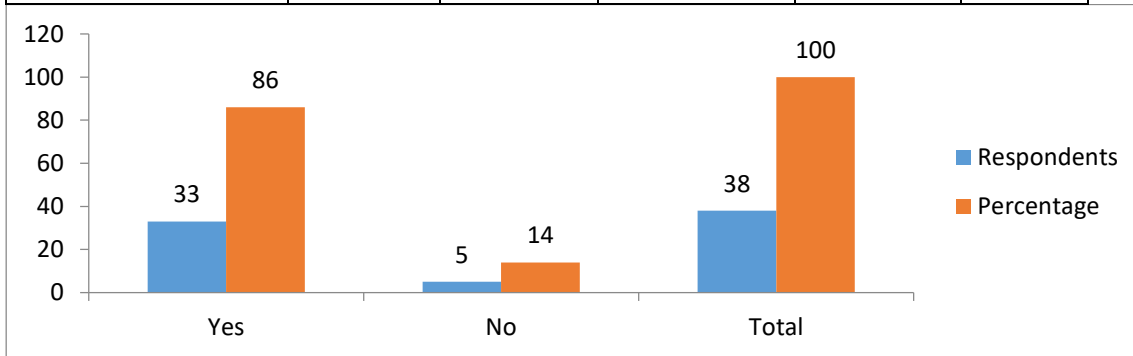
Have you faced any issues with digital payments?	Yes	No	Total
Respondents	22	16	38
Percentage	58	42	100



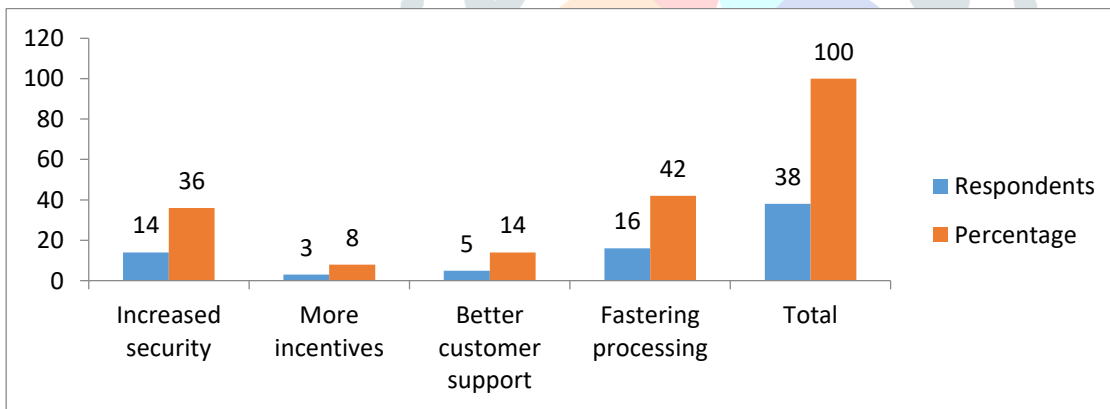
Interpretation: 58% of the respondents are facing the issue with Digital Payments and 42% are not facing any issue with Digital Payments.

Do you think digital payments are becoming more popular in india?	Yes	No	Total
Respondents	33	5	38
Percentage	86	14	100

What would encourage you to use digital payments more frequently?	Increased security	More incentives	Better customer support	Faster processing	Total
Respondents	14	3	5	16	38
Percentage	36	8	14	42	100

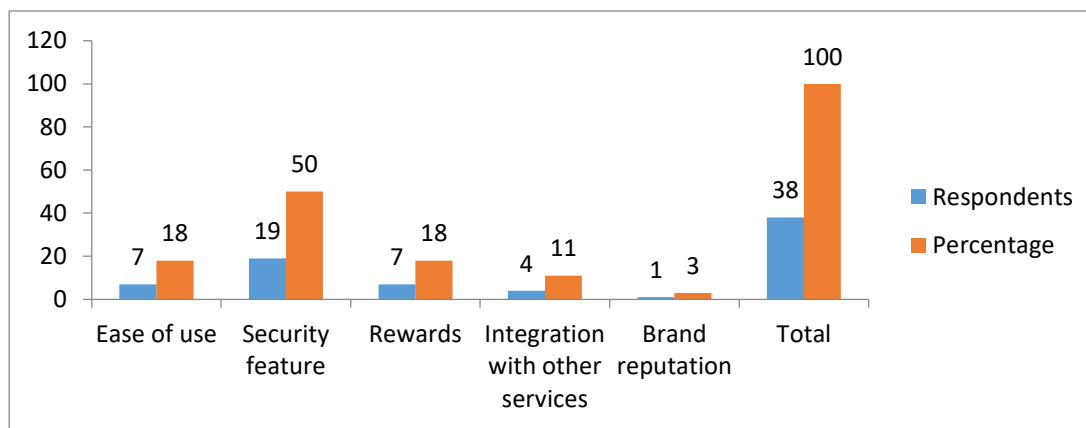


Interpretation: 86% of the respondents are saying that Digital Payments are becoming popular and 14% are saying that Digital Payments are not becoming more popular in India.



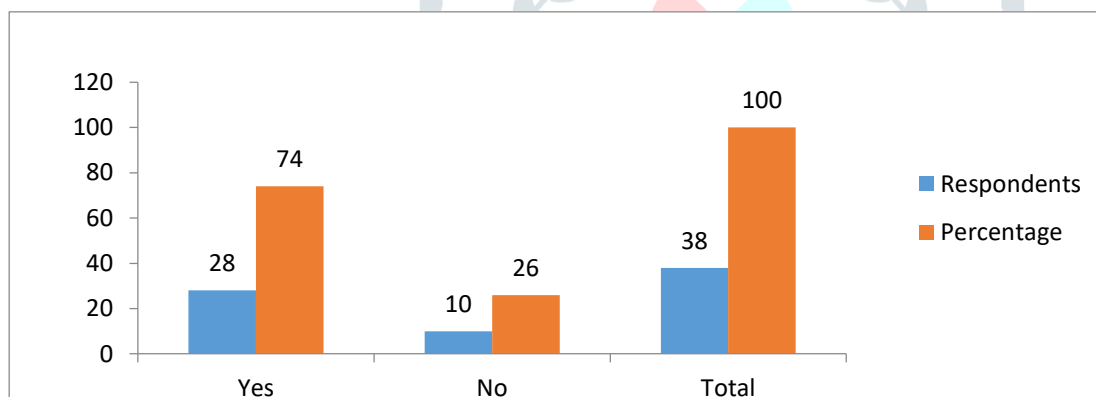
Interpretation: 42% respondents are being encouraged to use Digital payments more frequently due to Fast processing and 36% are being encouraged for Increased Security and 14% are being encouraged for better customer support and 8% are being encouraged to use Digital payments more frequently due to More incentives.

What factors influence your choice of a digital payment app?	Ease of use	Security feature	Rewards	Integration with other services	Brand reputation	Total
Respondents	7	19	7	4	1	38
Percentage	18	50	18	11	3	100



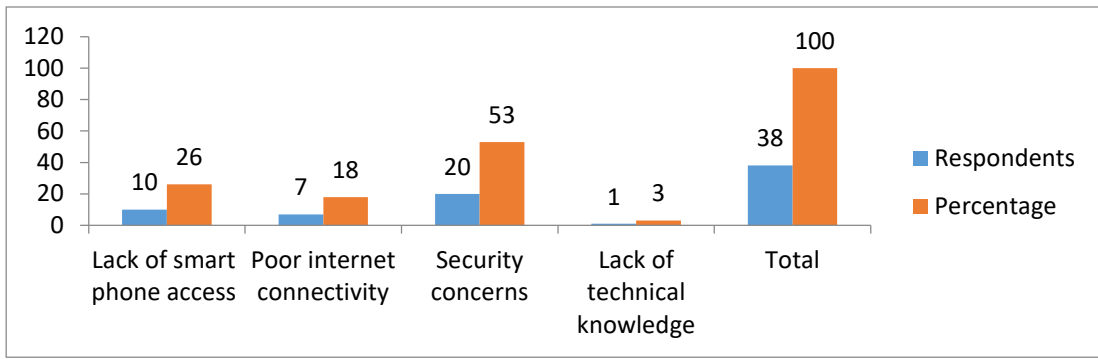
Interpretation: 50% of the respondents are influenced by Security features of Digital Payments and 18% are influenced by Rewards and 18% are influenced by ease of use and 3% are influenced by Brand Reputation of Digital Payments.

Do you trust digital payments?	Yes	No	Total
Respondents	28	10	38
Percentage	74	26	100



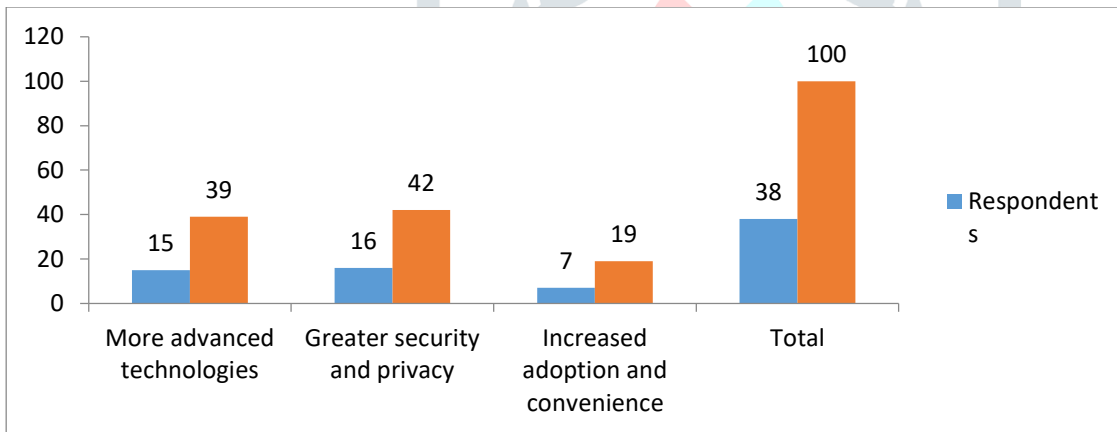
Interpretation: 74% of the respondents are saying that Digital Payments can be trusted and 26% are saying that Digital Payments cannot be trusted.

What barriers prevent you from using digital payments more frequently?	Lack of smart phone access	Poor internet connectivity	Security concerns	Lack of technical knowledge	Total
Respondents	10	7	20	1	38
Percentage	26	18	53	3	100



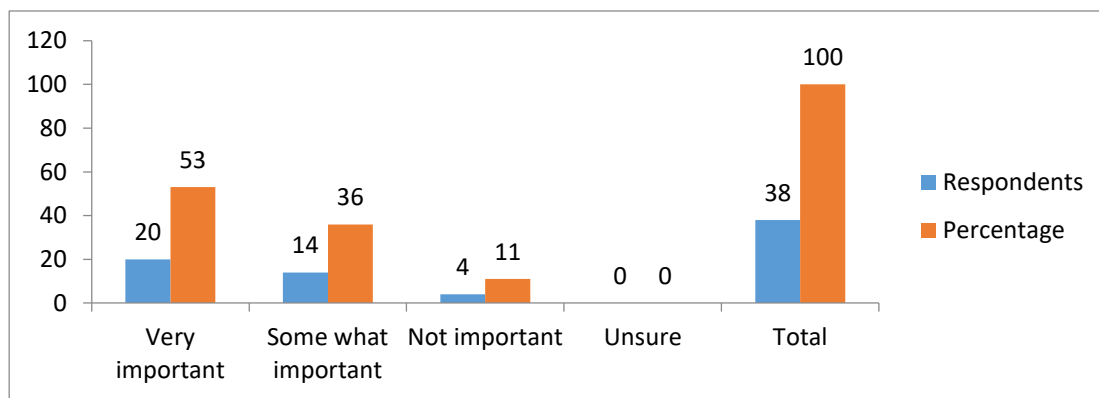
Interpretation: 53% of the respondents are saying that Security concerns barrier can prevent the digital payments more frequently and 26% can prevent by Lack of smart Phones and 18% can prevent by Poor internet connectivity and 3% can prevent by Lack of technical knowledge of Digital Payments.

What do you think the future of digital payments in India looks like?	More advanced technologies	Greater security and privacy	Increased adoption and convenience	Total
Respondents	15	16	7	38
Percentage	39	42	19	100



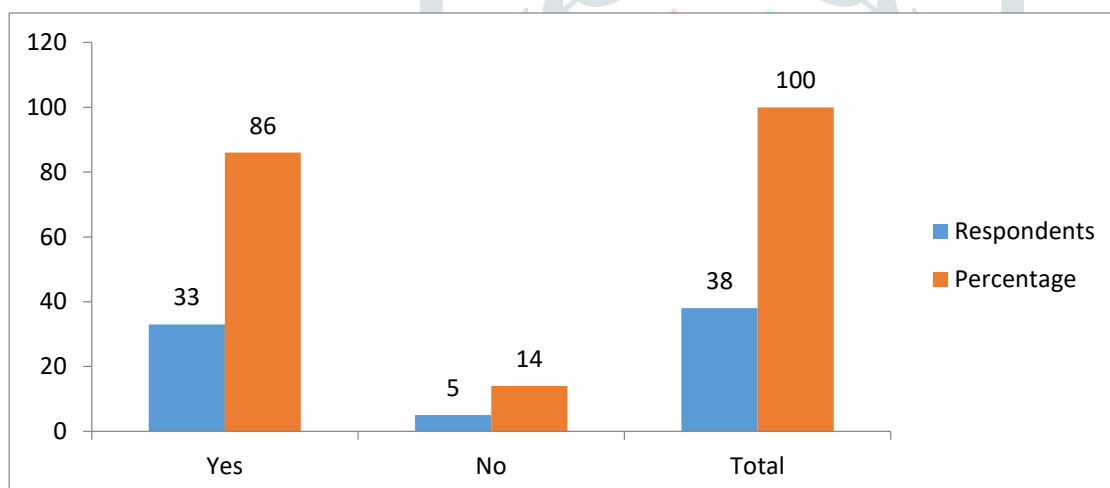
Interpretation: 42% of the respondents are saying that the future of digital payments in India is Greater security and privacy and 39% are responded for more advanced technologies and 19% for Increased adoption and convenience.

How important is the government role in promoting digital payments?	Very important	Somewhat important	Not important	Unsure	Total
Respondents	20	14	4	0	38
Percentage	53	36	11	0	100



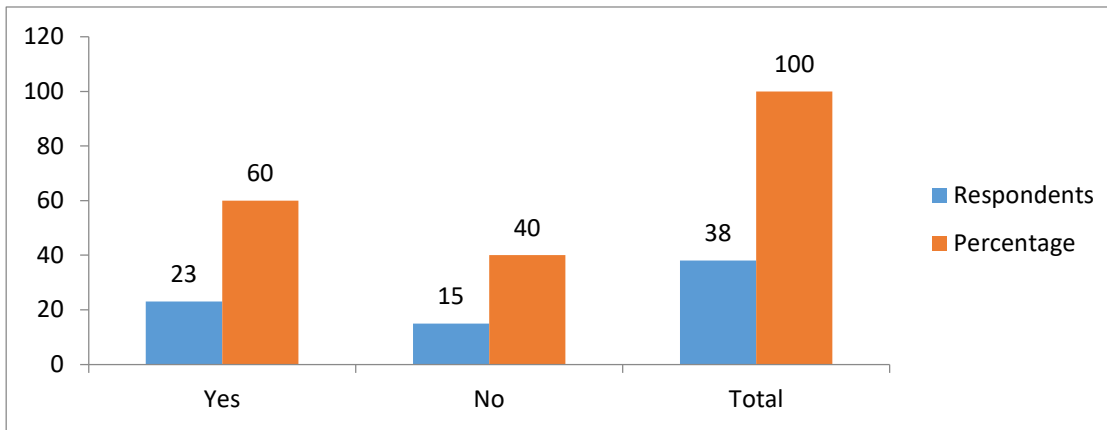
Interpretation: 53% respondents are saying that government role is very important in promoting the Digital Payments and 36% are saying that somewhat important and 11% are saying that government role is Not important in promoting the Digital Payments.

Would you recommend digital payments to others?	Yes	No	Total
Respondents	33	5	38
Percentage	86	14	100



Interpretation: 86% of the respondents are saying that they will recommend Digital Payments and 14% are saying that they won't recommend Digital Payments.

Have you experienced any type of fraud or unauthorized activity with digital payments?	Yes	No	Total
Respondents	23	15	38
Percentage	60	40	100



Interpretation: 60% of the respondents are saying that they have experienced the fraud with Digital Payments and 40% are saying that they haven't experienced the fraud Digital Payments.

STATISTICAL TOOLS FOR ANALYSIS

HYPOTHESIS

H₀: There is no significant difference experienced of frauds and unauthorized activity with Digital Payments

H₁: There is significant difference experienced of frauds and unauthorized activity with Digital Payments

	Yes	No	MARGINAL ROW TOTALS
MALE	18 (16.34) [0.17]	9 (10.66) [0.26]	27
FEMALE	5 (6.66) [0.41]	6 (4.34) [0.63]	11
MARGINAL COLUMN TOTAL	23	15	38 (Grand Total)

The chi-square statistic is 1.4719. The p-value is .22504 which is not significant at $p < .05$

The chi-square statistic with Yates correction is 0.067. The p-value is .795809. Not significant at $p < .05$

As the p value is less than .05, we reject H_0 and accept H_1 that means, there is significant difference experienced of frauds and unauthorized activity with Digital Payments

FINDINGS

- The total respondents are 38 out of which are male 11% and 27% are female.
- It is observed that the majority of the respondents followed Below 25 with 86%.
- Most of the respondents are Students with 76% and next follows Employees of 29%.
- 44% of the respondents are using the Digital Payments Daily and 29% are using Monthly and 10% are using weekly and 3% are using rarely and 3% are not using the Digital Payments.

- 68% respondents are using the UPI Payment and 13% are using Mobile Wallets and 10% are using Credit/Debit Cards and 9% are using the Net Banking Payments.
- 47% respondents are using the Digital Payments for Convenience and 24% are using for Speed and 24% are using for Security and 5% are using Digital Payments for Rewards
- 58% of the respondents are facing the issue with Digital Payments and 42% are not facing any issue with Digital Payments.
- 86% of the respondents are saying that Digital Payments are becoming popular and 14% are saying that Digital Payments are not becoming more popular in India.
- 42% respondents are being encouraged to use Digital payments more frequently due to Fast processing and 36% are being encouraged for Increased Security and 14% are being encouraged for better customer support and 8% are being encouraged to use Digital payments more frequently due to More incentives.
- 50% of the respondents are influenced by Security features of Digital Payments and 18% are influenced by Rewards and 18% are influenced by ease of use and 3% are influenced by Brand Reputation of Digital Payments.
- 74% of the respondents are saying that Digital Payments can be trusted and 26% are saying that Digital Payments cannot be trusted.
- 53% of the respondents are saying that Security concerns barrier can prevent the digital payments more frequently and 26% can prevent by Lack of smart Phones and 18% can prevent by Poor internet connectivity and 3% can prevent by Lack of technical knowledge of Digital Payments.
- 42% of the respondents are saying that the future of digital payments in India is Greater security and privacy and 39% are responded for more advanced technologies and 19% for Increased adoption and convenience.
- 53% respondents are saying that government role is very important in promoting the Digital Payments and 36% are saying that somewhat important and 11% are saying that government role is Not important in promoting the Digital Payments.
- 86% of the respondents are saying that they will recommend Digital Payments and 14% are saying that they won't recommend Digital Payments
- 60% of the respondents are saying that they have experienced the fraud with Digital Payments and 40% are saying that they haven't experienced the fraud Digital Payments.

SUGGESTIONS

It is important to undertake a non-parametric and post hoc analysis in order to provide insights into the patterns and structure of digital payments in India. Initially, examining the increasing rates of use of digital payment systems in diverse demographic groups and socioeconomic contexts may yield insightful information. Contextualizing contemporary patterns also requires looking at how regulatory frameworks and digital payment infrastructure have changed over time. Additionally, examining how current technology developments—like digital banking services, UPI, and mobile wallets—have affected consumer behaviour and transaction patterns

can reveal new trends. A post hoc study can also be used to find trends, abnormalities, and underlying causes affecting digital payment trends, which will help stakeholders plan ahead and make wise decisions.

CONCLUSION

In summary, this study's non-parametric and post hoc analysis provides insightful information about how digital payments are changing in India. It is clear from looking at trends and structural patterns that the use of digital payments is expanding significantly, driven by things like government programs, customer preferences, and technology improvements. The results underscore the growing influence of digital banking services, e-wallets, and mobile payments on the future of financial transactions in the nation. The study also emphasizes how crucial infrastructure development and regulatory frameworks are to creating an environment that is favourable to the growth of digital payments.

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