

Consumer Awareness and Adoption Barriers of E-Pharmacy Services in Delhi/NCR: A Mixed-Methods Investigation

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Abstract

Background: The rapid digitization of India's pharmaceutical market has positioned e-pharmacies as a transformative force; yet consumer adoption remains significantly low despite growing awareness. **Objectives:** This study investigates consumer awareness levels, purchasing behaviors, trust perceptions, and adoption barriers regarding e-pharmacy services among urban Indian consumers. **Methods:** A sequential explanatory mixed-methods design was employed. Quantitative data were gathered via a structured questionnaire administered to 65 respondents in Delhi. Qualitative insights were derived from thematic analysis of open-ended survey responses. Descriptive statistics (frequency and percentages) were computed. **Results:** While 60% of respondents demonstrated awareness of e-pharmacies, 98.5% reported an overwhelming preference for traditional brick-and-mortar pharmacies. NetMeds emerged as the leading platform (42.9%), with awareness primarily driven by advertisements (36.9%) and word-of-mouth (33.8%). Quality (44.6%) and medicinal composition (43.1%) were the dominant purchase determinants. Qualitative themes revealed distrust, perceived lack of urgency, regulatory ambiguity, and inadequate product information as critical barriers. **Conclusions:** A pronounced awareness-adoption gap exists, attributable to trust deficits, regulatory concerns, and suboptimal digital health literacy. Strategic improvements in platform transparency, regulatory compliance under the Drugs and Cosmetics Act (1940), targeted marketing for older demographics, and assured quality mechanisms are essential for accelerating e-pharmacy adoption in India. The paper contributes a mixed-methods framework for evaluating digital pharmaceutical consumer behavior in emerging economies.

Keywords: E-pharmacy, consumer awareness, online pharmacy, adoption barriers, mixed methods, India, pharmaceutical e-commerce, consumer behavior

INTRODUCTION

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Received Date: April 08, 2026

Accepted Date: April 25, 2026

Published Date: April 26, 2026

Citation: Tarun Chopra, Nidhi Bhasin. Consumer Awareness and Adoption Barriers of E-Pharmacy Services in Delhi/NCR: A Mixed-Methods Investigation. Research & Reviews: A Journal of Pharmacology. 2026; 16(2): 23–32p.

The global pharmaceutical industry is undergoing a profound digital transformation, with e-pharmacies emerging as a pivotal channel for the delivery of healthcare products and services. In India, this transformation is particularly consequential given the country's vast geographic expanse, a population exceeding 1.4 billion, and persistent challenges in last-mile healthcare delivery. E-pharmacies – also termed online pharmacies or internet pharmacies – enable consumers to procure prescription and over-the-counter medications through digital platforms, facilitating home delivery and reducing dependence on physical retail chemists (Srivastava & Raina, 2021).

India's e-pharmacy market, valued at approximately USD 360 million in 2020, is projected to grow at a compound annual growth rate (CAGR) of over 45% through 2025, driven by increased smartphone penetration, improved internet connectivity, and the COVID-19 pandemic's acceleration of digital health behaviors (Apte et al., 2023). Key players, such as NetMeds, 1 mg, MedplusMart, and Medidart, have established considerable market footprints, yet the sector continues to face challenges related to regulation, consumer trust, and awareness (Ansari et al., 2025).

The regulatory environment governing e-pharmacies in India is primarily shaped by the Drugs and Cosmetics Act (1940), which mandates that Schedule H and Schedule X drugs – those with significant potential for misuse or adverse effects – be dispensed only upon presentation of a valid medical prescription. However, enforcement in the online domain remains inconsistent, giving rise to regulatory loopholes that have raised consumer safety concerns and impeded the sector's legitimacy (Apte et al., 2023).

Despite growing awareness, consumer adoption of e-pharmacy services in India remains stubbornly low. Studies have consistently identified a significant gap between awareness and actual purchase behavior, attributing this to concerns over product authenticity, lack of real-time pharmacist consultation, prescription verification challenges, and deep-rooted trust in traditional community pharmacists (Ahalawat et al., 2024; Assin et al., 2025). Understanding these dynamics is critical for policymakers, platform operators, and healthcare administrators seeking to harness the potential of digital pharmaceuticals for public health improvement.

The present study addresses this gap by employing a sequential explanatory mixed-methods design to investigate consumer awareness, behavior, and adoption barriers pertaining to e-pharmacies among urban Delhi consumers. By integrating quantitative survey data with qualitative thematic insights, the study aims to provide a nuanced, multi-layered understanding of consumer perspectives that purely quantitative approaches cannot achieve.

Research Objectives

The specific objectives of this study are:

- To assess the level of consumer awareness regarding e-pharmacy services and platforms.
- To examine consumer behavior patterns, including purchase frequency, channel preference, and platform usage.
- To identify the key factors influencing consumer decision-making in the context of pharmaceutical purchases.
- To explore the barriers preventing widespread e-pharmacy adoption among urban Indian consumers.
- To formulate evidence-based recommendations for enhancing consumer adoption and trust.

LITERATURE REVIEW

E-Pharmacy: Concept and Global Context

E-pharmacy refers to the dispensing of pharmaceutical products through electronic platforms, encompassing prescription drugs, over-the-counter medications, nutraceuticals, and health supplements (Ansari et al., 2025). Globally, the online pharmacy market is expected to exceed USD 200 billion by 2030, propelled by aging populations, chronic disease management needs, and post-pandemic digital health normalization (Bahamdan & Almanasef, 2024). In developed economies, such as the United States and the United Kingdom, regulatory frameworks (e.g., NABP's pharmacy credential; UK's GPhC registration), provide robust legitimacy and consumer protection mechanisms. Conversely, emerging economies, like India, face more complex regulatory landscapes characterized by fragmented enforcement and evolving digital governance.

E-Pharmacy in the Indian Context

India's e-pharmacy ecosystem began taking shape around 2014–2015, with Medidart recognized as one of the first operational online pharmacies. The subsequent entry of well-funded platforms –

NetMeds (backed by USD 50 million in investment), 1mg, PharmEasy, and MedplusMart – signaled growing investor confidence in the sector's potential (Chopra, 2024). These platforms offer unique value propositions: NetMeds leverages its century-old supply chain heritage through Dadha & Company; 1mg focuses on consumer education and cost-effective generic alternatives; MedplusMart emphasizes omnichannel convenience through store pickup and home delivery integration.

The Indian Internet Pharmacy Association (IIPA) has emerged as a self-regulatory body, but the absence of finalized central e-pharmacy regulations (despite multiple draft iterations) continues to create operational uncertainty (Apte et al., 2023). The 2015 Draft E-pharmacy Rules under the Drugs & Cosmetics Act remain in a prolonged deliberation phase, leaving the sector in a regulatory gray zone that undermines consumer confidence.

Consumer Behavior and E-Pharmacy Adoption Theories

Consumer behavior in the pharmaceutical context is uniquely shaped by health risk perceptions, the necessity-driven nature of purchases, and the high stakes of product quality (Louden & Bitta, 1993). Several theoretical frameworks have been applied to e-pharmacy adoption:

- *Technology Acceptance Model (TAM)*: Davis (1989) posited that perceived ease of use and perceived usefulness are the primary determinants of technology adoption. Applied to e-pharmacies, consumers who perceive online platforms as convenient and reliable are more likely to adopt them (Ahalawat et al., 2024).
- *Theory of Planned Behavior (TPB)*: Ajzen (1991) emphasized the role of subjective norms and perceived behavioral control. In the Indian context, family and social circle recommendations significantly shape e-pharmacy trial behavior (Srivastava & Raina, 2021).
- *Innovation Diffusion Theory (IDT)*: Rogers (2003) identified relative advantage, compatibility, trialability, and observability as factors influencing innovation adoption. E-pharmacies offer clear relative advantages in price and convenience, but compatibility with existing pharmacy visit habits and observability of quality remain challenged.
- *Trust-Based Models*: Assin et al. (2025) demonstrated that trust mediates the relationship between perceived risk and e-pharmacy adoption intention, particularly in emerging market contexts where institutional trust is historically fragile.

Awareness and Adoption Gaps

Multiple studies have documented the awareness-adoption paradox in Indian e-pharmacy research. Srivastava and Raina (2021), in a mixed-methods study, found that while a growing segment of consumers is aware of e-pharmacies, behavioral intention remains low due to concerns over drug authenticity, prescription abuse, and privacy. Bansal et al. (2022) assessed knowledge, attitude, and practices (KAP) among Indian consumers and found moderate knowledge but poor behavioral adoption, attributing this primarily to inadequate awareness of legal safeguards. Dutta et al. (2025), in a post-pandemic study from Uttarakhand, observed that while COVID-19 catalyzed initial trial, sustained adoption was impeded by delivery reliability concerns and pharmacist interaction deficits.

Regulatory Barriers

The regulatory framework is a critical determinant of e-pharmacy legitimacy and consumer trust. The Drugs and Cosmetics Act (1940) prohibits the sale of Schedule H drugs (e.g., antibiotics, hormones) without a valid prescription, and Schedule X drugs (e.g., psychotropic substances) under even stricter controls. Online platforms' ability to verify prescriptions digitally remains technically and legally contested. Apte et al. (2023) noted that while e-pharmacies offer significant potential to improve medicine access in rural and tier-2/tier-3 areas, regulatory ambiguity presents the foremost systemic barrier to scaling operations responsibly.

Research Gap

Extant literature, while growing, predominantly employs either purely quantitative or purely qualitative approaches, often in single geographic contexts with homogenous sample populations. The

present study addresses this gap by deploying a sequential explanatory mixed-methods design, integrating quantitative survey data with qualitative thematic analysis, within the specific urban Delhi context. This approach enables a more holistic understanding of the consumer experience with e-pharmacies, particularly the post-awareness factors that precede (or inhibit) adoption.

METHODOLOGY

Research Design

This study adopted a sequential explanatory mixed-methods research design (Creswell & Plano Clark, 2017). In Phase 1, quantitative data were collected through a structured questionnaire to establish prevalence estimates and behavioral patterns. In Phase 2, qualitative data from open-ended survey responses underwent thematic analysis to explain and enrich the quantitative findings. The integration of both phases allowed for triangulation of results and a more robust interpretation of the awareness-adoption gap.

Setting and Population

The study was conducted in Delhi, the National Capital Territory of India, targeting consumers who had experience purchasing medicines – either from physical pharmacies or online platforms. Delhi provides an appropriate research setting given its high internet penetration rate (estimated at 68% in 2023), its large urban consumer base, and its diverse pharmaceutical retail landscape.

Sampling and Sample Size

A non-probability convenience sampling approach was employed given the exploratory nature of the study and the constraints of time and resources. The final sample consisted of 65 respondents, consistent with sample sizes employed in comparable exploratory pharmaceutical consumer studies (Bansal et al., 2022; Srivastava & Raina, 2021). Data were collected through a Google Forms-based digital survey, distributed via social media networks and in-person in academic and residential settings across Delhi.

Research Instrument

The quantitative survey instrument comprised two sections: Section A collected demographic variables (age, gender, occupation, monthly income) using 4 items. Section B assessed e-pharmacy awareness, behavior, and perceptions using 11 structured items with Likert-type, multiple-choice, and dichotomous response formats.

Survey items addressed: (1) e-pharmacy awareness; (2) platform usage; (3) purchase frequency; (4) channel preference; (5) information sources; (6) primary buying factor; (7) expiry date checking; (8) brand vs. composition preference; (9) service evaluation; (10) ayurvedic product knowledge; and (11) referral intent. Open-ended qualitative prompts (integrated at the end of the survey) invited respondents to elaborate on their reasons for preferring or avoiding e-pharmacies, yielding rich textual data for thematic analysis.

Data Collection Procedure

Ethics approval was obtained from the institutional research committee. Data were collected during a defined four-week period. A pilot test with 10 respondents was conducted to assess instrument clarity and validity, with minor wording adjustments made thereafter. Respondents were assured anonymity and voluntary participation.

Data Analysis

- *Quantitative Analysis:* Frequency distributions and percentages were computed for all survey items using Microsoft Excel. Descriptive statistics provided profile characterizations of the sample and patterns in consumer behavior and awareness.
- *Qualitative Analysis:* Open-ended responses were analyzed using inductive thematic analysis following Braun and Clarke's (2006) six-phase framework: familiarization, initial coding, theme

searching, theme reviewing, theme defining, and report writing. Two independent coders conducted the analysis, achieving Cohen's Kappa inter-rater reliability coefficient of $\kappa = 0.82$, indicating strong agreement. Emerging themes were subsequently mapped against the quantitative findings for integration and interpretation.

Validity and Reliability

Content validity of the questionnaire was established through expert review by two faculty members specializing in pharmaceutical management and e-commerce research. Construct reliability was assessed via Cronbach's Alpha, yielding a coefficient of $\alpha = 0.78$ for the attitude and perception items, indicating acceptable internal consistency. Member checking was performed for qualitative themes by sharing preliminary findings with five respondents to confirm accurate representation of their perspectives.

RESULTS

Demographic Profile of Respondents

The study sample comprised 65 respondents. The majority were female (61.5%, $n = 40$) and male respondents constituted 38.5% ($n = 25$). In terms of age, 70.8% ($n = 46$) were under 20 years of age, 18.5% ($n = 12$) were between 20–30 years, and the remaining 10.8% ($n = 7$) were 30 years or older. Occupationally, students constituted the dominant group (76.9%, $n = 50$), followed by service-sector employees (16.9%, $n = 11$), with professionals, homemakers, and businesspersons constituting the remainder. Regarding income, 72.3% ($n = 47$) reported nil income (consistent with the student majority), 13.8% earned less than ₹20,000 per month, and approximately 14% earned above ₹20,000 (Table 1).

Table 1. Demographic profile of respondents ($N = 65$).

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	40	61.5
	Male	25	38.5
Age	<20 years	46	70.8
	20–30 years	12	18.5
	30–40 years	5	7.7
	>40 years	2	3.1
Occupation	Student	50	76.9
	Service	11	16.9
	Professional/Business/Homemaker	4	6.2
Monthly Income	Nil	47	72.3
	<₹20,000	9	13.8
	₹20,000–₹40,000	5	7.7
	>₹40,000	4	6.2

Quantitative Findings

Consumer Awareness of E-Pharmacies

Sixty percent ($n = 39$) of respondents reported awareness of e-pharmacy services, while 40% ($n = 26$) were unaware. Among the aware respondents, NetMeds was the most recognized platform (42.9%), followed by MedplusMart (28.6%), Medidart (17.1%), and other platforms (11.4%). Primary channels of awareness included advertisements (36.9%), friends/family (33.8%), online surfing (24.6%), and print media such as newspapers/magazines (4.6%) (Table 2).

Consumer Purchase Behavior and Channel Preference

Regarding medicine purchase frequency, 53.8% ($n = 35$) reported buying medicines rarely, 26.2% ($n = 17$) often, and the remainder seldom or on other occasions. A striking finding was that 98.5% ($n =$

64) preferred purchasing medicines from physical brick-and-mortar stores, with only 1.5% ($n = 1$) expressing a preference for online platforms. This stark disparity between awareness (60%) and behavioral adoption (1.5%) constitutes the central finding of the study.

Table 2. E-pharmacy awareness and platform familiarity.

Measure	Category	Frequency (n)	Percentage (%)
Awareness	Yes	39	60.0
	No	26	40.0
Platform Used	NetMeds	18	42.9*
	MedplusMart	12	28.6*
	Medidart	7	17.1*
	Other	2	11.4*
Awareness Source	Advertisement	24	36.9
	Friend/Family	22	33.8
	Online Surfing	16	24.6
	Newspaper/Magazine	3	4.6

Note: Percentages based on aware respondents only ($n = 39$ for platform; all 65 for awareness source).

Purchase Decision Factors

When asked to identify the most important factor in purchasing medicines, 44.6% ($n = 29$) cited quality, 43.1% ($n = 28$) cited medicinal composition, and only 4.6% ($n = 3$) cited price. A further 7.7% ($n = 5$) cited other factors. When asked to choose between purchasing a medicine by a reputed company versus one matching the required composition, 55.4% ($n = 36$) prioritized composition while 44.6% ($n = 29$) preferred the reputed brand. An overwhelming 92.3% ($n = 60$) reported always examining expiry dates before purchase, reflecting high safety consciousness (Table 3).

Table 3. Consumer purchase decision factors.

Factor	n	%
Quality	29	44.6
Medicinal Composition	28	43.1
Price	3	4.6
Other	5	7.7

Service Evaluation and Product Knowledge

When asked about their evaluation of e-pharmacy services, 58.5% ($n = 38$) responded “Maybe” (indicating ambivalence or uncertainty), 21.5% ($n = 14$) responded “Yes,” and 20.0% ($n = 13$) responded “No.” Regarding product range awareness, 41.5% ($n = 27$) were unaware that e-pharmacies also stock ayurvedic medicines, pointing to a significant product knowledge gap. Despite reservations about personal usage, 53.8% ($n = 35$) indicated they would recommend e-pharmacy services to friends and family, reflecting latent goodwill and growth potential (Table 4).

Table 4. Service evaluation and referral intent.

Item	Response	n	%
Do you like e-pharmacy services?	Yes	14	21.5
	No	13	20.0
	Maybe	38	58.5
Aware ayurvedic medicines available online?	Yes	38	58.5
	No	27	41.5
Would recommend e-pharmacy?	Yes	35	53.8
	No	18	27.7
	Maybe	12	18.5

Qualitative Findings: Thematic Analysis

Thematic analysis of open-ended responses yielded four primary themes, as detailed below:

Theme 1 – Trust Deficit and Authenticity Concerns

The most salient theme across respondents' qualitative responses was a deep-seated distrust of online drug sourcing. Representative responses included concerns about counterfeit or substandard medications, the inability to physically inspect products before purchase, and skepticism regarding the authenticity of drugs received through courier delivery. Several respondents referenced awareness of illegal drug circulation through unregulated online platforms. This aligns strongly with findings by Assin et al. (2025), who identified trust as the primary mediator of adoption behavior in emerging e-pharmacy markets.

Theme 2 – Regulatory Ambiguity and Prescription Concerns

A second prominent theme centered on regulatory uncertainty. Respondents expressed confusion about the legal requirements for online drug purchases, particularly concerning prescription-only medications. Multiple respondents were unsure whether platforms would enforce prescription requirements for Schedule H drugs, and several indicated they would distrust a platform that appeared to dispense such drugs without prescription verification. This theme underscores the critical role of regulatory clarity and compliance communication in consumer confidence building.

Theme 3 – Preference for Physical Interaction and Immediate Availability

Many respondents articulated a strong preference for the immediacy of physical pharmacy visits – the ability to receive medications within minutes of diagnosis, to consult with a pharmacist face-to-face, and to physically examine product packaging and expiry dates. This theme reflects the compatibility dimension of Rogers' (2003) Innovation Diffusion Theory: e-pharmacies, regardless of their advantages, remain incompatible with the urgency and interpersonal dimensions of most medicine-purchasing episodes.

Theme 4 – Inadequate Awareness of Full Product Range and Benefits

Several respondents expressed surprise upon learning that e-pharmacies stocked ayurvedic medicines, nutraceuticals, and health supplements beyond allopathic drugs. A lack of awareness of competitive pricing, loyalty programs, and pan-India delivery options was also evident. This theme suggests that the marketing communication strategies of e-pharmacy platforms have not effectively penetrated the general consumer consciousness, particularly among non-student, older demographics.

Integration of Quantitative and Qualitative Findings

The integration of quantitative and qualitative strands reveals a coherent narrative: despite majority awareness (60%), adoption is suppressed by a confluence of trust deficits (Theme 1), regulatory anxiety (Theme 2), habitual incompatibility (Theme 3), and incomplete product knowledge (Theme 4). The quantitative finding that 98.5% prefer physical stores is thus not a function of ignorance alone, but of nuanced, multi-dimensional attitudinal barriers that qualitative data illuminate. Conversely, the 53.8% referral intent suggests latent consumer goodwill that could be leveraged through targeted trust-building interventions.

DISCUSSION

The findings of this study contribute to an emerging body of literature documenting the paradoxical awareness-adoption gap in Indian e-pharmacy markets (Srivastava & Raina, 2021; Bansal et al., 2022; Dutta et al., 2025). The 60% awareness rate recorded in this Delhi-based urban sample is broadly consistent with urban Indian averages reported in comparable studies, yet the near-total preference for physical pharmacies (98.5%) represents a more extreme divergence than typically documented, likely attributable to the predominantly student sample whose medicine-purchasing behavior reflects familial rather than autonomous decision-making.

The dominance of quality and composition as purchase determinants over price (44.6% and 43.1% vs. 4.6%) diverges from the common industry narrative that price discounts are the primary driver of e-pharmacy adoption. This finding aligns with Bansal et al. (2022), who found that quality assurance – rather than cost savings – is the pivotal criterion for pharmaceutical purchases, and has critical implications for e-pharmacy marketing strategies that over-index on discount-led promotions.

The four qualitative themes identified – trust deficit, regulatory ambiguity, physical interaction preference, and inadequate product knowledge – mirror and extend the barriers documented in prior literature. Notably, the trust dimension emerges not merely as a generalized anxiety but as a specifically pharmaceutical-context trust, rooted in the unique stakes of drug authenticity and patient safety. This distinction has important implications for platform design: generic e-commerce trust signals (secure payment badges, customer reviews) may be insufficient; pharmacovigilance-specific trust signals (CDSCO registration, real-time prescription verification, licensed pharmacist chat) are likely necessary.

The regulatory ambiguity theme reinforces Apte et al.'s (2023) scoping review findings regarding the centrality of regulatory clarity to e-pharmacy development in India. The pending finalization of e-pharmacy rules under the Drugs & Cosmetics Act represents not merely a compliance challenge but a consumer confidence crisis: without clear public communication about regulatory safeguards, consumers will default to distrust of online platforms.

The finding that 53.8% would recommend e-pharmacies despite not personally using them represents a paradox of vicarious endorsement – a disposition to encourage others toward a behavior one has not adopted oneself. This phenomenon may reflect a recognition of e-pharmacy's value for specific populations (the elderly, those in remote areas, patients with chronic diseases requiring regular refills) even among consumers who personally maintain physical pharmacy preferences. Platform operators should leverage this latent goodwill through ambassador-style referral programs and targeted communication to health-conscious, digitally literate consumer segments.

The demographic concentration of respondents in the under-20, student category (70.8% and 76.9%, respectively) deserves particular methodological reflection. While this limits the generalizability of findings to broader age groups – particularly the 40 + demographic who represent the heaviest consumers of medications – it also reflects the accessible population in an urban, academic setting. Future research should deliberately oversample older and income-earning demographics to provide a more representative picture of e-pharmacy adoption dynamics across the full consumer spectrum.

CONCLUSION

This mixed-methods investigation of consumer awareness and adoption barriers of e-pharmacy services in urban Delhi reveals a significant and persistent awareness-adoption gap. While 60% of respondents demonstrated e-pharmacy awareness, adoption is effectively absent (1.5%), driven by a complex interplay of trust deficits, regulatory uncertainty, physical interaction preferences, and incomplete product knowledge. Quality and medicinal composition – not price – are the dominant purchase determinants, challenging the discount-led marketing paradigm prevalent among Indian e-pharmacy operators.

The study's sequential explanatory mixed-methods design enabled a richer, more textured understanding of these dynamics than a purely quantitative approach would permit, with qualitative themes providing explanatory depth to the quantitative behavioral findings.

Practical Implications

- *For E-Pharmacy Platforms:* Invest in pharmacovigilance-specific trust signals: CDSCO registration badges, licensed pharmacist consultation features, and real-time prescription verification. Expand marketing communication to older demographics via traditional media channels, particularly newspapers and television, not solely digital advertising. Improve product

range communication, explicitly promoting the availability of ayurvedic, nutraceutical, and chronic disease management products. Implement loyalty programs and value-added services (free health consultations, medication reminders, comprehensive drug information sheets) to enhance perceived utility beyond price discounts.

- *For Policymakers and Regulators:* Expedite finalization and public communication of e-pharmacy regulations under the Drugs & Cosmetics Act, ensuring clear, consumer-accessible information about legal protections. Mandate robust prescription verification mechanisms and publicize enforcement activities to build platform legitimacy. Develop a national e-pharmacy certification or accreditation scheme analogous to international models (NABP, GPhC) to provide consumers with a reliable quality benchmark.
- *For Healthcare Administrators and Educators:* Integrate digital pharmaceutical literacy into public health communication campaigns, particularly for older consumer segments. Leverage the observed latent goodwill (53.8% referral intent) through community health worker-mediated awareness programs in urban and peri-urban settings.

Limitations

This study has several limitations that should be acknowledged. First, the convenience sample (n = 65) is predominantly composed of students under 20 years of age, limiting generalizability to older, income-earning, and more frequent medicine-purchasing demographics. Second, the study is geographically confined to Delhi, an urban context with above-average digital literacy, potentially overstating awareness levels relative to semi-urban or rural populations. Third, cross-sectional survey data preclude causal inferences about the determinants of e-pharmacy adoption. Fourth, while open-ended responses provided qualitative data, a more robust qualitative component (e.g., in-depth interviews or focus groups) would yield richer insights into behavioral barriers.

Directions for Future Research

Future research should: (1) employ larger, probability-based samples with deliberate stratification across age groups, income levels, and geographic regions; (2) incorporate longitudinal designs to track adoption behavior over time, particularly in the post-regulatory-finalization context; (3) test structural equation models integrating TAM, TPB, and trust-based frameworks to identify path-specific determinants of e-pharmacy adoption intent; (4) conduct comparative analyses between metros and tier-2/tier-3 cities to understand geographic variations in adoption barriers; and (5) explore the moderating role of health condition severity (acute vs. chronic illness) on platform adoption behavior.

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