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Understanding FinTech Gender Gap: A Survey on Financial Literacy, Inclusion and FinTech Use

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Abstract

It is well known that the gender gap in financial literacy and inclusion exists. In recent years, financial technology (FinTech) has boomed. However, less data is available in the existing literature on the FinTech gender gap. This research aims to understand gender differences in financial literacy and inclusion, FinTech awareness and use, and explore other factors that influence financial literacy and inclusion. A Qualtrics survey questionnaire was distributed to a convenience sample over social media (WhatsApp) to urban people in India, Singapore, and other countries. Fully completed surveys were analyzed in Excel. Descriptive statistics are used to compare the proportions, while one-way ANOVA is used to compare gender differences, and regression when more variables are compared on the outcome variable. A total of 181 (females 106 and males 75) complete responses were included in the analysis. The results showed no significant gender differences in financial literacy and inclusion. However, education significantly affected financial literacy. Overall, FinTech awareness and usage was lower among females, and significant gender differences were seen in Fintech awareness and frequency of FinTech usage. The survey shows a significant gender gap in FinTech awareness and usage even among urban residents. More research is needed to understand barriers to FinTech usage among women. Empowering women through financial education, and policies are needed to reduce the gender gap.

Keywords

Financial Literacy, Financial Inclusion, Financial Technology (FinTech), Digital, Finance

1. Introduction

Financial literacy and inclusion are recognized as key ingredients for individual welfare and the overall stability of the financial system, and poor financial behavior has consequences on the individual and the economy. Financial literacy rates greatly vary across the globe ranging from 71% to 13% (Klapper & Lusardi, 2020), and even seen among well-developed countries like the US, literacy rates vary (Mitchell & Lusardi, 2015). Financial literacy rates differ between countries due to factors like gender, age, education, and income. The S & P FinLit survey 2014 showed gender differences in financial literacy 35% vs. 30% between men and women respectively (Klapper & Lusardi, 2020). However, the FinLit survey 2021 has shown some progress among the underserved community. In developing countries, the gender gap in account ownership has lowered and fallen from 9% to 6% points (The Global Findex Database, 2021).

In the last decade, financial technology (FinTech) has emerged as a catalyst driving the rapid acceleration of the financial industry. Digital payments among adults in developing countries grew from 35% in 2014 to 57% in 2021, and 95% in high-income countries (The Global Findex Database, 2021). The COVID-19 pandemic has accelerated the transition to digital platforms and made people move into an era of FinTech. Technology has not only changed the way banking and financial transactions are done in the world but also has given the opportunity to bridge gaps and enable financial inclusion among vulnerable populations. FinTech, particularly digital financial services, helps to fill the gap especially where the traditional delivery of financial services is less available (Tok & Heng, 2022). Moreover, digital financial services are viewed as an important tool to reduce gender disparities in financial inclusion (Tripathi & Rajeev, 2023).

The motivation of this study is to understand if FinTech has helped to reduce the gender gap in financial literacy and inclusion. Although FinTech is expected to reduce the entry barrier to many types of financial services, using FinTech requires access to internet and technology infrastructure, and basic internet literacy, and is influenced by various socio-demographic factors. Existing literature on the FinTech gender gap is very sparse and needs exploration. With an overall aim to understand FinTech financial inclusion and literacy, the specific research questions are: 1) Are there gender differences in financial literacy? 2) Are there gender differences in FinTech awareness and use? 3) Is financial literacy, inclusion, and FinTech use related to other factors (education, age, etc.)?

Worldwide women face numerous hurdles to access essential resources such as education, healthcare, and tangible assets (Kabeer, 2009). Further, women and are less likely to be seen in the workforce, even though they are known to bring significant value to the economy. The gender gap in financial literacy is caused by several factors, one of many being confidence in making financial decisions. In a survey, three questions were asked to women and men of all socioeconomic backgrounds and ages. The overall results from every country showed a lower percentage of women who got the questions right compared to men (Smith &

Liao, 2020). Because of the lack of knowledge, women are less likely able to make household decisions, but even when the woman is the decision-maker they are less financially knowledgeable. This is seen as a barrier and makes women less prone to making financial decisions and less likely to be involved in decision-making. Many other factors may also affect financial literacy in women like the wage gap, education, and age. A survey of 215 respondents revealed a significant association between the usage of FinTech services and different demographic profiles. However, the awareness and use of such services are found more among millennials and Generation Z as compared with Generation X and baby boomers (Das & Das, 2020).

Other studies among the middle class in Asia show financial literacy levels are largely comparable to industrialized countries, but understanding of more advanced financial concepts is lower, use of sophisticated products is less common, and higher financial literacy leads to improved financial decision-making (Grohmann, 2018). Further, financial literacy has a clear beneficial effect on financial inclusion, considered a key enabler in eradicating poverty and enhancing prosperity. And an important policy tool to achieve Universal Financial Access (UFA) and the Sustainable Development Goals (SDG) (Khan et al., 2022). With the growing FinTech market, it is important to learn about financial literacy and inclusion, and how these can be influenced.

The rest of the article is organised as follows. Section 2 reviews the relevant literature and discusses the contribution of this article to the literature. Section 3 outlines the research methodology, data collection, and data analysis. Section 4 presents an array of results on the financial literacy, financial inclusion, and the awareness and usage of FinTech. Section 5 discusses implications and Section 6 limitations of results. Section 7 concludes.

2. Literature Review

Financial literacy, a broad concept, is defined as "a combination of awareness, knowledge, skill, attitude, and behavior to make financial decisions and ultimately achieve an individual's financial well-being" (Atkinson & Messy, 2012). Financial literacy has been researched widely. This section provides a brief review of the work done in this area. A study found that the level of financial literacy is generally low (only 35% of total adults on average answering all three questions correctly, 13% for middle-income nations, and just 4% for transition countries), and substantial differences between national economies and demographic cohorts (Stolper & Walter, 2017).

According to cross-country evidence, the financial literacy rates among adults are at least 65% in the countries such as Australia, Canada, Denmark, Finland, Germany, Israel, The Netherlands, Norway, Sweden, and the United Kingdom whereas it is only 25% or less in South Asia (Klapper & Lusardi, 2020). Further, the Organization for Economic Co-operation and Development (OECD) 2020 survey among 26 countries (including 12 OECD countries) reported low finan-

cial literacy across economies (OECD, 2020a). Individuals across the entire sample on average scored only 12.7 or just fewer than 61% of the maximum financial literacy score (knowledge, behaviors, and attitudes). Although individuals had high product awareness, use was low with less than half of the respondents purchasing a financial product or service. Internationally researchers have also shown low financial literacy rates in youths (Garg & Singh, 2018). Among 15-year-old students in the PISA survey, only 22% of all students on average scored below the threshold level across 15 OECD countries (OECD, 2020b).

Several studies have examined demographic and socioeconomic factors affecting financial literacy levels (Garg & Singh, 2018; Cucinelli et al., 2019). Across the board, it was shown that gender significantly affects financial literacy and women are less financially literate compared to men (Dewi, 2022). Several previous studies show that sex significantly affected different levels of financial literacy (Bucher-Koenen et al., 2021; Klapper & Lusardi, 2020) except for a study (Ibrahim et al., 2016) that showed gender does not affect financial literacy. However, the gender gap is found in both economically developed and developing societies (Dewi et al., 2020). A global financial literacy survey showed that 35% of men and 30% of women worldwide are financially literate (The Standard & Poor's Ratings Services Global Financial Literacy Survey, 2015). Women in various age groups, countries, education levels, and incomes have lower financial skills than men (Klapper & Lusardi, 2020). Additionally, factors influencing financial literacy are educational level, financial attitude, financial knowledge, financial behavior, gender, household income, and investments (Klapper & Lusardi, 2020; Santini et al., 2019).

With the emergence of FinTech, more research has gone into understanding the impact of technology use on financial literacy and inclusion. In Fintech digital financial inclusion has increased between 2014 and 2017, even where traditional financial inclusion was stalling or declining (Tok & Heng, 2022). FinTech is expected to fill gaps where the traditional delivery of financial services is less available (Tok & Heng, 2022). Further, the rapid digitization of financial services holds a promise for women and has been viewed as an important tool to reduce gender disparities and promote financial inclusion (Amidžić et al., 2014; Gammage, 2017; World Bank, 2020; Chen et al., 2021). However, even with FinTech, the gender gap exists. In a study across markets, FinTech adoption rates were different, and males were ahead of females. Further, younger users were more likely to adopt FinTech services compared to their older counterparts (Imam et al., 2022). One of the studies showed a larger FinTech gender gap compared to bank account ownership and existed in all countries (Chen et al., 2021). The authors attribute the gender disparity to differences in attitudes and preferences toward new digital technology (Chen et al., 2021). Also, it is expected that the FinTech gender gap will widen in the post-COVID era (Tok & Heng, 2022).

To summarize, while there has been much published research on the topic of gender gap in financial literacy and financial inclusion, few studies have ex-

amined the gender gap in the use of FinTech and the role of FinTech in reducing the gender gap. As the influence of technology grows rapidly and substantially in many areas, it is important to understand if FinTech has helped to reduce or narrow the gender gap. Less is known about this topic, and this article aims to examine gender gap in FinTech awareness and usage in south-eastern Asia.

3. Methods

3.1. Survey Development

The questionnaire contained questions on financial literacy and inclusion from the OECD/INFE financial literacy survey (OECD, 2022), previously published papers (Morgan & Trinh, 2020), specific topics of interest like FinTech awareness and usage, and outcomes of using FinTech whether it helped improve financial literacy and made people more independent. The survey included basic demographic data (age range, sex, education, marital status, country of residence, and income range) as well. The survey was developed on Qualtrics, a web-based platform, and used multiple choice questions and some in Likert scale. The survey was set up so that all questions needed to be answered. Numerical values are assigned to the response choices for all questions. For example, when a question asks "Do you think the use of FinTech has made you more financially independent?", the answer options will contain answers like Fully Agree, Agree, Neutral, Disagree, and Fully Disagree, and each option will correspond to a number such as 1, 2, 3, 4, and 5. This allows the future steps, which is analysis, to be more viable. Pre-test of survey questions was done with 3 finance experts and minimally modified before being sent to participants.

3.2. Data Collection

The next step was to administer the survey and secure the required sample estimated to be 100 respondents. The Qualtrics survey link was mostly distributed through social media such as WhatsApp via anonymous link, and some by email with a QR code. The WhatsApp messages were sent to different groups of adults living in Singapore, India, and others, and specified that people not working in financial services answer the survey. The data collection started on 15 July 2023 and ended on 22 July 2023. Once the survey closed, data was exported as an Excel file as choice text or numerical values related to the corresponding questions in each column.

3.3. Data Analysis

Data was filtered to remove incomplete and missing responses, and the final dataset containing complete responses to all questions was analyzed in Excel. Descriptive statistics were used to describe data as percentages. Analysis of the Variance (ANOVA) method helps to compare means between groups. As the specific question is to study gender differences, one-way ANOVA (gender as a dependent variable) was used to compare the differences in the means in the out-

come variable and test if the difference is statistically significant set at $p < 0.05$. When the F value is larger than the F critical value, then the null hypothesis is rejected and a $p < 0.05$ shows the difference is statistically significant. To perform ANOVA dummy variables were used. For example, for financial literacy questions in the survey, the correct answer for each question was coded as 1 and the wrong answer coded as 0 and compared across gender. To understand differences in the frequency of FinTech usage, dummy variables were created. Frequency of usage weekly and higher (daily) together was coded as 1 and the rest of the options (monthly, yearly, and rarely) together were coded as 0, and compared between males vs. females.

When comparing outcome variables across more than one dimension factors regression was used and the level of statistical significance was set at $p < 0.05$. To convert the data for regression, dummy variables were created. For gender, male is coded as 1, and female 0; for place of residence India is coded as 1, and rest are coded as 0; for the age range 21 - 49 years is coded as 1, and older age range as 0. For the dependent variable frequency of usage, weekly and higher are coded as 1 and the rest of the options (monthly, yearly, and rarely) together are coded as 0.

4. Results

The survey collected 258 persons' responses and among them, 77 (about 30%) were non-responders and excluded from analysis. Among the respondents, over 60% are age 41 or older, 60% are females, 93% have a graduate degree or higher, 85% are married, over 70% are employed (paid employment or self-employed), and 54% place of residence was India. The demographic characteristics are described in Table 1. The source of all tables and graphs in the article is from the analysis of online survey data collected for the purpose of this research.

4.1. Results on Financial Literacy

The survey showed high financial literacy rates among the people who answered. For the 3 questions on financial literacy, 91.7% (91.2% females vs. 92% males) responded correctly on compound interest, 83.4% (81.1% females vs. 86.7% males) responded correctly on inflation, and 90% (88% females vs. 74% males) answered correctly on investment awareness. Table 2 shows findings on financial inclusion in detail.

On comparing differences using ANOVA, the means showed no significant gender difference in financial literacy-compound interest $p = 0.29$ (Table 3), inflation $p = 0.94$ (Table 4) and stock investment $p = 0.29$ (Table 5).

The results from regression analysis (Table 6) on financial literacy on compound interest to show if coefficients of gender (whether male is more like to answer correctly than female), and education (whether the above postgraduate is more likely to answer correctly) using dummy variables with 1 and 0 was tested. The coefficients represented the incremental probability of answering correctly by switching from 0 to 1 in gender or education. The results show that respondents

Table 1. Respondents' characteristics (Total n = 181).

Item	n (%)
Age range (yrs)	
21 - 30	9 (5)
31 - 40	47 (26)
41 - 50	34 (19)
51 - 60	59 (32.5)
>60	32 (17.5)
Gender	
Male	75 (41)
Female	106 (59)
Education	
Primary	1 (0.5)
Secondary	4 (2.2)
Graduate	54 (30)
Postgraduate	116 (64)
Doctorate	6 (3.3)
Marital status	
Married	154 (85)
Widowed	4 (2.3)
Divorced	1 (0.5)
Separated	0
Unmarried	22 (12.2)
Employment status	
Paid employment	88 (48.7)
Self-employed	42 (23.2)
Home maker	28 (15.5)
Retired	20 (11)
Unemployed	3 (1.6)
Place of residence	
India	97 (54)
Singapore	55 (30)
Others	29 (16)
Income level (based on income range lowest to highest)*	
Level 1	35 (19.3)
Level 2	43 (23.7)
Level 3	29 (16)
Level 4	74 (40)

*Counts are based on income range collected in local currency for Indian rupees, Singapore dollar and USD for others, and may not be comparable.

Table 2. Findings on financial literacy.

Question	Overall n = 181 n (%)	Females n = 106 n (%)	Males n = 75 n (%)
Suppose you had $100 in a savings account and the interest rate was 2 percent per year. After 5 years, how much do you think you would have in the account if you left the money to grow?			
More than $102	166 (91.71)	97 (91.5)	69 (92)
Exactly $102	3 (1.66)	2 (1.9)	1 (1.3)
Less than $102	5 (2.76)	2 (1.9)	3 (4)
Don't know	7 (3.87)	5 (4.7)	2 (2.7)
Imagine that the interest rate on your savings account was 1 percent per year and inflation was 2 percent per year. After 1 year, how much would you be able to buy with the money in this account?			
More than today	7 (3.9)	3 (2.8)	4 (5.3)
Exactly same	12 (6.6)	8 (7.6)	4 (5.3)
Less than today	151 (83.4)	86 (81.1)	65 (86.7)
Don't know	11 (6.1)	9 (8.5)	2 (2.7)
Is this statement True or False. "Buying a single company's stock usually provides a safer return than a stock mutual fund."			
True	17 (9.39)	12 (11.32)	5 (6.7)
False	164 (90.61)	94 (88.68)	70 (93.3)

Table 3. Gender differences in financial literacy on compound interest.

Anova: Single Factor (Financial literacy question 10)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	69	0.92	0.074		
Female	106	97	0.91	0.078		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	0.001	1	0.001	0.014	0.90[#]	3.89
Within Groups	13.755	179	0.07			
Total	13.76	180				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, [#]Not significant.

Table 4. Gender differences in financial literacy on inflation.

Anova: Single Factor (financial literacy and inclusion)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	35	0.46	0.252		
Female	106	50	0.47	0.251		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	0.001	1	0.001	0.004	0.94[#]	**3.89**
Within Groups	45.081	179	0.25			
Total	45.082	180				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, [#]Not significant.

Table 5. Gender differences in financial literacy on stock investment.

Anova: Single Factor (Investment question 12)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	70	0.93	0.06		
Female	106	94	0.88	0.10		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	0.09	1	0.095	1.11	0.29[#]	3.89
Within Groups	15.31	179	0.085			
Total	15.40	180				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, [#]Not significant.

Table 6. Factors affecting financial literacy (on compound interest).

Regression Statistics					
Multiple R	0.17				
R Square	0.02				
Adjusted R Square	0.18				
Standard Error	0.27				
Observations	183				
ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	0.40	0.20	2.69	0.07

Continued

Residual	180	13.37	0.07					
Total	182							
	Coefficients	Standard Error	t Stat	p-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.85	0.04	21.16	1.03E−50	0.76	0.92	0.76	0.92
Gender	0.012	0.041	0.29	0.76#	−0.07	0.09	−0.06	0.09
Education	0.09	0.04	2.32	0.021**	0.01	0.18	0.014	0.18

with postgraduate degrees and above are 9.9% (co-efficient for education 0.99) more likely to answer correctly than those with degrees below, and statistically significant ($p = 0.021$). But, gender did not show significance ($p = 0.76$) (Table 6). The conclusion is that education has a statistically significant effect on financial literacy while gender does not.

4.2. Results on Financial Inclusion

Account ownership among the respondents was high and showed good financial inclusion. Overall, 99.5% of the respondents had bank accounts (100% females vs 98.7% males), and 78.4% owned investment accounts (70% females and 89% males). More details on financial inclusion can be found in Table 7.

4.3. Results on FinTech Awareness and Usage

FinTech awareness on common digital products (digital borrowing, digital payments, digital insurance, digital financial advisory, digital currency, or none of the above), showed that 83.4% (77.3% females vs 92% males) were aware of digital payments, and only 38.6% (29.2 females vs 52% males) were aware of digital financial advisory (Figure 1). Digital payments were the most used product (84.5%), and digital personal loans were the least used product (12.7%). FinTech product awareness rates were lower in females compared to males across all products. Further, among 15% (27 respondents) who were unaware of any FinTech product, 77% (21 out of 27) were females. Overall, the proportion of females aware of FinTech products was lower than males (Figure 1).

For FinTech awareness by number of products, 85% (80.2% females vs 90.8% males) were aware of at least one FinTech product (Figure 2). Comparing the mean scores (aware of at least one product vs. not aware of any product) using one-way ANOVA showed significant gender differences in FinTech awareness ($p = 0.02$) (Table 8). While examining the FinTech usage 86.2% (82% females vs 92% males) use at least one product, and 25 respondents (13.8%) do not use any of the products that are listed, and among them, 17 out of 25 (75%) being females. This shows usage of financial products is generally lesser in women. However, differences in the means for FinTech usage (denoted as usage of at least one product) did not show significant differences across genders ($p = 0.05$) (Table 9).

Table 7. Findings on financial inclusion.

	Overall n = 181 n (%)	Females n = 106 n (%)	Males n = 75 n (%)
	Do you own a bank account?		
Yes	180 (99.5)	106 (100)	74 (99)
No	1 (0.5)	0 (0)	1 (1)
	Do you have an investment account (e.g.: Stocks, Bonds, Funds, etc.)?		
Yes	142 (78.4)	75 (71)	67 (89)
No	39 (21.6)	31 (29)	8 (11)

$***p < 0.01$, $**p < 0.05$, $*p < 0.1$, #Not significant.

Table 8. Gender differences in FinTech awareness (awareness of digital products).

Anova: Single Factor (Question 17 FinTech awareness)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	69	0.92	0.07		
Female	106	85	0.80	0.16		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	0.61	1	0.61	4.90	0.02**	3.89
Within Groups	22.35	179	0.12			
Total	22.97	180				

$***p < 0.01$, $**p < 0.05$, $*p < 0.1$, #Not significant.

Table 9. Gender differences in FinTech usage (at least one digital product vs none).

Anova: Single Factor (question 18 usage-at least one and no products)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	69	0.92	0.07		
Female	106	87	0.82	0.14		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	0.43	1	0.43	3.66	0.05*	3.89
Within Groups	21.11	179	0.11			
Total	21.54	180				

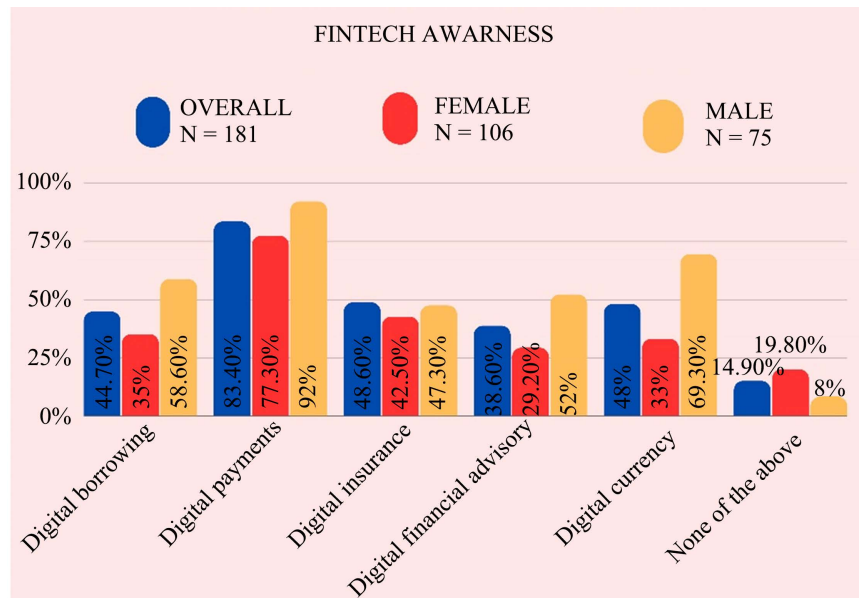$***p < 0.01$, $**p < 0.05$, $*p < 0.1$, #Not significant.
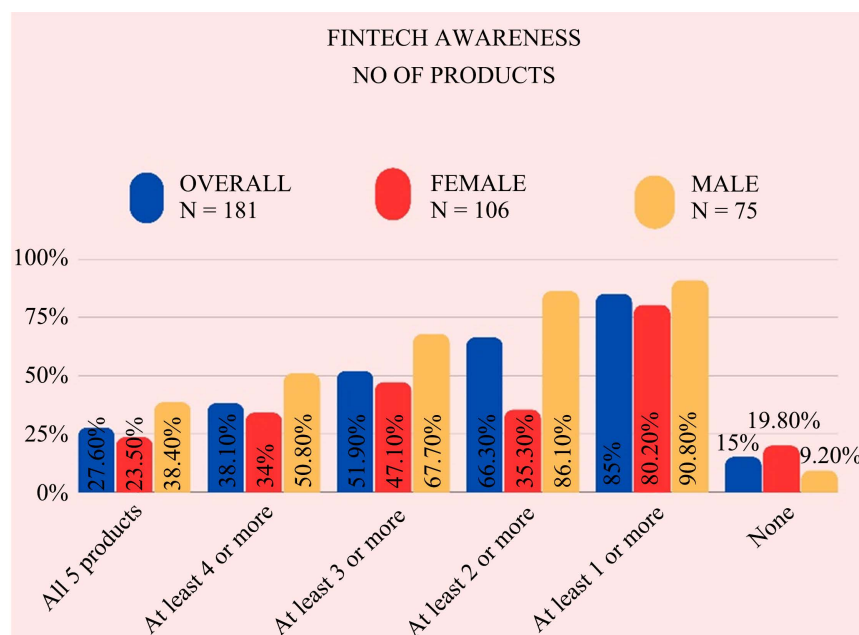
Figure 1. Awareness of FinTech products.

Figure 2. FinTech awareness by number of products.

The results showed that 41% of people use FinTech on a daily basis, 27% use it weekly, and 18% use it rarely (Figure 3). Among the 33 people who used it rarely, 70% (23 people) were females showing a lower frequency of FinTech usage among them. Frequency of usage daily vs. non-daily shows a lower proportion of usage among women (Figure 4). Comparing the frequency of usage daily vs. non-daily (including weekly, monthly, yearly, and rarely) using one-way ANOVA showed significant gender differences ($p = 0.006$) (Table 10). By this, we can conclude that FinTech usage is lower in females vs. males.
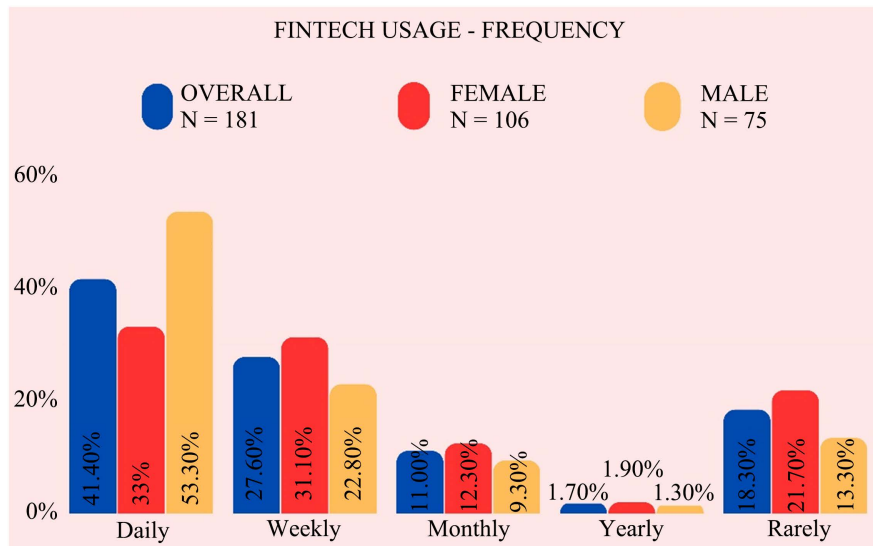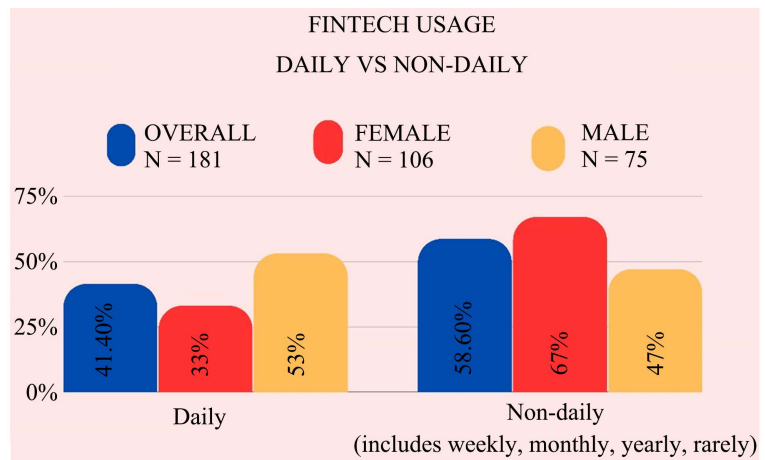
Figure 3. FinTech frequency of usage.

Figure 4. FinTech usage daily vs non-daily.

Table 10. Gender differences in FinTech usage (comparing daily vs non-daily).

Anova: Single Factor (daily vs nondaily)						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Male	75	40	0.53	0.25		
Female	106	35	0.33	0.22		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	1.81	1	1.81	7.70	0.006***	3.89
Within Groups	42.11	179	0.23			
Total	43.92	180				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, #Not significant.

Using regression, the effect of gender (male vs female), place of residence (place of residence India vs not in India), and age range (21 - 50 vs 51 and above) on FinTech usage (use FinTech at least once a week or higher) was tested assigning dummy variables (1 & 0) for the two comparators for each variable (Table 11). We are interested in the coefficients to know whether male is more likely to use fintech (weekly or higher) than female and whether people in country 1 (India) are more likely to use FinTech, and whether the younger age group (21 - 50 years) are likely to use more. Coefficients represent the incremental probability of using fintech more than switching from 0 to 1 in gender place of residence or age range. The coefficient of gender is 0.14 and indicates that males are 14% more likely to use FinTech compared to females, with p 0.03 showing the coefficient is statistically significant (Table 11). Likewise, the coefficient for age was 0.22 showing that the younger age group (50 years or younger) is 22% more likely to use Fintech compared to the older age group (>50 years), and the $p = 0.001$ shows this to be statistically significant (Table 11). Place of residence did not show any significant impact on Fintech usage. The findings show that gender and age are factors that affect FinTech usage.

Table 11. Factors affecting FinTech usage.

Regression Statistics								
Multiple R	0.280							
R Square	0.078							
Adjusted R Square	0.062							
Standard Error	0.447							
Observations	180							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	3	2.99	0.99	4.99	0.002			
Residual	176	35.19	0.19					
Total	179	38.18						
	Coefficients	Standard Error	t Stat	p-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.556	0.063	8.74	1.75E−15	0.43	0.68	0.43	0.68
Gender	0.145	0.068	2.13	0.034**	0.01	0.28	0.01	0.28
Place of residence	−0.059	0.067	−0.88	0.379#	−0.19	0.07	−0.19	0.07
Age	0.220	0.066	3.304	0.001***	0.088	0.35	0.08	0.35

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, #Not significant.

On performing multifactorial analysis adding two more factors (education and employment) along with gender, age and place of residence, regression showed that age was the only dependent variable that was significant ($p = 0.0006$). The effect of gender was reduced and was not significant (Table 12).

Subgroup analysis was performed on place of residence (India subgroup). One-way ANOVA showed significant gender difference ($p = 0.002$) in FinTech use (weekly and higher) (Table 13).

However, on examining factors that affect FinTech use, the regression analysis did not yield any significant results (Table 14).

On the question whether FinTech made them financially more independent, 46% (45.3% females vs 48% males) were neutral, and 41.5% (41.5% females vs 41.4% males) agree to show similar rates between genders (Figure 5). Further, 41% (44% females vs. 39% males) of the respondents agree that FinTech made them more financially literate. However, around 46.4% (45.3% females vs. 48% males) were neutral to the question revealing no statistical differences across gender (Figure 6).

Table 12. Multifactorial analysis on FinTech usage.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.2961							
R Square	0.087							
Adjusted R Square	0.061							
Standard Error	0.44							
Observations	181							
ANOVA								

	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	3.390	0.678	3.36352	0.0063			
Residual	175	35.28	0.201					
Total	180	38.67						

	Coefficients	*Standard Error*	*t Stat*	*p-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.48	0.085	5.735	4.19E−08	0.321	0.65	0.32	0.65
Gender	0.13	0.068	1.939	0.054*	−0.002	0.26	−0.002	0.26
Country	−0.04	0.067	−0.708	0.479 NS	−0.181	0.08	−0.18	0.08
Age	0.23	0.067	3.458	0.0006***	0.099	0.36	0.09	0.36
Employment	0.09	0.078	1.254	0.211#	−0.056	0.25	−0.05	0.25
Education	0.04	0.071	0.672	0.502#	−0.093	0.18	−0.09	0.18

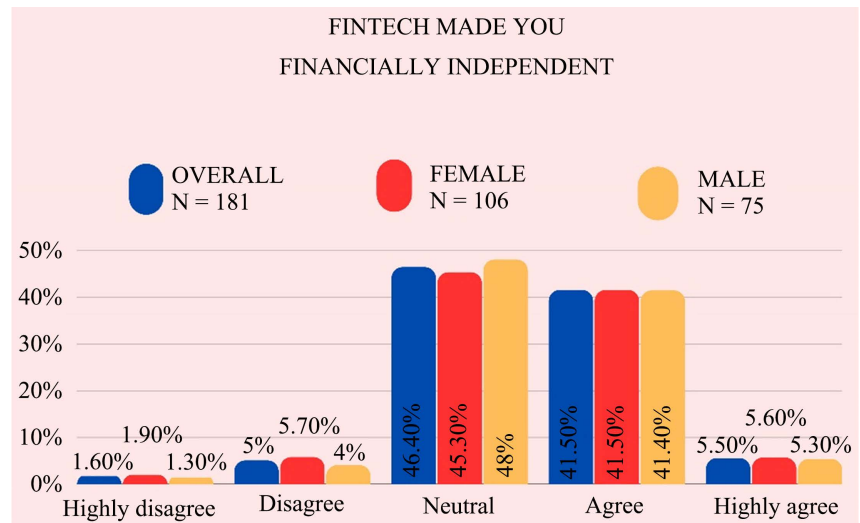***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, #Not significant.

Figure 5. FinTech and financial independence.
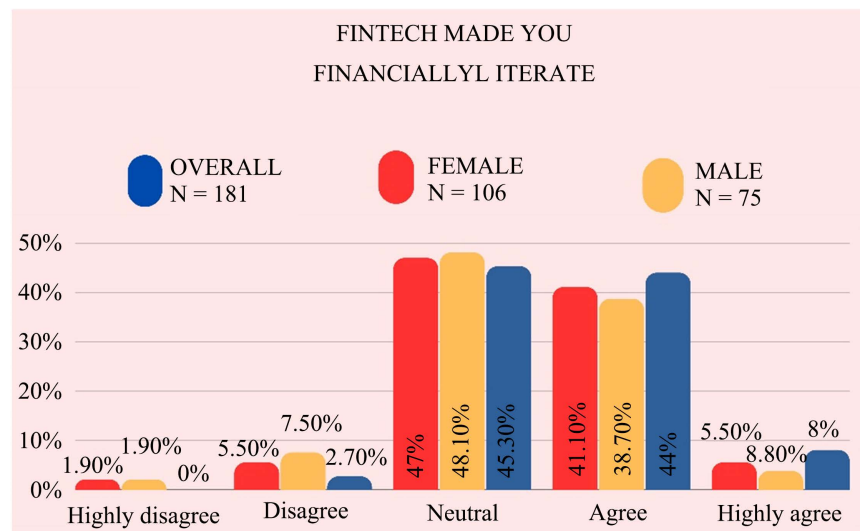
Figure 6. FinTech and financial literacy.

Table 13. Subgroup analysis-Gender differences in FinTech use.

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Gender	97	45	0.463	0.251		
Fintech use	97	66	0.680	0.219		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*p-value*	*F crit*
Between Groups	2.273	1	2.273	9.652	0.002***	3.8903
Within Groups	45.216	192	0.235			
Total	47.489	193				

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, #Not significant.

Table 14. Sub-group analysis-Factors affecting FinTech use.

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.239
R Square	0.057
Adjusted R Square	0.016
Standard Error	0.464
Observations	97

ANOVA

	df	SS	MS	F	Significance F
Regression	4	1.212	0.303	1.402	0.239
Residual	92	19.880	0.216		
Total	96	21.092			

	Coefficients	Standard Error	t Stat	p-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.479	0.111	4.290	4.4E−05	0.257	0.701	0.257	0.701
Age	0.091	0.104	0.873	0.384[#]	−0.116	0.299	−0.116	0.299
Gender	0.118	0.099	1.188	0.237[#]	−0.079	0.315	−0.079	0.315
Education	0.024	0.102	0.240	0.810[#]	−0.178	0.227	−0.178	0.227
Employment	0.120	0.116	1.032	0.304[#]	−0.111	0.351	−0.111	0.351

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, [#]Not significant.

5. Discussion

The results of the survey show no significant gender difference in financial literacy and inclusion, but education affected financial literacy. For all digital products, the proportion of males who were aware of Fintech products was much higher than females. There were also significant gender differences in FinTech usage and frequency of usage where males had a higher usage than females. Apart from gender, Fintech usage is influenced by age with younger age groups tending to use it more. There was no significant difference in whether FinTech made people more financially literate or aware.

Our sample shows high financial literacy and inclusion. However, the 2021 FinLit survey has shown the gender gap in account ownership in developing countries although it has fallen from 9% to 6% points (The Global Findex Database 2021). This is because the survey is sent to predominantly urban residents who seem to have higher financial literacy than rural residents. The financial literacy rates differ by urban and rural population, along with internet access which every single one of our respondents had access to.

In this survey, 80.2% of females and 90.8% of males were aware of at least one FinTech product, and 82% of females vs. 92% of males had used at least one or more products. There is a significant difference in FinTech awareness and usage, showing a gender gap in FinTech financial literacy and inclusion. This finding is similar to those reported in a survey from 28 countries which showed the "fintech gender gap" with 29% of men and only 21% of women using fintech products and services (Chen et al., 2021). Other factors that contributed to the Fintech gender gap are age and education. This finding is similar to another study that showed younger users were more likely to adopt FinTech services compared to an older age group (Imam et al., 2022).

Although most of the survey participants had a good education (95% above graduate level), gender differences were still seen. This could be due to confidence in decision-making, attitude toward financial matters, and technology. Previous reports that attitudes and preferences for new technology could be the reason behind the gender differences (Chen et al., 2021). Even though technology has advanced, and overall usage among males and females has increased, it is not certain whether confidence in making financial decisions or adopting new technology contributes to the FinTech gender gap. More systematic research needs to be conducted with a larger sample size taking into account both urban and rural populations. Further, to empower women to make financial decisions and improve financial behaviors, there is a need to develop and implement financial literacy programs for women to feel confident using FinTech products and newer technology on their own.

6. Limitations

One of the important limitations is the use of convenience sampling, as this leads to bias in the interpretation of the results and affects the generalizability of the findings. The survey was sent via WhatsApp, a social media app, where only people who have access to the internet could respond. From this, it is predicted that anyone who has access to the internet is somewhat knowledgeable of FinTech products. Further, the use of social media did not allow us to know the true response rate to the survey. Additionally, the population targeted is in urban areas, highly educated, and not random samples thus limiting the external validity. For the data analysis, dummy variables were used for using ANOVA and regression, and categorical variables and limits the findings.

7. Conclusion

This survey shows the gender gap in FinTech awareness and usage of FinTech, despite having high rates of financial literacy and inclusion. Although technology is very accessible for urban residents, there still seems to be a gap in FinTech usage between males and females. Education and age are other factors that impact FinTech adoption and usage. A boost in confidence in women, and education in terms of financial literacy can close the prevalent gap. Further research is

needed to identify the barriers and promote FinTech usage among women. Empowering young and older women through financial education, and policies are needed to reduce the gender gap.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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