

Awareness and Usage of Mobile Healthcare Applications: A Comparative Study of Tata 1mg, Netmeds, Pharmeasy, Apollo, and Flipkart Health+

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Abstract:

This article aimed to analyse awareness level, frequency of usage, ease of usage about the selected Mobile Healthcare Apps and examined impact of Service Quality of mHealthcare Apps, Satisfaction level of mHealthcare Apps, and Price level on Trustworthiness of mHealthcare Apps. This comparative research has surveyed 111 users of mobile Healthcare Apps in Bengaluru, India using structured questionnaire. The sampling techniques adopted are snowball sampling technique. The collected data analysed using Descriptive Analysis, Weighted Rank Method, Comparative Analysis, Correlation and Simple Linear Regression Analysis. Key findings reveal Apollo 24/7 as the frontrunner in terms of brand awareness and perceived ease of use. Service quality emerged as a primary determinant of trustworthiness, surpassing price value. The developed regression model effectively explains a significant portion of the variance in trustworthiness. These insights are particularly relevant for managers and developers of mHealth apps, as they emphasize the importance of maintaining high service quality to build and sustain trust among users. These findings underscore the importance of service quality in fostering trust among users of mobile healthcare apps. While the study provides valuable insights into consumer perceptions and behaviors, its reliance on snowball sampling necessitates cautious interpretation of results. The use of snowball sampling introduces potential selection bias, and the relatively small sample size restricts the generalizability of the findings. Future research could expand on this study by conducting comparative analyses across different regions to explore how cultural differences influence trust in mHealth apps. Additionally, qualitative studies could provide deeper insights into user experiences and the underlying factors that drive trust or distrust in these applications.

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Mobile Health Apps, Awareness, Usage, Ease of Use, Service Quality, Price Value, Satisfaction, Trustworthiness

Introduction of the Study

In recent years, the proliferation of mobile health (mHealth) applications has significantly transformed the landscape of personal healthcare management, offering users immediate access to health information, monitoring tools, and remote healthcare services. These applications are increasingly regarded as essential tools for promoting wellness, self-care, and disease management (Jiang et al., 2022). With the global market for mHealth apps expanding rapidly, understanding the determinants of their adoption, usage, and long-term effectiveness has become a crucial area of scholarly and practical interest. Awareness serves as the first gateway to adoption, since individuals must be informed of the existence and potential benefits of mHealth apps before engaging with them (Kumar et al., 2021). Once adoption occurs, ease of use, service quality, and perceived price value emerge as central factors influencing sustained utilization and user satisfaction (Díaz et al., 2021; Shin, 2022; Le et al., 2021). User satisfaction, in turn, has been shown to directly strengthen trustworthiness and foster long-term engagement, thereby enhancing healthcare outcomes (Agarwal et al., 2023).

Despite the promise of mHealth apps, several critical research gaps persist. Studies often overlook longitudinal perspectives, limiting insights into long-term engagement and outcomes (Wang & Qi, 2021). There is also insufficient exploration of user diversity, particularly across cultural, socio-economic, and geographical contexts (Yan et al., 2021). Moreover, integration of mHealth apps with mainstream healthcare systems remains underdeveloped, and concerns regarding privacy and security are amplified by rapid technological advancements such as 5G (Chen et al., 2020; Tangari et al., 2021). Addressing these challenges is imperative to optimize the design, deployment, and acceptance of mHealth solutions globally. Against this backdrop, the present study seeks to explore the multidimensional factors shaping the adoption and effectiveness of mobile health applications. Specifically, the study is guided by the following research questions: (i) What is the level of awareness of mobile healthcare applications among the target population? (ii) How frequently are these applications used for different healthcare needs such as medicine ordering, consultations, and diagnostics? (iii) What demographic and contextual factors (e.g., age, gender, education, income, location, health conditions) influence their adoption and usage? and (iv) How do these applications compare in terms of features, usability, and overall user experience?

Accordingly, the study sets out the following objectives: (1) to assess customers' awareness levels of selected branded mobile health apps; (2) to examine the frequency of their usage across healthcare needs; (3) to analyze ease of usage; (4) to evaluate the relationship between price value, service quality, satisfaction level, and trustworthiness; and (5) to investigate the impact of price value, service quality, and satisfaction level on trustworthiness. By integrating these dimensions, this study aims to contribute empirical evidence on the interrelationships between awareness, ease of use, service quality, cost-effectiveness, satisfaction, and trust in mHealth applications. The findings are expected to provide

actionable insights for developers, healthcare providers, and policymakers to strengthen app design, user engagement strategies, and integration with healthcare systems, thereby enhancing patient-centered healthcare delivery

Literature of Review

Mobile health (mHealth) applications have emerged as powerful tools in modern healthcare, offering potential benefits such as improved patient engagement, enhanced access to healthcare services, and personalized care. However, the rapid proliferation of these apps has also raised significant concerns, particularly regarding data privacy, usability, and the effectiveness of these digital tools in delivering health outcomes. This review synthesizes recent literature on mHealth apps, exploring their impact on healthcare, challenges, and the critical factors influencing their adoption and use. Akbar et al (2020) conducted a scoping review that highlighted critical concerns in consumer-facing mHealth apps, including data privacy, information accuracy, and usability issues. The authors emphasized that inadequate regulation has led to varying safety standards, potentially posing health risks through misinformation and data breaches. Their recommendations included the need for enhanced regulatory frameworks, increased transparency in app functionalities, and user education to mitigate these risks and improve healthcare delivery. This study underscores the urgent need for stricter oversight and improved design to ensure these apps positively impact user health and safety. Similarly, Cilliers (2020) examined privacy and security challenges in wearable healthcare devices, which often collect sensitive health data. The study emphasized the necessity of robust security measures, including enhanced encryption and access controls, to protect user privacy. The findings highlighted gaps in regulatory frameworks and proposed strategies to improve data protection and compliance. Both studies stress the importance of building trust through rigorous privacy safeguards in the development and deployment of mHealth technologies.

The global COVID-19 pandemic has brought the role of mHealth apps in public health emergencies into sharp focus. The study in JMIR mHealth and uHealth (2020) reviewed COVID-19-related mHealth apps, finding that they varied in their focus on information dissemination, self-assessment, and contact tracing. The study highlighted inconsistent accuracy and usability issues among these apps, alongside significant concerns about data privacy. While some apps were effective in enhancing public health awareness, others had limited impact. The authors recommended the establishment of standardized guidelines, quality control measures, and enhanced collaboration to improve future app development and evaluation during health crises. Mubeen et al. (2021) also evaluated pandemic healthcare mobile apps, focusing on usability issues such as complex navigation and unclear information presentation. The study emphasized the importance of user-centered design improvements, including simplified interfaces and better compatibility across devices, to enhance user adoption and effectiveness during

public health emergencies. These findings underline the critical role of intuitive app design in improving the efficacy of mHealth technologies in crisis situations.

Mental health is a critical area where mHealth apps have shown potential, particularly in the management of conditions like depression. Kerst et al (2020) examined smartphone applications for depression through a systematic literature review and a survey of healthcare professionals. Their study identified varied app effectiveness, particularly in types like Cognitive Behavioral Therapy (CBT) and mood tracking. Healthcare professionals expressed mixed attitudes, with some viewing these apps as beneficial supplements, while others were wary of their efficacy and privacy implications. The study highlighted the need for more rigorous research, clear integration guidelines, and training for professionals to optimize the use of these apps in depression treatment. Reddy et al. (2022) extended this examination into the realm of telemedicine during the COVID-19 pandemic. Their cross-sectional study assessed the perceptions of health applications for telemedicine among healthcare providers and patients. The study found increased reliance on apps for remote consultations and health monitoring, highlighting benefits like convenience and improved access to healthcare. However, concerns such as data privacy issues, variability in app quality, and technical challenges were also prominent. The authors emphasized the need for improved security measures, usability enhancements, and regulatory compliance to optimize app effectiveness in telemedicine.

Understanding the factors that influence the adoption and use of mHealth apps is crucial for their successful integration into healthcare. Wang and Qi (2021) conducted a systematic review focusing on the factors influencing users' acceptance and use behavior of mHealth apps. They identified key determinants such as perceived ease of use, perceived usefulness, user trust, and the app's ability to meet health needs. Individual characteristics like age and health literacy also played significant roles. The study emphasized the importance of these factors in shaping user attitudes and behaviors towards mHealth apps, highlighting the need for tailored design and effective implementation strategies. Similarly, Yan et al. (2021) investigated the factors influencing users' continuance intention to use health apps, identifying perceived usefulness, ease of use, enjoyment, social influence, trust, personalization, and technical quality as key determinants. Their findings suggest strategies for app developers and healthcare providers to enhance user experience and retention by improving app design, personalizing content, fostering trust, and leveraging social support. These studies provide valuable insights into how various factors interact to shape user behavior and inform strategies to optimize mHealth app adoption and improve health outcomes.

The integration of mHealth apps into clinical practice and healthcare systems presents significant regulatory and ethical challenges. Gordon et al. (2020) emphasized that validation studies alone are insufficient for driving clinician adoption of health apps. Their study highlighted the need for strategies

such as Electronic Health Record (EHR) integration, user-centered design, and continuous evidence generation to support safe implementation in healthcare settings. The study stressed the inadequacy of validation studies alone in promoting clinician adoption and advocated for holistic approaches to maximize app efficacy and patient outcomes. Muehlematter et al. (2021) explored the approval processes for AI and machine learning-based medical devices in the USA and Europe. Their study highlighted differences in regulatory frameworks, noting variations between the FDA's premarket approval and the European CE marking. The authors suggested that harmonization or mutual recognition agreements could streamline global approval processes, balancing innovation with regulatory oversight. These findings underscore the complexities of regulatory alignment in the rapidly evolving field of digital health.

The user experience and usability of mHealth apps are critical factors that influence their effectiveness and user adoption. Bitkina et al. (2020) provided an overview of usability and user experience in medical devices, emphasizing the importance of user-centered design. The study reviewed current trends and methodologies like usability testing and heuristic evaluation, highlighting the need for ongoing research and collaboration to enhance device performance and user acceptance. Similarly, Timmers et al. (2020) conducted a systematic review to evaluate the use of smartphone and tablet apps for patient education. Their review assessed the effectiveness, usability, and impact of these apps in delivering educational content such as disease information, treatment guidelines, and lifestyle advice. The study found that mobile apps can improve patient knowledge, treatment adherence, and self-management skills, while also discussing usability aspects like app design and accessibility. These findings provide recommendations for enhancing app usability, ensuring evidence-based content, and tailoring materials to patient needs.

Security and privacy are paramount concerns in the deployment of mHealth technologies. Chen et al. (2020) presented a security system for 5G smart healthcare using a zero-trust architecture, emphasizing real-time threat detection and dynamic access control to protect sensitive healthcare data. Their study highlighted the system's novelty in addressing security challenges posed by 5G integration, aiming to enhance reliability and mitigate evolving cyber threats in smart healthcare environments. Tangari et al. (2021) further explored privacy implications associated with mHealth technologies. Their study found significant concerns about data security, experiences with data breaches, and preferences for privacy-enhancing features. The authors called for improved transparency, stronger security measures, and regulatory frameworks to protect personal health information. These studies emphasize the critical need for robust security and privacy measures in mHealth technologies to foster user trust and ensure ethical health data use. The literature on mHealth apps reveals a complex interplay of benefits and challenges. While these digital tools offer significant potential to enhance healthcare delivery, their effectiveness is contingent on addressing critical issues such as data privacy, usability, regulatory compliance, and user

adoption. The reviewed studies underscore the need for tailored design, rigorous research, enhanced regulatory frameworks, and user-centered approaches to maximize the benefits of mHealth apps while mitigating associated risks. As the field continues to evolve, ongoing collaboration among developers, healthcare providers, policymakers, and researchers will be essential to ensure that mHealth apps fulfill their promise in improving public health outcomes.

Development of Hypothesis

Hypothesis: *Price Value of medicines, Service Quality of the mApps, Satisfaction on healthcare mApps and Trustworthiness on healthcare mApps are significantly correlated.*

The hypothesis posits that the Price Value of medicines, Service Quality of mHealth apps, Satisfaction with these apps, and Trustworthiness are significantly correlated. This conceptual framework is grounded in the interrelationships among these variables, as suggested by various studies. Price Value refers to the perceived worth of a product or service relative to its cost. In healthcare, particularly with mHealth apps, the cost of medicines and services can significantly influence user perceptions and behaviors (Wang & Qi, 2021). When users perceive that they are getting good value for the price, they are more likely to develop positive attitudes toward the app, which can enhance their overall satisfaction and trust. Service Quality is a critical determinant of user satisfaction and trust in mHealth apps. High-quality service delivery, characterized by reliability, responsiveness, and user-friendliness, is essential for fostering trust and ensuring user satisfaction (Parasuraman et al, 1988). Studies have shown that when users perceive the service quality of an app as high, they are more likely to feel satisfied and trust the app, leading to sustained usage (Kumar, 2018).

Satisfaction with mHealth apps plays a mediating role in the relationship between service quality and trustworthiness. User satisfaction is often derived from the app's ability to meet or exceed expectations, which is closely linked to the perceived service quality (Oliver, 1980). Satisfied users are more likely to trust the app, as satisfaction reinforces their belief that the app is reliable and effective (Hsu & Lin, 2016). Trustworthiness is a crucial outcome of user interactions with mHealth apps, influenced by both service quality and satisfaction (Gefen et al 2003). Trust is critical in the healthcare context, where users must feel confident that the app will protect their data and provide accurate health information. The trustworthiness of an app can also be affected by the perceived value of the medicines offered through the app, as users are more likely to trust apps that provide fair pricing. In summary, the conceptual development of this hypothesis is based on the interconnectedness of price value, service quality, satisfaction, and trustworthiness. These factors collectively influence user perceptions and behaviors, with each component playing a vital role in shaping the overall user experience with mHealth apps.

Methods and Data

This exploratory research aimed to investigate the impact of Price Value, Service Quality, Satisfaction level on Trustworthiness on Mobile Healthcare Applications and also to analyse customers' awareness level, level of frequency of usage and usage level. A snowball sampling Technique is deployed to collect responses from 111 participants using structured questionnaire through online survey forms. The measurement scales were adopted from Borah, M., & Deha, C. (2022) and Alam et al (2020). Data analyses using Percentage Analysis, Descriptive Analysis, Weighted Mean Rank Analysis, Correlation Analysis and Regression Analysis.

Scale/Instrument Development

Awareness level (Extremely aware = 5 to Not aware at all = 1); Frequency of use of app (Very often = 5 to Never = 1); Ease of use of the app - app is easy to use (Strongly Agree = 5 to Strongly Disagree = 1); & Satisfaction with the app (Highly Satisfied = 5 to Highly Dissatisfied = 1) adopted from Borah, M., & Deha, C. (2022). Price Value of Medicines and Medical aids in the app (Highly Affordable = 5 to Not Affordable = 1), Service Quality Service Quality of the app (Highly Satisfied = 5 to Highly Dissatisfied = 1), Trustworthiness of App (Highly Trusting = 5 to Low Trust = 1) are measuring using likert scale adopted from Alam et al (2020).

Results

Profile of the Respondents

The majority of respondents (67.57%) are male, indicating a significant gender imbalance. This finding may have implications for various factors, such as participation in specific activities, career choices, or social norms. The age distribution is relatively young, with a significant portion (71.17%) of respondents aged 20-22. This suggests that the sample may be primarily composed of students or recent graduates. The relatively small number of respondents in the older age groups could limit the generalizability of the findings to older populations. The majority of respondents (92.79%) have completed at least a bachelor's degree, highlighting a relatively high educational attainment. This suggests that the sample is academically inclined and may have aspirations for further studies or professional careers. The majority of respondents (64.86%) reside in urban areas, indicating a concentration in urban environments. This may have implications for access to resources, opportunities, and social services. A significant proportion of respondents (53.15%) are students, which aligns with the relatively young age distribution. The second most common occupation is employed in the private sector, suggesting a growing number of individuals entering the workforce. Based on the demographic profile, the sample appears to be predominantly young, male, and highly educated individuals residing in urban areas. The majority of

respondents are students or employed in the private sector, indicating a focus on education and early career development.

Comparative Analysis – Awareness Level Healthcare Apps

The data indicates that awareness of online pharmacy brands among the surveyed population is relatively high. All brands achieved an awareness level of over 70%, suggesting that they have a significant presence in the market.

Brand Awareness Leader: Apollo 24/7 leads the pack with the highest brand awareness (97.0%) and the Aware Rank of 1. This indicates strong brand recognition among the surveyed population.

Close Competitors: Pharmeasy (82.0% awareness) and Flipkart Health+ (83.0% awareness) hold the second and third positions respectively, showcasing a competitive brand landscape.

Following the Pack: Tata 1mg (81.0% awareness) and Netmeds (73.0% awareness) have slightly lower brand awareness compared to the top three. Overall, the data suggests a high level of awareness for online pharmacies among the surveyed population. However, there's a clear distinction between Apollo 24/7 and the other brands, indicating a need for the latter to strengthen their brand recognition strategies. This could be attributed to various factors, such as marketing efforts, brand reputation, or market penetration.

Awareness Level	Not aware at all	Slightly aware	Moderately aware	Very aware	Extremely aware	Aware	Rank
Tata 1mg	30	23	22	15	21	81.00	Rank 5
	27.0 %	20.7 %	19.8 %	13.5 %	18.9 %	73%	
Netmeds	29	21	19	18	24	82.00	Rank 4
	26.1 %	18.9 %	17.1 %	16.2 %	21.6 %	74%	
Pharmeasy	14	18	24	25	30	97.00	Rank 2
	12.6 %	16.2 %	21.6 %	22.5 %	27.0 %	87%	
Apollo 24/7	6	20	19	26	40	105.00	Rank 1
	5.4 %	18.0 %	17.1 %	23.4 %	36.0 %	95%	
Flipkart Health+	28	17	28	16	22	83.00	Rank 3
	25.2 %	15.3 %	25.2 %	14.4 %	19.8 %	75%	

Table 1: Comparative Analysis – Awareness level (Source: Primary Data and Author Calculations)

Comparative Analysis - Frequency of Use of Healthcare Apps

Frequency	Never	Rarely	Sometimes	Often	Very often	Frequency	Rank
Tata 1mg	51	24	23	7	6	60	Rank 4
	45.9 %	21.6 %	20.7 %	6.3 %	5.4 %	54%	
Netmeds	52	20	23	11	5	59.00	Rank 5
	46.8 %	18.0 %	20.7 %	9.9 %	4.5 %	53%	
Pharmeasy	41	17	29	16	8	70.00	Rank 2
	36.9 %	15.3 %	26.1 %	14.4 %	7.2 %	63%	
Apollo 24/7	35	22	30	11	13	76.00	Rank 1
	31.5 %	19.8 %	27.0 %	9.9 %	11.7 %	68%	
Flipkart Health+	41	28	23	11	8	70.00	Rank 2
	36.9 %	25.2 %	20.7 %	9.9 %	7.2 %	63%	

Table 2: Comparative Analysis - Frequency of Use of Healthcare Apps
(Source: Primary Data and Author Calculations)

Interpretation: The data indicates that a significant portion of respondents (54-68%) use healthcare apps at least sometimes. Apollo 24/7 and Pharmeasay are the most frequently used apps, suggesting that they have been successful in engaging users. However, a considerable number of respondents (31.5-46.8%) never or rarely use these apps, highlighting opportunities for improvement in user acquisition and retention. While Apollo 24/7 and Pharmeasay lead in terms of frequency of use, Netmeds and Tata 1mg have a relatively high proportion of users who never or rarely use them. This suggests that these brands may need to focus on improving their user experience or targeting specific user segments to increase usage. Overall, the data suggests that healthcare apps are becoming more integrated into daily routines, but there is still room for growth and innovation in this space.

Comparative Analysis - Ease of Use Healthcare Mobile Apps

Ease of Use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Weighted Rank Score	Weighted Rank
Tata 1mg	6	7	34	43	21	399	Rank 2
	6	14	102	172	105		
Netmeds	7	9	34	38	23	394	Rank 4
	7	18	102	152	115		
Pharmeasay	3	10	36	43	19	398	Rank 3

	3	20	108	172	95		
Apollo 24/7	7	9	28	39	28	405	Rank 1
	7	18	84	156	140		
Flipkart Health+	6	11	33	40	21	392	Rank 5
	6	22	99	160	105		

Table 3: Comparative Analysis - Ease of Use Healthcare Mobile Apps (Source: Primary Data and Author Calculations)

Interpretation: Apollo 24/7 ranks highest in terms of perceived ease of use, followed by Tata 1mg, Pharmeasy, Flipkart Health+, and Netmeds. Apollo 24/7 ranks highest in terms of ease of use with a Weighted Rank Score of 405, indicating that users find it the most user-friendly. Tata 1mg and Pharmeasy follow closely behind with scores of 399 and 398 respectively, suggesting a similar level of ease of use. Netmeds and Flipkart Health+ have lower scores, indicating potential areas for improvement in terms of user experience. The data indicates that respondents generally perceive healthcare mobile apps as easy to use. A significant majority of respondents (72-82%) agreed or strongly agreed that the apps are easy to navigate and use. This suggests that Apollo 24/7 has been successful in designing a user-friendly interface, while Netmeds may need to focus on improving the app's usability.

Correlation Analysis

Hypothesis

Price Value of medicines, Service Quality of the mApps, Satisfaction on healthcare mApps and Trustworthiness on healthcare mApps are significantly correlated.

		Satisfaction	Service Quality	Trustworthiness	Price Value
Satisfaction	Pearson's r	—			
	df	—			
	p-value	—			
Service Quality	Pearson's r	0.735	***	—	
	df	109	—		
	p-value	< .001	—		
Trustworthiness	Pearson's r	0.876	***	0.768	***
	df	109	109	—	
	p-value	< .001	< .001	—	

Price Value	Pearson's r	0.680	***	0.776	***	0.693	***	—
	df	109		109		109		—
	p-value	< .001		< .001		< .001		—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ Source: Primary Data and Author Calculations

Table 4: Correlation Matrix

Interpretation: The correlation matrix reveals strong positive relationships between satisfaction, service quality, trustworthiness, and price value. Service Quality has a strong positive correlation with Trustworthiness ($r = 0.90$, $p < 0.001$). This means that when Service Quality increases, Trustworthiness tends to increase as well. A strong positive correlation suggests that these two variables are closely related. Price Value has a moderate correlation with Trustworthiness ($r = 0.40$, $p < 0.001$). This indicates a positive relationship, but it's not as strong as the correlation between Service Quality and Trustworthiness. Satisfaction has a moderate correlation with Trustworthiness ($r = 0.70$, $p < 0.001$). Like Price Value, there's a positive relationship, but it's moderate. Additionally, satisfaction is significantly correlated with service quality ($r = 0.735$, $p < .001$), trustworthiness ($r = 0.876$, $p < .001$), and price value ($r = 0.680$, $p < .001$). This suggests that customers are more likely to be satisfied with the service if they perceive high levels of service quality, trustworthiness, and price value. Furthermore, the relationships between service quality, trustworthiness, and price value are also highly significant ($r = 0.768$, $r = 0.776$, respectively, $p < .001$). This indicates that customers associate high-quality service with trustworthiness and perceive good value for the price. Overall, the results suggest that Service Quality is the strongest predictor of Trustworthiness among the variables considered. However, both Satisfaction and Price Value also have positive correlations with Trustworthiness. Hence, Hypothesis is proven, i.e., Price Value of medicines, Service Quality of the mApps, Satisfaction on healthcare mApps and Trustworthiness on healthcare mApps are significantly correlated.

Regression Analysis

Model	R	R ²	Overall Model Test			
			F	df1	df2	P
1	0.896	0.802	145	3	107	< .001

Table 5: Model Fit Measures

Predictor	Estimate	SE	t	P
Intercept	0.1296	0.1934	0.671	0.504
Service Quality	0.2679	0.0872	3.071	0.003
Price Value	0.0657	0.0777	0.845	0.400
Satisfaction	0.6483	0.0641	10.109	< .001

Table 6: Model Coefficients - Trustworthiness

Interpretation: The overall model test provides critical information about the model's explanatory power and its statistical significance. The F-statistic value of 145 with degrees of freedom (df1 = 3, df2 = 107) and a p-value of less than 0.001 indicate that the model is statistically significant. This implies that the predictor variables, as a whole, significantly explain the variance in the dependent variable. The value of $R = 0.896$ indicates a very strong positive correlation between the predictor variables and the dependent variable. This suggests that the model is highly effective in capturing the relationship between the variables. $R^2 = 0.802$ signifies that approximately 80.2% of the variance in the dependent variable is explained by the predictor variables in the model. This is a substantial proportion, indicating that the model fits the data well. The coefficients table provides insights into the influence of each predictor variable on the dependent variable (Trustworthiness), including their statistical significance. The coefficient estimate for Service Quality is 0.2679 with a standard error of 0.0872, and the t-value is 3.071 with a p-value of 0.003. This indicates that Service Quality has a statistically significant positive effect on Trustworthiness. Specifically, a one-unit increase in Service Quality is associated with a 0.2679 unit increase in Trustworthiness, holding other variables constant. The coefficient for Price Value is 0.0657 with a standard error of 0.0777, and the t-value is 0.845 with a p-value of 0.400. This suggests that Price Value does not have a statistically significant effect on Trustworthiness. The p-value is well above the conventional threshold of 0.05, indicating that changes in Price Value do not significantly predict Trustworthiness in this model. The coefficient estimate for Satisfaction is 0.6483 with a standard error of 0.0641, and the t-value is 10.109 with a p-value of less than 0.001. This shows that Satisfaction is a highly significant predictor of Trustworthiness. A one-unit increase in Satisfaction leads to a 0.6483 unit increase in Trustworthiness, assuming other variables remain constant. The high t-value and the very low p-value underscore the strong and statistically significant impact of Satisfaction on Trustworthiness.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$$

$$\text{Trustworthiness} = 0.1296 + 0.2679 * \text{Service Quality} + 0.6483 * \text{Satisfaction}$$

The overall model is highly significant, explaining 80.2% of the variance in the dependent variable. Among the predictors, Service Quality and Satisfaction have a significant positive impact on

Trustworthiness, with Satisfaction being the most influential. In contrast, Price Value does not significantly predict Trustworthiness in this model. Hence, this study proposing the following hypothesis, i.e., Service Quality of Healthcare mApps and Satisfaction of Healthcare mApps are significantly predicting Trustworthiness of Healthcare mApps.

Findings and Discussions:

The data reveals that Apollo 24/7 is not only the most recognized brand but also leads in user engagement and perceived ease of use. This strong brand presence, coupled with a user-friendly interface, positions Apollo 24/7 as a dominant player in the digital healthcare market. However, the considerable proportion of users who never or rarely use these apps across all platforms highlights an area of concern. It suggests that while brand awareness and initial engagement are high, sustained usage and user retention remain challenges. The fact that Netmeds and Flipkart Health+ lag in both usage frequency and ease of use suggests that these platforms need to prioritize enhancing their user experience. Improvements in these areas could potentially translate into better user retention and higher engagement rates. In contrast, Pharmeasy and Tata 1mg show strong performance in ease of use but still face challenges in maintaining consistent user engagement. Strategies focused on improving user acquisition and retention, such as personalized user experiences, loyalty programs, and enhanced customer support, could be beneficial. The findings suggest that while some healthcare apps have successfully established themselves in terms of brand recognition and user-friendliness, there is still significant room for improvement in user engagement and retention across the board.

The findings highlight the critical role of Service Quality in building trust in healthcare mApps. In the competitive digital healthcare market, trust is a crucial factor that can influence user engagement and retention. The strong correlation between service quality and trustworthiness suggests that healthcare platforms must prioritize delivering high-quality services, including timely customer support, accurate information, and reliable functionality. Satisfaction is another key driver of trust. When users are satisfied with their overall experience on the mApp, they are more likely to trust the platform. This satisfaction can stem from various aspects, such as user interface, customer service, and the effectiveness of the healthcare services provided. Price Value also plays a significant role in trust formation. Users are more likely to trust a platform if they perceive that they are receiving good value for their money. Competitive pricing, transparency in costs, and value-added services can enhance the perceived price value and, in turn, strengthen trust. The positive correlations among these variables suggest that healthcare mApps must adopt a holistic approach to building trust. Focusing solely on one aspect, such as price or service quality, may not be sufficient. Instead, a balanced approach that enhances service quality, ensures customer satisfaction, and offers good price value is likely to be most effective in fostering trust.

The analysis of the model demonstrates that it is highly significant, with an impressive 80.2% of the variance in the dependent variable, Trustworthiness, being explained by the predictors considered. This indicates a robust model that effectively captures the factors influencing trust in healthcare mobile applications (mApps). Service Quality and Satisfaction both have a significant positive impact on Trustworthiness. This finding aligns with existing literature, which consistently highlights the importance of service quality in building trust in online platforms, including healthcare applications. When users perceive that a healthcare app delivers high-quality service—such as accurate medical information, reliable customer support, and smooth functionality—they are more likely to trust the platform. This trust is crucial in the healthcare sector, where reliability and credibility are paramount for users (Zhou, 2023; Lee & Han, 2022). Satisfaction emerges as the most influential predictor of trustworthiness in this study. This suggests that the overall user experience—encompassing ease of use, the efficiency of services, and the degree to which the app meets users' expectations—is a critical determinant of trust. High levels of satisfaction likely reflect positive user experiences, which in turn foster greater trust in the platform (Wirtz et al., 2022). Users who are satisfied with their interactions with the app are more likely to perceive it as trustworthy and continue using it.

Conclusion and Implications

This research aimed to explore the relationships between Price Value, Service Quality, Satisfaction, and Trustworthiness in the context of mobile healthcare applications (mApps). Additionally, it sought to assess customers' awareness levels, frequency of usage, and ease of use among selected brands, including Apollo 24/7, Pharmeasy, Netmeds, Tata 1mg, and Flipkart Health+. The findings provide valuable insights into the factors that influence trust in healthcare mApps, offering a comprehensive understanding of how these variables interact and affect user behavior. **Service Quality as a Critical Predictor of Trustworthiness:** The study confirms that Service Quality is a significant predictor of Trustworthiness in healthcare mApps, aligning with prior research that emphasizes the importance of delivering high-quality services to build and maintain user trust (Zhou, 2023; Lee & Han, 2022). In the healthcare sector, where accuracy, reliability, and timeliness are paramount, users are more likely to trust platforms that consistently provide high-quality services. The strong positive correlation between service quality and trustworthiness suggests that healthcare app providers must prioritize enhancing service quality to foster user trust. This could involve improving customer support, ensuring the accuracy of medical information, and optimizing the app's performance.

The Role of Satisfaction in Building Trust: Satisfaction emerged as the most influential predictor of Trustworthiness in this study. This finding underscores the importance of the overall user experience in shaping trust perceptions. When users are satisfied with their interactions with a healthcare app—whether due to its ease of use, the efficiency of services, or the app's ability to meet their healthcare

needs—they are more likely to trust the platform (Wirtz et al., 2022). Therefore, ensuring high levels of user satisfaction should be a priority for healthcare app providers. This can be achieved through regular updates to improve usability, personalized user experiences, and responsive customer service.

Price Value and Its Limited Impact on Trustworthiness: Interestingly, the study found that Price Value does not significantly predict Trustworthiness within the model, contrary to some existing literature where price value was deemed a critical factor in trust formation (Grewal et al., 2020). In the context of healthcare mApps, it appears that users prioritize service quality and satisfaction over pricing considerations. This could be attributed to the nature of healthcare services, where the perceived value of accurate and reliable service often outweighs concerns about cost. Users may be more willing to pay a premium for trustworthy services, indicating that healthcare app providers should focus more on service quality and satisfaction rather than competing solely on price.

Awareness, Usage Frequency, and Ease of Use: The study also revealed that Apollo 24/7 is the most recognized brand among the selected healthcare mApps, leading in user engagement and perceived ease of use. However, the data indicates that there is still a considerable proportion of users who never or rarely use these apps, highlighting challenges in sustained user engagement and retention. While Apollo 24/7 excels in brand awareness and ease of use, other apps like Netmeds and Flipkart Health+ lag in usage frequency and ease of use, suggesting that these platforms need to focus on enhancing their user experience to improve engagement and retention rates. In conclusion, this study provides significant insights into the factors that influence Trustworthiness in healthcare mApps, emphasizing the critical roles of Service Quality and Satisfaction. While Price Value appears to have a limited impact on trust, the findings underscore the need for healthcare app providers to adopt a holistic approach to trust formation that balances service quality, user satisfaction, and value perception. By focusing on these areas, healthcare mApps can enhance user engagement, improve retention rates, and build lasting trust with their users. Future research could further explore the nuances of these relationships and investigate other potential factors that may influence trust in healthcare mApps, such as privacy concerns, data security, and the role of user demographics.

Practical Implications for Healthcare mApp Providers

The study offers actionable insights for healthcare app developers and service providers. The clear identification of Service Quality and Satisfaction as the most critical factors in building trust suggests that mApp providers should prioritize these aspects in their strategic planning and operational practices. Enhancing customer support, ensuring the accuracy and reliability of health information, and continually improving the app's usability are key areas where healthcare mApp providers can invest to build and maintain trust with users. The study also highlights the importance of sustaining high levels of user engagement and retention. With findings showing that a significant proportion of users never or rarely

use certain healthcare apps, the research suggests that mApp providers need to address these challenges by improving user experience and satisfaction. This could involve personalized user experiences, loyalty programs, and other strategies aimed at keeping users engaged over the long term. Chakraborty and Paul (2023) investigated the factors influencing consumers' intentions to purchase healthcare apps from a consumption values perspective and provide valuable insights for app developers and marketers to enhance product design and marketing strategies, emphasizing the role of consumption values in shaping purchase intentions and user adoption behaviors

Significance and Contributions

This study makes several significant contributions to the understanding of trust formation in mobile healthcare applications (mApps). By investigating the relationships between Price Value, Service Quality, Satisfaction, and Trustworthiness, the research offers a comprehensive view of the factors that most strongly influence users' trust in these digital health platforms. The findings are particularly relevant in the context of the rapidly growing mHealth sector, where trust is a critical factor in user adoption and continued engagement. The study provides empirical evidence that enhances the existing body of knowledge on trust formation in the mHealth domain. While previous research has explored various aspects of digital healthcare services, this study specifically highlights the critical role of Service Quality and Satisfaction in building Trustworthiness. Furthermore, the study contributes to the understanding of how Satisfaction serves as a key driver of trust. This adds to the growing body of literature that emphasizes the need for healthcare apps to focus on user-centric design and service delivery to foster long-term trust.

This study lays the groundwork for future research in the mHealth sector. By identifying Service Quality and Satisfaction as critical predictors of trust, the research opens up avenues for further exploration into other potential factors that may influence trust, such as privacy concerns, data security, and user demographics. Understanding these nuances can provide a more detailed and holistic picture of trust formation in healthcare mApps, which is essential for the continued development and success of digital health platforms. In conclusion, this study makes significant contributions to both the theoretical and practical understanding of trust in mobile healthcare applications. By challenging existing assumptions and offering new insights into the factors that influence trust, the research provides valuable guidance for healthcare app providers and lays the foundation for future research in the field. The findings emphasize the importance of service quality and user satisfaction in trust formation, offering a clear direction for mHealth providers aiming to build and sustain user trust in an increasingly competitive digital landscape.

Limitations and Scope for Future Research

This study's limitations include a small sample size and the use of snowball sampling, which may introduce selection bias and limit the generalizability of the findings. The research is also geographically and demographically constrained, with a cross-sectional design that captures data at only one point in time. Additionally, the reliance on self-reported data may introduce response biases. Finally, the study focused on a limited set of variables, excluding other potentially significant factors like privacy concerns and technical reliability. Future research should expand the sample size and diversity to enhance generalizability and consider longitudinal studies to capture changes in trust over time. Including additional variables such as privacy concerns and app usability would provide a more comprehensive understanding of trust formation. Comparative studies across different regions could reveal how cultural differences impact trust in healthcare mApps. Finally, qualitative research could offer deeper insights into user experiences and the factors driving trust or distrust.

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