

Perceived eWallet security: impact of COVID-19 pandemic

Impact of
COVID-19
pandemic

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Abstract

Purpose – Coronavirus (COVID-19) pandemic forced nationwide lockdown in India. During the period of lockdown usage of eWallet increased by 44%. With the increased usage of digital transactions, cyber-crime attacks also increased as much as by 86%. The socio-economic environment and the peoples' mindset in the country yet not ready for this kind of rise in digital transactions. The purpose of this study is to capture "security concern" and "comfortability" in regard to using eWallet during the COVID-19 pandemic situation. The study further investigated the influence of demographics such as gender and income on "security concern" and "comfortability" in using eWallet.

Design/methodology/approach – This was an empirical study. The respondents were selected using a purposive sampling method. Only those people who had been using eWallet were included in the survey. The questionnaire was circulated to 100 respondents who agreed to participate in the survey. After scrutiny total of 43 questionnaires were found to be completely filled in all aspects, and thus used for analysis. This study used an innovative multi-method approach for analysis. The hypotheses were tested using two methods: the conventional p -value method and the robust BCa bootstrap method. The effect size was also reported.

Findings – The findings suggest that female users are more concerned about eWallet security than male users. This study showed that people from the middle-income group are more concerned about the security of digital payments than the people from the lower-income group.

Research limitations/implications – This study covered the influence of two demographic variables "gender" and "income" on security and comfort in using eWallets. Other demographic variables such as age, education, occupation and area of residence (rural or urban) need to be investigated with the inclusion of rural populations. From the findings of this study, this paper argues that the middle-income group in India is more risk intolerant than the lower-income group while higher and lower-income groups are indifferent. A separate detailed study is recommended for additional support. This study used an innovative multi-method approach of analysis and use of bootstrapping. This may encourage other researchers to adopt such approaches.

Practical implications – This study showed that irrespective of the forceful adoption; security concerns are prevailing and on the rise. This is an alarm to developers and service providers that, although the use of eWallets increased exponentially during this COVID-19 pandemic, it is a forceful adoption and not willful. They should not get deceived by rise in eWallet users and must endeavor to improve the security of eWallets otherwise, there may be a sharp decline in eWallet users once the COVID-19 pandemic is over.

Originality/value – This study attempted to capture the comfortability and security concerns of eWallet users during the COVID-19 pandemic. This study used an innovative multi-method approach of analysis and used bootstrapping in addition to the conventional p -value method to test the significance. This study showed that irrespective of the forceful adoption of eWallets owing to the COVID-19 pandemic, security concerns are



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prevailing and on the rise. The study confirms that gender has an influence on eWallet security. The findings of this study are in partial conformity with the findings of previous researchers.

Keywords Risk propensity, COVID-19 pandemic, Digital payment, eWallet, Security of digital transactions

Paper type Research paper

Introduction

Coronavirus (COVID-19) pandemic forced nationwide lockdown in India. Preventive measures like social distancing compelled people to use digital payment applications. During the period of lockdown usage of eWallet increased by 44%. “PayTM” and “Google pay” are emerged as mostly used digital payment apps (PTI, 2020). The shift from physical payments to digital payments seems to be smooth owing to the increasing number of smartphone users in India. There were 502.2 million smartphone users in the country as of December 2019 (Gadgets360, 2020). “Business Standard” reported that in terms of value, the mobile wallet transactions are estimated to jump from Rs 5,500 crores in 2015–2016 to Rs 30,000 crore in 2022 (Umarji, 2016). However, there is a grey side to this advancement as well. With the increased usage of digital transactions, Cyber-crime attacks have also increased as much as by 86% between the lockdown months of March and April 2020 (Desai, 2020). All over India, 44,546 cases of cybercrimes were registered in 2019 (National Crime Records Bureau, 2020) and Rs 1.24tn amount was lost (Mehta, 2020). By August 2020, that is only in 8 months 8,546 cases of cybercrimes were registered in Pune surpassing a total of 7,700 cases in the calendar year of 2019 (Madaan, 2020). Although the authentic data about the rupee amount lost in 2020 is not available till the time of this article was written; the percentage rise in cybercrime cases provides ample base to believe that it might have crossed Rs 1.24tn (the amount which was lost in 2019 due to cybercrimes). This has posed serious challenges and there are increasing concerns about eWallet security. This pandemic has forced a premature surge in eWallet usage. The socio-economic environment and the peoples’ mindset in the country yet not ready for this kind of rise in digital transactions. The purpose of this empirical study was to capture how much people are comfortable using eWallet? Whether they are concerned about the security of eWallet transactions and whether demographics influence “comfort” and “security” concerns regarding use of eWallets.

Definition of eWallet

An e-wallet is a type of electronic card which is used for transactions made online through a computer or a smartphone. Its utility is the same as a credit or debit card. An eWallet needs to be linked with the individual’s bank account to make payments (The Economic Times, 2020).

eWallet sometimes also referred to as a *digital wallet* or *mWallet*. For the sake of simplicity, we hereafter use the term eWallet for all types of digital wallets.

Literature review

COVID-19 is an unprecedented scenario for the entire world. Therefore, it is difficult to expect literature to be available which has considered such a “never before” situation. However, the following are some important research work related to the topic of this study. Nag and Gilitwala (2019) investigated the influence of various factors on intention to use eWallets, in Bangkok, Thailand. They studied five factors: “perceived usefulness, perceived ease of use, security/privacy confidence, social

influence and trustworthiness.” The study reported a moderate positive correlation between “security” and “intention to use” eWallets. LAI (2016) argued that “intention to use” of ePayment system was significantly influenced by “security,” design, “perceived usefulness” and “perceived ease of use.” He reported that “security” positively influence users’ “intention to use” the ePayment system. Kim *et al.* (2010) found that “perceived security” has a positive impact on “perceived trust” and on the usage of ePayment systems. Wijayanthi (2019) reported that “perceived trust” and “perceived usefulness” influence the behavioral “intention to use” e-wallet among Indonesian young consumers. Karim *et al.* (2020) used an extended “technology acceptance model (TAM)” to investigate the factors influencing the use of eWallets among Malaysian youths. Their findings confirmed that “perceived usefulness, perceived ease of use, privacy and security” have a significant positive influence on “behavioral intention to use an e-wallet.” Soodan and Rana (2020) studied factors influencing the adoption of eWallets. They reported that “hedonic motivation, perceived security, general privacy, facilitating conditions, performance expectancy, perceived savings and social influence and price value in this order, influence the intention to adopt e-wallets.” They advocated to modify existing services to maintain the customers’ “privacy and security.” Brahmabhatt (2018) surveyed the customers’ perceptions regarding E-wallets in Ahmedabad city. The study reported that most of the customers were aware of the eWallets and were satisfied with the service provided by eWallet providers. The study reported that customers were concerned about the “security” of transactions through eWallets. Mallat (2007) investigated the consumer adoption of mobile payments. She argued that the relative advantages specified in adoption theories were different for mobile payments which include “independence of time and place, availability, possibilities for remote payments and queue avoidance.” She reported certain barriers to adoption such as “premium pricing, complexity, a lack of critical mass and perceived risks.” Grable (2000) reported that financial risk tolerance was associated with demographics of respondents such as gender, income and education. According to this study, men are more risk-tolerant than women and high-income groups are more risk-tolerant than lower-income groups. Kindberg *et al.* (2004) argued that along with “trust and security,” “ease of use, convenience and/or social factors” are equally important while designing the ePayment technology. URS (2015) argued that “information security is an essential requirement for any efficient and effective e-Payment system.” Jung and Jang (2014) argued that the eWallet application requires to be secure and reliable. They cautioned against the vulnerability of the “Internet of Things (IoT)” environment that allows moving both data and the computing environment along with the users. They proposed a secure and reliable eWallet application using a smart solid-state drive (SSD). Urs, B.A. (2015) emphasized security and malicious applications targeting online banking transactions. The most common threats, he reported were, “worms, trojans, viruses, phishing, pharming, spoofing, man-in-the-middle, denial of service attack, transaction poisoning and spamming.” He argued that digital payments should have reliable and secure methods for authentication of their customers. This would according to him, reduce the inherent risks. Salodkar *et al.* (2015) studied security concerns and proposed an eWallet application. They claimed that their proposed eWallet application would ensure a secure, fast and futuristic way of transactions. Nachappa and Lathesh (2018) argued that people are more emphasizing the “security,” confidential personal financial information such as bank’s balance details, details of license and authorization details. They claimed that eWallets would be best to offer the security of peoples’ information. Octavian (2012) reported “security and feasibility” as a major concern where the “security systems must restrain the possibility of the frauds within the electronic environment.” While the

“feasibility systems must be accessible and available at any moment in time.” He argued that the electronic wallet had no commercial success in the recent past because of the difficulties in using them.

Objectives

The objectives of this empirical study were to capture “security concern” and “comfortability” in regard to using eWallet during the COVID-19 pandemic situation. The study further investigated the influence of demographics like gender and income on security concern and comfortability in using eWallet.

Hypotheses

Influence of gender on security concerns and comfortability using eWallet

Conventionally India is a male-dominated civilization. Although recently a good number of women have started earning for their families; male holds financial power irrespective of who is earning. Still, most of the financial transactions are carried out by men for their families. Even with technological advancement and an increasing population of well-educated women, they have limited opportunities to carry out financial transactions (Kohli, 2018). Schubert *et al.* (1999) argued that men and women do not differ in risk propensities in a given context. However, conventionally it is believed that women are risk-averse. Grable (2000) reported that “men were more risk-tolerant than female.” Therefore, women may have high-security concerns and may not be comfortable with eWallet transactions as compared to male users. Thus, this study hypothesizes as:

- H1. There is a significant difference in security concerns between male and female.
- H2. There is a significant difference between Male and Female in their comfort using e-wallet transactions.

Influence of income on security concerns and comfortability using eWallet

It is well documented that level of income influence the risk propensity of people. People with higher incomes likely to take more risks than people with lower incomes (Grable, 2000). Based on this we believe income may influence security concerns and comfortability of eWallet users. Therefore, this study hypothesizes as:

- H3. Security concerns differ significantly among different income groups.
- H4. Comfortability differs significantly among different income groups.

Research methodology

This was an empirical study. The respondents were selected using a purposive sampling method. Only those people who had been using eWallet were included in the survey. The questionnaire was circulated to 100 respondents who agreed to participate in the survey. After scrutiny total of 43 questionnaires were found to be completely filled in all aspects, and thus only these 43 were used for analysis. Therefore, the response rate yielded for this study was 43%. The data were analyzed using MS-EXCEL and SPSS software.

An innovative multimethod approach was used to analyze the data. The hypotheses were tested using two methods a. Conventional *p*-value method and, b. Bootstrap Class

Interval (CI) method. Conventional and bootstrap “independent sample *t*-test” and “one way ANOVA” were used to test the significance. Bootstrap is one of the robust ways to test differences between the means (Field, 2009). Robust Bias-corrected and accelerated (BCa) method of bootstrap is used when the sample size in each group is unequal and has less than 30 sample size (Chen and Peng, 2014). As sample size in all the classes, all demographic variables were unequal and less than 30, we used the BCa method of bootstrap. In addition, we reported the effect size for all the results.

Reliability and validity

Reliability and validity were established using a subjective approach. The validity was limited to content validity only. Based on the literature review and inputs from experts a structured questionnaire was developed. The developed questionnaire was presented to a panel of experts for scrutiny. This panel was comprising 10 members including two academicians, two information technology experts, two bank experts, two eWallet service providers and two eWallet users. They were asked to examine whether the questionnaire would be able to capture “security concerns” and “comfortability” of users about eWallet. The questionnaire was refined as per the suggestions of the panel. Thus, content validity was established.

Scope and limitations

Scope

The study was confined to security concerns and comfortability of eWallets and the influence of “gender” and “income” on it. The respondents were from Pune, a metropolitan city in India. The study attempted to capture perceived security concerns and comfortability of users and not attempted to investigate technical issues related to security and comfort.

Limitations

This study surveyed participants from a small geographic urban area i.e. Pune. The rural area was not included in this study. The sampling method used was purposive sampling which does not ensure the representativeness of the population. This research was limited to the study of security concerns and comfortability using eWallet and other concerns were not taken into account. Influence of demographic variables other than gender and income not studied. Therefore, the findings of this study cannot be generalized beyond a small population aforementioned.

Data analysis and results

Table 1 presents frequency distribution among various categories of demographics of respondents. It was observed that 87% of the total respondents were using eWallets regularly. In total, 69.8% of respondents were comfortable and only 9.3% were not comfortable with e-wallet transactions. Whereas, 20.9% were observed to be *neutral* with e-wallet transactions. However, 44.1% of respondents felt that their money was not safe with e-wallets. The safety of money for them was a major concern. In response to the question regarding prevailing security glitches; 45.2% of respondents feared that their account might get hacked. In total, 18.7% of respondents' felt that OTP cannot be cracked. In total, 44.2% of respondents opined that *fingerprint* recognition could help in providing security to e-wallets and 7% suggested to add *face recognition* while the remaining suggested *OTP and drawing pattern* as security features.

Values of skewness (Sk) and kurtosis (Kr) for “security” ($Sk = 0.328, Kr = 0.641$) and for “comfort” (using eWallet) ($Sk = -0.322, Kr = -0.586$) (Table 3) were within ± 1 indicating that the data were normally distributed (Darren and Mallery, 2011). Therefore, parametric tests (t -test and ANOVA) were used to test the significance. Further, the number of cases in each class of all the demographic variables were not equal (Table 1). Therefore, the bootstrap robust method was used. Bootstrap is one of the robust ways to test differences between the means (Field, 2009). Bias-corrected and accelerated (BCa) method of bootstrap is used when the sample size in each group is unequal and has less than 30 sample sizes (Chen and Peng, 2014). Further, it is recommended to use 2,000 bootstrap samples (Field and Wilcox, 2017). We followed these recommendations while analyzing the data.

Hypotheses testing

H1. There is a significant difference in “security concerns” between male and female.

The mean value of overall “security concern” is 2.942 with a standard deviation of 0.825 from Table 2 indicates that aggregately some people have security concerns while some do not have. We have hypothesized that the gender of users influences security concerns. Therefore, to assess whether men and women differ in regard to their security concerns; an independent t -test was used. Further to achieve the robustness in our findings, we used the BCa method of bootstrap and calculated effect size:

$$\text{Calculation of Effect size } (r) = \sqrt{\frac{t^2}{t^2 + df}} = \sqrt{\frac{-3.013^2}{-3.013^2 + 41}} = .426$$

Table 1.
Demographics of
respondents

Variable	f	(%)
<i>Gender</i>		
Male	31	72.1
Female	12	27.9
<i>Age</i>		
18–30 years	39	90.7
Above 30 years	4	9.3
<i>Income</i>		
Below 10k*	8	18.6
10k–50k	20	46.5
50k–75k	8	18.6
75k and above	7	16.3

Notes: k = thousand; $n = 43$

Table 2.
Descriptive statistics:
security and comfort

Variable	n	Mean	SD	Skewness	Kurtosis
Security	43	2.942	0.825	0.328	0.641
Comfort	43	5.23	1.324	-0.322	-0.586

It was observed that female users ($M = 3.5, SD = 0.91$) (Table 3) were more concerned than male users ($M = 2.73, SD = 0.70$) (Table 3) about eWallet security. This difference was significant $t(41) = -3.013, p < 0.05$ (Table 4) and the effect size was $r = 0.426$. The effect size value of 0.3 is considered as a medium effect while 0.5 is considered a large effect (Field, 2009). Therefore, effect size value 0.426 indicates that the effect size for the above test was medium-large. This result was further confirmed by a robust estimate of 95% Class Intervals (CI) by BCa method of bootstrap. The bootstrapped CI (lower bound = -1.322 and upper bound = -0.232 , Table 5) did not include zero indicating the difference was indeed significant. The male respondents were found to be neutral on this question. This may be indicating a high-risk propensity of the younger population,

Variable	Gender	Measure	Statistic	Bias	Bootstrap ^a		
					Std. Error	BCa 95% CI	
					Lower	Upper	
Security	Male	Mean	2.726	0.005	0.123	2.484	2.983
		Std. deviation	0.693	-0.019	0.091	0.533	0.815
		Std. error mean	0.125				
	Female	Mean	3.500	0.0055	0.257	3.056	3.963
		Std. deviation	0.905	-0.059	0.189	0.607	1.066
		Std. error mean	0.261				

Table 3.
Group statistics-security by gender

Note: ^aUnless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Variable	Levene's test for equality of variances		<i>t</i> -test for equality of means						
	F	Sig.	<i>t</i>	df	Sig. (two-tailed)	Mean difference	Std. error difference	95% CI	
								Lower	Upper
<i>Security</i>									
Equal variances assumed	0.062	0.805	-3.013	41	0.004	-0.774	0.257	-1.293	-0.255
Equal variances not assumed			-2.676	16.263	0.016	-0.774	0.289	-1.387	-0.162

Table 4.
Independent samples test-security by gender

Variable	Mean difference	Bias	Std. error	Bootstrap ^a			
				Sig. (two-tailed)	BCa 95% CI		
					Lower	Upper	
<i>Security</i>							
Equal variances assumed	-0.774	-0.00008	0.278	0.009	-1.322	-0.232	
Equal variances not assumed	-0.774	-0.00008	0.278	0.015	-1.322	-0.232	

Table 5.
Bootstrap for independent samples test-security by gender

Note: ^a Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

as most of the respondents in this study were of young age (up to 30 years of age). The younger population is known to take a high risk (Bonsang and Dohmen, 2015; Dohmen et al., 2017):

H2. There is a significant difference between Male and Female in their comfort using e-wallet transactions.

User comfortability with eWallet was measured using a seven-point rating scale where 1 = *not at all comfortable* through 7= *highly comfortable*. The mean value for comfortability 5.23 with a standard deviation of 1.324 (Table 2) indicates that respondents were “slightly comfortable” with eWallet transactions. We have hypothesized that the gender of users influences comfortability with the use of eWallet. Therefore, to assess whether men and women differ in regard to their comfortability; an independent *t*-test was used. Further to achieve the robustness in our findings, we used the BCa method of bootstrap and calculated effect size:

$$\text{Calculation of Effect size } (r) = \sqrt{\frac{t^2}{t^2 + df}} = \sqrt{\frac{1.509^2}{1.509^2 + 41}} = 0.23$$

It was observed that female users (M = 4.75, SD= 1.055) (Table 6) were less comfortable using eWallet than male users (M = 5.42, SD = 1.385) (Table 6). This difference was not significant $t(41) = 1.509, p > 0.05$ (Table 7) and the effect size was $r = 0.23$. The effect size

Table 6.
Group statistics-
comfort with eWallet
transactions

Variable	Gender	Measure	Statistic	Bias	Bootstrap ^a		
					Std. error	BCa 95% CI	
						Lower	Upper
Comfort	Male	Mean	5.42	0.00	0.25	4.91	5.86
		Std. deviation	1.385	-0.030	0.146	1.141	1.569
		Std. error mean	0.249				
	Female	Mean	4.75	0.00	0.30	4.11	5.30
		Std. deviation	1.055	-0.059	0.185	0.738	1.225
		Std. error mean	0.305				

Note: ^a Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Table 7.
Independent samples
test-comfort with e-
wallet transactions

Variable	Variance assumption	Levene's test for equality of variances		<i>t</i> -test for equality of means				95% CI		
		<i>F</i>	Sig.	<i>t</i>	df	Sig. (two-tailed)	Mean difference	Std. error difference	Lower	Upper
Comfort	Equal variances assumed	2.330	0.135	1.509	41	0.139	0.669	0.444	-0.227	1.565
	Equal variances not assumed			1.702	26.276	0.101	0.669	0.393	-0.139	1.477

value of 0.1 is considered a small effect while 0.3 is considered a medium effect (Field, 2009). Therefore, effect size value 0.23 indicates that the effect size for the above test was small to medium. The result was further confirmed by a robust estimate of 95% class intervals (CI) by BCa method of bootstrap. The bootstrapped CI (lower bound = -0.107 and upper bound = 1.437, Table 8) include zero indicating the difference was indeed not significant:

H3. Security concerns differ significantly among different income groups.

We have hypothesized that the level of income influences the security concern of eWallet users. To understand which income groups differ in regard to their security concern; we used One way ANOVA and Welch’s ANOVA which is a robust procedure when we suspect the violation of assumptions of equal variance (Field, 2009). The number of cases in each class of the income was not equal (Table 1). Therefore, we used the BCa method of bootstrap (Chen and Peng, 2014). We also calculated the effect size:

Table 8.
Bootstrap for independent samples test-comfort with eWallet transactions

Variable	Variance assumption	Mean difference	Bias	Std. error	Bootstrap ^a BCa 95% CI	
					Lower	Upper
Comfort	Equal variances assumed	0.669	-0.004	0.396	-0.107	1.437
	Equal variances not assumed	0.669	-0.004	0.396	-0.107	1.437

Note: ^aUnless otherwise noted; bootstrap results are based on 2000 bootstrap samples

Income	Measure	Statistic	Bias	Std. error	Bootstrap ^a BCa 95% CI	
					Lower	Upper
<10k	Mean	2.8750	-0.0040	0.1264	2.6667	3.0852
	SD	0.35355	-0.03829 ^b	0.08823 ^b	0.25000 ^b	0.39441 ^b
	SE	0.12500				
	95% CI					
10k-50k	Mean	2.7000	0.0011	0.1697	2.3808	3.0238
	SD	0.76777	-0.03289	0.11864	0.57157	0.88967
	SE	0.17168				
	95% CI					
50k-75k	Mean	3.6875	0.0035	0.2489	3.2000	4.1667
	SD	0.70394	-0.07973 ^c	0.21367 ^c	0.41560 ^c	0.84755 ^c
	SE	0.24888				
	95% CI					
75k and above	Mean	2.8571	0.0059	0.4369	2.1250	3.7500
	SD	1.10733	-0.14982 ^d	0.36592 ^d	0.44721 ^d	1.41421 ^d
	SE	0.41853				
	95% CI					

Table 9.
Descriptives-security by income

Notes: ^aUnless otherwise noted, bootstrap results are based on 2000 bootstrap samples; ^bBased on 1996 samples; ^cBased on 1998 samples; ^dBased on the 1988 samples

$$\text{Calculation of Effect size } (\omega^2) = \frac{SS_B - (k - 1)MS_w}{SS_T + MS_w} = \frac{5.704 - (3) \cdot .587}{28.605 + .587} = 0.135$$

where: SS_B = sum of squares between the groups, SS_T = sum of squares total, MS_w = mean square within the groups, K = number of levels of an independent variable.

There was a significant difference in security concerns among various income groups, $F(3, 39) = 3.238, p < 0.05, \omega^2 = 0.135$ (Tables 11 and 12). The effect size ω^2 was large as the value was close to 0.14 (Olejnik and Algina, 2000). As the variances among different income groups were equal (Levene’s Test: $p > 0.05$) (Table 10), post hoc test for equal variance- *LSD* was used to find out which income group differs significantly from others in regard to their security concerns. It was observed that the middle-income group “50k to 75k” ($M = 3.688, SD = 0.704$) (Table 9) was significantly more concerned than other income groups less than “50k” and “75k and above” ($p < 0.05$) (Table 13). The robust estimate of 95% bootstrapped CI by BCa method (Table 14) for the difference between income group “50k to 75k” and “<50k” did not include zero indicating the difference was indeed significant. However, the bootstrapped CI between income groups “50k to 75k” and “75k and above” did include zero. Therefore, the difference between these two income groups was not significant.

Our findings showed that people from the middle-income group (50k to 75k) were more concerned about the security of eWallet than the people from the lower-income group (less than 50k). This is partially consistent with the findings of Grable(2000) in a way that unlike his findings our study revealed that respondents in the middle-income group are more risk intolerant than the lower-income group, and therefore have more eWallet security concern:

H4. Comfortability differ significantly among different income groups.

Table 10.
Test of homogeneity
of variances-security
by income

Levene statistic	df1	df2	Sig.
1.937	3	39	0.140

Table 11.
ANOVA-security by
income

Particular	Sum of squares	df	Mean square	F	Sig.
Between groups	5.704	3	1.901	3.238	0.032
Within groups	22.901	39	0.587		
Total	28.605	42			

Table 12.
ANOVA-(robust
tests) security by
income

Test	Statistic ^a	df1	df2	Sig.
Welch	3.468	3	15.817	0.041

Note: ^a Asymptotically F distributed

$$\text{Calculation of Effect size } (\omega^2) = \frac{SS_B - (k - 1)MS_w}{SS_T + MS_w} = \frac{2.760 - (3)1.818}{73.674 + 1.818} = -0.036$$

There was no significant difference in comfortability using eWallet among various income groups, $F(3, 39) = 0.506, p > 0.05$ (Tables 17), $\omega^2 = 0$ (-0.036). The negative omega square value is interpreted as 0 (Tunks, 1978) and indicates no effect. The mean values of each income group were close to 5 (Table 16) indicate that irrespective of the level of income all respondents were “slightly comfortable” (on a seven-point scale 5 = slightly comfortable) with the use of eWallet.

(I) Income	(J) Income	Mean difference (I-J)	Std. error	Sig.	95% CI	
					Lower	Upper
Below 10k	10k-50k	0.175	0.321	0.588	-0.473	0.823
	50-75k	-0.813*	0.383	0.040	-1.588	-0.038
	75k and above	0.018	0.397	0.964	-0.784	0.820
10k-50k	below 10k	-0.175	0.321	0.588	-0.823	0.473
	50k-75k	-0.988*	0.321	0.004	-1.636	-0.339
	75k and above	-0.157	0.337	0.643	-0.838	0.524
50k-75k	below 10k	0.813*	0.383	0.040	0.038	1.588
	10k-50k	0.988*	0.321	0.004	0.339	1.636
	75k and above	0.830*	0.397	0.043	0.028	1.633
75k and above	below 10k	-0.018	0.397	0.964	-0.820	0.784
	10k-50k	0.157	0.337	0.643	-0.524	0.838
	50k-75k	-0.830*	0.397	0.043	-1.633	-0.028

Table 13. Post hoc test (LSD) – security by income multiple comparisons

Note: *The mean difference is significant at the 0.05 level

(I) Income	(J) Income	Mean difference (I-J)	Bias	Std. error	Bootstrap ^a BCa 95% CI	
					Lower	Upper
below 10k	10k-50k	0.175	-0.0063 ^b	0.21014 ^b	-0.22222 ^{b,c}	0.58501 ^b
	50k-75k	-0.813	-0.0083 ^b	0.27818 ^b	-1.39033 ^{b,c}	-0.28755 ^b
	75k and above	0.018	-0.0068 ^b	0.44045 ^b	-0.90537 ^{b,c}	0.80067 ^b
10k-50k	below 10k	-0.175	0.0063 ^b	0.21014 ^b	-0.58501 ^{b,c}	0.22222 ^b
	50k-75k	-0.988	-0.0020 ^b	0.30249 ^b	-1.57999 ^{b,c}	-0.39579 ^b
	75k and above	-0.15714	-0.0005 ^b	0.46012 ^b	-1.11447 ^{b,c}	0.65850 ^b
50k-75k	below 10k	0.81250	0.0083 ^b	0.27818 ^b	0.28755 ^{b,c}	1.39033 ^b
	10k-50k	0.98750	0.0020 ^b	0.30249 ^b	0.39579 ^{b,c}	1.57999 ^b
	75k and above	0.83036	0.0015 ^b	0.49152 ^b	-0.23317 ^{b,c}	1.71764 ^b
75k and above	below 10k	-0.01786	0.00682 ^b	0.44045 ^b	-0.80067 ^{b,c}	0.90537 ^b
	10k-50k	0.15714	0.00054 ^b	0.46012 ^b	-0.65850 ^{b,c}	1.11447 ^b
	50k-75k	-0.83036	-0.0015 ^b	0.49152 ^b	-1.71764 ^{b,c}	0.23317 ^b

Table 14. Bootstrap post hoc test (LSD) – security by income multiple comparisons

Notes: ^aUnless otherwise noted, bootstrap results are based on 2,000 bootstrap samples ^bBased on 1982 samples, c. Some results could not be computed from jackknife samples, so this confidence interval is computed by the percentile method rather than the BCa method

Discussion and conclusions

COVID-19 Pandemic forced people to use digital payment applications. There is an unprecedented surge in the usage of such applications. Not all people are comfortable and even willing to use eWallets. However, they are compelled due to the outbreak of the CORONA virus. In this context, we attempted to capture the comfortability and security concerns of eWallet users and the influence of demographic variables like gender and income on it. We found that female users have more concerned about eWallet security than male users. This finding is although consistent with findings of

Income	Measure	Statistic	Bias	Bootstrap ^a		
				Std. error	BCa 95% CI	
					Lower	Upper
<10k	Mean	5.25	0.00	0.49	4.33	6.18
	SD	1.389	-0.133	0.322 ^c	0.916 ^c	1.590 ^c
	SE	0.491				
	95% CI					
					Lower	Upper
10k-50k	Mean	5.30	0.00	0.32	4.62	5.95
	SD	1.418	-0.047	0.196	1.091	1.661
	SE	0.317				
	95% CI					
					Lower	Upper
50k-75k	Mean	4.75	-0.01	0.45	3.80	5.60
	SD	1.282	-0.113 ^d	0.255 ^d	0.957 ^d	1.397 ^d
	SE	0.453				
	95% CI					
					Lower	Upper
75k and above	Mean	5.57	0.00 ^b	0.44 ^b	4.80 ^b	6.43 ^b
	SD	1.134	-0.133 ^c	0.282 ^e	0.816 ^e	1.225 ^e
	SE	0.429				
	95% CI					
					Lower	Upper

Table 15.
Descriptives-Comfort
with eWallet by
Income

Notes: ^aUnless otherwise noted, bootstrap results are based on 2000 bootstrap samples; ^bBased on 1999 samples, ^cBased on 1996 samples; ^dBased on 1997 samples and ^eBased on 1992 samples

Table 16.
ANOVA-Comfort
with eWallet by
Income

Particular	Sum of squares	df	Mean square	F	Sig.
Between groups	2.760	3	0.920	0.506	0.680
Within groups	70.914	39	1.818		
Total	73.674	42			

Table 17.
ANOVA-(Robust
tests) comfort with
eWallet by income

Test	Statistic	df1	df2	Sig.
Welch	0.555	3	16.178	0.652

Note: ^aAsymptotically F distributed.

[Grable (2000)] but, not in conformity with the findings of Schubert *et al.* (1999), who argued that both men and women have similar risk propensity in a given context.

This study showed that people from the middle-income group are more concerned about the security of eWallets than the people from the lower-income group. This is partially consistent with the findings of the previous study of Grable (2000), who reported that higher income groups are more tolerant of financial risk.

Our findings suggest that gender and income have no influence on comfortability in using eWallet. This result is inconsistent with our reasoning about the relationship between income and risk propensity. A separate detailed study needs to be carried out to investigate the relationship between demographics and comfortability using digital payment technology.

This study concludes that security concerns prevailed irrespective of the forceful adoption of eWallets due to the COVID-19 pandemic.

Research implications

This study covered the influence of two demographic variables “gender” and “income” on security and comfort in using eWallets. Other demographic variables such as age, education, occupation and area of residence (rural or urban) need to be investigated. This study was confined to the single metro city of India i.e. Pune. Only the urban population was studied. There is a need to conduct a further study with the inclusion of the rural population. From the findings of this study, we argue that the middle-income group in India is more risk intolerant than the lower-income group while higher and lower-income groups are indifferent. A separate detailed study is recommended for additional support. This study used an innovative multi-method approach of analysis and use of bootstrapping. This may encourage other researchers to adopt such approaches.

Practical implications

Irrespective of the forceful adoption of eWallets due to the COVID-19 pandemic, users continue to concern about the security of their eWallet transactions. Cyber-attacks not only increased but also crossed the figure of the total number of registered cases during 2019, within just eight months in 2020. This study showed that irrespective of the forceful adoption; security concerns are prevailing and on rising. This is an alarm to developers and service providers that, although the use of eWallets increased exponentially during this COVID-19 pandemic, it is a forceful adoption and not willful. They should not get deceived by a rise in eWallet users and must endeavor to improve the security of eWallets otherwise we may experience a sharp decline in eWallet users once the COVID-19 pandemic is over.

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