Evaluating e-Service Quality of Indian Online Pharmacies

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ABSTRACT

The emergence of e-pharmacies has revolutionized the global healthcare landscape, particularly since the COVID-19 pandemic in 2020. In India, online pharmacies have witnessed significant growth due to their convenience, accessibility, and ability to meet consumer demands. Customers today expect more than just access to medicines—they demand user-friendly platforms, prompt and reliable delivery, robust data and payment security, efficient customer service, and competitive pricing. Meeting these expectations is critical for e-pharmacies to enhance customer experience, establish market leadership, and foster repurchasing intentions. This study evaluates the e-service quality of Indian online pharmacies by employing a hierarchical model of e-service quality, focusing on six key dimensions: website/application design, customer service, security and privacy, fulfillment, cost-effectiveness, and overall service quality.

To gather meaningful insights, the study will utilize a survey methodology, targeting a sample size of 55 consumers from Madhya Pradesh specifically from Indore. The participants will be selected to represent a diverse range of demographics and experiences with e-pharmacies. The survey will capture detailed consumer feedback on their expectations and perceptions of service quality, offering a comprehensive data set for identifying and comparing gaps across leading online pharmacy platforms.

The findings will provide actionable insights into addressing critical service delivery gaps and enhancing the performance of e-pharmacies. By aligning consumer expectations with service offerings, this study aims to contribute to the understanding of e-service quality in the Indian online pharmacy sector and offer a robust framework for improving customer satisfaction in an increasingly competitive digital healthcare market.

Keywords: Service Quality, Online Pharmacies, Digital Healthcare Market.

How to cite this article: Dubey P, Sharma R, Chhabra S, Kanaskar V, Arya R, Choudhary N. Evaluating e-Service Quality of Indian Online Pharmacies. Int J Drug Deliv Technol. 2026;16(7s): 1005-1020; DOI: 10.25258/ijddt.16.7s.109

Source of support: None

Conflict of interest: None

Introduction:-

E-services

E-service refers to the delivery of services through electronic means, primarily the internet, enabling businesses to provide efficient, accessible, and user-friendly services to customers. It encompasses sectors like banking, retail, healthcare, and education, focusing on enhancing customer experience through digital platforms. E-pharmacy, a subset of e-service in the healthcare industry, involves the onlinesaleanddistributionofpharmaceuticalproductsandservices. Itallowsconsumerstopurchase prescriptionandover-the-countermedications,accessconsultations,andreceive medicalinformation conveniently, improving

accessibility — especially in remote areas — while ensuring secure transactions and regulatory compliance.

E-ServiceQualityofOnlinePharmacies

E-service quality in online pharmacies refers to how effectively these platforms deliver healthcare products and services to consumers. It includes website usability, security, order accuracy, timely delivery, and responsive customer service. A user-friendly interface ensures easy navigation and purchasing,whilestrongsecuritysafeguardssensitiveh ealthandpaymentdata.Reliabledeliveryand responsive support enhance customer trust and satisfaction. In India's growing online pharmacy market, maintaining high service quality is essential for building trust, ensuring safety, and staying competitive.

E-serviceQualityEvaluation

Evaluating e-service quality involves assessing factors like reliability, responsiveness, security, and websiteusability.ModelslikeE-SERVQUALhelpmeasuretheseaspectsthroughcusto merfeedback and performance metrics. Customer satisfaction surveys, online reviews, and service performance indicators (like delivery times and error rates) provide actionable insights. Combining data-driven analysis with customer feedback allows online pharmacies to identify weaknesses, improve services, and enhance the customer experience.

Online pharmacies in India

India's pharmaceutical industry is one of the largest in the world and is rapidly embracing digital transformationthrough thegrowth ofonlinepharmacies.Theseplatforms havebecomeavital part of India'shealthcaredeliverysystem,especiallyinurbanar eas.Theyenableuserstopurchasemedicines online, consult healthcare professionals, manage prescriptions, and access medical records through apps or websites. The rise of e-pharmacies is driven by internet penetration, increased prevalence of chronicdiseases,demandforconvenience,andchangin gdigitalhabits.Startupsandestablishedbrands like Tata 1mg, PharmEasy, Apollo 24/7, and Netmeds are leading this change by offering benefits suchasdiscountedprices,doorstepdelivery,real-timetracking,andaccesstoawiderrangeofproducts than local pharmacies. However, their sustained success depends on delivering high-quality digital services. Delays in delivery, product mismatches, poor app usability, or lack of pricing transparency can directly impact trust and loyalty. As competition intensifies, e-service quality has become a strategic differentiator for platforms aiming to retain and grow their customer base.

This study assesses the actual performance of these platforms through primary user feedback — not just theoretical evaluation. The data collected from active online pharmacy users in Indore provides practical insights into consumer expectations, satisfaction levels, and service delivery challenges in India's evolving e-pharmacy landscape.

Literature Review:-

Kumar and Patil (2023) explored and compared the e-service quality between two leading Indiane-pharmacies,1mgandPharmEasy.Theirfind ingsrevealedthatwhilebothplatforms offer similar website designs and customer service, 1mg surpasses PharmEasy in terms of fulfillment, security/privacy, and overall service quality.

Apteetal.(2024)identifiedvariousfacilitat orsandbarrierstoe-pharmacyadoptioninIndia. Thestudyemphasizedthate-pharmaciesimproveaccesstomedicines,par ticularlyinremote regions, and lower costs, yet they face significant challenges such as inadequate regulation and low digital literacy.

Dcruz et al. (2022) examined the accelerated growth of e-pharmacies in India during the COVID-19 pandemic. The study highlighted the convenience and accessibility of e- pharmacies but also underscored regulatory challenges and the need for stronger quality assurance measures.

Bansal et al. (2022) assessed the knowledge, attitudes, and practices (KAP) of Indian consumers regarding e-pharmacy services. The results showed varying levels of awareness, indicating a need for increased consumer education about the benefits and risks associated

with e-pharmacies.

RehmanandJamshed(2024)evaluateddifferente-pharmacyappsinIndiausingtheMobile App Rating Scale (MARS). Their assessment of engagement, functionality, aesthetics, and information quality revealed several areas for improvement in these applications.

Rathi et al. (2023) explored how e-pharmacies are enhancing access to medications, particularly in rural and remote regions of India. The study stressed that while e-pharmacies bridgehealthcaregaps,thereisapressingneedforrobustregulatoryframeworkstomaintain service quality.

Das and Khan (2023) investigated consumer perceptions and satisfaction with e-pharmacy services in India. The findings indicated that consumers value the convenience and cost advantages of e-pharmacies but remain concerned about the authenticity of medicines and data privacy.

Kumar and Kumar (2023) examined the regulatory and ethical challenges associated with e-pharmacyoperationsinIndia.Thestudyhighlightedthenecessityforstricterregulationsto safeguard patient safety and ensure ethical practices in online drug dispensing.

Sharma and Prasad (2023) analyzed the impact of e-pharmacies on traditional pharmacies in India. The study found that traditional pharmacies must embrace digital solutions to compete effectively with the growing popularity of e-pharmacies.

TiwariandKapoor(2023)highlightedhow e-pharmaciescontributetoimprovedmedication adherence among chronic disease patients in India through timely reminders and home delivery services.

Verma and Bhatnagar (2023) conducted a large-scale quantitative study applying the E- SERVQUALframework toevaluate Indianonline pharmacies.Theirresultshighlightedthat whileall service dimensions matter, reliability (accuracy and timeliness)and responsiveness (customer support speed) had the greatest impact on overall consumer satisfaction.

Nair and D'Souza (2022) applied Structural Equation Modelling (SEM) to assess the interplay between e-service quality, trust, and loyalty in Indian e-pharmacies. Their findings emphasizedthattrustplaysamediatingrole,strengtheningtheinfluenceofservicequality on consumer loyalty and long-term usage intentions.

Malhotra and Sen (2023) explored the critical importance of data privacy and security in shaping customer perceptions of e-pharmacies. Their mixed-method study (survey + interviews) found that concerns around data misuse and lack of transparency in digital transactions were major deterrents for first-time users.

JainandTripathi(2024)focusedontheuser interfaceandexperience(UI/UX)elementsof online pharmacy apps. Their usability tests revealed that app layout clarity, speed, and intuitive design were directly correlated with users' perceptions of quality and satisfaction.

Singh and Mehta (2023) carried out a comparative study urban and semi-urban online pharmacyusersinIndia.Theydiscoveredthatwhileurbanusersvaluedappconvenienceand time-savingfeatures,semi-urbanusersprioritizedmedicineauthenticityandtimelydelivery, reflecting varied expectations across regions.

TABLE1OFLITERATUREREVIEW

Serial No.	Authorsand Year	Titleof Study	Methodology Used	Findings

1	RaviKumar andUtkarshPatil (2023)	AComprehensiveReviewofE- service Quality and Comparative Study Between Online Pharmacies in India: 1mg and PharmEasy	Comparative Analysis	1mg outperforms PharmEasyinfulfillment, security/privacy, and overall service quality.
2	AditiApteet al. (2024)	Facilitators, Barriers, and Potential Impacts of Implementation of e-Pharmacy inIndiaanditsPotentialImpact on Cost, Quality, and Accessto Medicines: Scoping Review	ScopingReview analysis	E-pharmacies significantly improve medicine access butstrugglewithregulatory challenges and low digital literacy.
3	Alison C. Dcruzetal. (2022)	The Rise of E-pharmacy in India:Benefits,Challenges,and the Road Ahead	Descriptive Analysis	E-pharmacies offer convenience and accessibilitybutrequire stronger regulatory oversight and quality assurance.
4	SeemaBansal et al. (2022)	A Preliminary Study to EvaluatetheBehaviorofIndian PopulationTowardE-pharmacy in India	Survey-based analysis(322 participants)	Consumerawarenessofe-pharmacies is limited, highlighting the need for better education on their benefits and risks.
5	HinaRehman and JashiaJamshed (2024)	Assessment of Online PharmacyApplicationsinIndia by Employing the Mobile App Rating Scale (MARS)	Evaluationusing MARS tool(13 Applications)	E-pharmacy apps need improvement in engagement,functionality, aesthetics,andinformation quality.
6	PradeepS. Rathietal. (2023)	E-PharmacyinIndia:LastMile Access to Medicines	Qualitative Analysis	E-pharmacies expand medicine access in rural areasbutdemandstricter regulatory frameworks.
7	Abhijit Das and Ayesha Khan (2023)	ConsumerPerceptionand Satisfaction Towards E- Pharmacies in India	Survey-based analysis	Consumers value e-pharmaciesforconvenience but worry about medicine authenticity and data privacy.
8	Sandeep Kumar and RajeshKumar (2023)	Regulatory and Ethical ChallengesinE-Pharmacy Practice in India	Thematic Analysis	Stricter regulations are essential to ensure patient safetyandethicalpractices in e-pharmacy operations.
9	Amit Sharma and RameshwarPrasad(2023)	ImpactofE-PharmacyServices on Traditional Brick-and- Mortar Pharmacies in India	Comparative analysis	Traditional pharmacies mustdigitizetocompete with e-pharmacies' growing popularity.

10	Tiwari and Kapoor(2023)	EvaluatingtheEffectiveness of E-Pharmacy Services in Enhancing Medication Adherence	CaseStudy analysis	E-pharmacies support better medicationadherencethrough timely reminders and home delivery services.
11	Verma, S., &Bhatnagar,R. (2023)	Measuring E-Service Quality of Online PharmaciesinIndiaUsing E-SERVQUAL Model	Quantitative survey(sample size = 300)	Reliabilityandresponsiveness had the strongest influenceon overall satisfaction.
12	Nair, A., & D'Souza,R. (2022)	TrustandLoyaltyinIndian Online Pharmacies: A Structural Equation Modelling Approach	SEMbased analysis	Trustmediatestherelationship between e-service quality and customer loyalty.
13	Malhotra,P., & Sen, A. (2023)	TheRoleofDataPrivacy and Security in Shaping Customer Trust in E- Pharmacies	Mixed-method study	Consumers ranked data protectionandconfidentiality among the top 3 factors influencing repeat usage.
14	Jain, R., &Tripathi,N. (2024)	ImpactofUserExperience onPerceivedQualityinE-Pharmacy Applications	Usability testing +user interviews	App design, speed, and clarity ofinformationdirectlyaffected satisfaction and engagement.
15	Singh,K.,& Mehta, H. (2023)	Comparative Evaluation of Urban and Semi-Urban Users'PerceptionsofOnline Pharmacy Services in India	Comparative surveyanalysis (n=350)	Urban users prioritized convenience, while semi-urban usersweremoreconcernedwith authenticity and delivery timelines.

Research Methodology:-

ResearchDesign

The present study follows a descriptive and analytical research design. It aims to describe consumer perceptions of online pharmacy services and to analyze the relationship between service quality dimensionsandsatisfactionoutcomes.Descriptiveanalysis wasusedtosummarizeuser feedbackon variousserviceparameters,whileinferentialstatisticaltests wereappliedtovalidateassociationsand differences across demographic groups. The research is cross-sectional in nature, as the data was collected at a single point in time.

TypeofDataCollected

The study is based on primary data, collected through a structured, self-administered online questionnaire. The instrument captured respondents' evaluations across 14 dimensions of e-service quality (such as navigation, delivery, pricing, support, and security), along with demographic variables includingagegroup,gender,andplatformpreference.Theuseofprimarydataensuresthatthefindings reflect authentic, first-hand consumer experiences, adding both credibility and contextual relevance to the analysis.

SamplingMethod

A non-probability convenience sampling method was employed to select participants for the survey. RespondentswererequiredtohavepriorexperienceusingatleastoneIndianonlinepharmacyplatform (such as Tata 1mg, Netmeds, or PharmEasy). The survey link was distributed online through digital platforms including WhatsApp, email, and social media to reach eligible users. While this sampling method limits the generalizability of the findings, it was suitable given the study's scope, exploratory nature, and time constraints.

SampleSize

Atotalof55validresponseswerecollectedandincludedinthefinalanalysis.Therespondentswere regularusersofonlinepharmacyplatformsandprovidedcompletefeedbackonallsurveydimensions. The sample size was deemed sufficient to perform meaningful descriptive and inferential statistical analyses, providing localized insights relevant to the urban Indore market.

Area/Locationof Study

The geographic focus of the study is Indore, Madhya Pradesh, one of India's prominent Tier-2 cities

withgrowingdigitaladoptionandincreasingrelianceononlinehealthcareservices.FocusingonIndore allowed the study to capture user perceptions in an emerging urban context where online pharmacy usage is expanding but remains underexplored in academic research.

ToolUsed: Questionnaire/Survey

Astructuredquestionnairewasusedastheprimarydatacollectioninstrument.Itincluded:

- Demographicquestions(e.g.,age,gender,occupation,preferred platform)
- Likert-scaleisusedfor(1=VeryDissatisfiedto5= VerySatisfied)coveringthefollowing service quality dimensions:
  - Navigationandusability
  - Platform functionality
  - Searchconvenience
  - Customerservice responsiveness
  - Issueresolutionefficiency
  - Deliverytimelinessand accuracy
  - Stock availability
  - Paymentsafety
  - Dataprivacy
  - Pricereasonabilityanddiscount transparency
  - Overallsatisfactionand willingnessto recommend

ThequestionnairewashostedonGoogleForms, designedtobeconcise, mobile-friendly,andeasyto understand in order to maximize response rates.

DataAnalysis Techniques

The collected data was coded and analyzed using Microsoft Excel and Python for statistical computations.Thefollowingtechniqueswereemployedto ensurerigorousandvalidanalysis:

- DescriptiveStatistics:Mean,standarddeviation,andfrequencydistributionswerecalculatedto summarize user responses for each service quality dimension.
- Cross-tabulation:Usedtoexplorebasicrelationshipsbetweendemographicvariablesand platform preferences.
- InferentialStatistics:
  - Chi-SquareTestofIndependence:Toassesswhetherthereisasignificantassociationbetween gender and preferred online pharmacy platform.
  - IndependentSamplesT-Test:Tocompareoverall satisfactionlevelsbetweenmaleandfemale respondents.
  - PearsonCorrelationAnalysis:Toassessthestrengthanddirectionoftherelationshipbetween ease of website/app navigation and overall user satisfaction.

Thesetoolswerechosenfortheirappropriateness,simplicity,andrelevancetothestudies objectivesanddatastructure.

Hypotheses of the Study

The formulation of hypotheses provides a clear framework for empirical testing and supports meaningful inferences. Based on the research objectives and the nature of the data collected, the study tests the following hypotheses:

Hypothesis 1: Association between Gender and Platform Preference

- Null Hypothesis (H_0): There is no significant association between gender and the preferred onlinepharmacy platform.
- Alternative Hypothesis (H_1): There is a significant association between gender and the preferredonline pharmacy platform..

Hypothesis 2: Difference in Satisfaction across Genders

- Null Hypothesis (H_0): There is no significant difference in overall satisfaction levels between male and female users.
- Alternative Hypothesis (H_1): There is a significant difference in overall satisfaction levels betweenmale and female users.

Observation:-

TheoreticalUnderpinningofObservation

This study is anchored in the E-SERVQUAL framework, which adapts the traditional SERVQUAL modeltoelectronicservicecontexts.Thedimensionsconsidered—suchasreliability,responsiveness, assurance, and empathy—are operationalized in e-pharmacy services as:

- Website usability
- Searchconvenience
- Customersupportefficiency
- Timelyandaccuratedelivery
- Dataprivacyandpayment security
- Pricefairnessandtransparency

Observing customer ratings on these dimensions enables the researcher to measure perceived service qualityfromtheuser'sperspective.Theexpectation-confirmationtheoryalsoinformsthisstage,where satisfaction is determined by the degree to which

perceived performance matches or exceeds expectations.

Methodof Observation

Theobservationsweremadeusingaquantitativesurveymethod.Participantsrated14aspectsofe- service quality based on their real experiences. This method ensures that observations are not speculative but derived from actual interactions with online pharmacy platforms. Thefollowinginstrumentsandpracticeswereused forgatheringobservations:

- AstructuredonlinequestionnairecomprisingLikert -scaleitems(1=VeryDissatisfiedto5=Very Satisfied).
- Conveniencesamplingof userswithpriore-pharmacyusage experience.
- Variablesobservedincludedemographiccharacteristics,platformusagepatterns,andsatisfaction across multiple service dimensions.

TabulatedObservations:DescriptiveSummary

TABLE4.1:DESCRIPTIVESTATISTICSOFE-SERVICEQUALITYDIMENSIONS

Dimension	Mean Score	Standard Deviation
Website Navigation	3.44	1.04
Platform Functionality	3.87	0.65
EaseofSearching	4.15	0.68
Customer Service	3.26	1.12
IssueResolution	3.85	1.03
Timely Delivery	3.85	1.12
OrderAccuracy	4.56	0.60
Stock Availability	3.94	0.68
PaymentSafety	4.44	0.77
Privacy&DataSecurity	3.83	1.08
PriceReasonability	3.37	1.26
DiscountTransparency	3.69	1.08
OverallSatisfaction	3.94	0.92
WillingnesstoRecommend	4.19	0.83

KeyObservationsandInitial Insights

- HighSatisfactionAreas: RespondentsratedOrderAccuracy(M=4.56)and PaymentSafety(M =4.44)thehighest. Thesedimensionsreflect operationaltrustandarepivotalforrepeat usage.
- Moderate Satisfaction: Usability-related factors such as Ease of Search (M = 4.15) and Navigation(M=3.44)werepositivelyrated,although thereremainsroomforimprovementin user interface design.
- LowSatisfactionAreas:CustomerService(M=3.26)andPriceReasonability(M=3.37)scored lowest. This suggests that despite operational efficiency, emotional engagement and pricing transparency remain weak spots.
- TrustIndicators:HighratingsinDataSecurity(M =3.83)and WillingnesstoRecommend(M= 4.19) indicate growing user trust in e-pharmacies as viable healthcare alternatives.

DemographicObservations(Cross-tabulated) **dPlatform**

Table4.2:Gendervs.Preferre

Platform	Male	Female	Total
Tata1mg	19	0	19
Netmeds	7	0	6
PharmEasy	5	6	11
Others	9	9	18
Total	40	15	55

Initialobservationofthistablesuggestsgender-basedpreferencedifferences,whichjustifiedtheuseof inferential statistics in the next part.

Findings:-

DescriptiveAnalysisof E-ServiceQualityDimensions

A descriptive statistical analysis was carried out based on responses from 55 active users of online pharmacy platforms in Indore. Participants rated 14 different e-service quality dimensions using a five- point Likert scale, where 1 indicated "Very Dissatisfied" and 5 meant "Very Satisfied." The results indicatedthatOrderAccuracy(Mean=4.56)andPaymentSafety(Mean=4.44)werethemostpositively rated dimensions. These findings highlight that users trust the platforms in terms of delivering correct ordersandensuringsafedigitaltransactions.Additionally, WillingnesstoRecommend(Mean=4.19)and Ease of Searching Products (Mean = 4.15) were also rated favorably, indicating strong usability and positiveuserexperienceslikelytogeneratereferrals.Ontheotherhand,dimensionslikeCustomerService (Mean = 3.26) and Price Reasonability (Mean = 3.37) received relatively lower ratings. This suggests dissatisfactionwithcustomersupportresponsivenessandconcernsregardingfairpricing.Thedimension ofDiscountTransparency(Mean=3.69)furtherrevealedthatwhilepromotionaloffersexist,theirclarity andpresentationremaininsufficient.Theseinsightssuggestthatwhiletheplatformsexcelinorder-related functions and digital payment security, significant improvements are still required in customer care and pricing transparency to ensure complete consumer satisfaction.

InferentialAnalysisofUserBehaviorandServiceRelationships

To explore deeper patterns in user behavior and assess demographic influences, relevant inferential statistical tools were applied. Firstly, a Chi-Square Test of Independence was conducted to analyze the relationship between gender and preferred pharmacy platform. The test result ($\chi^2 = 17.97$, $p = 0.0004$) revealed a statistically significant association, indicating that gender plays a role in determining user preference for specific platforms. This opens up possibilities for gender-specific marketing strategies. Secondly, an Independent Samples T-Test was conducted to determine whether there were significant differences in overall satisfaction between male and female users. The results ($p = 0.72$) suggested no significant variation, implying that both genders experience similar levels of satisfaction, even if their platformchoicesdiffer.Lastly,aPearsoncorrelationanalysiswascarriedouttoevaluatetherelationship between Website Navigation and Overall Satisfaction. The correlation coefficient ($r = +0.187$, $p = 0.17$) was weak and statistically non-significant. This shows that while intuitivewebsite design is appreciated, it does not strongly predict satisfaction. Other service aspects such as secure delivery and trustworthy operations have a greater influence on shaping positive user experiences.

Objective-WiseKey Findings

In linewith thestudy'scoreresearch objectives, multipleinsights wereidentified. First, in thecontext of evaluatinge-servicequalitydimensions,theplatformsareperformingstronglyintermsoforderaccuracy and payment safety but fall short in customer service and clarity of discounts. Second, the assessment of overall consumer satisfaction revealed a moderately high satisfaction score with an overall mean of approximately 3.94. The high score for willingness to recommend reflects an overall positive service experience with a few areas needing attention. Third, when identifying determinants of satisfaction, the analysis showed that order accuracy and payment safety

are major contributors to user trust and satisfaction. In contrast, poor customer service was identified as a significant drawback. Fourth, the analysis of demographic influence found that gender affects platform preference but not satisfaction levels.Thisindicatesthatwhilemarketingstrategiescanbetailoreddemographically,servicequalityitself should remain universally high. Lastly, when analyzing inter-service relationships, the weak correlation betweenwebsitenavigationandsatisfactionsuggeststhatnosinglefactordominatestheuserexperience. Instead, a comprehensive approach involving functionality, security, pricing, and support services is required to improve overall satisfaction.

Conclusion

- **ComprehensiveEvaluationofE-ServiceQuality**

  This study presents an in-depth assessment of e-service quality and consumer satisfaction among onlinepharmacyusersinIndore.Usingbothdescriptiveandinferentialanalysisonprimarydatafrom 55respondents,theresearchexploreshowconsumersperceivedigitalpharmacyplatformsinIndia's dynamic healthcare environment. Key findings indicate a generally positive view of service quality, especially in the areas of *order accuracy* (Mean = 4.56) and *payment safety* (Mean = 4.44). These high-performing dimensions highlight consumers' strong trust in the platforms' ability to deliver accurate orders and secure transactions, making them fundamental drivers of satisfaction.

- **ServiceGapsandImprovementNeeds**

  Despite these strengths, the study identifies clear service gaps that need attention. Respondents expressedlowersatisfactionwith*customerservice*and *pricereasonability*,indicatingconcernsabout supportresponsivenessandperceivedvalueformoney .Additionally,*discounttransparency*received onlymoderateratings,suggestingthatpromotionaloffers couldbecommunicatedmoreclearly.These findings point to the need for a more holistic service model—one that not only ensures operational efficiency but also strengthens emotional engagement through empathetic support and fair pricing.

- **RoleofDemographicsandUserExperienceFactors**

  Inferentialanalysisdeepenstheseinsightsbyhighlightinghowdemographicandexperientialfactors affect user behavior. A statistically significant relationship was observed between *gender and platform preference*, although satisfaction levels remained consistent across genders. Furthermore, the correlation between *website navigation* and *overall satisfaction* was weak and statistically insignificant, suggesting that while usability features are appreciated, they do not independently influencesatisfaction.Instead,usersplacegreateremphasisonfactorslikereliabilityandtransaction security in forming their overall evaluation of service quality.

- **AchievementofResearchObjectivesandStrategicImplications**
- The study successfully addresses its core research objectives by evaluating service quality dimensions, identifying key satisfaction drivers, and assessing the influence of demographics on platform usage. With an overall satisfaction score of approximately 3.94, the findings reflect a generally favorable consumer perception. Theoretically, the results align with established service quality models while highlighting the specific characteristics of India's e-pharmacy landscape. Practically, the research offers actionable insights for platform managers: focus on strengthening customer support, improve pricing transparency, and develop demographic-specific marketing strategies. Ultimately, by addressing these gaps, online pharmacy platforms can enhance consumer loyalty and strengthen their strategic position in the fast-growing digital health market.

Data Analysis and Interpretation:-

Theanalysisandinterpretationoftheprimarydatacollected from55respondents who have experience using Indian online pharmacy platforms. The objective is to evaluate e-service quality across key dimensions such as usability, delivery, pricing, and customer support, and to test relevant hypotheses regarding demographic variables and user satisfaction.

Toensureclarityandacademicrigorwhilemaintainingsimplicity,thefollowingdataanalysismethods were employed:

- DescriptiveStatistics:Tosummarizeratingsforeachservicequalitydimension.
- Chi-SquareTestofIndependence:Toexaminetheassociationbetweengenderandpreferred pharmacy platform.
- IndependentSamplesT-Test:Tocomparesatisfactionlevels

betweenmaleandfemale respondents.

- PearsonCorrelationAnalysis:Toassessthestrengthanddirectionoftherelationshipbetween website navigation and overall satisfaction.

eptionsofvariouse-servicequality dimensions on a 5-point Likert scale (1 = Very Dissatisfied to 5 = Very Satisfied).

Table:DescriptiveStatisticsOfE-ServiceQualityDimensions

DescriptiveStatistics

Descriptivestatisticswerecalculatedtounderstandusers'perc

Dimension	Mean	Standard Deviation
Website Navigation	3.44	1.04
Platform Functionality	3.87	0.65
EaseofSearching	4.15	0.68
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OrderAccuracy	4.56	0.60
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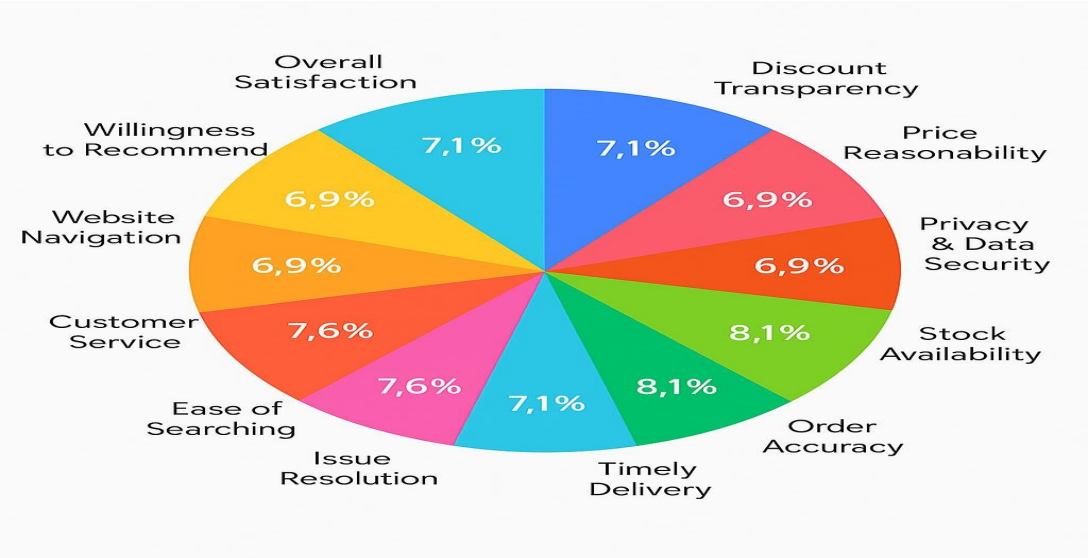
PaymentSafety	4.44	0.77

Dimension	Mean	Standard Deviation
Privacy and Data Security	3.83	1.08
Price Reasonability	3.37	1.26
Discount Transparency	3.69	1.08
Overall Satisfaction	3.94	0.92
Willingness to Recommend	4.19	0.83

GRAPH 5.1 PIE CHART OF E-SERVICE QUALITY DIMENSION



Chi-SquareTestof Independence

Todeterminewhetherthereisasignificantassociationbetwee nGenderandPreferredOnlinePharmacy Platform.

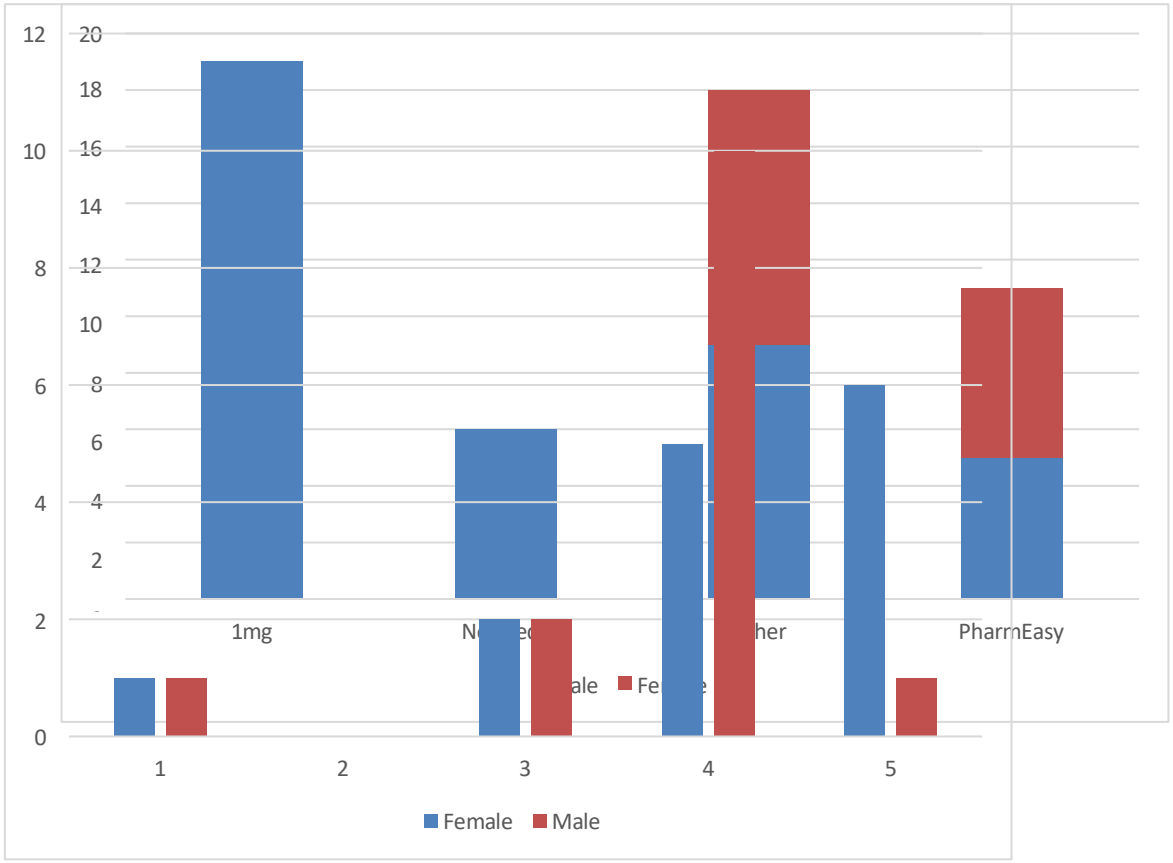
Hypotheses:

- *H0(NullHypothesis):*Thereisnoassociationbetwee ngenderandpreferredplatform.
- *H1(AlternativeHypothesis):*Thereisanasso ciationbetweengenderand preferredplatform. Table : Contingency Table – Gender vs. Preferred Platform

Platform	Male	Female	Total
1mg	19	0	19
Netmeds	7	0	6
PharmEasy	5	6	11
Others	9	9	18
Total	40	15	55

TestStatistic: χ^2 =17.97

DegreesofFreedom:3p-value:0.0004



GRAPH:-
GENDERvsPREFERREDONLINEPHARMACYPLATFORM

IndependentSamplesT-Test

TocomparetheOverallSatisfactionbetweenmaleandfemalerespondents.

Hypotheses:

- *H0(NullHypothesis):*Thereisnodifferencein satisfactionbetweenmalesand females.
- *H1(AlternativeHypothesis):*Thereisadifferenceinsatisfactionbetween malesandfemales.

Group Statistics:

Gender	N	Mean Satisfaction	Standard Deviation
Male	39	3.97	0.74
Female	15	3.87	1.30

Test Result:

- t =0.36
- p =0.72

GRAPH:OVERALLSATISFACTION

PearsonCorrelationAnalysis

Toassesstherelationshipbetween WebsiteNavigationandOverallSa tisfaction. Hypotheses:

- *H0:*ThereisnocorrelationbetweenWebsiteNavig ationandOverallSatisfaction.
- *H1:*Thereisacorrelationbe tweenWebsiteNavigationandOver allSatisfaction. Results:
- PearsonCorrelationCoefficient(r)= +0.187
- *p* =0.17

GRAPH: Average overall satisfaction by website navigation rating

cing,and satisfaction.

- The study uses a sample of 55 active users of platforms such as Tata 1mg, Netmeds, and PharmEasy,andappliesquantitativestatis ticaltechniques(DescriptiveStatistics,Ch i-Square Test of Independence, Independent Samples T-Test, and Pearson Correlation Analysis) for meaningful insights.
- The study contributes localized, data-driven insights that may support platform developers, marketing teams, and healthcare policy planners in improving service quality and customer satisfaction.

Limitation:-

Scopeofthe Study

1. Overall Limitations

- This research aims to evaluate the e-service quality of Indian online pharmacies through a primary survey conducted in Indore, a rapidly growing urban center in Madhya Pradesh.
- A structured questionnaire was used to assess 14 key dimensions of e-service quality, includingusability,functionality,custom ersupport,deliveryefficiency,privacy,pri

2. GeographicLimitations

- The primary data for this research was collected through a localized survey conducted exclusivelyinIndore,whichmaylimittheg eneralizabilityoffindingstoconsumersfr omthis specific urban setting.
- Theseresultsmaynotfullyrepresenttheex periencesorexpectationsofconsumersfro mother Indian cities or rural areas, where infrastructure, digital access, and healthcare needs can differ significantly.

- While the survey responses provide detailed local insights, they may not capture regional diversity or national-level variations in online pharmacy service perceptions.

3. AcademicLimitations

- Thestudyemphasizesquantitativeanalysisofuserperceptionsin Indore,whichmayrestrict itsscopeinunderstandingdeeperqualitativeorpsychologicalfactorsinfluencingsatisfaction.
- The sample size and localized focus limit the project's ability to capture comprehensive nationwide trends in the Indian e-pharmacy sector.
- The absence of direct interviews with industry professionals, platform executives, or regulatory bodies limits the inclusion of operational and strategic perspectives from the industry side.

4. Personal Limitations

- As the sole researcher, there is potential for subjective interpretation of data, despite maintaining structured, statistical, and objective analysis methods.
- Limited access to domain experts, platform managers, or policymakers may have restricted deeper insights into operational or strategic challenges faced by e-pharmacy providers in India.

5. Time Limitations

- Theresearchwasconductedwithinarestrictedacademictimeline,whichimpactedtheability to collect a larger or more demographically diverse sample.
- Due to time constraints, the study reflects consumer sentiment during a specific period and maynotcaptureemergingservicetrends,technologicalchanges,orpost-studydevelopments in the Indian e-pharmacy landscape.

6. Data Collection Limitations

- While the survey was designed to be broad-based, it may underrepresent certain user groups, such as elderly users, rural consumers, or those with limited digital literacy.
- Data is based entirely on self-reported responses, which may be influenced by recency bias, selective memory, or extreme experiences.
- Passive consumers (those who use services but do not provide feedback) are not captured, possibly skewing the overall picture of satisfaction and service perception.

7. Technological Limitations

- Data was collected using Google Forms, which required internet access and basic digital proficiency. This may have excluded certain respondents, especially from older age groups or those with limited digital exposure.
- Platform accessibility and device compatibility may have affected users' ability or willingness to participate in the survey, potentially limiting respondent divers.

Direction for future research:-

- **GeographicandDemographicExpansion**

  Whilethisstudyfocusedononlinepharmacyusersin Indore,futureresearchcouldsignificantly benefitfromexpandingitsgeographicscope.IncludingTier-1citiessuchasMumbai,Delhi,and Bangalore may uncover different patterns of e-service quality shaped by more advanced digital infrastructure and consumer behavior. Similarly, conducting studies in rural areas—where internet access, digital literacy, and healthcare availability vary considerably—would provide contrasting insights and a more balanced, inclusive understanding. Increasing the sample size anddiversifyingthedemographicvariablessuchas incomelevels,education,anddigitalliteracy would enhance the depth and generalizability of the findings.

- **LongitudinalandQualitativeResearchApproaches**

  The current research provides a cross-sectional snapshot of consumer perceptions, but future studies could adopt longitudinal or time-series designs to capture changes in satisfaction, behavior,andexpectationsovertime.Thiswouldbeespeciallyvaluableintrackingresponsesto technological innovations, evolving market dynamics, or policy reforms. Additionally,

incorporatingqualitativemethodslikefocusgroup discussionsorin-depthinterviewswouldadd rich,interpretativedepthtothedata.Theseapproac hescanhelpuncovertheemotional,cultural, and psychological motivations behind consumer preferences and choices, offering a more holistic view of e-pharmacy usage.

- **ComparativeandPlatform-Specific Studies**

  Further studies could be designed to compare consumer satisfaction and service performance across major online pharmacy platforms such as Tata 1mg, Apollo 24/7, PharmEasy, and Netmeds. This would help identify brand-level differentiators, strengths, and areas needing improvement. Comparative analysis of these platforms would also be useful in understanding how competition drives innovation and influences consumer loyalty. Such research could contributevaluableinsightsintomarketpositionin gandstrategicdevelopmentinthegrowinge-pharmacy landscape.

Technological,Operational,andPolicy-Based Exploration

Future research should also delve into the operational and technological dimensions of e-pharmacyplatforms.Factorssuchasappinterfaced esign,cybersecurityprotocols,ordertracking efficiency, and delivery logistics play a vital role in shaping user trust and satisfaction. Additionally, with growing regulatory intervention, exploring how government policies, data protectionlaws,andlicensingnormsaffectconsum erconfidenceandbusinesscompliancewould be highly relevant.

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