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A Study on the Changing Consumer Attitude and Perception Towards E-Pharmaceutical Services During the COVID-19 Pandemic

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***Abstract*: This study aims to explore the attitude of the respondents towards the evolving change in preference to e-pharmaceutical services during the covid-19 pandemic. With social distancing becoming the norm, "contactless" has become the "new normal" buzzword. No industry is immune to this disruption, including healthcare, where the need to move away from in-person doctor-patient-pharmacy interactions and more towards digitally powered online consultations has become critical. The objective of the study is to assess the transition of the Indian healthcare system to e-pharmaceutical services as a result of disruptions, opportunities, and challenges associated with it during the COVID-19 Pandemic. The determinants identified are price of the services, accessibility to e-pharma stores and changing consumer lifestyle. The survey was conducted among 163 individuals from different age groups. The data collected was analyzed by using IBM-SPSS software wherein tests such as Correlation test, One-Way Anova test, Regression and CronBach Alpha test were conducted.**

***Keywords*: E-pharmacy, Consumer Attitude, Consumer Perception, COVID-19 Pandemic, Online Pharmacy, Digital Healthcare, Consumer Behavior, Telemedicine.**

1. Introduction

Over the past year, the world has faced a deadly pandemic and lived through an unexpected economic shutdown. World-over, central banks have been flushing the economy with unprecedented levels of liquidity. And just days before the world marks a year since the first lockdowns came into effect, reports have shown that the global economy is on track to make a faster-than-expected recovery.

The business of medicine-making has for long remained immune to the ups and downs of business cycles, priding itself as a defensive sector that is firmly anchored on the premise that as long as people are sick medicines will be in demand. But the coronavirus, different from the pathogens of the past, has affected some fundamental shifts in the way the pharmaceutical industry is perceived, operates and will build its future growth.

Indian pharmaceutical sector supplies over 50% of the global demand for various vaccines, 40% of the generic demand for the US and 25% of all medicines for the UK. India contributes the second largest share of the pharmaceutical and biotech workforce in the world. India's domestic pharmaceutical market turnover reached Rs. 1.4 lakh crore (US$ 20.03 billion) in 2019, up 9.8% y-o-y from Rs. 1.29 lakh crore (US$ 18.12 billion) in 2018. In May 2020, pharmaceutical sales grew 9% to Rs. 10,342 crores (US$ 1.47 billion).

During December 2019, on moving annual total (MAT) basis, industry growth was at 9.8%, price growth was at 5.3%, new product growth was at 2.7%, and volume growth was at two%.

Indian drugs are exported to more than 200 countries in the world, with the US being the key market. Generic drugs account for 20% of the global export in terms of volume, making the country the largest provider of generic medicines globally. It is expected to expand even further in the coming years. The Indian pharmaceutical exports, including bulk drugs, intermediates, drug formulations, biologicals, Ayush & herbal products and surgical, reached US$ 16.28 billion in FY20. As of October 2020, India exported pharmaceuticals worth US$ 13.87 billion in FY21. Pharmaceutical exports from India stood at US$ 16.28 billion in FY20 and US$ 2.07 billion in October 2020.

Medical devices industry in India has been growing 15.2% annually and is expected to reach US$ 8.16 billion by 2020 and US$ 25 billion by 2025.Affordable medicines under Pradhan Mantri Bhartiya Janaushdhi Kendra's (PMBJKs) achieved an impressive sale of Rs. 100.40 crore (US$ 14.24 million) in the first two months of FY21.

'Pharma Vision 2020' by the Government's Department of Pharmaceuticals aims to make India a major hub for end-to-end drug discovery. The sector received cumulative Foreign Direct Investment (FDI) worth US$ 16.54 billion between April 2000 and June 2020. Under Union Budget 2020-21, allocation to the Ministry of Health and Family Welfare stands at Rs. 65,012 crores (US$ 9.30 billion), whereas, Rs. 6,429 crores (US$ 919 million) have been allocated to health insurance scheme, Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY). In November 2019, the cabinet approved the extension/renewal of extant Pharmaceuticals Purchase Policy (PPP) with the same terms and conditions, while adding one additional product, namely Alcoholic Hand Disinfectant (AHD), to the existing list of 103 medicines till the final closure/strategic disinvestment of pharma CPSUs.

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Government expenditure on healthcare increased to Rs. 3.24 lakh crore (US$ 45.96 billion) in FY20, growing at a CAGR of 18% from FY16. As per Economic Survey 2019-20, Government expenditure (as a percentage of GDP) increased to 1.6% in FY20 from 1.2% in FY15 for health. FDI increased to 74% in existing pharmaceutical companies and 100% in new projects. India plans to set up a nearly Rs. 1 lakh crore (US$ 1.3 billion) fund to provide a boost to companies to manufacture pharmaceutical ingredients domestically by 2023.

The industry saw a sudden surge in popularity during the covid- 19 pandemic which peaked from March till December 2020. As several industries such as petroleum, retail, hospitality etc. failed to an unrecoverable extent the past year, the pharmaceutical industry took a big turn. The increasing fear and paranoia among consumers over the highly infectious disease benefitted the 1.25 trillion-dollar industry. In the crucial market of the US, which accounts for 30% to 40% of total revenues of most leading Indian pharma companies – the likes of Sun Pharma, Dr Reddy's, Lupin, Zydus Cadila among others, severe price erosion has been a problem for a few years now. This is now stabilizing. The pandemic has also triggered a lower acceptance of China as the sole supplier and retaining its world's factory status. For instance, according to news reports, Mexico is trying to reach out to half a dozen leading Indian pharma companies to help set up its own pharma supply chain.

Today, it is not unusual to find even a squishy-minded business executive extolling the virtues of a "China plus one" business strategy on supply of medicines. This could be a long-term positive development for Indian pharma companies, especially those that produce APIs (active pharmaceutical ingredients or bulk drugs) or the key starting materials (KSMs in short).

India has also embarked on this journey, though some would argue it is rather late having given up the edge to China, especially in fermentation-based medicines such as certain antibiotics (like penicillin G) and select vitamins, for which India is totally dependent on China.

As compared to price erosion running into the mid-teens two years back, it is now down around 3 to 5%. Also, demand for medicines today is guided more by concerns around supply security than on incremental price discounts.

The COVID-19 market in India based on market sources, is today worth around Rs 2,700 crore. These include medicines like azithromycin, paracetamol, hydroxychloroquine, methylprednisolone, remdesivir and favipiravir. This is even as more Indian companies are dipping their toes in new COVID antidotes. The pureplay pharma companies Dr Reddy's taking to vaccine-making is a case in point.

Data collated by AIOCD AWACS, for the 12-month period ended September 2020 show a growth rate in the Indian pharma market down to 3.5% from 9.7% posted in the 12-month period ended March 31, 2020.

Explaining the numbers, Rakesh Dave, president at AIOCD AWACS, a leading Indian pharmaceutical market research organization, said the acute therapy segment – medicines for cold, cough, anti-infectives or antibiotics and related medicines that make up for nearly 50% of the total Indian pharma market sales, took a big hit and saw a sharp decline in growth between these two periods led by slipping growth rate in the anti-infectives from 10.3% for the 12 months ended March 2020 to a de-growth of 0.7% (-0.7 %) for the 12 months ended September 2020."

The internet has taken over the world in all aspects. Not sparing any field, it is not surprising that even pharmacies have gone online. An online pharmacy refers to a business organization that is involved in sale of pharmaceutical preparations like non- prescription and prescription-only drugs, by ordering them online and delivery through mail. About 32,500 online pharmacists working worldwide aims to promote public health by legal framework of the country and thus fulfils the successful vision of Digital India.

An E-Pharmacy is a pharmacy that operates over the internet by selling drugs, medicines & sending them to the customers. Internet making all things easy & convenient. Patients can now buy prescriptions from registered medical practitioners, order the medicines via use of the internet & receive them at their own doorsteps. They are a massive hit & more and more people are opting to use them rather than stroll down to local pharmacies.

How does an E -Pharmacy model work?

1. Mobile-based application for consumers to upload the scanned copy of their prescriptions and place requests for medicines.
2. Every order that is received to be verified and checked by a team of registered pharmacists.
3. The registered pharmacists to forward the validated prescriptions to the pharmacy store from where the medicines are dispensed.
4. The web or mobile-based platform to be governed under the IT Act 2000 and only act as a platform to facilitate connection between consumer and pharmacy stores. The IT Act 2000 applies to companies that do business in India. This includes entities registered in India, outsource there, and maintain servers within the country's borders. The act covers all activity involving online exchanges and electronic documents. If your only connection with India is having customers there, you are not held to the IT Act.

The general benefits that a consumer would enjoy by using e-pharma services are as follows:

1. *Convenience*: It is easy to order online medicines with prescription. Individuals who live great distances from a terrestrial pharmacy, the elderly, disabled persons, and those whose daily schedule includes additional hassles, all can benefit from the easy and fast purchasing of medicines online. Additionally, shipping charges are often less than the expense incurred from travel costs associated with a visit to a traditional pharmacy.
2. *Future Vision*: Under Digital India initiative, Jan Aushidhi Program the government takes initiative to create awareness & provide access to affordable medicines to the general public which compromises good quality drugs. The operating model of E-pharmacy which has mobile & web-based

applications, directly linked to inventory & dispensing existing at Jan Aushadhi Stores.

3. *Time Saving*: In just a matter of minutes, you can log into the internet, head over to an E-pharmacy website and buy any prescription medicine that you want. It takes less time and effort than travelling to your local pharmacy and having to wait in line for your medicine.
4. *Lower Price*: Drug shopping on the internet helps a buyer to save money. Several surveys conducted by research bodies have shown that as much as one third the price can be saved on prescribed medicines if they are bought online.
5. *Private & Confidential*: This is particularly helpful to people who find it hard to speak face to face with doctors & pharmacists. It is also helpful to people who feel as if they have very embarrassing or shameful situations like erectile dysfunction, acne, STD's, hair loss etc. They can order their products without feeling embarrassed or judged.
6. *Range of Choices*: E-pharmacy offers a great variety of options. They usually have larger stocks of drugs than a physical pharmacy.
7. *Drug Approval*: Most of these legal stores have a process of drug approval. They require a prescription from a personal physician, or at least offer a drug as a prescribed medication only after the consumer fills up a questionnaire. This questionnaire is reviewed by a doctor before the drug is dispatched.
8. *Medical Information*: Some online pharmacies provide useful information about medications and diseases as well as links to medical resources such as universities, government agencies, and health associations

The cons often faced by consumers using e-pharmaceutical services are as follows-

1. *Lack of Physical evaluation in place*: Since the internet makes it easy to sidestep the safety net, these online stores do not have any processes of medical supervision or physical evaluation in place. If at all there is any such process, these are not performed by a licensed health professional.
2. *Need of using the same Online Pharmacy all of the Time*: If you do not use the same online pharmacy all of the time, they may not be aware of any potential drug interactions, it can be difficult to find someone to answer any specific questions about medications you may have, it is not possible to get the prescription the same day and you lose the personal interaction.
3. *Some online Pharmacies don't Adequately Safeguard your Health*: By failing to require a prescription, you could take medication that is not appropriate for you. It could take patient to the extreme stages of sickness. PharmacyChecker.com- approved pharmacies must require prescriptions. Some illegal online drug stores deal with dangerous contaminated, counterfeit or outdated drugs that can lead to dangerous drug interactions.
4. *Some do not Adequately Protect your Personal and Financial Information*: It's important for pharmacy websites to publish their privacy policy, one that promises not to share your personal information with third parties. Online financial transactions should be secured through adequate use of encryption technology. Pharmacychecker.com verifies whether privacy is promised, and transmittal of financial information is secured

Social distancing and lockdown measures means that patients are relying more on the internet, and pharma companies can capitalize on this irrespective of the various cons that posed as a threat earlier.

With pharmaceutical giants focused on developing vaccines for eradicating the virus, the small-scale pharmaceutical industry was focused on supplying the consumers with medicines to cure symptoms of the novel coronavirus. The pharmaceutical industry is without doubt the most successful business of the past year. Through this study we are going to shed light on the small-scale pharma industry that fared well over the years. The Covid-19 pandemic has pushed pharma engagement further into the digital space and hence is the focus of the study.

2. Review of Literature

A. Review of Literature

During the COVID 19 Pandemic, the government of most countries imposed several lockdowns and restrictions in order to combat the spread of the virus. Various measures introduced, although necessary, led to changing perceptions and attitudes of consumers towards online shopping which had varying degrees of impact on the economy. With regard to purchase of medicines, although medical stores are classified as essential services and remained functioning throughout, the risk of contagion encouraged consumers to move towards e-pharmaceutical services, thereby these businesses being the major beneficiaries.

Fittler et al (2018) elaborated that the growth of the web has made healthcare items, such as medications previously accessible only on the advice of the doctor, readily available to patients and consumers through illicit or counterfeit medication practices. The paper aims to determine, by surveying p, the condition of Internet-related procurement and consumption of medication. This survey includes 245 people from 9 pharmaceutical companies from 5 cities. 8.3 percent of those surveyed havealready purchased medicinal products through the web, based on the findings of this survey, and 7.1 percent plan to in the near future. Among those who purchased drugs online between the ages of 18 and34, have high school or university education, and are typically males. Most respondents were not awareof the possible qualitative discrepancies between Internet-based medical products and in traditional pharmacies. These data reflect a clear warning, as growing attention must be sought towards routine patient care towards the issue of online acquired medicines

Singh et al. (2020) stated that the aim of e-pharmacy is to

build a nation with direct and tangible benefits for both patients and the industry. E-Pharmacy is an attractive model that is innovating the online healthcare program to develop and sustain tremendous demand in the future as well. In a recent survey study conducted, 76 percent of respondents said that e-Pharmacy is more convenient as opposed to the pre-COVID-19 19 buying process.

Chordiya and Garge (2018) describe that online pharmacies lack the personal touch that a traditional pharmacy provides. You won't be able to speak to a pharmacist about side effects or medication reactions like you would at a local pharmacy. The paper has clarified the benefits and drawbacks of E-pharmacies versus traditional pharmacies. They can be more convenient and less costly than conventional pharmacies, however one should still be aware of the risks associated with using an online pharmacy.

Shankar et al. (2011) states that customers now rely on social media sites such as Twitter, Facebook, Instagram and LinkedIn to make marketing consumer choices, so promotion across these platforms has become critical. Facebook, for example, is a much safer choice than other advertising processes because it retains information about its users. Web marketing has a number of advantages that can help them improve their efficiency.

Chakraborty and Satsang (2019) states that both online and offline pharmacies are licensed in the United States, but online pharmacies are only permitted to operate under certain conditions. In the case of online pharmacies, the Indian government must consider patient privacy and protection. They will teach ordinary citizens about the safest ways to buy medicines online. In the future, they will be able to include a list of approved/accredited online pharmacies. Without a question, E-Pharmacy increases customer convenience and access, which would help elderly patients with chronic illnesses who previously would have to necessarily visit a pharmacy to purchase medications.

V.P and Ashok (2019) point out that owing to technological advancements, the common man now has easy access to drugs through the Internet. Since the year 2000, the number of internet users in India has steadily increased. With the rapidly growing number of netizens, smartphone users, and patients, now is the best time for the E-pharmacy model to thrive. In India, the e-pharmacies industry is rapidly expanding, despite the lack of a clear regulatory framework. In an unstable and uncertain regulatory environment, the model's performance is not assured, but its graph is steadily rising. E-pharmacies are subject to a lack of proper and transparent legislation.

Yadav et al. (2020) mention in their research paper that E-pharmacy is a step forward in the health-care system in today's rapidly changing digital world. Physicians must stay current on new technology such as e-pharmacy, which is expected to become even more popular in the coming years. Telemedicine has previously been used on a much smaller scale. However, regulatory authorities in India and other countries have recently issued guidelines for physicians to use telemedicine in the current COVID-19 pandemic, where social distancing is needed and door-to-door drug distribution is possible.

Jawad and Ahmed (2018) state that While the majority of physicians in their sample use digital resources to varying degrees of success, there are still opportunities for advancement in digital marketing. Pharmaceutical companies must incorporate digital marketing campaigns in order to compete in today's highly competitive sector. Collaboration among companies, more regular case studies, the launch of mobile apps, the formation of information technology (IT) and e-marketing teams, an emphasis on computerization, and keeping physicians up to date with the new digital marketing tools are just a few of the suggested strategies.

Mackey and Liang (2013) analyses how in an age of free and open information sharing, digital forms of direct-to-consumer pharmaceutical marketing (eDTCA) have gone global. Nonetheless, the unchecked expansion of eDTCA has resulted in global public health risks that have gone unaddressed. Illicit online pharmacies, in particular, sell products that are allegedly safe and legal but are actually counterfeit or substandard. These fraudsters use available eDTCA mediums on the Internet to sell their questionable products around the globe. Despite these dangers, no comprehensive evaluation of public health, patient safety, or security hazards, as well as governance processes to resolve them, has been carried out.

Chaurasia et al. (2011) conclude in their research that despite the government's best efforts to protect the public through law enforcement, new websites appear on a regular basis. It is the duty of the user to use the Internet with caution and experience. Consumers who use the Internet as part of their pharmaceutical treatment process should follow certain guidelines. These recommendations include only using licensed pharmacies and consulting with your doctor before initiating any medication.

Thalkari et al. (2018) mention that internet pharmacies that engage in unlawful dispensing activities threaten the health of their customers. It is obvious that patients must be safeguarded from such questionable dispensing activities. Physicians and pharmacists can consider whether their patientsprefer drugs without a prescription, a face-to-face appointment, or a trip to their nearest pharmacy, andwhat legitimate and legal procedures the medical profession may learn from online pharmacies to strengthen the physician-patient relationship. When establishing guidelines, the protection of patients and the efficacy of the drugs should be prioritized.

Almutairi et al. (2018) concludes from their study that physicians' perceptions of e-prescribing systems in Kuwaiti primary healthcare centers were mostly positive, according to this report, particularly in terms of time savings, effectiveness, patient care quality, and protection. These findings endorse Kuwait's continued adoption and use of electronic prescription systems. However, some flaws in the functionality of e-prescribing schemes, as well as a lack of technological support and maintenance, werediscovered. Improvements in these areas can increase the effectiveness of such systems' adoption and usage.

Desai (2016) To combat any fraudulent practices, customers must be informed about the importance of verifying the legitimacy of both the service provider and the product, as well as avoiding places that offer drugs without a valid prescription.

Online pharmacies that are trustworthy have well-defined safety and quality standards, simple privacy and security policies, a verifiable physical address, and a licensed pharmacist on staff. Clinicians should become acquainted with a few trustworthy and legal online pharmacies that they can refer their patients to.

Henney (1999) states that of particular concern are websites wherein questionnaires are used to decide whether administering medications to patients who have never prescribed them before is acceptable. In contrast to the conventional relationship between a patient and his or her physician, many on-line practitioners give prescriptions to patients for the first time without a physical examination or some other kind of direct communication. As a result, patients are more likely to receive an ineffective prescription, increasing their risk of adverse effects and drug reactions.

3. Research Design

A. Research Problem

The Covid-19 pandemic presented a significant challenge to individuals across the globe, impacting numerous sectors and corporations. The study aims to understand the effect of the pandemic on a largely neglected market, the e-pharmaceutical service industry. Over the pandemic era, this sluggish, rising sector has taken a leap. The growing fear of infection and numerous other factors have led to the e-pharma service industry becoming increasingly common. 'Has there been any shift in the use of e-pharma services over the pandemic and what are the variables behind this sudden surge?' is the critical question the research study seeks to address.

B. Research Objectives

- To understand the attitude of the respondents towards the evolving change in preference to e-pharmaceutical services during the covid-19 pandemic.
- To determine the factors influencing consumer's perception and preference towards e-pharma services.
- To determine the significant factors that influence the frequency of usage of e-pharmaceutical services

C. Research Hypothesis

- H0- There is no impact of price paid for e-pharmaceutical servicesand the preference for these services among consumers.
  H1- There is an impact of price paid for e-pharmaceutical servicesand the preference for these services among consumers.
- H0- There is a significant difference between the demographic variable (age) of the consumer and preference for e-pharma services among consumers

H1- There exists no significant difference between the demographic variable (age) of theconsumer and preference for e-pharma services among consumers

- H0- There is no significant relationship between consumer lifestyle and the preference for e-pharma services among consumers

H1- There exists a significant relationship between consumer lifestyle and the preference for e-pharma services among consumers

D. Scope of the Study

This research study covers the review during the prevailing covid-19 pandemic of the changing customer attitude and perception of consumers towards e-pharmacy services. Although the understanding of the use of e-pharmacy services has been well established in the past, the changing attitude of consumers as a result of the prevailing pandemic is poorly understood. The aim of this study is to study the changes in the attitudes of consumers of different age groups as a result of different underlying factors, such as fear of contagion of the virus, restrictions on lockdowns across the world and increased availability of e-pharmacy service providers. The scope of the study covers 163 respondents currently residing in the southern states of Kerala, Karnataka, Tamil Nadu, Andhra Pradesh and Telangana. In order to determine their attitude and perspective towards using these resources and how they have changed over the duration of the pandemic, each volunteer to the study will be asked to complete a short questionnaire.

E. Research Methodology

Primary method of data collection was preferred. A questionnaire-based approach was adopted, using a 20-item questionnaire developed from the related literature on online pharmaceutical services and pandemic response. The survey was hosted on Google Forms and tested. The online questionnaire was sent through email to all prospective respondents that fall within the predetermined age group/ chosen location. Descriptive statistics on frequency distributions and percentages were used to analyze the given responses. Data were analyzed using Statistical Package for the Social Sciences (SPSS). The following tests were performed on SPSS to analyze the data and test the hypothesis -

1. Percentage Analysis
2. Regression test
3. Correlation test
4. Anova test

F. Source of Data Collection

The data for this research paper was collected through primary source. The data for this research paper was collected through a structured questionnaire to gather all the information, which is necessary for the research paper and answers the entire question, which is required for analysis.

G. Sampling Technique

Stratified sampling technique is used for the study. Stratified sampling is a type of sampling method in which the total population is divided into smaller groups or strata to complete the sampling process. The strata are formed based on some common characteristics in the population data. After dividing the population into strata, the researcher randomly selects the sample proportionally. While using stratified sampling, the researcher should use simple probability sampling. The population is divided into various subgroups such as age,

gender, nationality, job profile, educational level etc. Stratified sampling is used when the researcher wants to understand the existing relationship between two groups.

H. Sample Size

The sample size for the purpose of study includes individuals from varying age groups from the states of Kerala. Karnataka, Tamil Nadu, Telangana and Andhra Pradesh.

I. Limitations of the Study

- Online pharmacy use was self-reported, therefore, subject to recall bias and untruthful reporting by the individual, which may underestimate actual prevalence.
- In this research, legitimate and illegitimate actors are not distinguished, mainly because online sellers can deceive or cannot distinguish between customers.
- This research also comes with a geographic sample size limitation. The study was conducted in South India, and the questionnaire was sent to the southern states of Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and Telangana.
- The current situation of the e-retail pharmaceutical sector in India has been highlighted by this study. We have not addressed the increasing popularity of OTC (over the counter) drugs in e-pharmacies and their sales here in India.

4. Data Analysis

A. Percentage Analysis

Table 1
Table showing age of the respondents

Particulars	No. of Responses	%
Below 18	13	7.4
18-25	97	59.5
26-40	16	10.4
Above 40	37	22.7
Total	**163**	**100**

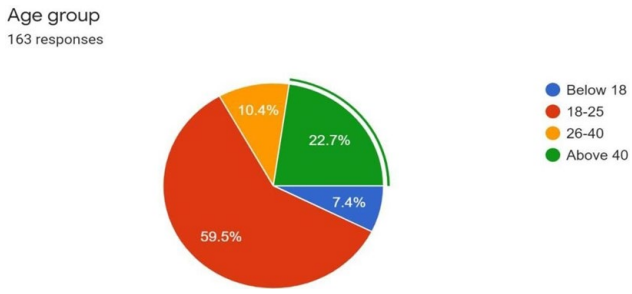

Fig. 1. Age of the respondents

Interpretation:

It can be interpreted that out of the total of 163 respondents, majority of the respondents are between the ages of 18 and 25. 59.5% of the people who filled this questionnaire are in the age bracket of 18 and 25. 22.7% of the people are above the age of 40. 10.4% of people are between ages of 26-40. The smallest number of respondents are below 18 years of age. They account for about 7.4% of the total respondents. From this, it is seen that respondents are from varying age groups. This helps get the perspective of people from all groups in this research.

Table 2
Table showing location of the respondents

Particulars	No. of Responses	%
Kerala	67	41.1
Karnataka	62	38
Tamil Nadu	18	11
Andhra Pradesh	6	3.7
Telangana	10	6.1
Total	**163**	**100**

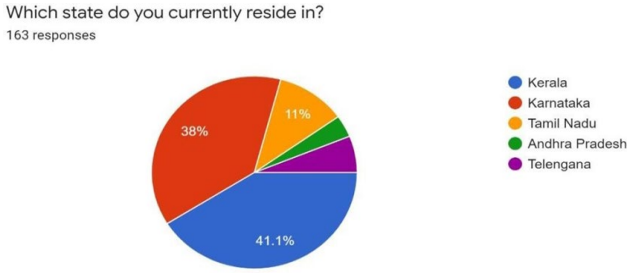

Fig. 2. The location of the respondents

Interpretation:

As this study was focused only in South India, out of the 163 responses received, 41.1% of the respondents were from Kerala, 38% from Karnataka, 11% from Tamil Nadu, 6.1% from Telangana and 3.7% from Andhra Pradesh.

Table 3
Table showing frequency of usage of e-pharmaceutical services

Particulars	No. of Responses	%
Once a week	8	4.9
Once a month	47	29.4
Once every 2-3 months	37	22.7
Once a year	21	12.9
Never used before	50	30.1
Total	**163**	**100**

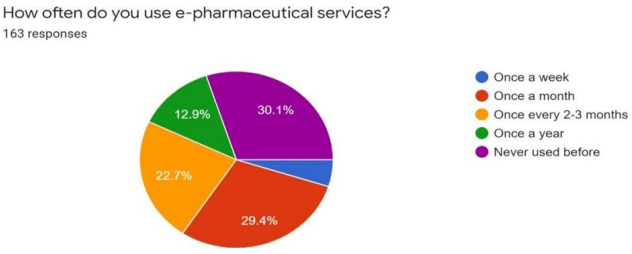

Fig. 3. The frequency of usage of e-pharmaceutical services

Interpretation:

Out of the 163 responses received, it is seen that only 4.9% of the respondents use these services on a weekly basis. 29.4% of the respondents use it monthly, 22.7% use it quarterly, 12.9% use it annually and the majority of the respondents have not used these e-pharmaceutical platforms.

Table 4
Table showing change in frequency of usage of e-pharmaceutical services

Particulars	No. of responses	%
Yes	68	41.7
No	69	42.3
Maybe	26	16
Total	**163**	**100**

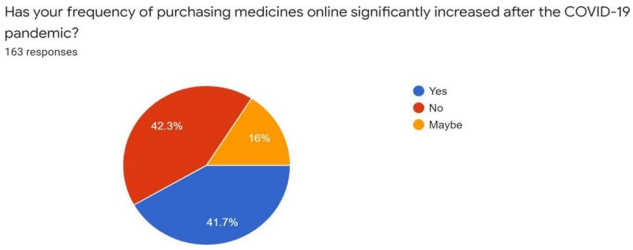

Fig. 5. The change in frequency of usage of e-pharmaceutical services during the COVD-19 pandemic

Interpretation:

Out of 163 respondents, 41.7% said that their purchasing pattern has seen an increase in frequency of usage as opposed to 42.3% that said the opposite. 16% of the respondents are unsure of their change in purchasing pattern.

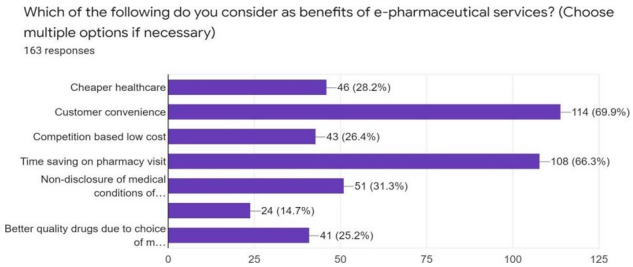

Fig. 6. Benefits of the e-pharmaceutical services as perceived by the respondents

Interpretation:

Out of the 163 respondents that participated in the study, it is seen that majority of the respondents, 70% (114 respondents) believe that the most important benefit of e-pharmaceutical services is the convenience it offers to its customers and time saving on pharmacy visit comes in at a close second with 66% of the respondents agreeing that it is an essential benefit of such services. 28.2% of the respondents believe that these services offer cheaper healthcare. 26.4% of the respondents agree that they receive lower prices. 31.3% of the respondents believe that an important benefit availed is non-disclosure of medical conditions. 25.2% of the respondents agree that they receive better quality drugs due to choice offered of medicines and lastly, 14.7% agree that e-pharmaceutical services controls illegal drug delivery and usage.

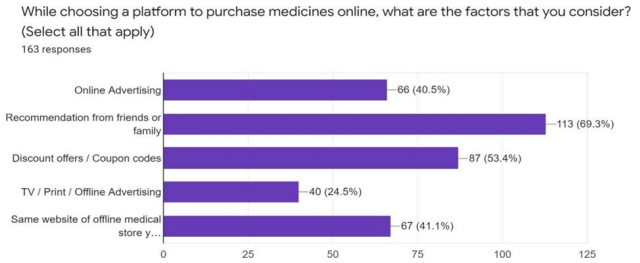

Fig. 7. Factors considered by respondents while choosing an e-pharmaceutical platform

Interpretation:

From the above bar chart, it is seen that out of the 163 respondents, the most crucial factor for selection of an e-pharmaceutical service is recommendation from friends or family as 69.3% of the respondents chose this option. 40.5% of the respondents believe online advertising is a crucial factor. 53.4% of the respondents agree that discount offers and coupon codes is a factor they consider while choosing a platform. 24.5% of the respondents mentioned that TV, Print and Offline Advertising is a factor, whereas 41.1% agreed that they choose a platform based on the same website of the offline medical store they are accustomed to.

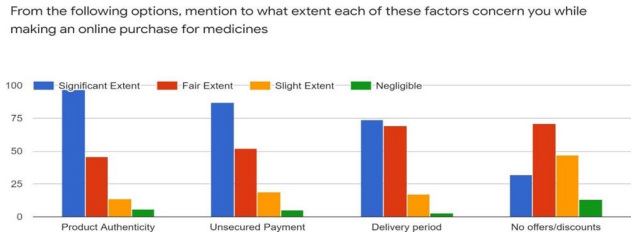

Fig. 8. Extent of various factors that concern the respondents while making an online purchase for medicines

Interpretation:

From the above chart, it can be inferred that the major concerns of the respondents are both, product authenticity and unsecured payment methods. In today's digital age, staying secure and keeping one's information safe should be of utmost importance. Delivery period is another factor that influences the respondents to a certain extent. It is seen that offers and discounts, as opposed to the other factors mentioned above, do not play a major role in purchasing decision making. This is

Table 5
Benefits of e-pharmaceutical services as perceived by respondents

Particulars	No. of responses	%
Cheaper Healthcare	46	28.2
Customer convenience	114	69.9
Competition based low cost	43	26.4
Time saving on pharmacy visit	108	66.3
Non-disclosure of medical conditions of individuals	51	31.3
Control of illegal drug delivery and usage	24	14.7
Better quality drugs due to choice of many brands	41	25.2

Table 6
Factors considered by respondents while choosing an e-pharmaceutical platform

Particulars	No. of Responses	%
Online Advertising	66	40.5
Recommendation from friends or family	113	69.3
Discount offers / Coupon codes	87	53.4
TV / Print / Offline Advertising	40	24.5
Same website of offline medical store you generally use	67	41.1

probably due to the reason that medicines are an essential commodity and therefore have inelastic demand. Change in price is not seen as a major contributing factor for the respondents while purchasing medicines online.

Table 7
The quality of service received from e-pharmaceutical services

Particulars	No. of Respondents	%
Poor	0	0
Fair	23	14.1
Good	73	44.8
Very Good	46	28.2
Excellent	21	12.9
Total	**163**	**100**

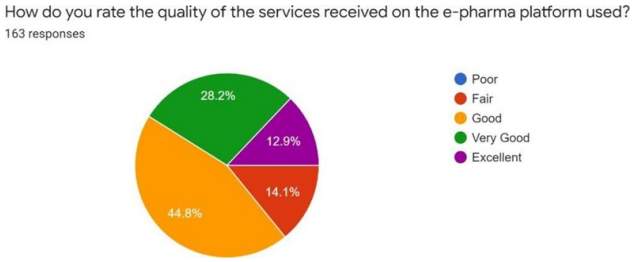

Fig. 9. The quality of service received from e-pharmaceutical services

Interpretation:

From the above graph, out of 163 respondents, majority of the respondents (44.8%) feel that the quality of service received by them is merely good, however, not very good or excellent. This shows that there is significant room for improvement from the e-pharmaceutical service side and these service offering platforms should work on improving the overall experience it provides to the purchasing party in order to attract more consumers.

Table 8
If respondents would permanently shift to using e-pharmaceutical services post the pandemic

Particulars	No. of Respondents	%
Yes	56	34.4
No	41	25.2
Maybe	66	40.5
Total	**163**	**100**

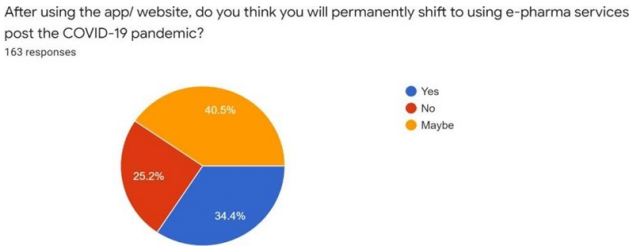

Fig. 10. If respondents would permanently shift to using e-pharmaceutical services post the pandemic

Interpretation:

From the above graph, it is seen that 34.4% are willing to make a permanent shift whereas 25.2% of the respondents are not willing to make a permanent shift. However, the majority of the respondents i.e., 40.5% are unsure if a shift would be made from offline medical pharmacies to online e-pharmaceutical services.

B. CronBach Alpha Test

A Cronbach alpha coefficient was calculated for the factors affecting preference of e-pharmaceutical services. The Cronbach's alpha coefficient was evaluated using the guidelines suggested by George and Mallery (2016) where > .9 excellent, > .8 good, > .7 acceptable, > .6 composite, > .5 poor, and ≤ .5 unacceptable.

Interpretation

Since the CronBach Alpha test results reflect a score of 0.716, which is between 0.7 and 0.8, it can be inferred that the reliability of the responses received are fairly acceptable and can be used for further tests and data analysis.

C. Regression

H0- There is no significant relationship between the price paid for e-pharmaceutical services and the preference for these services among consumers.

H1- There exists a significant relationship between the price paid for e-pharmaceutical services and the preference for these services among consumers.

Table 9
Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.716	.696	7

Table 10
Item statistics

	Mean	Std. Deviation	N
Medicines are cheaper through online pharmacies, especially during times like the pandemic.	3.558	1.0605	163
Additional delivery charges payable makes over the counter medicines more preferable	3.601	1.1682	163
Discounts and offers available on e-pharma websites/ apps has encouraged usage of pharmaceutical services	3.914	.9054	163
Limited access to pharmacy stores encouraged usage of pharmaceutical services during the pandemic	4.043	1.0022	163

Table 11
Regression analysis to test the relationship between prices paid for e-pharma services and the preference for services among consumers

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
1 (Constant)	1.402	.173		8.091	.000
Medicines are cheaper through online pharmacies, especially during time the pandemic.	.237	.047	.371	5.074	.000

Table 12
Regression analysis to test the relationship between access to pharmaceutical stores and the preference for e-pharma services among consumers

Coefficients					
	Unstandardized Coefficients		**Standardized Coefficients**		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1 (Constant)	1.630	.216		7.547	.000
Limited access to pharmacy stores encouraged usage of pharmaceutical services during the pandemic	.152	.052	.226	2.938	.004

Table 13
Regression analysis to test the relationship between consumer lifestyle and the preference for e-pharma services among consumers

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
1 (Constant)	1.477	.327		4.519	.000
Consumer lifestyle	.183	.077	.184	2.381	.018

Table 14
Anova test to check the relationship between demographic variable (age) and the preference for e-pharma services

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	10.007	3	3.336	8.264	.000
Within Groups	64.177	159	.404		
Total	74.184	162			

Interpretation:

As observed from the test results in Table 11, the regression significance 0.000 is lesser than 0.05, hence it can be inferred that the null hypothesis is rejected, and the alternate hypothesis accepted. Thus, it has been proved that there exists a significant relationship between the prices paid for e-pharma services and the preference for the services among consumers.

H0- There is no significant relationship between the access to pharmaceutical stores and preference for e-pharma services

H1- There exists a significant relationship between the access to pharmaceutical stores and preference for e-pharma services

Interpretation:

Since the significance value of the regression test 0.004 lesser than 0.05, it can be inferred that the null hypothesis is to be rejected and alternate hypothesis is to be accepted. Thus, the test results from Table 12 proved that there exists a significant relationship between the access to pharmaceutical stores and preference for e-pharma services among consumers.

H0- There is no significant relationship between consumer lifestyle and the preference for e-pharma services among consumers

H1- There exists a significant relationship between consumer lifestyle and the preference for e-pharma services among consumers

Interpretation:

As observed from the Table 13, the regression significance value reflects 0.018 which is lesser than 0.05, it can be inferred that the alternate hypothesis is accepted, thus rejecting the null hypothesis. Hence the test results prove that there exists a significant relationship between consumer lifestyle and the preference for e-pharma services among consumers. The regression test gives the result that the dependent variable preference for e-pharma services is influenced by consumers' lifestyle.

D. One-Way Anova Test

H0- There is a significant relationship between the demographic variable (age) of the consumer and preference for e-pharma services among consumers

H1- There exists no significant relationship between the demographic variable (age) of the consumer and preference for e-pharma services among consumers

Interpretation

As observed from the test results in Table 14, the significance value of the Anova test is .000 which is lesser than 0.05, hence it can be inferred that the alternate hypothesis is accepted, and the null hypothesis is rejected. Thus, it has been proven that there exists a significant relationship between the demographic variable (age) and the preference for e-pharma services among consumers.

E. Correlation

Interpretation:

As per the correlation test results in Table 15, it can be interpreted that the 4 variables were identified as significant factors that influence the frequency of using e-pharma services during the covid-19 pandemic which are availability of cheaper medicines (Sig 0.012), discounts and offers available on the website. (Sig 0.000), limited access to pharmaceutical stores (Sig 0.000) and fear of contagion of virus (Sig 0.000)

5. Findings and Suggestions

A. Findings

1) Percentage Analysis

- Age group: Amongst the respondents, it is seen that the majority of the respondents, 60% are between the age group of 18-25 and this is the age group that is most likely to adopt new technology and therefore, the respondents for the questionnaire are ideal.
- Frequency of usage of service: Although the Covid-19 pandemic has changed the way we see the world, through this study it is evident that people are still quite apprehensive to make a complete shift from traditional pharmacy stores to e-pharmaceutical services. it is seen that 30% of the respondents have

Table 15
Correlation test

		frequency of purchasing medicines online	**Medicines are cheaper through online pharmacies**	**Discounts and offers available on e-pharma websites/ apps**	**Limited access to pharmacy stores**
frequency of purchasing medicines online	Pearson Correlation	1	-.202*	-.288**	-.351**
	Sig. (2-tailed)		.012	.000	.000
	N	153	153	153	153
Medicines are cheaper through online pharmacies,	Pearson Correlation	-.202*	1	.397**	.099
	Sig. (2-tailed)	.012		.000	.207
	N	153	163	163	163
Discounts and offers available on e-pharma websites/ apps	Pearson Correlation	-.288**	.397**	1	.392**
	Sig. (2-tailed)	.000	.000		.000
	N	153	163	163	163
Limited access to pharmacy stores	Pearson Correlation	-.351**	.099	.392**	1
	Sig. (2-tailed)	.000	.207	.000	
	N	153	163	163	163
Fear of contagion of the virus has led you to use e-pharmacy services	Pearson Correlation	-.307**	.015	.293**	.506**
	Sig. (2-tailed)	.000	.850	.000	.000
	N	153	163	163	163
People's preference for e-commerce platforms	Pearson Correlation	-.055	-.028	.275**	.349**
	Sig. (2-tailed)	.498	.718	.000	.000
	N	153	163	163	163
Ease of using online platform	Pearson Correlation	.029	.175*	.349**	.341**
	Sig. (2-tailed)	.721	.025	.000	.000
	N	153	163	163	163

Correlations

		Fear of contagion of the virus	People's preference for e-commerce platforms	Ease of using online platform
frequency of purchasing medicines online	Pearson Correlation	-.307**	-.055	.029
	Sig. (2-tailed)	.000	.498	.721
	N	153	153	153
Medicines are cheaper through online pharmacies,	Pearson Correlation	.015	-.028	.175*
	Sig. (2-tailed)	.850	.718	.025
	N	163	163	163
Discounts and offers	Pearson Correlation	.293**	.275**	.349**
available on e-pharma	Sig. (2-tailed)	.000	.000	.000
websites/ apps	N	163	163	163
Limited access to pharmacy stores	Pearson Correlation	.506**	.349**	.341**
	Sig. (2-tailed)	.000	.000	.000
	N	163	163	163
Fear of contagion of the virus	Pearson Correlation	1	.389**	.355**
	Sig. (2-tailed)		.000	.000
	N	163	163	163
People's preference for e-commerce platforms	Pearson Correlation	.389**	1	.460**
	Sig. (2-tailed)	.000		.000
	N	163	163	163
Ease of using online platform	Pearson Correlation	.355**	.460**	1
	Sig. (2-tailed)	.000	.000	
	N	163	163	163

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

never used these services before; however, this figure is expected to reduce in the near future owing to growing popularity and various advantages e-pharmaceutical services have to offer.

- Change in frequency of usage of service: The pandemic is a major contributing factor to this study. The fear of contagion of the virus, various government-imposed lockdowns and limited access to traditional pharmacy stores have undoubtedly positively impacted the e-pharmaceutical sector.

When the respondents were asked if their frequency of purchasing medicines online had significantly increased during the prevailing pandemic, 41.7% of the respondents responded in the affirmative. This indicates that there is significant room for improvement from the e-pharmaceutical service provider's side and they should work on attracting more customers in the first place. This could be achieved by various methods such as informative advertising, offers and discounts, referral bonuses and assuring the customer of product authenticityand secure payment gateway service.

- Benefits of service: When asked about benefits that these platforms offer, the majority of the respondents stated that customer convenience, time saving on pharmacy visit and non-disclosure of medical condition of the individual are the most prominent benefits. The e-pharmaceutical service provider should leverage on these benefits as perceived by the consumer as well as work towards providing additional benefits to the consumer.
- Permanent shift to using service: Finally, when asked if the respondent is likely to make a permanent shift to using e-pharmaceutical services, only 34% of them said yes. This indicates that 66% of the respondents are either unsure or completely against using these platforms to purchase medicines. This could be due to varying factors such as delivery time period, no offers or discounts, unsure of product authenticity, unsure of secure payment transaction or even unsure of confidentiality of medical records.
- Presently, most e-pharmaceutical platforms essentially focus only on the price of the product and offer various offers and discounts. However, it is imperative that these platforms spend time and money on their advertising strategies and marketing campaigns as it is evident that consumers are apprehensive to use their services and are unlikely to do so unless their confidence and trust is gained.

2) CronBach Alpha Test

The first test performed after gathering responses from the consumers was the CronBach Alpha test which checks the reliability of the responses received to analyze the data further and draw necessary inferences. The test concluded that the score secured 0.70 on the reliability level was acceptable and further data analysis can be carried out on the data received.

3) Regression analysis

i. The first regression analysis was performed to test the validity of the hypothesis about the existence of a significant relationship between price paid for e-pharma services and the preference of the service among consumers. Since the regression significance 0.000 is lesser than 0.05, hence it can be inferred that the null hypothesis is rejected, and the alternate hypothesis accepted. Thus, it has been proved that there exists a significant relationship between the prices paid for e-pharma services and the preference for the services among consumers. The regression test gives the result that the dependent variable preference for e-pharma services is influenced by prices paid for the services.

ii. The second regression analysis was performed to test the validity of the hypothesis that there exists a significant relationship between access to pharmaceutical stores and preference for e-pharma services among consumers. Since the significance value of the regression test 0.004 is lesser than 0.05, it can be inferred that the null hypothesis is to be rejected and alternate hypothesis is to be accepted. Thus, the test results proved that there exists a significant relationship between the access to pharmaceutical stores and preference for e-pharma services among consumers. The regression test gives the result that the dependent variable preference for e-pharma services is influenced by access to pharmaceutical stores.

iii. The third regression analysis was performed to test the validity of the hypothesis that there exists a significant relationship between consumer lifestyle and preference for e-pharma services among consumers. Since the regression significance value reflects 0.018 which is lesser than 0.05, it can be inferred that the alternate hypothesis is accepted, thus rejecting the null hypothesis. Hence the test results prove that there exists a significant relationship between consumer lifestyle and the preference for e-pharma services among consumers. The regression test gives the result that the dependent variable preference for e-pharma services is influenced by consumers' lifestyle.

4) Anova Test

The Anova test was performed to test the validity of the hypothesis that there exists a significant relationship between the demographic variable (age) and the preference for e-pharma services. the significance value of the Anova test is .000 which is lesser than 0.05, hence it can be inferred that the alternate hypothesis is accepted, and the null hypothesis is rejected. Thus, it has been proven that there exists a between the demographic variable (age) and the preference for e-pharma services among consumers. The dependent variable being preference amongst consumers is thus proven to be influenced by the variable(age).

5) Correlation

The correlation test was performed to check the factors that influence the frequency of usage of e-pharma services among the different variables identified from the questionnaire responses.Out of which 4 variables were identified as significant factors that influence the frequency of using e-pharma services during the covid-19 pandemic which are availability of cheaper medicines (Sig 0.012), discounts and offers available on the website. (Sig 0.000), limited access to pharmaceutical stores (Sig 0.000) and fear of contagion of virus (Sig 0.000)

B. Suggestions

- Online stores, to gain consumer confidence, should

open offline pharmacy stores. According to the findings of the questionnaire, 41% of the respondents mentioned that the same website of offline medical stores they generally purchase from is a significant contributing factor while choosing an e-pharmaceutical service. Further, given the aggregator model of most e-pharmaceutical platforms, little to no control is directly exercisable over product quality and authenticity. Opening of offline stores, and incidentally, self-owned warehouses will enable the e-pharmaceutical platform to have more control over the products being distributed and can in turn give assurance to the consumer and gain their trust.

- An e-pharmaceutical service provider should work towards keeping the delivery period as short as possible and this would attract a large number of customers as well as serve as a source of competitive advantage.
- In terms of points of concern from the respondents' perspective, a major concern was product authenticity. The e-pharmaceutical service provider should market their service in such a way as to gain the consumer's confidence. A possible suggestion would be to tie up with doctors at reputed hospitals and ask them to recommend such service to their patients. A positive expert opinion could largely benefit the e-pharmaceutical service provider as this would help gain the consumer's trust and confidence regarding product authenticity.
- Another major concern was the payment method. With increasing cybercrimes and hacking, it is of utmost importance to keep sensitive information confidential. The e-pharmaceutical service provider should tie up with reputed payment gateway service providers to build customer confidence in this regard. Further, cash on delivery should always be given as an option to the customer at no additional cost. Time taken for delivery of the medicine is yet another factor that is of concern to the respondents. Most services take 24-48 hours for delivery of the product. Medicine, being an essential commodity, should ideally have shorter delivery periods.

6. Conclusion

The COVID-19 pandemic has called for a new way of thinking due to movement restrictions in lockdown and the need to maintain physical distance. Due to the pandemic, the digital and e-commerce industries are becoming increasingly important. E-Pharma industries are also growing significantly as a result of the pandemic-induced lockdown, as people recognize that purchasing medicines online is a safer way to protect themselves from the infection. Consumers benefit from e-pharmacy in lockdown by receiving a consistent supply of medicines, hand sanitizers, face masks, and other health care products in a safe and comfortable manner.

Through our research, we have been able to achieve our objectives. We have been able to understand the attitude of the respondents towards the evolving change in preference to e-pharmaceutical services during the covid-19 pandemic and determine the attitude of people over varying age groups towards the growing popularity of e-pharmaceutical services. It's also observed that the frequency of usage highly depends on the age factor too. It can also be concluded that the price paid for the e-pharma services, access to pharmaceutical stores and changing lifestyle of the consumer during the pandemic have an impact on preference of the consumer towards a-pharmaceutical services.

The COVID-19 pandemic is a major contributing factor to this study. The fear of contagion of the virus, various government-imposed lockdowns and limited access to traditional pharmacy stores have undoubtedly positively impacted the e-pharmaceutical sector. Although the Covid-19 pandemic has changed the way we see the world, through this study it is evident that people are still quite apprehensive to make a complete shift from traditional pharmacy stores to e-pharmaceutical services.

Majority of the respondents (66%) are either unsure or completely against using these platforms to purchase medicines. This could be due to varying factors such as delivery time period, no offers or discounts, unsure of product authenticity, unsure of secure payment transaction or even unsure of confidentiality of medical records. Presently, most e-pharmaceutical platforms essentially focus only on the price of the product and various offers and discounts. However, it is critical that these platforms invest time and money in their advertising marketing and promotional campaigns because it is likely that customers are hesitant to use their services and are unlikely to do so unless they gain their confidence and trust.

Recognizing the future potential of the online pharma sector (post-COVID), the major e-commerce industries have begun to invest in the E-pharma sector. Because of the comprehensive value proposition offered by e-pharma companies, past experiences, and the shift to digital platforms as a result of COVID-19, the online pharma industry has enormous potential in the coming years.

To overcome the various challenges faced by the Indian online pharmacy industry, we must also develop a strong regulatory support system to make the e-pharmacy model more foolproof.

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