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Determinants of Consumers' Intention to Adopt Online Pharmacies: Convenience, Price, Trust and Perceived Risk

Vullinga Nethish
KL Business School Koneru Lakshmaiah Education Foundation (Deemed to be University) Vaddeswaram, Guntur, Andhra Pradesh, India MBA (Y25) Management Research Project Subhodeep Mukherjee

Online pharmacies have become an important part of distributing medicines and healthcare products. However, there are many differences in the extent to which consumers adopt them due to both perceived benefits and perceived risks. This study looks at four factors that predict consumers' intentions to adopt online pharmacies. A questionnaire was created with 5-point Likert scale questions and completed online. 37 responses were received. Out of these, 35 were valid responses, as one respondent had never used or even considered using an online pharmacy. Another response was from someone under 18. An analysis was performed using descriptive statistics, Cronbach's alpha, Pearson's correlation and multiple linear regression.

Convenience, Price, and Trust were all positively correlated with adoption intention (r: .66, .55, .59, $p < .001$). The model as a whole was significant (R 2: .495, Adjusted R 2: .428, F(4,30): 7.36, $p < .001$). However, none of the individual predictors was significant ($p < .05$). The most significant predictor was Trust (β: .36, p: .071). Perceived Risk was weakly correlated and in the opposite direction to intention (r: .36). However, this was not significant when using a rank-based test. Overall, Convenience, Price and Trust were reliable (α: .70-.73). Perceived Risk and Intention were not reliable (α: .55, .50). Due to the small sample size and lack of randomisation, this study provides exploratory findings. It shows that Convenience, Price and Trust all correlate positively with adoption intention. The most common risk associated with online pharmacies was delayed/unreliable deliveries. Larger sample sizes and finer scales would be required to separate these factors.

Keywords: Online Pharmacy, E-pharmacy, Consumer Perception, Adoption Intention, Trust, Perceived Risk, Convenience, India.

1. INTRODUCTION

With digitalisation, the way consumers shop for goods has changed. This has led to changes in the retail of healthcare. Online pharmacies allow consumers to order medicines and health products via websites and mobile applications. This is advantageous for those with difficulty travelling, needing medicine that isn't available locally or simply saving them time.

However, medicines are not typical retail goods. Consumers may be concerned about the authenticity of the medicines, receiving the right product and dose, their personal and payment data being secure and whether they will receive their urgent order in a timely manner. Therefore, there needs to be a balance between perceived benefits (Convenience and Price) and perceived issues (Trust and Risk).

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Due to increased smartphone usage, digital payments and delivery logistics, e-pharmacies have increased in India. There has been previous research into consumer satisfaction and quality of service (Das et al., 2024; Kumar & Patil, 2024). As regulations continue to develop around online medicine sales, it is important to focus on consumer trust. This study provides primary data showing which factors consumers perceive to influence their intention to adopt online pharmacies.

2. PROBLEM STATEMENT

Despite increased online pharmacies, there is a wide range of differences in consumer's willingness to use them. Although the platforms offer discounts and convenience, consumers may still be concerned about the authenticity, security of their data, incorrect/delayed deliveries and lack of face-to-face pharmacist advice. Understanding which factors have the strongest relationship with adoption intention is important for platforms and policy makers. This study looks at the relationship between Convenience, Price, Trust and Perceived Risk.

3. AIMS AND OBJECTIVES

Aim:

To investigate determinants of consumer intention to adopt online pharmacies.

Objectives:

Describe consumer perceptions of Convenience, Price, Trust and Perceived Risk relating to online pharmacies.

Investigate the reliability of the scales.

Investigate the relationship between each determinant and intention to adopt online pharmacies.

Estimate how much the four determinants contribute to adoption intention as a whole and in relation to each other.

Provide implications for online pharmacy platforms and policymakers.

Research Questions:

RQ1: How do Convenience, Price, Trust and Perceived Risk relate to adoption intention?

RQ2: How much do the four determinants explain the variance in adoption intention?

RQ3: Which determinant has the most unique relationship with adoption intention?

4. LITERATURE REVIEW AND THEORETICAL BACKGROUND

4.1 Theoretical Background

This study uses the technology acceptance theory, which suggests perceived ease of use and usefulness influence intention to use technology (Davis, 1989). Behavioural intention is seen as a proximal determinant of behaviour (Ajzen, 1991). The unified theory of technology acceptance extends this by looking at other social and facilitating factors (Venkatesh et al., 2003). Convenience and Price are perceived benefits similar to usefulness. Trust is defined as being vulnerable to another party based on expectations of competence,

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benevolence and integrity (Mayer et al., 1995). Perceived Risk is the feeling of potential loss from purchase (Bauer, 1960). Due to the nature of purchasing medicines, these factors were added.

4.2 Convenience

Convenience in online shopping includes saving time, being able to shop anytime, delivery to the doorstep and an easy ordering process. When purchasing medicines, it can also include finding products that aren't available locally. Therefore, it is expected to be positively related to adoption intention.

4.3 Price

Online platforms often compete by offering discounts and ease of comparing prices. If consumers perceive medicines to be cheaper or good value online, it may be more likely they will adopt. It is likely to be positively related to intention. However, delivery costs can reduce this perceived benefit.

4.4 Trust

As consumers cannot view the medicine or talk to a pharmacist personally, trust in authenticity, data security, and reliability of the platform will be important. Licensing and verification can increase consumer trust. It is likely to be positively related to intention.

4.5 Perceived Risk

Perceived Risk in this context includes counterfeit/old medicine, data and payment security, incorrect products/dose, no pharmacist advice and delayed/unreliable delivery. It is likely to be negatively related to intention.

4.6 Related Research

Das et al. (2024) looked at consumer satisfaction when purchasing from online pharmacies in the new Indian e-pharmacy market. Data were collected from 220 consumers. Factors such as convenience, perceived risk, perceived honesty and perceived quality of service were examined. Kumar and Patil (2024) looked at e-service quality and compared 1mg and PharmEasy in India. In general e-commerce, Aljohani (2024) highlighted the importance of delivery times and convenient delivery. Ding (2026) found that information quality in last-mile delivery relates to customer satisfaction and repurchase intention. These show that benefits, quality of service and delivery are important to online consumers. However, this does not show how Convenience, Price, Trust and Risk relate to each other to influence adoption intention.

4.7 Research Gap

There is little research looking specifically at intentions to adopt online pharmacies, instead looking at consumer satisfaction or e-commerce in general. There is also little evidence looking at Convenience, Price, Trust and Risk together in a single model for Indian consumers. This study aims to provide exploratory primary data.

5. CONCEPTUAL FRAMEWORK AND HYPOTHESES

The independent variables were Convenience, Price, Trust and Perceived Risk. The dependent variable was intention to adopt online pharmacies.

Figure 1: Conceptual Framework

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Convenience (H1: +), Price (H2: +), Trust (H3: +) and Perceived Risk (H4: -) → Intention to adopt online pharmacies.

H1: Convenience is positively related to intention to adopt online pharmacies.

H2: Price advantage is positively related to intention to adopt online pharmacies.

H3: Trust is positively related to intention to adopt online pharmacies.

H4: Perceived Risk is negatively related to intention to adopt online pharmacies.

6. RESEARCH METHODOLOGY

6.1 Design

Quantitative, deductive, cross-sectional design. Cross-sectional designs can show relationships but not causality.

6.2 Population, Sampling and Sample

The population were adults who have purchased or have considered purchasing medicines/health products online. A convenience sample was used, and data were collected through an online form. 37 responses were received; however, one was excluded as they had never purchased or considered purchasing online. One was under the age of 18, so it was also excluded. This gave a total of 35 valid responses. This is less than the recommended 98 responses (Green, 1991) using the formula $N \geq 50 + 8k$ (k: number of predictors). This means all of the inferential findings are exploratory.

6.3 Instrument

The questionnaire included one screening question and six demographic questions (age group, gender, education, household income, area lived in, frequency of purchase). 24 Likert scale questions (1: Strongly Disagree, 5: Strongly Agree). One open-ended question. Five scales were used: Convenience (5 questions), Price (5), Trust (5), Perceived Risk (5) and Intention to Adopt (4). Each scale score was calculated from the mean of the items.

6.4 Ethical Considerations

The questions were voluntary to complete and anonymous. No names or contact information were collected. Personal medical information was not requested. The responses are only used for this academic purpose.

6.5 Data Analysis

Data were analysed using Python (pandas, scipy, statsmodels). Data screening was performed. Descriptive statistics were calculated. Cronbach's alpha was calculated ($\alpha \geq .70$ was considered acceptable (Nunnally, 1978)). Pearson's correlation was calculated (Spearman's rho was used for robustness). Multiple Linear Regression was performed to look at the relationship between intention and the four predictors. Multicollinearity (VIF), normality of residuals (Shapiro-Wilk) and independence of errors (Durbin-Watson) were checked. Significance was set at $p < .05$.

7. RESULTS

7.1 Demographics (N = 35)

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Table 1: Demographic Characteristics of Respondents (N = 35)

Variable	Category	n	%
Age	18-24	7	20.0
	25-34	10	28.6
	35-44	16	45.7
	45-59	2	5.7
Gender	Male	23	65.7
	Female	11	31.4
	Prefer not to say	1	2.9
Education	Up to higher secondary	1	2.9
	Undergraduate	4	11.4
	Postgraduate	25	71.4
	Doctorate/Other	5	14.3
Monthly household income	<25,000	3	8.6
	25,000-50,000	2	5.7
	>50,001-100,000	15	42.9
	>100,000	15	42.9
Area	Urban	25	71.4
	Semi-urban	7	20.0
	Rural	3	8.6
Frequency of Purchase	Weekly	1	2.9
	Monthly	11	31.4
	Occasionally	22	62.9
	Rarely/Never	1	2.9

The sample consisted of younger to middle-aged, highly educated, high-income, and mainly urban consumers. This was not an accurate representation of all Indian consumers.

7.2 Descriptive Statistics and Reliability

Table 2: Descriptive Statistics and Reliability of the Scales

Scale	Items	Mean	SD	Cronbach's α	% Agree
Convenience	5	3.19	0.74	.70	42.9
Price	5	2.96	0.75	.72	35.4
Trust	5	3.31	0.71	.73	45.1
Perceived Risk	5	2.88	0.64	.55	30.3
Intention to Adopt	4	3.23	0.69	.50	42.9

The mean scores are close to the middle of the scale, meaning there are mixed opinions. Convenience, Price and Trust have reliabilities above .70. Perceived Risk and Intention do not meet this requirement and should be interpreted with caution.

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Looking at the item level, it can be seen that the top scoring items were 'The process is easy to use to pay' (M = 4.11; 68.6% agreed) and 'It is easy to find medicines I cannot find locally' (M = 3.60; 71.4% agreed). Most did not see delivery to the door as a large benefit (M = 3.14; only 14.3% agreed with this statement). The bottom-scoring item for Price was 'Overall the price including delivery is reasonable' (M = 2.60). The top-scoring item for Trust was 'I feel confident it is licensed/verified' (M = 3.71; 60.0% agreed). The lowest-scoring item was 'I believe online pharmacies sell real medicines' (M = 2.91; 22.9% agreed). The top-scoring item for Risk was 'The delivery is delayed/unreliable' (M = 3.29; 51.4% agreed). The second highest was 'No pharmacist advice' (M = 3.14).

There were two poor-performing items. The first item in the Price scale, 'Medicines are usually cheaper online ', had a low correlation with the rest of the scale (.09). Removing this item would increase the reliability of Price to .80. The first and fourth items in the Intention scale had low item-total correlations (.13, .03). The full scales were used in all main analyses. Sensitivity analyses were carried out (Section 7.5).

7.3 Correlation Analysis

Table 3: Pearson Correlation Matrix

	Convenience	Price	Trust	Perceived Risk	Intention
Convenience	1				
Price	.84	1			
Trust	.65	.37	1		
Perceived Risk	.64	.66	.39	1	
Intention	.66	.55	.59	.36	1

Overall, Convenience, Price and Trust were moderately to highly correlated with Intention. Perceived Risk was weakly correlated in the opposite direction to what was expected (r: .36, p: .032). Using a Spearman test, this was not confirmed (ρ: .19, p: .263). Convenience and Price were highly correlated (r: .84), which affected the regression analysis below.

7.4 Multiple Regression

The model to predict intention from the four constructs was significant (R 2: .495, Adjusted R 2: .428, F(4,30): 7.36, p < .001).

Table 4: Multiple Linear Regression Predicting Intention to Adopt

Predictor	B	SE	β	t	p	95% CI	VIF
Constant	0.926	0.510		1.82	.079	[-0.115, 1.967]	
Convenience	0.262	0.306	.281	0.86	.399	[-0.363, 0.886]	6.40
Price	0.256	0.261	.277	0.98	.335	[-0.277, 0.788]	4.76
Trust	0.346	0.185	.355	1.87	.071	[-0.032, 0.723]	2.14
Perceived Risk	-0.150	0.191	-.139	-0.78	.439	[-0.540, 0.240]	1.88

Note: R^2 = .495, Adjusted R^2 = .428, F(4, 30) = 7.36, p < .001. Dependent variable: Intention to Adopt.

None of the predictors was significant (p < .05). Trust had the highest standardised coefficient and was the closest to significant. Perceived Risk had the expected negative relationship but a small insignificant effect.

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7.5 Assumptions and Sensitivity

The residuals were not significantly different from a normal distribution (Shapiro-Wilk: W: .945, p: .082). Errors were independent (Durbin-Watson: 2.01). VIF scores were below 10. However, Convenience had a higher score (6.40) than the stricter cutoff of 5. This was due to it overlapping with Price. Two sensitivity analyses were run. Removing the weak item from Price and only using the two most coherent items from Intention, the model remained significant (R 2: .41, p: .003) but none of the predictors were significant (p > .18). Exploratory analysis was done without Price and Convenience became significant (N = 350__, p: .014). This indicates there is a lot of overlap between Convenience and Price. However, this was not planned and should not be seen as confirmatory.

7.6 Summary of Hypotheses

Table 5: Summary of Hypotheses

Hypothesis	Bivariate (Pearson)	Regression	Conclusion
H1: Convenience → Intention (+)	r: .66, p < .001	β: .28, p: .399	Supported by bivariate analysis. Not confirmed as unique.
H2: Price → Intention (+)	r: .55, p < .001	β: .28, p: .335	Supported by bivariate analysis. Not confirmed as unique.
H3: Trust → Intention (+)	r: .59, p < .001	β: .36, p: .071	Supported with bivariate analysis. Marginally significant as unique.
H4: Risk → Intention (-)	r: +.36, p: .032 (Wrong direction, not confirmed by Spearman ns)	β: -.14, p: .439	Not Supported.

7.7 Open-Ended Responses

Five responses were given. One was unclear. One mentioned they were deterred by too much advertising. Three mentioned Convenience was a main motivator, with delivery to the doorstep and saving time. One mentioned they could potentially get better prices. Reasons for being deterred were long delivery times, high delivery costs, concerns over authenticity and delays for urgent orders. With so few responses, this is just an example. However, it does fit with the quantitative findings that delivery reliability is a key concern.

8. DISCUSSION

Overall, the findings show that positive perceptions of Convenience, Price and Trust all relate together to influence adoption intention. The four variables explain around half of the variance in intention (R 2: .495). This is a lot for a perception-based model. This fits with expectations from technology acceptance and trust research that perceived benefits and confidence are key to adoption (Davis, 1989; Mayer et al., 1995).

Although no unique effects were found, this doesn't mean they aren't important. The sample size was small (35 responses), so there was low power. The high correlation between Convenience and Price (r: .84) also made it difficult to determine the individual effect. Trust had the highest standardised effect and lowest standard error of the benefit predictors. This fits with expectations that when purchasing medicines, you want to be confident they are authentic and licensed. Licensing and verification were the highest-scoring reasons for confidence. However, they were least confident that online pharmacies sold real medicines. This shows there is a gap in trust which can be addressed by platforms.

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The positive correlation between Perceived Risk and Intention was unexpected. It was a weak correlation and wasn't confirmed by the rank-based test. The scale also had a low reliability (α: .55), so there was likely to be measurement error. A plausible explanation is that those who engage more with online pharmacies are more aware of the risks. However, this couldn't be tested in this study. This means H4 was not supported.

Many of the findings relate to delivery. Most didn't see delivery to the doorstep as a large benefit. The highest agreement was for the risk of delayed/unreliable delivery. Open-ended responses mentioned delivery times, delivery costs and delays for urgent orders. This suggests that delivery performance influences perceptions more than delivery availability. This links to last-mile delivery research (Aljohani, 2024; Ding, 2026). Only two delivery items were measured, so this would be an area for future work.

9. IMPLICATIONS

For Online Pharmacy Platforms

Increase visible trust indicators such as licensing and verification information. Licensing was the biggest confidence booster. Be clear about the authenticity of products.

Improve reliability of delivery and be transparent. Especially for urgent orders. Be clear about delivery costs. Overall price including delivery was the lowest-scoring item.

Make the ordering and payment process simple. Promote that medicines are easy to find, which may not available locally. This was highly scored.

Offer pharmacist advice to reduce concerns about lack of face-to-face advice.

For Policy Makers and Regulators

Promote and advertise licensing verification for online pharmacies. Provide clear standards for authenticity, data security and delivery of medicines. These issues seem to be the most concerning to consumers.

These are tentative findings due to sample size and sampling.

10. LIMITATIONS AND FUTURE WORK

Sample Size

There was a low sample size (35 valid responses), so there was low power. Coefficients were not precise. The sample was below the recommended sample size (Green, 1991) of 98.

Sampling

The sample was obtained using convenience sampling, so it was mostly urban, highly educated, high-income, and male. Findings cannot be generalised to all Indian consumers.

Measurement

Perceived Risk and Intention had alphas below .70, so they weren't measured reliably. One item in Price and two in Intention

Limitations

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Multicollinearity – The relationship between convenience and price makes it difficult to interpret them individually.

The design of the study is a cross-sectional self-reported study; therefore, causality cannot be established. The sample also suffers from response bias, as the screening question included people who have only looked at buying online. This resulted in a varied sample.

Delivery was measured using only two variables.

Future research should include a larger, more diverse sample (minimum 100-150) and improve the risk and intention scales. A split between experienced users and non-users should be made. Structural models should be used to account for the overlap between variables. The last mile delivery section can be expanded to include more detailed questions on timeliness, reliability, accuracy, tracking, communication and flexibility. Satisfaction should also be included.

11. CONCLUSION

An exploratory study was conducted to understand the relationship between convenience, price, trust and perceived risk to determine intention to adopt online pharmacies. Convenience, price and trust were positively correlated with intention to adopt online pharmacies. Together they explained about half of the variance, but none of the variables stood out as clear independent predictors. Perceived risk did not have the expected negative correlation. At the item level, trust and reliable delivery were the main variables consumers were least convinced by. These findings are preliminary and should be tested on a larger representative sample.

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