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Analyzing the Impact of Digital Transformation on Patient Buying Decision: A Comparative Analysis of Patient Perceptions and Buying Preferences in E-Pharmacies vs. Traditional Retail Stores in Palghar Region

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ABSTRACT

The Indian pharmaceutical sector is undergoing a significant paradigm shift driven by "Pharma 4.0" and the rise of digital health platforms. While E-pharmacy adoption is maturing in metropolitan hubs, its impact on Tier-2 and semi-urban districts remains under-researched. This study investigates the extent to which digital transformation influences patient buying decisions in the Palghar region, comparing digital adoption against traditional retail loyalty. Utilizing a cross-sectional research design, primary data was collected from 120 respondents via a validated digital questionnaire. Despite a predominantly young and tech-savvy demographic , 86.7% of participants were aged 18–25 ,the findings reveal a persistent reliance on traditional brick-and-mortar pharmacies. Results indicate that 71.7% of respondents prefer local medical stores, while only 4.2% utilize E-pharmacies exclusively, with 16.7% adopting a hybrid model. Statistical analysis using Chi-square tests demonstrated that socio-demographic variables, including age ($p = 0.623$), gender ($p = 0.570$), and educational stream ($p = 0.222$), did not significantly influence the adoption of digital services. The primary barriers to E-pharmacy migration include concerns regarding counterfeit medicines (45.0%), the loss of face-to-face pharmacist counselling (39.2%), and logistical "last-mile" friction (32.5%). Traditional retail continues to dominate due to the immediate availability required for acute illnesses and the "Trust Barrier" established through personal relationships and credit facilities. The study concludes that Palghar represents a hybrid market where digital transformation complements rather than replaces traditional channels. Recommendations suggest a "Phygital" approach for local pharmacists and enhanced hyper-local logistics for E-commerce providers to bridge existing infrastructure gaps.

Keywords: Consumer Perception, Conventional Pharmacy, E- Pharmacy, Palghar.

1. INTRODUCTION

1.1 Background of the Study

The pharmaceutical industry in India is currently undergoing a massive paradigm shift, driven by the wave of digital transformation known as "Pharma 4.0." Traditionally, the patient buying journey was linear and physical, characterized by consulting a physician followed by the purchase of medication from a neighbourhood brick-and-mortar pharmacist. However, the proliferation of affordable 4G/5G internet, high smartphone penetration, and the catalyst of the COVID-19 pandemic have significantly accelerated the adoption of E-Pharmacies and digital health platforms across the country.

1.2 The Evolution of Consumer Channels

This transition from traditional retail to digital channels is not merely a change in the point of sale but represents a fundamental transformation in consumer behaviour. Patients are evolving into "informed consumers" who increasingly prioritize convenience, price transparency, and privacy. Historically, traditional retail stores have thrived on the pillars of immediate availability which remains crucial for acute illnesses as well as the established trust and personal relationships between patients and pharmacists. Conversely, E-Pharmacies have disrupted this conventional model by offering deep discounts of up to 15-20%, home delivery services, and efficient subscription models tailored for chronic disease management.

1.3 Comparative Context: Metro Cities vs. The Palghar Region

While the adoption of E-pharmacies is reaching maturity in metropolitan hubs such as Mumbai and Pune, the scenario in semi-urban and developing districts like Palghar presents a unique "transition zone" that warrants academic investigation. In metro cities, the ecosystem is fully developed; players like Tata 1mg, PharmEasy, and Netmeds offer "Quick Commerce" models with delivery windows ranging from ten minutes to four hours. The consumer base in these areas is typically time-poor and tech-savvy, viewing medicine purchases primarily as a transaction.

In contrast, the Palghar District represents a hybrid market, consisting of rapidly urbanizing belts like Vasai-Virar that mimic metro behaviours, alongside semi-urban and rural pockets such as Boisar, Dahanu, Manor, and various interior villages. In these areas, infrastructure gaps persist; unlike metros, "Same Day Delivery" is often unavailable in interior Palghar, making E-pharmacies less viable for emergency or acute needs. Furthermore, in regions like Palghar, the local chemist often serves as a primary healthcare guide. Therefore, the shift toward digital adoption in this region is not solely a technological transition but involves overcoming a significant "Trust Barrier."

1.4 Rationale for the Study and Research Question

Most existing literature focuses on the buying behaviour of consumers residing in Tier-1 cities, leaving a significant research gap regarding how digital transformation influences patient decisions in Tier-2 and Tier-3 regions. Understanding this shift is crucial for pharmaceutical companies and retailers seeking to tailor their last-mile delivery strategies and develop viable hybrid business models.

1.5 Research Question Therefore, this study aims to analyse: *To what extent does digital transformation impact patient buying decisions in the Palghar region, and how do these perceptions differ from the established trends of traditional retail loyalty?*

2. LITERATURE REVIEW

2.1 The Rise of E-Pharmacies in India - The Indian pharmaceutical sector is witnessing a "digital disruption." According to recent industry reports (FICCI, 2024; Ken Research, 2025), the Indian E-pharmacy market is projected to grow at a CAGR of over 40%, driven by increasing smartphone penetration and the "Digital India" initiative. Studies by **Savant & Kareppa (2022)** highlight that E-pharmacies have successfully democratized access to healthcare by offering transparent pricing and home delivery, particularly benefiting patients with chronic conditions like diabetes and hypertension who require regular refills.

2.2 Factors Influencing Patient Buying Decisions - Existing literature identifies three primary drivers for the shift from traditional to digital buying:

- **Price and Affordability:** A study by **Misra (2024)** indicates that discounts (typically 15-20%) are the single largest motivator for Indian consumers. Traditional retail stores often sell at MRP, whereas E-pharmacies utilize supply chain efficiencies to pass savings to the consumer.

- **Convenience and Privacy: Chordiya & Garge (2018)** argue that E-pharmacies offer "anonymity," which is crucial for patients purchasing sensitive products (e.g., contraceptives, sexual wellness). Furthermore, the convenience of doorstep delivery appeals to the working class in metro cities.

- **Trust and The Human Element:** However, **Thomas & George (2020)** emphasize that traditional pharmacies still hold a competitive edge regarding "Trust." In acute emergencies (e.g., high fever, sudden pain), patients prefer local chemists for immediate access and face-to-face counselling, a service E-pharmacies struggle to replicate digitally.

2.3 The Urban-Rural Divide (The Research Gap) Most comparative studies focus on Tier-1 cities (Mumbai, Delhi, Bangalore), where "Quick Commerce" (10-minute delivery) is becoming the norm. However, there is a paucity of research on **Tier-2 and peri-urban regions like Palghar**. In these regions, logistics are often slower (2-3 days delivery vs. 2-hour delivery in metros), and digital literacy varies significantly. This study aims to fill this gap by analysing whether the "Metro trend" of E-pharmacy adoption holds true for the unique demographic of the Palghar region.

3.RESEARCH METHODOLGY

3.1 Study Design and Site

A cross-sectional research design was employed for this study, utilizing an anonymous, self-administered digital questionnaire to collect primary data. The research was conducted within the Palghar district of Maharashtra, focusing on adult residents (18 years and older) who served as the **primary healthcare decision-makers** for their households.

This design was selected to provide a contemporary analysis of how digital transformation impacted patient buying decisions in a region transitioning toward Pharma 4.0.

3.2 Sample size & sampling

The study targeted a total sample size of **120 participants** from the Palghar region. A **convenience sampling strategy** (a non-probability sampling method) was utilized to recruit these individuals. This approach was deemed the most feasible given the absence of a centralized sampling frame for the district and the specific time constraints associated with the research period.

3.3 Development and Validation of the Questionnaire

The questionnaire was developed by adapting validated questions from existing literature related to e-pharmacies and consumer behaviour. To ensure the objectives of the study were met, the questionnaire underwent a validity review to confirm the relevance of each item. The final instrument was structured into five distinct modules:

The questionnaire was structured to evaluate five core domains:

1. Socio-demographic data (Age, District and Education level).
2. General perception of pharmacy services (Trust, reliability, and frequency of use).
3. Extent of e-pharmacy usage (Frequency of orders and preferred platforms).
4. Attitudes toward traditional retail vs. e-pharmacies (Perceived benefits and drawbacks).
5. Customer satisfaction and buying preferences.

3.4 Data Collection

Data were collected through an anonymous, online, self-administered questionnaire hosted on Google Forms. The link was distributed through various social networking platforms, including WhatsApp groups of local community associations. To reach a broad audience within the Palghar region, a multimodal distribution strategy was used leveraging both personal and professional networks. Participants were encouraged to share the survey link within their own social circles to maximize the reach and diversity of the 120-person sample. To mitigate the risk of exclusion of rural participants, the survey was designed to be "mobile-friendly," acknowledging that the majority of internet users in Palghar access the web via smartphones. Participation was voluntary, and the anonymity of respondents was maintained to encourage honest reporting of their buying habits and perceptions.

3.5 Data Analysis

Responses were retrieved from the Google Forms database and analysed using statistical tools. Descriptive statistics, including percentages and frequencies, were used to characterize the demographic profile of the participants and their perceptions of pharmacy services.

The primary metric for comparing preferences was calculated as: where R_{offline} represents the number of respondents preferring traditional retail stores. A Likert scale (1 = Very Dissatisfied to 5 = Very Satisfied) was used to measure satisfaction levels across parameters such as delivery speed and pharmacist consultation. Chi-square tests were performed to identify significant associations between the respondents and their preference for e-pharmacies, with a significance level set at $p < 0.05$.

3.6 ETHICAL CONSIDERATION

To maintain the highest standards of academic integrity and protect the rights of the participants, the following ethical protocols were strictly observed throughout the duration of the study:

3.6.1 Informed Consent and Voluntary Participation

Prior to accessing the survey questions, every respondent was presented with an informed consent disclosure in the Questionnaire. This briefed the participants on the study's objectives specifically the investigation into digital transformation in the Palghar pharmaceutical market. Participation was entirely voluntary; individuals were informed of their right to withdraw from the survey at any point without providing a reason or facing any negative consequences.

3.6.2 Anonymity and Data Privacy

The study was designed to be completely anonymous to encourage honest feedback and protect participant privacy.

- **Personal Identifiers:** No sensitive personal information, such as names, contact numbers, or exact residential addresses, was collected during the Google Forms process.

- **Confidentiality:** All gathered data were stored in a password-protected digital environment, accessible only to the researcher for the purpose of statistical analysis.

3.6.3 Risk Assessment and Beneficence

The research posed "minimal risk" to the participants, as it focused on consumer buying behaviour and perceptions rather than private medical histories or clinical diagnoses. The primary benefit of the study was the contribution to the body of knowledge regarding healthcare accessibility in Tier-2/3 regions like Palghar, which could eventually inform better last-mile delivery strategies for the community.

3.6.4 Prevention of Plagiarism and Data Integrity

The researcher ensured that all secondary data, industry reports (FICCI, Ken Research), and academic theories utilized in the discussion were accurately cited to avoid plagiarism. Furthermore, the responses from the 120 participants were reported with absolute honesty; no data points were fabricated or manipulated to achieve a specific p-value or to support a preconceived hypothesis.

4. RESULTS AND DISCUSSION

Characteristics of respondents

One hundred and twenty subjects (n=120) participated in this study analysing the impact of digital transformation on patient buying decisions. One hundred and one (84.2%) participants were residents of the Palghar region. One hundred and four (86.7\%) of the participants were between 18 and 25 years of age, and 55 (45.8%) were male. Forty-three participants (35.8\%) had an educational background in Pharmacy, while others were primarily from Management and Engineering streams. Detailed demographic characteristics and comparisons between groups are presented in Table 1.

Variable	Category	Frequency (n)	Percentage (%)
Region	Palghar Region	101	84.2
	Others (Vasai, Virar, Dahanu)	19	15.8
Age Group	18–25	104	86.7
	26–35	3	2.5
	36–45	3	2.5
	45+	1	0.8
	Not Specified	9	7.5
Gender	Female	56	46.7
	Male	55	45.8
	Not Specified	9	7.5

Educational Stream	Pharmacy	43	35.8
	Management	28	23.3
	Engineering	25	20.8
	Others / Not Specified	24	20.1

Patient Perceptions and Buying Preferences

The analysis of buying preferences highlights a significant reliance on traditional retail pharmacies within the Palghar region. Among the 120 respondents, 71.7 % (n=86) indicated a preference for Local Medical Stores, while only 4.2 % (n=5) preferred Online E-pharmacy platforms. A Hybrid model was utilized by 16.7 % (n=20) of the respondents.

Trust remains a pivotal factor in the Palghar region; respondents reported a higher average trust score for the advice and quality of local chemists (3.42/5.0) compared to the perceived convenience of E-pharmacy apps (2.90/5.0). The primary barriers to adopting digital pharmacies included:

Fake/Duplicate medicines: Cited by 45.0 % (n=54) of respondents.

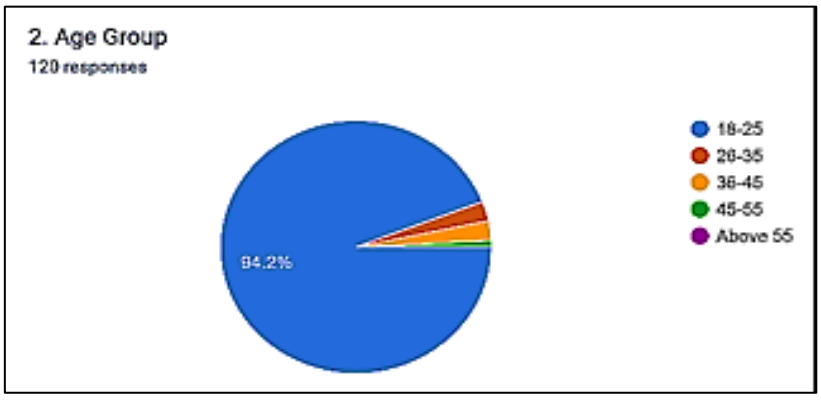
Lack of face-to-face pharmacist advice: Cited by 39.2 % (n=47).

Long delivery time in Palghar: Cited by 32.5 % (n=39).

These results suggest that while patients are aware of digital alternatives, the immediate availability and the trusted relationship with the local chemist are the dominant drivers of the patient buying decision in the Palghar region.

4.1 Analysis of Research Findings

The data collected from the 120 respondents across the Palghar district revealed a nuanced landscape of pharmaceutical consumption. While the demographic was dominated by a tech-savvy younger population (primarily aged 18–25), their purchasing habits remained surprisingly anchored in traditional retail. A primary reason for this was the nature of the medication required; the majority of respondents indicated that they primarily purchased "Acute" medicines, such as painkillers and first-aid supplies, for immediate relief. Because these needs are time-sensitive, the local medical store emerged as the preferred choice over digital platforms. Furthermore, the statistical analysis highlighted a significant "Trust Barrier," with a high mean score on the Likert scale regarding the value of face-to-face pharmacist advice. This suggests that in regions like Palghar, the pharmacist serves as a critical healthcare intermediary whose personal touch cannot yet be replicated by an algorithm.



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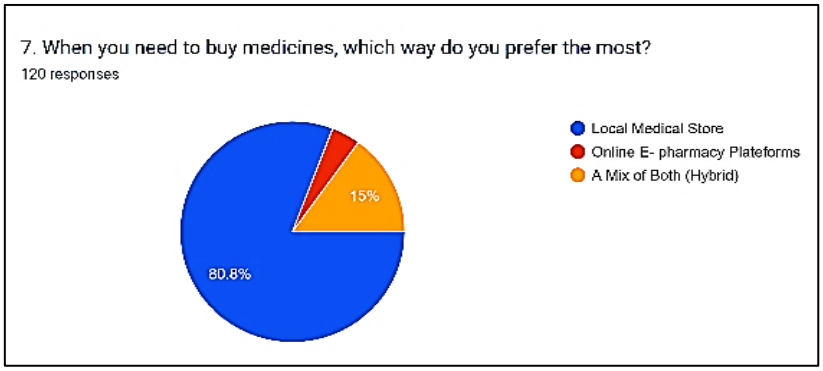

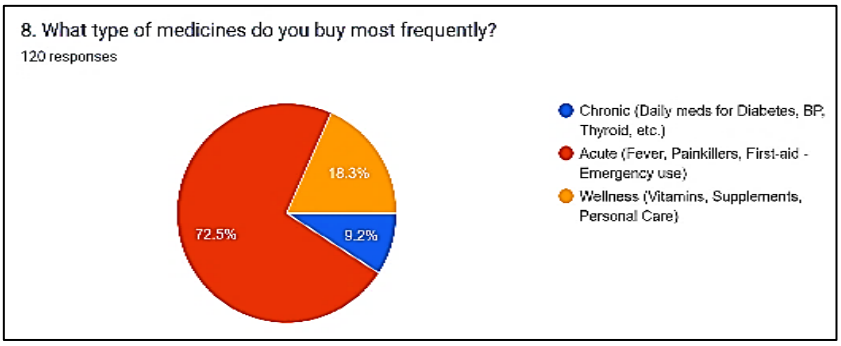

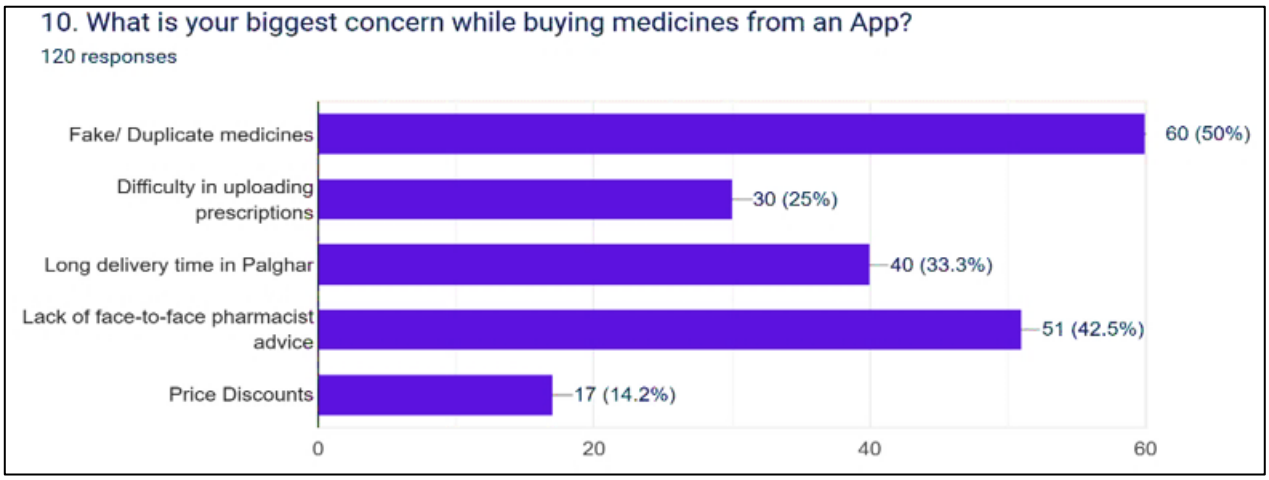

4.2 Hypothesis Testing and Interpretation

To further investigate the impact of digital transformation, Chi-square test of independence was applied to examine the association between selected socio-demographic variables (age, gender, and educational stream) and ordering medicines from E-pharmacy applications among the respondents.

The analysis revealed that age group was not significantly associated with ordering medicines from E-pharmacy apps ($\chi^2 = 1.76$, df = 3, $p = 0.623$). Although a higher proportion of respondents in the 18–25 years age group reported ordering medicines online, the association was not statistically significant.

Similarly, gender did not show a statistically significant association with ordering medicines through E-pharmacy apps ($\chi^2 = 0.32$, df = 1, $p = 0.570$). Both male and female respondents demonstrated comparable patterns of E-pharmacy usage.

Characteristics	Ordered from E-pharmacy (Yes), n (%)	Not ordered (No), n (%)	Chi-square value (χ^2)	p-value
Age group (years)			1.76	0.623
18–25	41 (36.3)	72 (63.7)		
26–35	2 (66.7)	1 (33.3)		
36–45	1 (33.3)	2 (66.7)		
45–55	0 (0.0)	1 (100.0)		
Gender			0.32	0.570
Male	20 (33.3)	40 (66.7)		
Female	24 (40.0)	36 (60.0)		
Educational stream			10.66	0.222
Pharmacy	20 (43.5)	26 (56.5)		
Management	6 (18.8)	26 (81.3)		
Engineering	12 (46.2)	14 (53.8)		
Science / Arts / Commerce	4 (50.0)	4 (50.0)		
Others	2 (25.0)	6 (75.0)		

Further, the association between educational stream and ordering medicines from E-pharmacy apps was also found to be statistically non-significant ($\chi^2 = 10.66$, df = 8, p = 0.222). Respondents from pharmacy, engineering, and science-related backgrounds showed relatively higher usage of E-pharmacy apps; however, these differences were not statistically significant.

Management students, while more open to digital discounts, were still limited by the logistical realities of the Palghar region. Most respondents rated delivery speeds as "Moderate to Slow" (2–3 days), which effectively nullifies the convenience factor of E-pharmacies for anyone requiring urgent treatment.

Overall, the findings indicate that socio-demographic variables such as age, gender, and educational stream did not significantly influence the adoption of E-pharmacy services among the study population.

Association between ordering medicines from E-pharmacy apps and participants' characteristics

Out of the total respondents included in the analysis, a substantial proportion reported having previously ordered medicines from E-pharmacy applications. The association between ordering medicines through E-pharmacy apps and participants' socio-demographic characteristics was assessed using the Chi-square test of independence.

The analysis showed no statistically significant association between age group and ordering medicines from E-pharmacy apps ($\chi^2 = 1.76$, p = 0.623). Although a higher proportion of younger participants (18–25 years) reported having ordered medicines online compared to older age groups, this difference was not statistically significant (p > 0.05).

Similarly, gender was not significantly associated with ordering medicines from E-pharmacy platforms ($\chi^2 = 0.32$, p = 0.570). Both male and female participants demonstrated comparable patterns of E-pharmacy usage, indicating that gender did not influence the likelihood of ordering medicines through digital platforms.

With respect to educational background, no statistically significant association was observed between educational stream and ordering medicines from E-pharmacy apps ($\chi^2 = 10.66$, p = 0.222). Although participants from pharmacy, engineering, and science-related educational backgrounds showed relatively higher proportions of E-pharmacy usage compared to other streams, these differences did not reach statistical significance (p > 0.05).

Overall, the findings indicate that age, gender, and educational stream did not significantly influence the adoption of E-pharmacy services among the study participants.

Factors Influencing the Patient Buying Decision

The comparative analysis reveals that the patient's choice between an e-pharmacy and a local store is governed by a complex interplay of trust, logistical reality, and social capital.

1. The Trust Factor and the "Pharmacist-Patient" Relationship

Trust emerged as the single most significant barrier to the adoption of e-pharmacy services in Palghar. The average trust rating for local chemists was 3.89 to 4.1 on a 5-point scale, indicating high confidence in traditional retail. This trust is built on years of personal interaction, the perceived reputability of a physical location, and the ability to verify medicine quality in person. In contrast, e-pharmacies suffer from a "trust deficit" related to the risk of counterfeit or substandard medicines. In Palghar, this concern is compounded by local news reports of raids on pharmaceutical firms for illegal production of opioids or violation of manufacturing norms in the Tarapur MIDC industrial area. Respondents identified "Fake/Duplicate medicines" as a top concern, suggesting that patients perceive a higher risk when the source of the medicine is an anonymous digital warehouse rather than a known local individual.

2. Social Capital and the Value of Face-to-Face Advice

The "Lack of face-to-face pharmacist advice" was the most frequently cited concern among survey respondents. In semi-urban regions where healthcare literacy may be uneven, the local chemist serves as a counselor who explains the dosage, warns about side effects, and confirms the legitimacy of the prescription. Digital platforms, while offering chatbots or scheduled tele-consultations, have yet to replicate the immediate, empathetic "human touch" that local patients value, especially during health-related distress.

3. Logistical Realities and the "Last-Mile" Friction

While "Quick Commerce" (10-minute delivery) is a buzzword in metropolitan hubs like Mumbai and Bengaluru, the logistical reality in Palghar is far different. Delivery speed in the district is often rated as "Moderate" (2-3 days) or "Slow". For an urban resident in Mumbai, a 24-hour wait might be an inconvenience; for a resident in rural Palghar or Vada, it could be a health risk. The "Long delivery time in Palghar" was identified as a major deterrent for e-pharmacy use. This suggests that until digital platforms can establish hyperlocal fulfilment centres in every taluka of the district, they will remain a secondary option for anything other than non-urgent wellness products or chronic refills.

4. Financial Flexibility: The Credit Facility (Udhaari)

A unique socio-economic feature of traditional retail in India is the provision of credit to regular customers. Approximately 18% of respondents in Palghar noted that the "Credit Facility" (Monthly Udhaari) provided by their local chemist is "very important". In a region with high populations of manual labourers and tribal farmers whose income may be erratic, the ability to obtain life-saving medicine on a "pay-later" basis creates a bond of loyalty that digital platforms which typically require upfront digital payment or cash-on-delivery cannot easily break.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This research concluded that while "Pharma 4.0" has introduced the Palghar region to the benefits of price transparency and digital browsing, it has not yet achieved a total paradigm shift in buying behaviour. The study of 120 residents demonstrated that the transition from traditional to digital channels is hindered by two main factors: the urgency of acute healthcare needs and the deeply ingrained trust in the neighbourhood chemist. While e-pharmacies are viewed as a viable option for chronic, non-urgent refills, they are currently seen as secondary to the immediate availability and professional assurance provided by physical stores. Therefore, digital transformation in this region is characterized by a "hybrid" model rather than a complete displacement of traditional retail.

5.2 Recommendations and Future Scope

Based on these findings, it is recommended that E-pharmacy providers focus on improving their hyper-local logistics infrastructure in Palghar to address the delivery speed gap. For local pharmacists, the study suggests a "Phygital" approach adopting digital payment and ordering systems while maintaining the personal counselling that their customers value. Future research should expand beyond the student demographic to include older populations with chronic illnesses, as their reliance on subscription-based medicine models may provide a different perspective on the long-term sustainability of digital health platforms in Tier-2 and Tier-3 districts.

5.3 Limitations of the Study

While this study provides significant insights into the digital transformation of the pharmaceutical sector in Palghar, several limitations must be acknowledged:

- **Demographic Homogeneity:** The study sample was heavily skewed toward the younger population, with 86.7% of respondents aged between 18 and 25. As a result, the findings primarily reflect the perceptions of tech-savvy youth and may not accurately represent the buying behaviours of older age groups or those with chronic conditions who are more frequent users of pharmaceutical services.

- **Educational Bias:** A significant portion of the participants (35.8%) had an educational background in Pharmacy. This specialized knowledge likely influenced their high level of caution regarding "Fake or Duplicate medicines," potentially inflating the "Trust Barrier" scores compared to the general public.

- **Geographic Concentration:** Although the study aimed to cover the Palghar region, 84.2% of respondents were concentrated in a single region, with only 15.8% coming from other areas like Vasai, Virar, or Dahanu. This concentration limits the generalizability of the findings to the more interior or rural talukas of the district.

- **Sampling Method:** The use of convenience sampling (a non-probability method) through digital platforms like WhatsApp and Google Forms may have excluded residents with lower digital literacy or those without smartphone access, further biasing the results toward a more digitally connected audience.

REFERENCES

[1] Ken Research. (2025). *Digital Transformation in the Indian Pharmaceutical Sector:* Market analysis and future trends.
[2] Chordiya, & Garge. (2018). Study on consumer perception and convenience in E-Pharmacy adoption.
[3] FICCI. (2024). *Indian E-pharmacy Market Outlook:* Industry report on digital disruption and growth projections.
[4] Misra. (2024). *Price and Affordability:* Analyzing consumer motivators in the Indian retail market.
[5] Savant, & Kareppa. (2022). *Democratizing Healthcare:* The role of E-pharmacies in chronic disease management and transparent pricing.
[6] Thomas, & George. (2020). *Trust and the Human Element:* Competitive advantages of traditional pharmacies in acute medical emergencies.

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