Impact of E-Pharmacies on Offline Purchasing Behaviour of Pharmaceutical Consumers in India

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Abstract—The digital transformation of the pharmaceutical sector has introduced e-pharmacies and online drug education as influential forces in consumer health behaviour. This study examines the impact of these digital platforms on the offline purchasing behaviour of pharmaceutical consumers in urban and semi-urban India. Using a quantitative cross-sectional survey of 200 respondents aged 18–45 who actively use e-pharmacy services, the study explores how access to online medicine information, price comparisons, and promotional offers influences consumers at traditional pharmacy retail shops.

Purpose:
This research paper tries to investigate how e-pharmacies and knowledge about drugs by e-pharmacy platforms are impacting the offline pharmaceutical purchasing behaviour of consumers in urban and semi-urban India. It focuses on how digital access to information, pricing, and promotional content influences consumer decision-making in the traditional retail pharmacy settings.

Design/methodology/approach:
A quantitative cross-sectional survey was conducted among 200 individuals aged between 18 to 45 who have used e-pharmacy platforms. The primary data was collected using structured questionnaires. Observations made to assess behavioural changes in the offline medicine purchases afetr engagement with E-Pharmacies.

Findings:
The study reveals that 82.5% of consumers have experienced changes in their offline purchasing habits after using e-pharmacy platforms. Major behavioural shifts include factors such as increased price comparison (92%), inquiries about alternatives (80%), demand for discounts (81.5%), and improvised interactions with retail pharmacists (97.5%). This research work also suggests that the e- pharmacy platforms are not replacing the traditional pharmacy instead it is reshaping them.

Practical implications:
It is recommended that pharmacists, digital marketers, pharmaceutical firms and policymakers adopt a combined model to foster informed and digitally proficient consumers. This would encourage chemists to suggest best generic alternatives to cost and quality conscious consumers as well as it will improve e-pharmacy content, consumer education and transparency in pharma retail.

Originality/value:
This research paper provides insights into the relation and impact of pharma retail via e-commerce on traditional pharmaceutical setup. The results highlight how e-pharmacy platforms contribute to a more engaged, more knowledgeable, and price-sensitive consumer for the traditional retail drug shops.

Index Terms—E-pharmacy, Online drug education, Consumer behaviour, pharmaceutical retail, Hybrid health model, Digital literacy, India

I. INTRODUCTION

The digital transformation of the pharmaceutical industry has drastically changed the way in which consumers interact with healthcare products and services, e-pharmacies and online drug education platforms (Shaikh, 2022; Alahdal et al., 2024) are now present. For example, in India, as individuals became more digitally literate in a health context and able to access better information and price transparency about medicines, a new class of pharmaceutical consumers emerged: people who are digitally literate, price-conscious, and proactive about their health (Suryani, 2022; Zhao, 2023). With e-pharmacies, consumers can now order medicines online and obtain richer context about the drug, generic alternatives, and promotional offers that shape their purchasing decisions away from traditional offline retailer context (Azzi et al., 2020; Uche and Thomas, 2021).

Although both global and Indian studies point to the benefits of convenience, transparency on price and choice (Kaur and Dhiman, 2020; Kumari et al., 2024),

trust, counterfeit medicines and monitoring regulations for the e-pharmacy environment creates a stronger reliance on the traditional chemist (Almuzaini et al., 2020, Forrest and Cao, 2010). The Covid19 pandemic has also committed people to the e-pharmacy service acceleration without totally detracting of people's preference for face-to-face, immediate access (Anand, 2020; Nwachukwu and Okafor, 2019Where O2O (i.e., online-to-offline) commerce is concerned, the impact of digital exposure on offline purchasing behavior has gained traction through an O2O hybrid consumer engagement approach (i.e., O2O commerce has combined learning about a medication, systemic prescribing of the medication by a physician or prescribing professional, purchasing the medication from a pharmacy in physical spaces, observing the medication delivery, and even price and second brand comparison purchasing in pharmacies) (Pao, 2022; Nugroho et al., 2023).

The current study will further investigate the interactions between e-pharmacy platforms and online education about medicines, the results of which may be able to demonstrate if and for whom these possible influences have materialized towards offline pharmaceutical purchasing behaviour of consumers located in urban and semi-urban communities in economically developed aspects of India. By reviewing the decision-making manufacturer purchasing process involving price comparison, pharmacy brand, discounts, and pharmacist advice, this study will provide valuable information on how digital platforms and strategies impact the traditional pharmacy retail environment (Online et al., 2023; Rani, 2023). Findings from this study will provide pharmacists, pharmaceutical marketers, and policymakers with valuable approaches to changing consumer expectations related to services and the need for developing integrated service approaches.

II. LITERATURE REVIEW

Considering recent explosive growth of e-commerce, the pharmaceutical sector continues to react and reinvent itself based on how health consumers have changed access to health information and health-related products. The development of digital and electronic platforms have created a pathway for consumers to make decisions about their health medications where they can have unlimited access to information based on their proximity to health resources and their ability and opportunity to view this information in the digital space in an ad-driven way that influences overlooking traditional retail locations (Shaikh, 2022). In order to summarize the key evidence from the current body of literature existing in relation to digital pharmaceutical commerce, I am presenting the current literature review as emergent themes based on the conceptual intersection of online and offline behaviour attributes.

2.1 Growth of E-Commerce in the Pharmaceutical Sector

E-pharmacies have increased in rapid succession as demand for convenience, accessibility and cost are driving factors, particularly for the elderly, differently abled, and those in rural areas (Shaikh, 2022). Digital tools such as health apps, prescription management, the ability to automate reorders also make online offerings so much more appealing. That said, there are critical urgent care needs, personal trust in the pharmacist, and the authenticity of online orders that will keep an important amount of demand grounded in offline settings (Alahdal et al., 2024; Shaikh, 2022).

2.2 Impact of COVID-19 on Consumer Behavior

COVID-19 functioned as a critical inflection point. The 'stay at home' orders and concerns about health safety caused many consumers to go online for the first time, resulting in accelerated digital adoption across demographics (Kaur & Dhiman, 2020). Anand, 2020 states that loyalty has markedly shifted, and many consumers are preferring platforms that offer contactless delivery, total transparency of pricing, and immediate visibility into medicine availability in real-time. However, these changes are, at least in some instances, moderated by concerns over counterfeit medicines and inconsistent timelines for delivery (Nwachukwu & Okafor, 2019; Shaikh, 2022).

2.3 Perceived Benefits and Risks of E-Pharmacies

Many researchers have highlighted the perceived advantages of online pharmacies, which include convenience, price competitiveness, availability of generics, and home delivery (Azzi et al., 2020; Uche & Thomas, 2021). However, apprehensions around vendor legitimacy, drug authenticity, and regulatory oversight remain. Almuzaini et al. (2020) note that about half of online pharmacies lack valid certifications. The lack of a required consultation with a physician adds to perception of the risks involved,

especially for elderly users and users with less digital literacy. International regulatory agencies, such as WHO and USFDA, have called for robust monitoring systems for online pharmacies to protect the public from unsafe interactions.

2.4 Trust, Risk, and Digital Literacy

Several factors influence consumer trust in digital channels including web-design quality, visible certifications, responsiveness of customer service, and the level of perceived transparency (Forman et al., 2010; Alahdal et al., 2024). Nonetheless, even high-quality websites may not reveal bad actors, thereby making consumers more exposed to fraudulent interactions. Digital health literacy is paramount for consumers—especially when differentiating legitimate from illegitimate sources (Suryani, 2022). Research, such as Zhao (2023), recognize the importance of platform reputation and other user experiences in establishing trust among those using digital-first approaches.

2.5 Influence of Social Media and Digital Marketing

Social media is now establishing itself as a very potent tool in healthcare marketing. Social media platforms, including Instagram, YouTube, and Facebook enable interactive channels for brands to reach and influence users with short videos, testimonials, or sponsored advertisements (Rani, 2023). Muthulakshmi and Karthik (2023) showed that user-generated reviews and influencer endorsements have a strong impact on medicine brand choices. AI can support targeted, preference-based optimizations of social media influencers and content, to successfully execute these campaigns to influence particularly younger generations, including Gen Z and millennials (Kumari et al., 2024).

2.6 The Persistence of Offline Pharmacies

Although doing more digital research, offline chemists still appear to be growing (Gledhill et al., 2022). Interactive engagement with pharmacists for advice, instant access to medications, and the comfort of being a part of caring interface will continue to consult with and use local chemists in several areas (Shaikh, 2022; Forrest & Cao, 2010). Areas of semi-urban and rural regions, in particular, may lack digital penetration and are very relevant to offline pharmacy. In a recent survey of health consumers in Mumbai, respondents called themselves "researchers" of health information before consulting or visiting the local chemist, where over 50 percent relied on advice from and used the local chemists (Shaikh, 2022).

2.7 Digital Transformation in the Pharma Sector

Digital transformation in India does not only involve customer-facing applications, but also applies to supply chain management, compliance, and teleconsultation in some circumstances. Arshad and Ahmad (2025) suggest that pharmaceutical companies have adopted artificial intelligence (AI), data analytics and cloud computing to help personalize services and move towards more automated operations. These were triggered by a window of opportunity during COVID-19 as companies were able to respond to new regulations allowing companies to innovate their logistics and how they delivered healthcare through teleconsultation (Alam & Arshad, 2022).

2.8 Evolution of Trust in Online Pharmacies

The e-pharmacy industry is maturing and therefor is concerned with trust, which is a dynamic concept influenced by product reviews, ratings and digital word-of-mouth. According to Online et al. (2023), positive feedback from users builds trust and increases the likelihood for purchase, while negative feedback can negatively affect its perception of the brand. Al-Azzam et al. (2023) reported that transparency in pricing, and legal compliance can build trust and will help build long term relationships with customers.

2.9 Online-to-Offline (O2O) Commerce and Hybrid Models

The emergence of Online-to-Offline (O2O) commerce indicates a shift towards hybrid consumption. Nugroho et al. (2023) and Yao et al. (2022) have shown that digital exposure, whether it is via apps, emails or advertisements, usually has an effect on consumers "offline" purchasing choices. Additionally, while a consumer may find the lowest price of a product through a digital outlet and then choose to purchase it in-store to feel it, touch it or avoid delivery time, Pao (2022) terms such business activity as a "phygital" convergence when digital and physical retail environments overlap and meld. This suggests that our findings show that online drug education and e-pharmacies appear to enhance, not detract from, "Offline" chemist engagement.

III. PROPOSED RESEARCH FRAMEWORK

The Proposed research framework explores the extent to which online drug education and e-pharmacy

components impact the "offline" purchasing behaviour of pharmaceutical consumers. The framework posits that consumer perception and/or awareness serves as a mediating factor as to how online information and services impacts an "offline" purchasing decision. It would also consider a series of demographic factors - age, education, health issues etc. - as moderators to either moderate the relationships between these constructs. Altogether, the framework is intended to encompass the experience of engagement with exposure to both digital and traditional purchasing behaviour within the pharmaceutical buying space.

3.1 Independent Variable:
- Usage of e-pharmacy platforms

3.2 Dependent Variables (behavioural changes):
- Changed the way of buying offline
- Asking for discounts
- Asking for generics
- Preferring brands
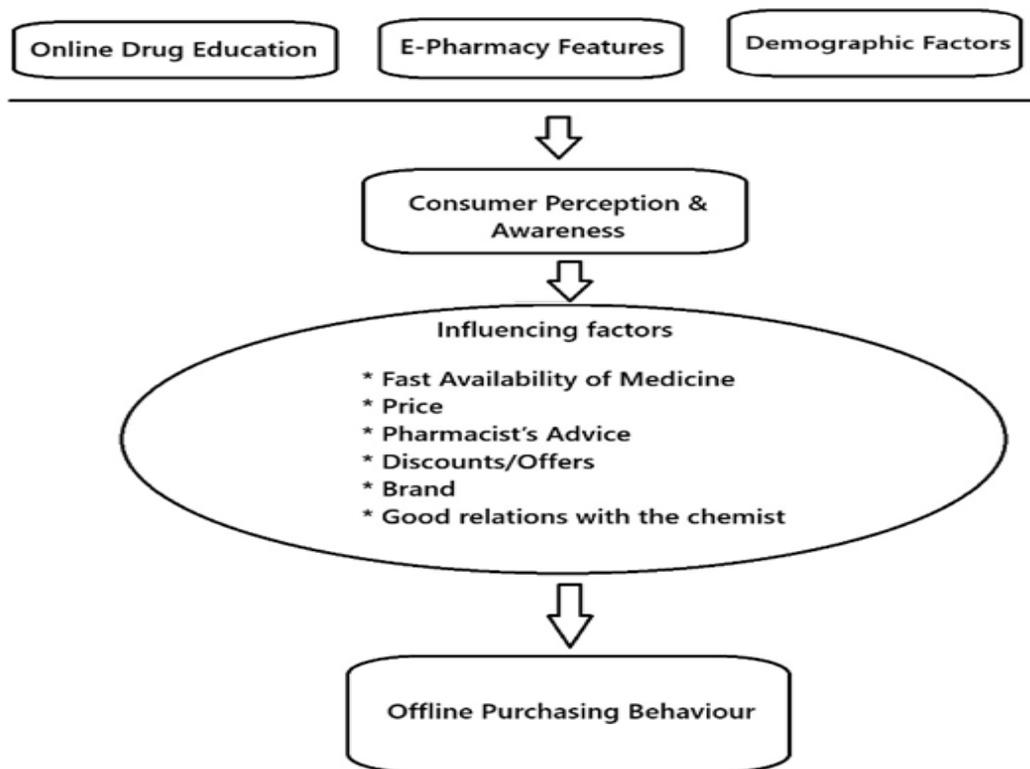- Price comparison
- Better pharmacist interaction

Figure 1: Proposed Research framework

IV. RESEARCH METHODOLOGY

4.1 Study Design: Quantitative cross-sectional study analyzing e-pharmacy's influence on offline medicine purchases.

4.2 Research Design
This study adopts a quantitative, cross-sectional research design to examine how e-pharmacy platforms influence offline medicine purchasing behaviour among consumers.

Sample size: 200

4.3 Inclusion Criteria
Respondents were selected based on:
1. Age (18–45 years)
2. Residency (urban/semi-urban areas)
3. Used e-pharmacy platforms in the past 6 months

Table 1: Sample Characteristics:

Characteristics	Categories	Frequency	Percentage
Age (Years)	18–25	153	76.5
	26–35	37	18.5
	36–45	10	5
Gender	Male	129	64.5
	Female	71	35.5
Current Location Type	Urban	162	81
	Semi-Urban	38	19
E-pharmacy usage in last 6 months	Frequently	189	94.5
	Sometimes	11	5.5

Source: Author's own work

4.4 Sampling Technique: Convenience sampling with screening to ensure respondents actively use e-pharma portals.

4.5 Data Collection:
- Primary Data: The primary data is collected via structured questionnaire
- Survey Instrument: Survey Instrument is Close-ended questions on:
- Pattern of Using E-pharma platforms.
- Changes in offline purchasing behaviour
- Factors influencing medicine purchases
- Satisfaction levels with e-pharmacy services

4.6 Limitations: The research is Urban-focused; hence sample may vary from results in rural areas.

5. Hypothesis:

H_0: E-pharmacies in India have no significant impact on the offline purchasing behaviour of pharmaceutical consumers.

H_1: E-pharmacies in India have a significant impact on the offline purchasing behaviour of pharmaceutical consumers.

VI. FINDINGS AND OBSERVATIONS

Table 2: Features of E-Pharma Portals Used by respondents:

Feature	Frequency	Percentage
Medicine Information	143	71.50%
Price Comparison	111	55.50%
Online Purchase	116	58.00%
Offers & Discounts	111	55.50%
Alternative Medicine Suggestions	64	32.00%

Source: Author's own work

Figure 2: Features of E-Pharma Portals Used by respondents

Alternative Medicine Suggestions 12%
Offers & Discounts 20%
Online Purchase 21%
Medicine Information 26%
Price Comparison 21%

Medicine Information
Price Comparison
Online Purchase
Offers & Discounts
Alternative Medicine Suggestions
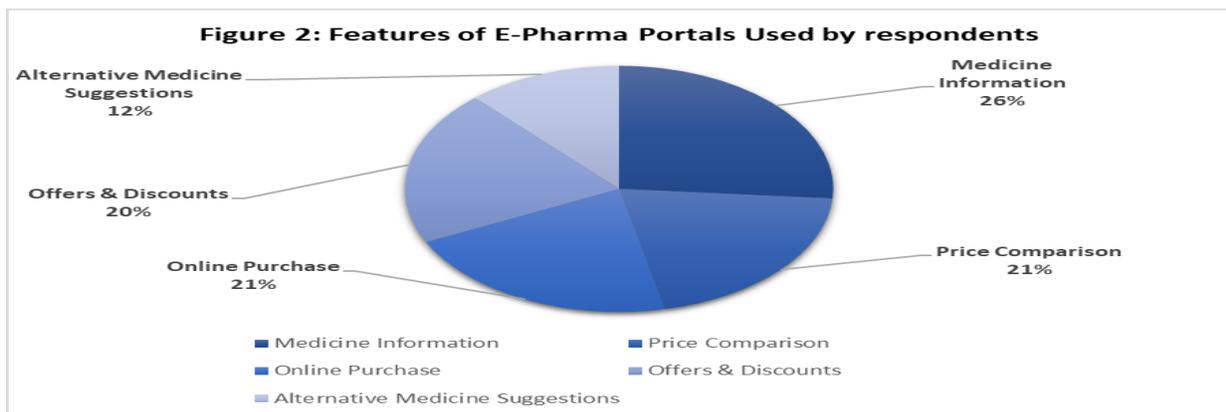
- The most common feature being used is for medicine information (71.5%), showing strong interest in self-education.
- Price comparison and offers and discounts are also prominent, suggesting a learning tendency by users.
- 21% users using for price comparison indicates a the generic use of E-commerce platform.

Table 3: Change in Buying Behaviour After Learning from E-Pharma Portals:

After learning from e-pharma portals, have you changed the way you buy medicines from retail chemist shops?	Frequency	Percentage
Yes	98	49%
Somewhat	67	33.5%
No	35	17.5%

Source: Author's own work

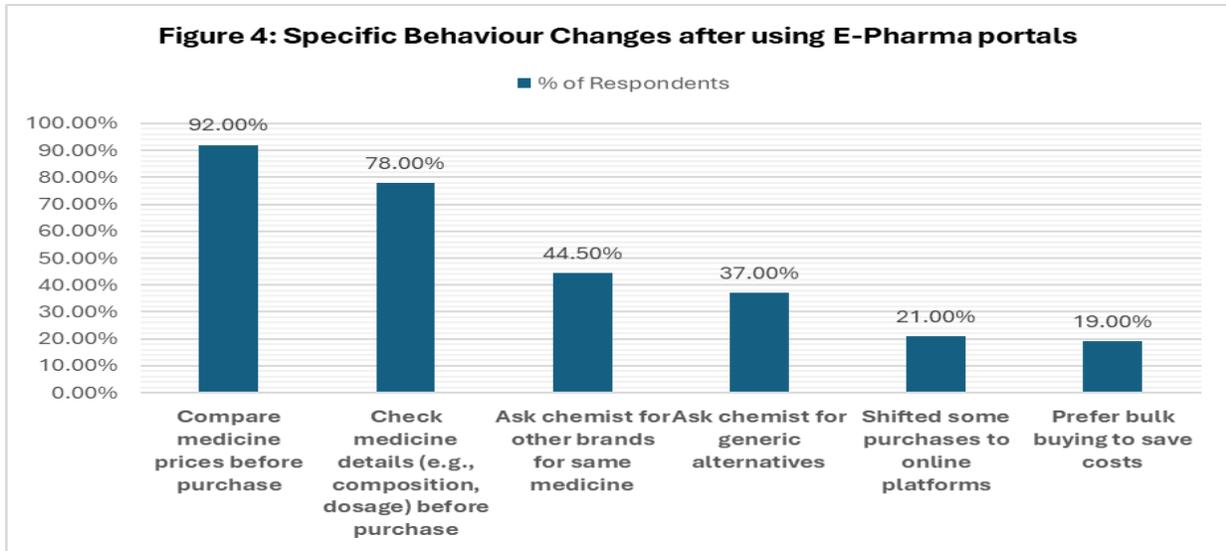Figure 3: Change in Buying Behaviour After Learning from E-Pharma Portals
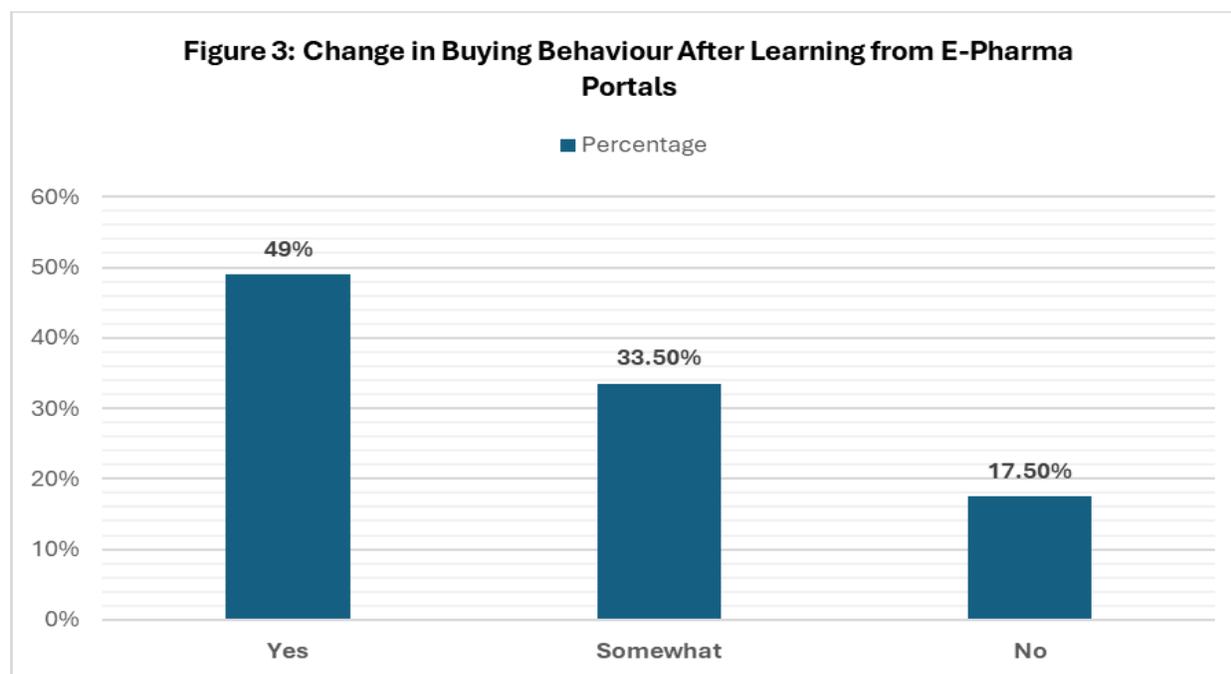
- More than 80% have changed their buying behaviour after using e-pharma portals.
- With only 17.50% believe that they have NOT changed their buying behaviour, the data Indicates a clear impact of online education on offline purchase behaviour.

Table 4: Specific Behaviour Changes after using E-Pharma portals:

Behaviour Change Variable	Frequency	% of Respondents
'Compare medicine prices before purchase'	184	92.00%
'Check medicine details (e.g., composition, dosage) before purchase'	156	78.00%
'Ask chemist for generic alternatives'	74	37.00%
'Ask chemist for other brands for same medicine'	89	44.50%
'Prefer bulk buying to save costs'	38	19.00%
'Shifted some purchases to online platforms'	42	21.00%

Source: Author's own work

Figure 4: Specific Behaviour Changes after using E-Pharma portals

■ % of Respondents

- Compare medicine prices before purchase: 92.00%
- Check medicine details (e.g., composition, dosage) before purchase: 78.00%
- Ask chemist for other brands for same medicine: 44.50%
- Ask chemist for generic alternatives: 37.00%
- Shifted some purchases to online platforms: 21.00%
- Prefer bulk buying to save costs: 19.00%

- A change in habit of comparing prices from online portals, suggesting an increased consumer awareness.
- About 40% of respondents are interacting with chemists for alternative medications, indicating a rise in knowledgeable consumers.
- Bulk buying, and migration to online purchasing is relatively low meaning they could lack trust or concerns delivery times.

Table 5: Preference for Specific Brands After Online Learning:

Do you now prefer specific brands after learning from e-pharma portals?	Frequency	% of Respondents
Yes	127	63.50%
No	73	36.50%

Source: Author's own work

Figure 5: Preference for Specific Brands After Online Learning
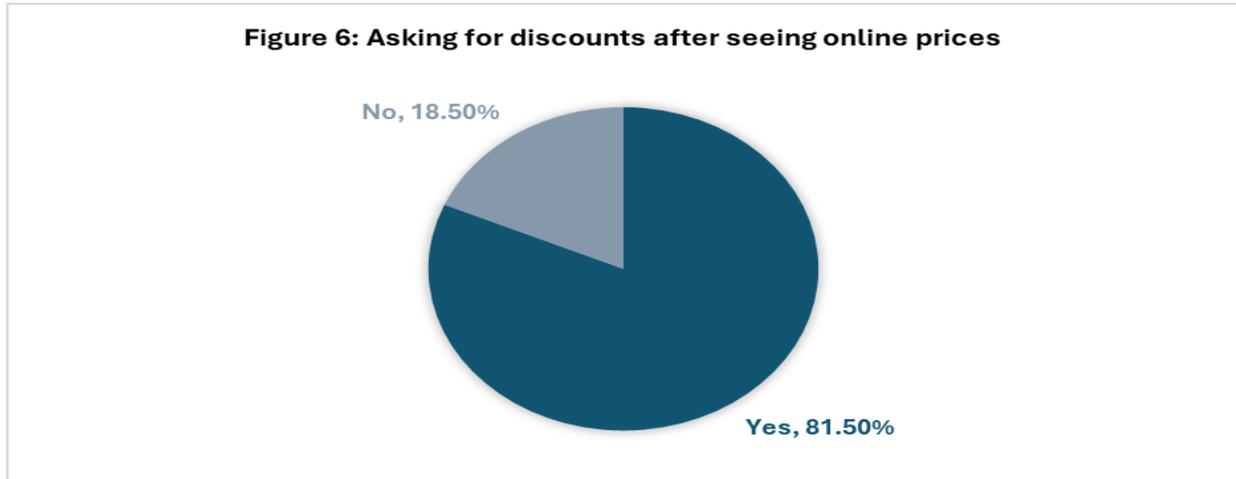
■ % of Respondents

- Yes: 63.50%
- No: 36.50%
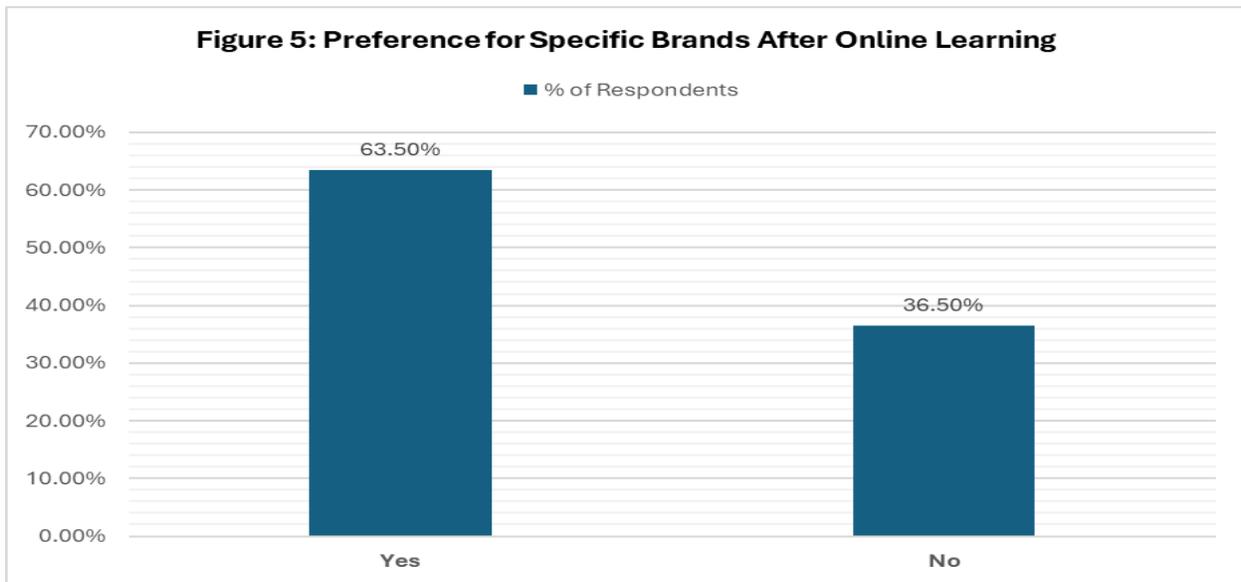
The data suggest that the Learning from online platforms has resulted in more than 60% respondents to develop brand preferences. It means the E-pharmacies have helped consumers to differentiate in pharmaceutical brands in similar medicine.

Table 6: Requesting Discounts After Seeing Online Prices:

Have you asked your chemist for discounts after seeing lower prices online?	Frequency	% of Respondents
Yes	163	81.50%
No	37	18.50%

Source: Author's own work

Figure 6: Asking for discounts after seeing online prices

- The online transparency has pressures traditional sellers. Almost 80% plus respondents now demand discounts by comparing online prices.
- It shows price sensitivity has increased in offline consumers due to E-pharmacy pricings.

Table 7: Inquiry for Generic or Alternative medicines after Online Learning:

Do you inquire about generic medicines or alternates after learning about them on E-pharmacies?	Frequency	% of Respondents
Yes	160	80.00%
No	40	20.00%

Source: Author's own work

Figure 7: Inquiry About Generics or Alternative medicines Post Online Learning
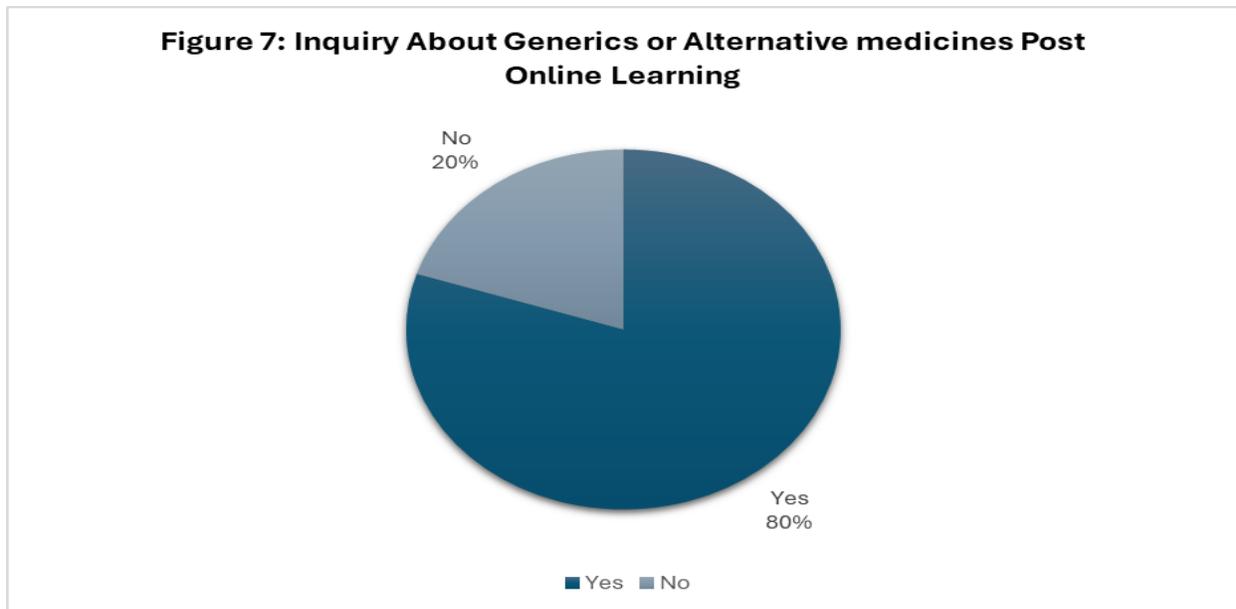
- It shows that respondents are finding alternate medicines after getting knowledge from E pharmacies.
- 4 out of 5 consumers are now exploring the cost-saving or composition-based alternatives offline.

Table 8: Factors Influencing Buying at Retail Chemist Shops:

Factor	Frequency	% of Respondents
Fast Availability of Medicine	200	100.00%
Price	152	76.00%
Pharmacist's Advice	90	45.00%
Discounts/Offers	111	55.50%
Brand	98	49.00%
Good relations with the chemist	92	46.00%

Source: Author's own work

Figure 8: Factors Influencing Buying at Retail Chemist Shops
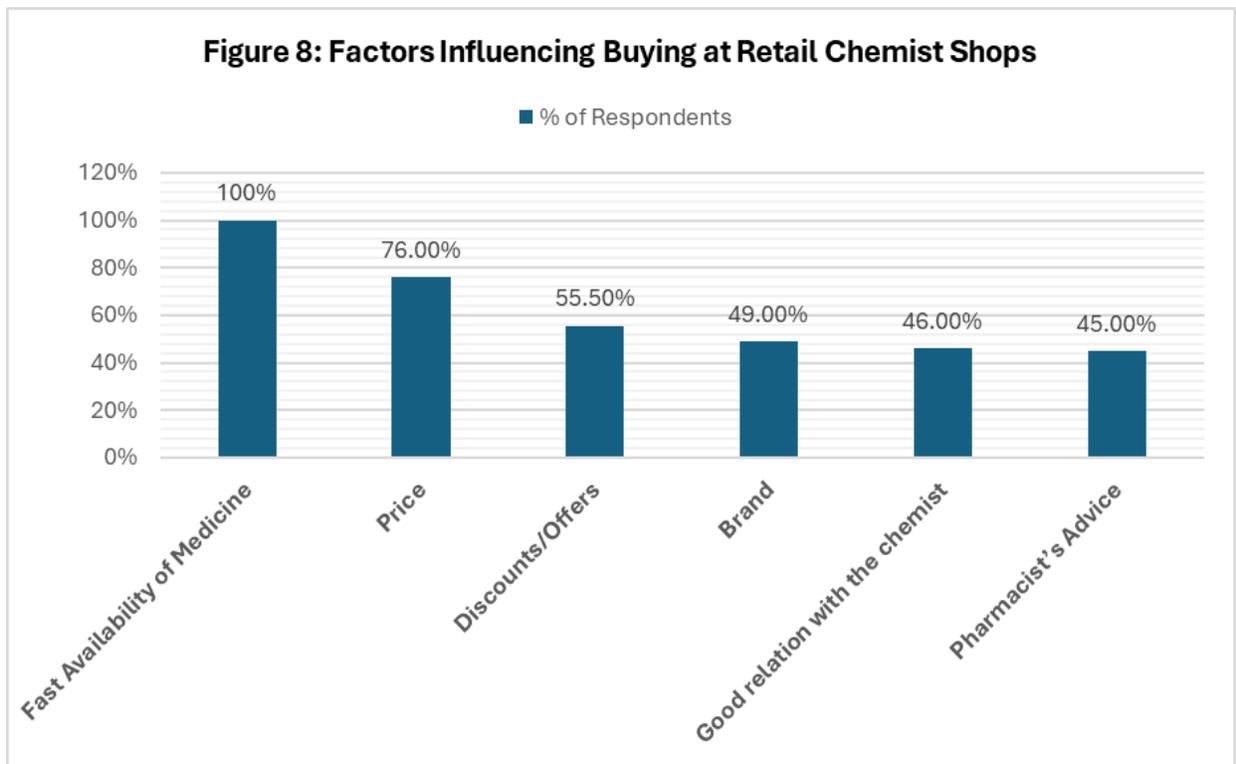
- Availability of medicines is the top priority for everyone, maybe because of urgency of use.
- Price and discounts are almost equally important for consumers.
- Pharmacist advice and relationship carries influence on offline purchases.

Table 9: Satisfaction with E-Pharma Information:

How satisfied are you with the information provided by e-pharmacy portals?	Frequency	Percentage
Satisfied	130	65%
Neutral	40	20%
Very Satisfied	30	15%

Source: Author's own work

Figure 9: Satisfaction with E-Pharma Information
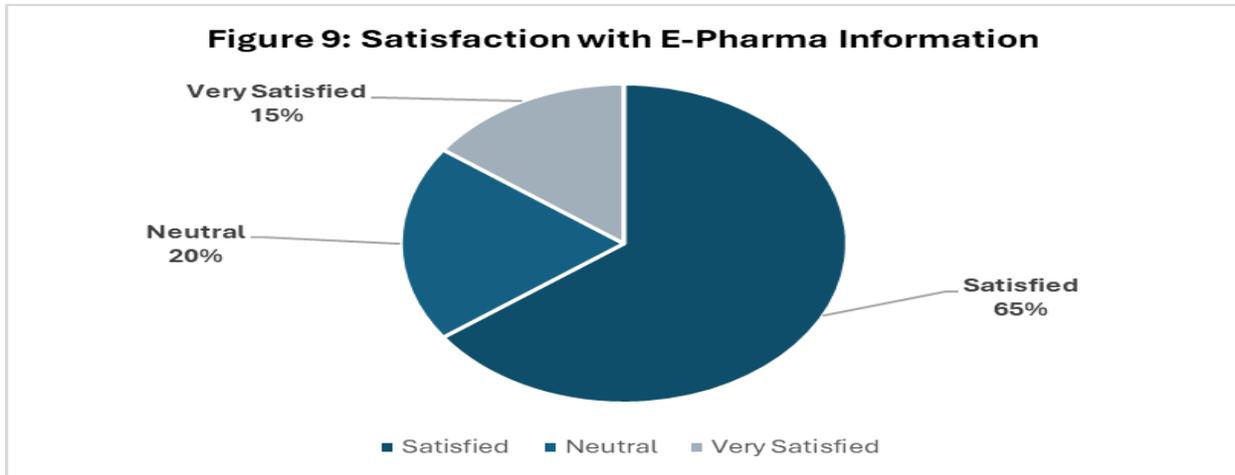
- 80% express satisfaction with online drug information. It shows the trust of consumers in E-pharmacy Platform's content.

Table 10: Improvement in Interaction with Pharmacist after gaining knowledge from e-pharma portals:

Have you experienced better conversations with your pharmacist after gaining knowledge from e-pharma portals?	Frequency	Percentage
Yes	195	97.50%
No	5	2.50%

Source: Author's own work

Figure 10: Improvement in Pharmacist Interaction after gaining knowledge from e-pharma portals
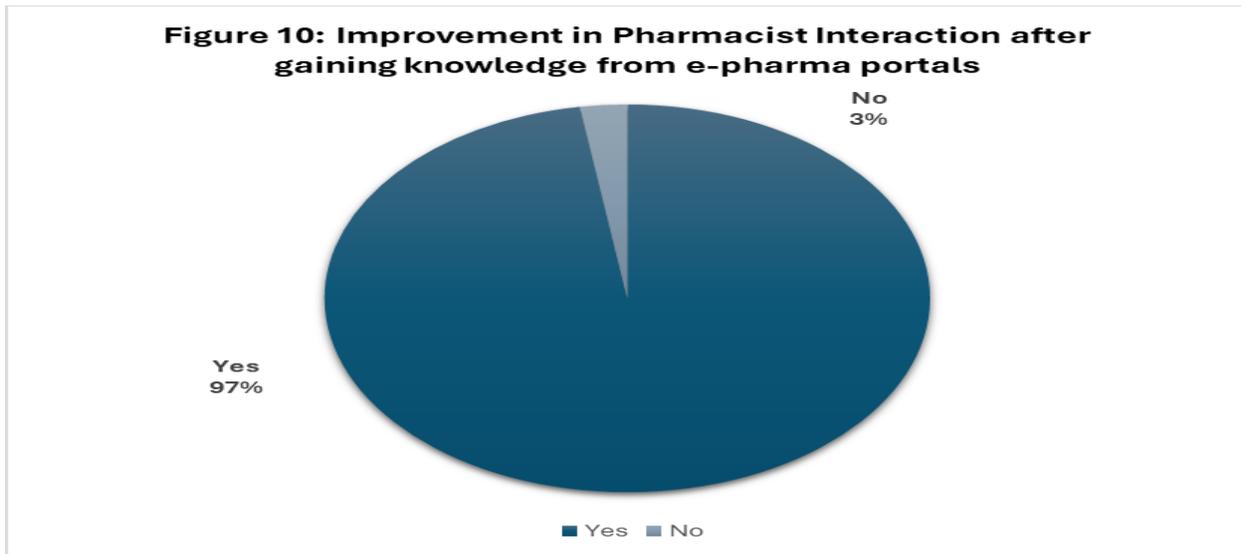
- A large number of respondents believe that they are able to communicate perfectly with pharmacist after getting knowledge from E-pharma Portals.

VII. HYPOTHESIS TESTING

The hypothesis is tested using One-proportion Z-test.
7.1. Change in Buying Behaviour (Yes: 98, Somewhat: 67, Total Changed: 165 / 200)
Proportion = 165 / 200 = 0.825

Let's test if 82.5% is significantly higher than a neutral 50%.

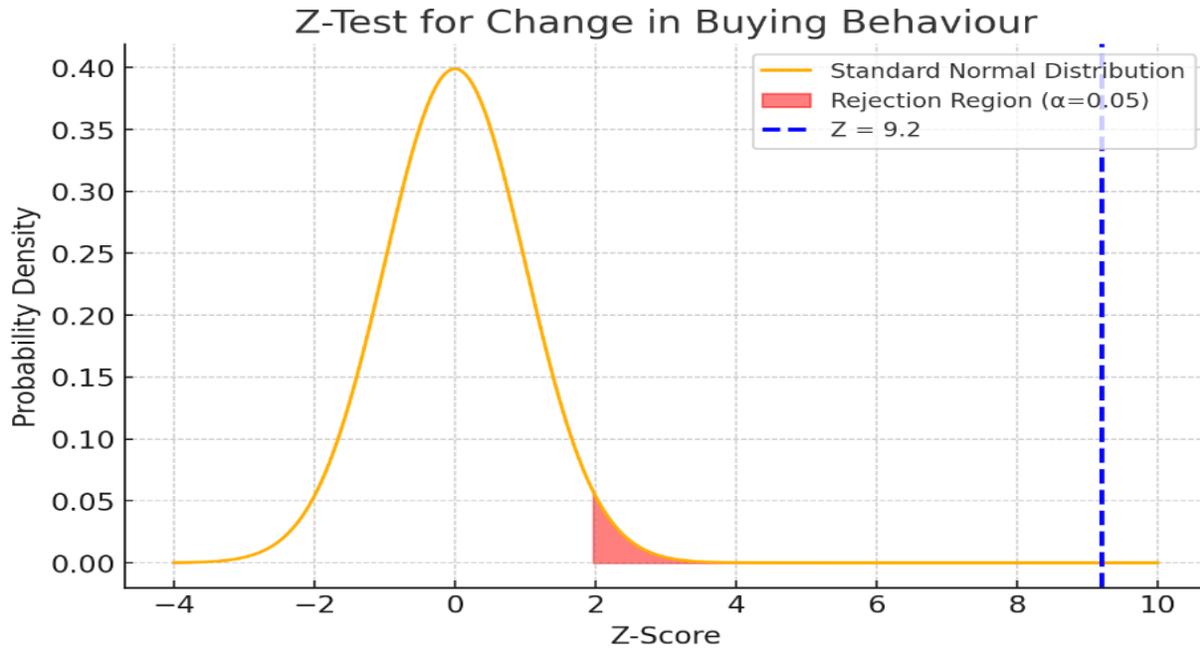$$Z = (\hat{p} - p_0) / \sqrt{[p_0(1 - p_0)/n]}$$

Where:

- $\hat{p} = 0.825$
- $p_0 = 0.5$
- $n = 200$

$Z = (0.825 - 0.5) / \sqrt{[0.5 * 0.5 / 200]} = 0.325 / 0.03536 \approx 9.2$
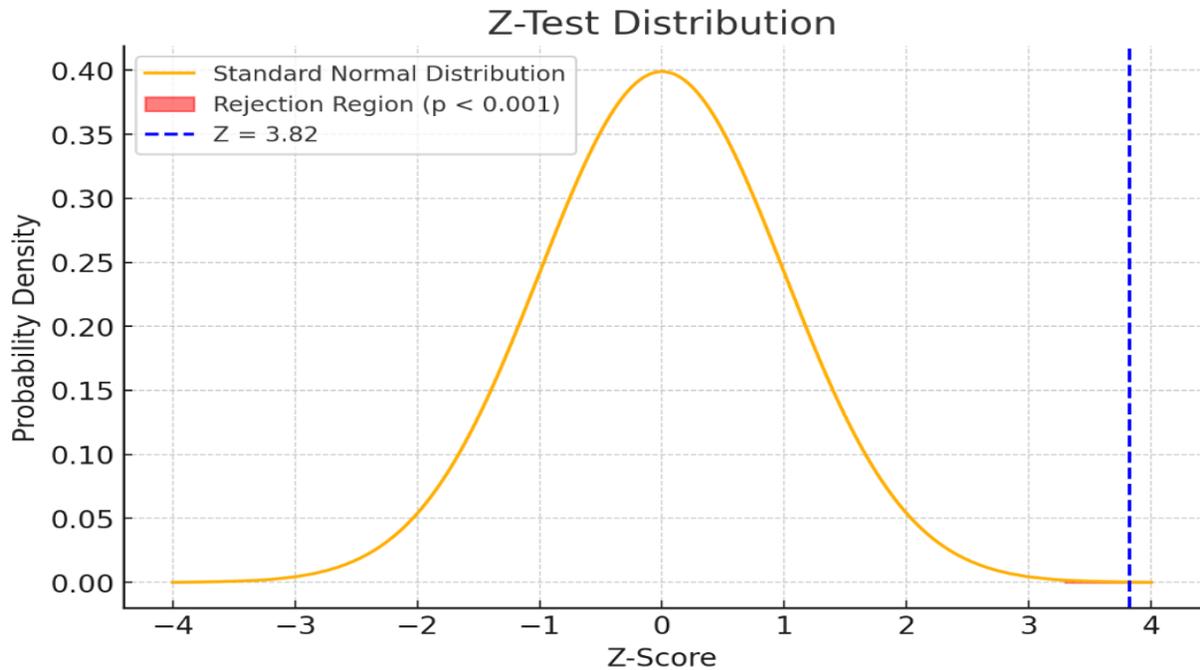
p-value ≈ 0

Conclusion: Statistically significant. Reject H_0.

Figure 11: Z-Test for Change in Buying behaviour

7.2: Preference for Specific Brands (Yes = 127, Proportion = 0.635)

$Z = (0.635 - 0.5) / \sqrt{[0.5 * 0.5 / 200]} = 0.135 / 0.03536 \approx 3.82$

Conclusion: Significant. $p < 0.001$. Reject H_0.

Figure 12: Z-Test for Preference for Specific Brands

7.3: Asking Chemists for Discounts (Yes = 163, Proportion = 0.815)

$Z = (0.815 - 0.5) / 0.03536 = 8.9$

Conclusion: Highly significant. Reject H_0.

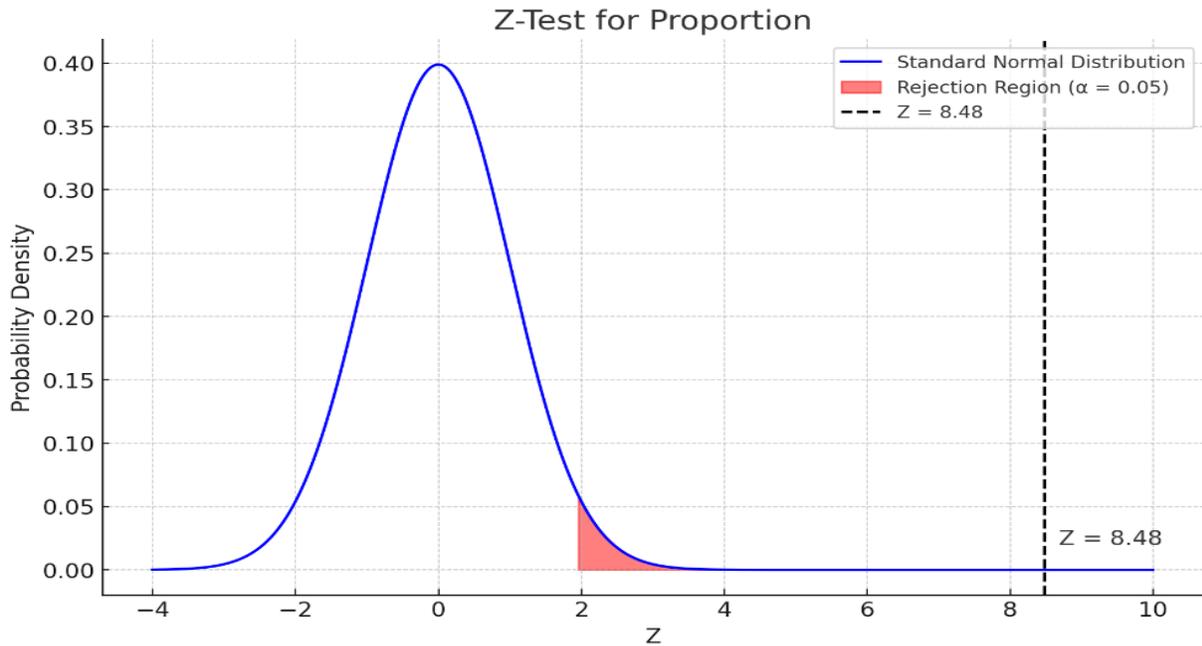Figure 13: Z-Test for Asking Chemist for Discount
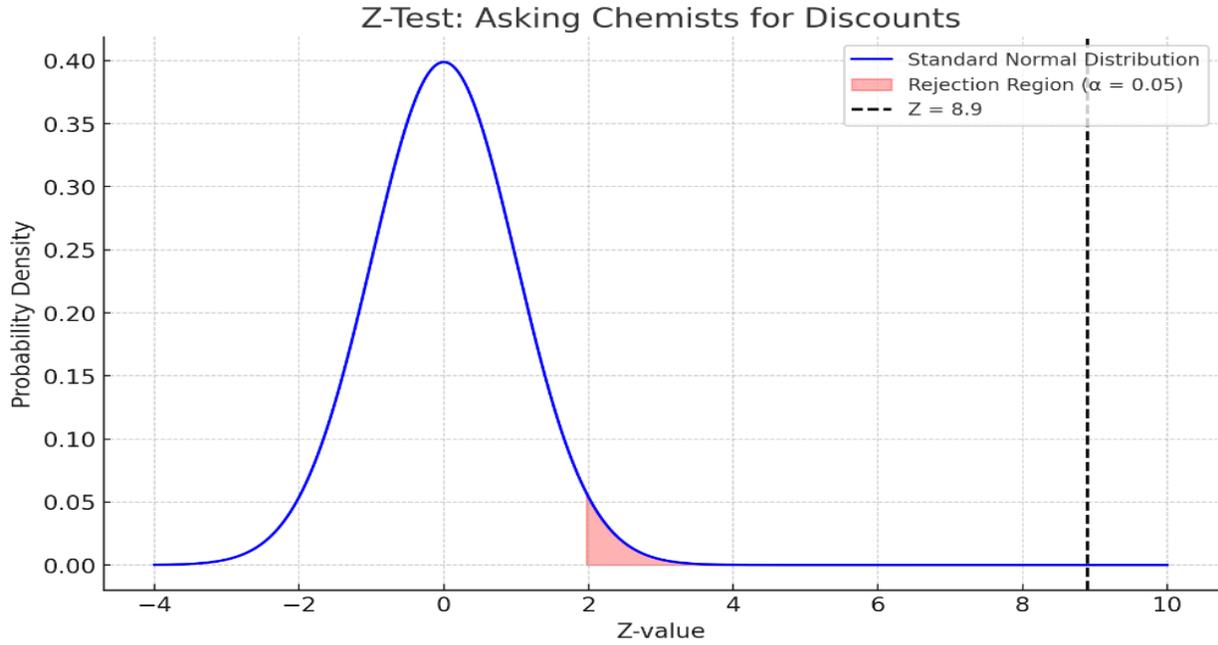
7.4: Inquiring About Generics (Yes = 160, Proportion = 0.80)

$Z = (0.80 - 0.5) / 0.03536 = 8.48$

Conclusion: Highly significant. Reject H_0.
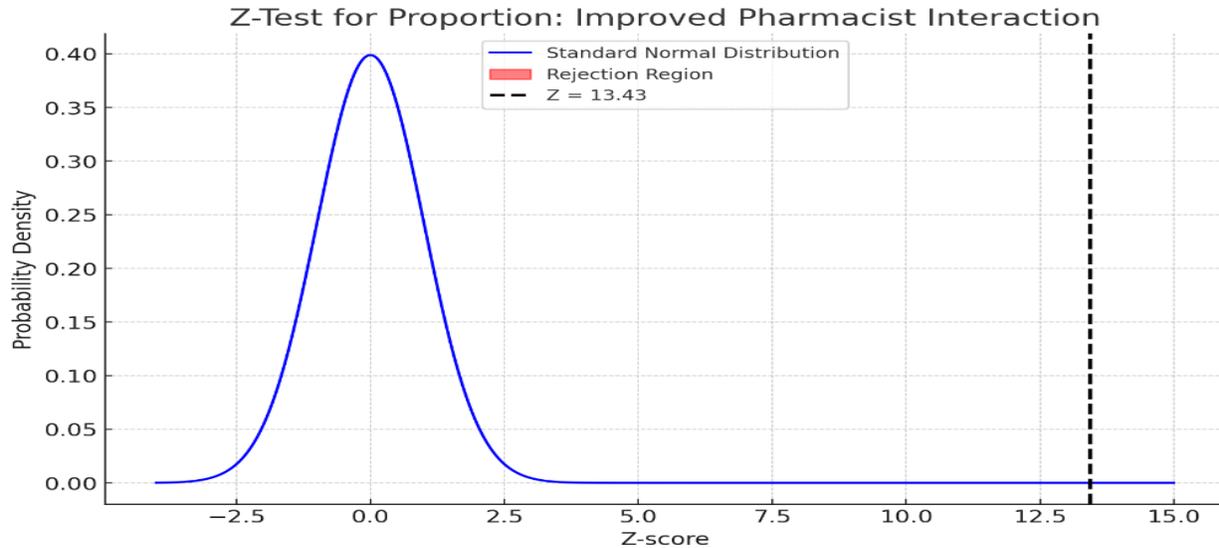
Figure 14: Z Test for Inquiring About Generics

7.5: Improved Pharmacist Interaction (Yes = 195, Proportion = 0.975)

$Z = (0.975 - 0.5) / 0.03536 = 13.43$

Conclusion: Extremely significant. Reject H_0.

Figure 15: Z-Test for Improved Pharmacist Interaction

Z-Test for Proportion: Improved Pharmacist Interaction

Interpretation:

- All behavioural change variables, such as price comparison, discounts, brand preference, pharmacist conversation, etc show a statistically significant increase.
- The p-values are very small. This supports strong evidence against the null hypothesis.

We reject the null hypothesis (H_0) based on the above analysis.

There is statistically significant evidence to support that E-pharmacies in India influence the offline purchasing behaviour of pharmaceutical consumers.

VIII. SUMMARY OF KEY FINDINGS

The results of this research paper indicate that consumer behaviours are changing because of advancements in e-pharmacy. Also the respondents, who were largely from 18 to 45 years of age and from urban and semi-urban locations are using e-pharma portals. The leading reason for using e-pharma portals was to obtain information on medication (71.5%), demonstrating a popular trend toward self-learning. In addition to obtaining information, more than half of users used the platform to purchase online (58%), compare prices (55.5%), and look for offers or discounts (55.5%). According to the responses only 32% accessed features like suggesting alternative medicine, which suggests users may not be adequately utilizing the e-pharma portal.

The important impact of the e-pharmacy usage is in behavioral changes to traditional retail purchasing behaviour. The research responses shows a clear shift in buying behaviour after using e-pharmacy platforms. Nearly half (49%) of the respondents reporting a clear shift and 33.5% indicated a partial shift. This suggests that over 82% of respondents have had an aspect of change in how they buy medicines from retail chemists. The shift towards new behaviours also includes engaging in new practices, such as checking prices before the purchase (92%), checking medicine details such as composition and dosage (78%), and asking about generic alternatives (37%) or different brands (44.5%). While a number of respondents indicating that they have made bulk purchases (19%) or made a slight shift towards online purchasing (21%). These percentages still suggest indications of behaviour change were taken place, possibly constrained by concerns of convenience, trust, and immediate need.

E-pharma portals have also been instrumental in shaping brand preference and price sensitivity. Approximately 63.5% of users now prefer specific medicine brands following online exposure to that brand, indicating a significant effect of online content, ratings, and quality assessments. Moreover, 81.5% of respondents indicated that they have started to ask for discounts from retail chemists after comparing their prices online resulting in a greater degree of consumer assertiveness. Armed with transparency in information access, e-pharmacy portals have increased consumer price sensitivity. While it is difficult to separate whether a general increase in consumer education and awareness of pharmacy choices and pharmaceutical costs is solely attributable to e-pharmacy portals.

It is worthwhile noting that 80% of respondents now tend to specifically ask for generic medicines or an equivalent brand of generic medicines to what they were previously exposed to online. Consequently, these users are now champions of greater knowledge (and a CHF Act-like knowledge) and are making smarter, value-based decisions when purchasing their medicines in person.

When looking at the reasons consumers choose to shop at a physical chemist shop, and the fast availability of medicines was the most important reason, as it was cited by 100% of participants. The next most important rationale was price (76%), followed by discounts and offers (55.5%), the advice from the pharmacist (45%), preferred brands (49%) and the relationship they have with the chemist (46%). This data indicates that while the online/digital environment has some influence on a purchaser's decision, off-line purchasing still relies on the immediacy of access and personal interaction—particularly in areas that are regarded as semi-urban.

Satisfaction levels for e-pharmacy portals appear positive with 80% of participants reporting that they are either satisfied or highly satisfied with the information they are given. However, only 15% of users recorded their experience as "very satisfied," suggesting there may be room for e-pharmacy stakeholders to convert some of these users to the "very satisfied" group. Overall, there are great levels of satisfaction with e-pharmacy platforms, and the knowledge that users are gathering from these portals is positively affecting offline interactions: 97.5% of respondents said that prior to using e-pharmacy platforms, their conversation with pharmacists was more productive. This indicates to us that e-pharma platforms do not replace the existing channels, but instead complement them by providing users with the information they need to interact with some level of informed discussion.

Overall, e-pharmacy platforms have the ability to create a new type of pharmaceutical consumer, one who is digitally informed, price-savvy, more involved in the management of their health. Overall, online platforms have empowered consumers and changed behaviours. While there are effective uses of online platforms, due to immediacy, trust and personal nature of drug consumerism, the offline chemist retains its strong hold over pharmacy consumers. These two channels sit beside each other and most likely encourage a more informed and empowered health care consumer.

IX. RECOMMENDATIONS

Based on above findings, following recommendations can help the specified stakeholders.

9.1 Recommendations for Pharmacists and Retail Chemist Shops

Retail pharmacists find themselves in an enviable position where they can use their skills to engage with knowledgeable consumers who are also price sensitive, and as the survey indicates, for example, 92% of respondents are now checking prices before they purchase. Moreover, 80% of respondents reported asking their pharmacist for a discount after observing supermarket prices online. Therefore, it is important for chemists to improve price disclosure. Pharmacists can maintain their customers if they can match the price or develop alternative flexible discount provisions. Moreover, the pharmacist can support their customers and educate them. 78% of respondents are checking the details of the medicines they are purchasing and 80% are asking about generics or alternative brands. Most importantly the pharmacist can differentiate themselves from segment competitors by delivering informed advice and being involved when each consumer chooses alternatives and generics especially around composition and affordability.

Personal relationships will remain another element of competitive advantage, particularly in semi urban places. Personalize the service, reminder on refills, track history or provide wellness advice will allow chemists to strengthen relationships with individual customers further.

The next step for pharmacies is to train pharmacy staff to recognise and engage with put empowered consumers into their shops, who come in with all of their digital intelligence. Recognising this change and then managing it will be necessary if pharmacy wishes to remain relevant in the digital age.

9.2 Recommendations for Digital Marketers in Pharma and E-Health

Digital marketers must concentrate on embedding the basic motivators driving consumers to e-pharmacy websites, price savings, convenience, and trusted information. With 81.5% of consumers seeking discounts and 63.5% of consumers having a brand

preference based on prior online research, campaigns should focus on value, affordability, and points of differentiation for each brand. It is pertinent to deliver educational content, especially with medicine used, benefits, side effects, and other generic alternatives prohibiting the free and informed choice. Educational blogs, videos, and FAQs, as well as tailored interactive tools to inform consumers, are most likely to improve their buying circumstances.

Moreover, digital platforms must be easy to use. Younger, urban consumers lead in e-pharma usage, so it is wise to make processes easy and accessible on mobile devices. Digital marketers should think about localizing content as well by regimenting multiple regional languages, so consumers can both reach out to a broader audience and get consumers to engage further with your content. User satisfaction and overall brand loyalty can also happen by using personalized algorithms that any loyal customer may benefit from when reviewing their future browsing and buying patterns.

9.3 Recommendations for Pharmaceutical Companies
Pharmaceutical manufacturers are presented an opportunity to interact directly with consumers through digital channels and shape the perceptions that customers form about their brands. Over 60% of users develop brand preferences using online methods, and therefore these organizations should work with e-pharmacy suppliers to increase visibility and ensure that product information is accurate and easily understood. Providing digital educational collateral in the form of visuals guides, dosage explainers, and comparison charts is a great way to help both pharmacists and end-users to make informed decisions.

There is also a great interest in generics and alternatives (80%) among consumers, making it important for pharmaceutical companies to promote the value and efficacy of their own generics. Distinguishing those products, and dispelling myths about generics will help build trust for their products and expand their market share. Additionally, the companies need to pursue developing their OTC product portfolio in the digital marketplace, as it is here that autonomy is at its highest and interest in decision-making based on price is the highest.

9.4 Recommendations for Government and Regulatory Authorities
Governments and regulatory agencies play a crucial role in developing a safe and effective pharmaceutical ecosystem that involves both digital technology and consumer confidence. The government will need to create a basis for standardization and regulation of the information given on e-pharmacy platforms. Clear direction and standardization of the data on e-pharmacy platforms concerning medicine information - dosage, side effects, generic equivalents, etc. may improve the quality and accuracy of the information, which will also provide consumer protection.

Additionally, any recommendation regarding the use of e-pharmacy platforms should include digital health literacy. Public awareness campaigns aimed at semi-urban and rural populations should be developed to enable people to use e-pharma platforms safely and confidently. These campaigns could provide public education relating to identifying e-pharmacy platform reliability, functionality of medicine labels, and price comparison. Hybrid models that include the local chemist within the e-commerce ecosystem for last-mile delivery and/or vetting could also promote increased safety and efficiency of the health eco-system. Additionally, the government should actively promote the use of generic drugs by initiating national promotional campaigns and creating a standard of generic prescribing, which should be mandated in all healthcare facilities.

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