

Determinants of Mhealth Applications Use and Digital Health Literacy Among Urban Smartphone Users in Chengalpattu District, Tamil Nadu: A Cross-Sectional Study

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ABSTRACT

Background: In India, mobile health applications have evolved rapidly, improving healthcare system but disparities in adoption still persist due to variations in digital literacy and privacy concerns. Community-based evidence on digital health literacy and barriers among users and non-users remains limited. This study assessed the prevalence, determinants, perceptions, and challenges to mHealth application use among urban smartphone users in Chengalpattu district, Tamil Nadu.

Methods: A community-based cross-sectional study was conducted among 313 adults who were selected through multi-stage sampling. Data were collected using a semi-structured questionnaire covering sociodemographic details and mHealth usage, digital health literacy, perceived barriers, satisfaction and reasons for non-use. Data were analyzed using Chi-square tests and multivariable logistic regression.

Results: The prevalence of mHealth application usage was 59.4% among smartphone users. mHealth usage was significantly associated with age, education, income, internet usage and digital literacy. In multivariable analysis, digital health literacy independently predicted mHealth use (AOR = 1.27; 95% CI: 1.16–1.39; $p < 0.001$). 68.8% reported satisfaction and 64.0% perceived improved adherence to health-related behaviours. Common barriers included data privacy concerns and high subscription costs.

Conclusion: mHealth use was predominantly lifestyle-oriented. Strengthening digital health literacy and addressing trust and privacy concerns may improve mHealth use. Community-based digital literacy interventions should be prioritized.

Keywords: mHealth, digital health literacy, digital health adoption, urban population.

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INTRODUCTION

Mobile health (mHealth) has evolved as an essential element of digital health. The rapid growth of smartphone usage and wireless technologies like wearable sensors, remote patient monitoring systems has significantly influenced the delivery of health care services across the world. The Global Observatory for eHealth (GOe) defines mobile health as “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices” [1].

In low- and middle-income countries such as India, mHealth applications have become prominent for health information, disease monitoring, teleconsultation,

laboratory diagnostic services like booking test, home based sample collection and medication adherence, supporting enhanced accessibility, continuity of services, and affordability of care [2]. Over the past decade, mHealth apps have progressed from simple fitness and lifestyle tracking to support complex clinical service like teleconsultation, chronic disease management, and patient monitoring [3-4]. Despite this substantial growth, evidence suggests that adoption and sustained use of mHealth apps remain uneven, influenced by socio-demographic factors, digital literacy, trust, privacy concerns, and usability [5].

The National Health Policy (2017) emphasized the development of a national digital health architecture to

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link public and private providers. Building on this vision, the National Digital Health Blueprint and subsequently the Ayushman Bharat Digital Mission (ABDM) were launched to create an integrated and interoperable digital health ecosystem. These initiatives aim to strengthen digital infrastructure and facilitate teleconsultation and health information exchange across India [6].

According to National Family Health Survey-5 (2019–21), digital access in India remains uneven. Only 33% of women and 57% of men aged 15-49 years use internet in the past 12 months. In Tamil Nadu, internet usage was higher (48% among women and 67% among men), reflecting better digital penetration. However, this gender disparities and gaps may influence equitable utilisation of mHealth technologies [7].

Studies from India and other countries have reported different levels of awareness and utilization of mHealth apps, implying the gap between advanced technological availability and actual use of them [8]. Most of the Indian studies have focused on specific disease-based applications, with limited emphasis on overall awareness, usage, and barriers across multiple mHealth domains.

Community-level evidence on the perceptions of both users and non-users of mHealth applications remains limited. Chengalpattu district, characterized by rapid urbanization and a mixed socio-economic profile, represents a transitional setting where digital health adoption patterns remain underexplored. Therefore, the primary objective of this study is to assess the prevalence and determinants of mHealth application utilization among urban smartphone users in Chengalpattu district. Secondary objective is to assess the level of digital health literacy and its association with mHealth application utilization, and to examine user perceptions, satisfaction, challenges, and reasons for non-use.

METHODOLOGY

Study design and setting

A community-based cross-sectional study was conducted among adult smartphone users residing in urban areas of Chengalpattu district, Tamil Nadu.

Study population

The study population included adults aged 18 years and above who owned a smartphone and had been residing in the study area for a minimum period of six months. (June – November 2025)

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee (IEC) of SRM Medical College, Chengalpattu (Approval No: SRMIEC-ST0126-6029). Written Informed consent was obtained from all participants prior to participation. Confidentiality and anonymity were ensured throughout the study.

Inclusion criteria

Adults aged ≥ 18 years, owns a smartphone, residence in the study area for at least six months and willingness to participate and provide informed consent.

Exclusion criteria

Individuals who were unable to respond due to cognitive impairment or serious illness and Individuals unwilling to participate.

Sample size and sampling technique

Considering the prevalence of usage of health-based mobile apps to be 35%, as reported by Rajan et al., assuming an absolute precision of 5.5% and a non-response rate of 10%, the sample size was calculated using the formula

$$n = \frac{Z^2 pq}{d^2}$$

where $Z = 1.96$ for a 95% confidence interval, $p = 0.35$, $q = 0.65$, and $d = 0.055(5.5\%)$. The minimum required sample size was 313.

A multi-stage sampling technique was done for this community-based cross-sectional study. Chengalpattu district consists of eight revenue blocks and multiple urban local bodies comprising of municipalities and town panchayats, further divided into urban wards. The list of urban wards was obtained from municipal records.

In the first stage, a list of urban wards in Chengalpattu district was obtained, and 20 wards were selected using simple random sampling.

In the second stage, within each selected ward, a random starting point was identified, and households were selected using systematic sampling.

In the final stage, one eligible adult aged ≥ 18 years was selected from each household for participation. If more than one eligible adult was present, one participant was selected by simple random selection. In cases of refusal/not available, the next household along the route was approached.

Study tool and data collection

Data were collected using a pre-designed, semi-structured questionnaire, developed based on a review of relevant literature. The questionnaire was pretested among 30 adults in a similar urban setting, and necessary modifications were made before final data collection. Content validity of the questionnaire was assessed by three faculty members from the Department of Community Medicine. The questionnaire has sections assessing sociodemographic characteristics, awareness and usage of mHealth apps, types of mHealth apps used, perceived benefits and challenges associated with mHealth apps, reasons for non-usage among non-users, key barriers and digital health literacy. The key barriers section was Technology Acceptance Model (TAM) questionnaire based short adaptation [9]. Digital health literacy was assessed using an adapted 7-item version of the Digital Health Literacy Instrument (DHLI)[10]. Each item was scored on a 4-point Likert scale (1 = Very difficult, 2 = Difficult, 3 = Easy, and 4 = Very easy), with higher scores indicating better digital health literacy. The total score ranged from 7 to 35, with higher scores indicating better literacy. Digital health literacy scores

were categorized into tertiles (low, moderate, high) based on the score distribution.

Data collection was carried out using interviewer-administered questionnaires through Google Forms.

Operational definitions

mHealth user: A participant who reported using at least one mHealth application for any health-related purpose during the past 1 year.

Non-user: A participant who reported never having used any mHealth application.

Data analysis: Data were entered into MS Excel and analyzed using SPSS version 29. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Associations between selected sociodemographic variables and mHealth application usage were examined using the Chi-square test.

RESULTS

Table 1: Sociodemographic profile (n=313)

Variable	Category	n (%)
Age	18-24	80 (25.6)
	25-34	82 (26.2)
	35-44	43 (13.7)
	45-54	41 (13.1)
	55-64	30 (9.6)
	65+	37 (11.8)
Gender	Male	169 (54.0)
	Female	144 (46.0)
Education	No formal education	18 (5.8)
	Primary to secondary	81 (25.9)
	Higher secondary / Diploma	39 (12.5)
	Graduate and above	175 (55.9)
Occupation	Employed / Self-employed	154 (49.2)
	Homemaker	92 (29.4)
	Retired	17 (5.4)
	Student	50 (16.0)
Income	≤10,000	117 (37.4)
	10,001-25,000	58 (18.5)
	25,001-40,000	66 (21.1)
	40,001-75,000	35 (11.2)
	>75,000	37 (11.8)
Chronic Diseases	Yes	108 (34.5)
	No	205 (65.5)
If yes*	Diabetes	27 (25.2)
	Hypertension	29 (27.1)
	Thyroid	19 (17.8)
	Sleep disturbances	17 (12.8)
	Mental health disorders	9 (8.4)
	Obesity	32 (29.9)

*Multiple responses were permitted for chronic diseases.

Among the study participants, majority of the participants belonged to 25-34 years age group (26.2%), followed by 18-24 years (25.6%). Male respondents were 54.0% and female were 46.0%. More than half were graduated and above (55.9%). 49.2% were employed/self-employed. Approximately one-third (34.5%) reported to have at least one chronic disease, of which hypertension (27.1%),

diabetes (25.2%) and Obesity (29.9%) were common. (As mentioned in Table 1)

Prevalence of mHealth use

Out of 313 adult smartphone users, 59.4% (n=186) were mHealth users, while 40.6% (n=127) were non-users of at least one mobile health apps.

Pattern of mHealth use

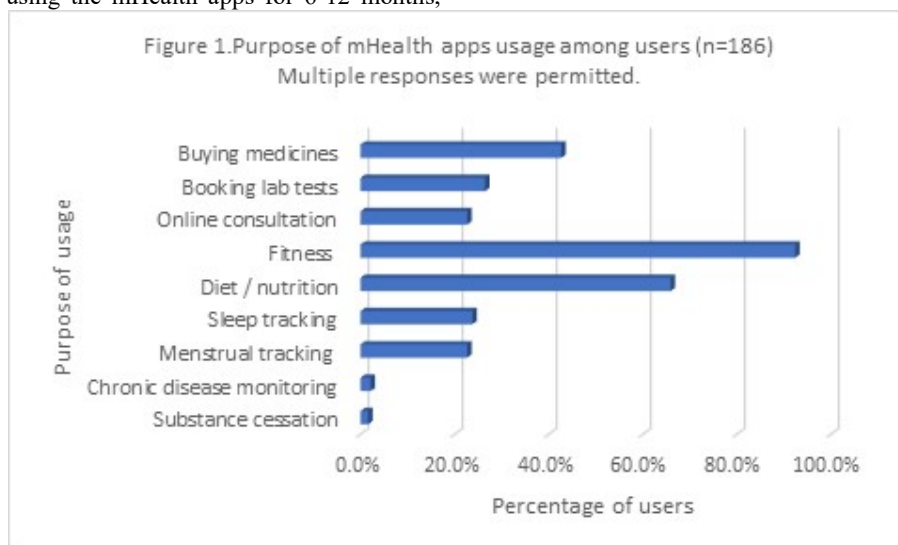
Table 2. Pattern of mHealth use among participants who use mobile health apps (n=186)

Variable	Category	n (%)
Purpose of Use*	Buying medicines	79 (42.7)
	Booking lab tests	49 (26.5)
	Online consultation	42 (22.7)
	Fitness	171 (92.4)
	Diet / nutrition	122 (65.9)
	Sleep tracking	44 (23.8)
	Menstrual tracking	42 (22.7)
	Chronic disease monitoring	4 (2.2)
	Substance cessation	3 (1.6)
Duration of Use	< 6 months	53 (28.5)
	6-12 months	92 (49.5)
	≥ 1 year	41 (22.0)
Frequency of Use	Daily	102 (54.8)
	Weekly	55 (29.6)
	Rarely	29 (15.6)
Number of Apps Used	1-2	64 (34.4)
	≥3	122 (65.6)
Paid Apps Usage	No, I have not paid	139 (74.7)
	Yes, up to ₹500	39 (21.0)
	Yes, ₹501–₹1000	7 (3.8)
	Yes, ≥ ₹1001	1 (0.5)

*Multiple responses were permitted for purpose of use; Percentages exceed 100%.

As given in Table 2, Among the study participants who reported to use mHealth apps (n = 186), the purpose of use was mostly fitness related apps (92.4%), followed by diet/nutrition apps (65.9%). Nearly half of the users (49.5%) were using the mHealth apps for 6-12 months,

and 54.8% reported the frequency of use to be daily. Majority used 3 or more mHealth apps (65.6%). Most of the users (74.7%) have not paid for any apps, indicating preference for free apps.



The participants who used apps for purchasing medicines (n=79) showed that Apollo 24/7 was their most preferred platform (39.2%) followed by Med Plus (30.4%) and NetMeds (24.1%). For diagnostic services (n = 49) Tata 1mg (55.1%) was their most frequently used platform while Dr. Lal Path Labs received 26.5% usage.

The majority of participants who used teleconsultation services (n = 42) selected Tata 1mg (41.4%) as their main platform and Apollo 24/7 at 39.7%. Practo was utilized by 27.6% of users, while Lybrate (10.3%) and mfine (1.7%) were less commonly reported. Device-integrated applications dominate fitness usage because 70.2% of

users choose Samsung Health as their primary fitness application. Users prefer third-party fitness applications like Google Fit, Mi Health, cultfit at a much lower rate than device-integrated applications. Users in India prefer to use HealthifyMe (n=81), CultFit (n=45) for their diet tracking needs because the application shows strong popularity.

In the Sleep and Mindfulness category (n=44) Calm app remains the mostly used (n=16) followed by Headspace (n=12). The built-in device health systems in

devices lead to users tracking their menstrual cycle through Samsung Health (n=43) and Apple health (n=12). Third party users like Maya, Flo have less users. Apps for smoking cessation (I AM Sober, SobrietyCounter) have very low usage (only 3 users). The usage of chronic disease monitoring applications remains extremely low since only four users engage with condition-specific digital management tools like mySugr, Glucose Buddy and Smart BP.

Factors associated with mHealth use:

Table 3: Bivariate Analysis of Factors Associated with mHealth Use

Variable	Category	Users n (%)	Non-Users n (%)	χ^2 (df)	p-value
Age group	18-24	50 (62.5)	30 (37.5)	19.20 (5)	0.002
	25-34	58 (70.7)	24 (29.3)		
	35-44	29 (67.4)	14 (32.6)		
	45-54	23 (56.1)	18 (43.9)		
	55-64	14 (46.7)	16 (53.3)		
	65+	12 (32.4)	25 (67.6)		
Education	No formal education	6 (33.3)	12 (66.7)	46.26 (3)	<0.001
	Primary to secondary	26 (32.1)	55 (67.9)		
	Higher secondary / Diploma	24 (61.5)	15 (38.5)		
	Graduate and above	130 (74.3)	45 (25.7)		
Gender	Male	100 (59.2)	69 (40.8)	0.01 (1)	0.921
	Female	86 (59.7)	58 (40.3)		
Income	≤10,000	57 (48.7)	60 (51.3)	11.99(4)	0.017
	10,001–25,000	33 (56.9)	25 (43.1)		
	25,001–40,000	46 (69.7)	20 (30.3)		
	40,001–75,000	23 (65.7)	12 (34.3)		
	>75,000	27 (73.0)	10 (27.0)		
Daily internet usage	<1 hour	25 (43.1)	33 (56.9)	10.02 (3)	0.018
	1–2 hours	104 (65.8)	54 (34.2)		
	3–4 hours	44 (56.4)	34 (43.6)		
	≥5 hours	13 (68.4)	6 (31.6)		
Smartphone type	Android	138 (60.8)	89 (39.2)	0.64 (1)	0.423
	iPhone	48 (55.8)	38 (44.2)		
Smartphone ownership	≤3 years	21 (44.7)	26 (55.3)	8.15 (2)	0.017
	3–5 years	22 (50.0)	22 (50.0)		
	> 5 years	143 (64.4)	79 (35.6)		
DHL category	Low (Tertile 1)	44 (41.1)	63 (58.9)	27.44 (1)	<0.001
	Moderate (Tertile 2)	66 (61.7)	41 (38.3)		
	High (Tertile 3)	76 (76.8%)	23 (23.2%)		

Percentages represent row percentages.

The study found that age group has a statistically significant relationship with mHealth usage ($\chi^2 = 19.20$, $df = 5$, $p = 0.002$), which showed that older people use mHealth less. And education level had a strong relationship with mHealth usage through the statistical test results ($\chi^2 = 46.27$, $df = 3$, $p < 0.001$), which showed that 74.3% of graduates or higher used mHealth while only 33.3% of people without a formal education did.

The DHLI operational skills subscale demonstrated moderate internal consistency (Cronbach's $\alpha = 0.65$). Most items showed acceptable corrected item-total correlations (>0.3), although one item exhibited a lower

correlation. Removal of this item did not result in a meaningful improvement in alpha, and therefore all items were retained.

The assessment of digital health literacy produced results which showed a range from 8 to 28 with a mean score of 20.9 ± 3.4 . Based on tertiles of the score distribution, 34.2% of participants were classified as having low digital health literacy, 34.2% as moderate, and 31.6% as high. The relationship between digital health literacy (DHL) and mHealth usage shows strong association ($\chi^2 = 27.44$, $df = 1$, $p < 0.001$) mHealth usage increased progressively with higher levels of digital health literacy,

with 41.1% of participants in the low literacy group using mHealth applications compared to 61.7% in the moderate group and 76.8% in the high literacy group.

Perceived barriers to mHealth apps users.

Table 4: Perceived Barriers to mHealth Application Use Among Users (n = 186).

Perceived Barriers	Agree	Neutral/Disagree
mHealth apps are difficult to use	37 (19.9)	149 (80.1)
It takes too much effort to navigate and understand app features.	38 (20.4)	148 (79.6)
mHealth apps do not significantly help me manage my health.	34 (18.3)	152 (81.7)
mHealth apps do not save me time or make healthcare easier.	43 (23.1)	143 (76.9)
I am concerned that my personal health data may be misused	98 (52.7)	88 (47.3)
I do not fully trust online doctors or consultations in these apps.	71 (38.2)	115 (61.8)
Subscriptions or consultation fees in mHealth apps are too costly	92 (49.5)	94 (50.5)
Poor internet connectivity or device limitations make it hard to use health apps	57 (30.6)	129 (69.4)

Data privacy problems and expensive subscription fees were the two main issues which users (n = 186) reported most often. The participants of the study reported that they did not trust online doctors which was the reason for their 38.2% rate of reporting this issue.

Perceptions and Satisfaction Among Users:

Among users, 68.8% reported overall satisfaction with mHealth apps. The study found that 64.0% of participants

observed better adherence to health-related behaviours such as fitness routines, sleep habits or lifestyle practices. The users showed strong support for the apps because 76.9% of them said they would recommend to others and 73.7% of them would continue to keep using them. More than half (54.8%) expressed preference for a government-endorsed mHealth application.

Challenges Faced During mHealth App Usage:

Table 5. Self-reported Challenges Experienced During mHealth App Usage Among Users (n = 186)

Challenges reported	n (%)
Data privacy concerns	50 (32.7)
Technical difficulties	48 (31.4)
Financial constraints	39 (25.5)
High app cost	32 (20.9)
Advertisements	31 (20.3)
Limited pharmacy/diagnostic tie-ups	27 (17.6)
Difficulty integrating with doctors/devices	23 (15.0)
Poor customer support	12 (7.8)

*Multiple responses allowed.

While, table 4 assessed perceived barriers, table 5 shows the actual challenges the study participants using mHealth apps experienced. mHealth app Users experienced two primary challenges which included data privacy concerns that affected 32.7% of users and technical difficulties that impacted 31.4% of users. The following two issues were

reported by users as their next most common problems which included financial constraints that affected 25.5% of users and high app costs which affected 20.9% of users.

Reasons for non-use:

Table 6: Self-Reported Non-use reasons of mHealth Apps (n = 127)

Reasons	n (%)
No need / prefer in-person visit	78 (65.5%)
Prefer government hospital services	43 (36.1%)
Don't know how to use apps / apps are confusing	32 (26.9%)
Don't trust online doctors	24 (20.2%)
Not comfortable with online payment	24 (20.2%)
Fear of privacy breach	20 (16.8%)
No one to help with mobile	17 (14.3%)
Don't have enough internet	10 (8.4%)

Multiple responses were permitted for reasons for non-use; Percentages exceed 100%. The main reason non-users (n = 127) chose not to use the service was their preference for face-to-face consultations which accounted for 65.5% of non-users. People reported their reasons

through two main factors which included their hospital service preference at government facilities (36.1%) and their unawareness of app usability (26.9%).

Multivariable Analysis of Factors Associated with mHealth Use:

Table 7: Factors Associated with mHealth Use Among Participants (n = 313)

Variable	AOR (95% CI)	P value
Digital health literacy (continuous)	1.27 (1.16–1.39)	<0.001
Age group (years)		0.207
25–34 vs 18–24	3.34 (1.08–10.34)	0.037
35–44 vs 18–24	2.93 (0.83–10.31)	0.096
45–54 vs 18–24	4.71 (1.39–15.93)	0.014
55–64 vs 18–24	2.28 (0.63–8.20)	0.215
Education level		<0.001
Primary vs no formal education	6.18 (3.05–12.50)	<0.001
Secondary vs no formal education	4.54 (1.75–11.79)	0.002
Higher vs no formal education	1.84 (0.46–7.33)	0.389
Income (overall)	—	0.008
Daily internet usage (overall)	—	0.017

Variables with $p < 0.20$ in bivariate analysis were included in the multivariable logistic regression model.

The results of the adjusted logistic regression analysis showed that digital health literacy functioned as an independent factor which affected mHealth usage because every literacy score increase resulted in 27% higher odds of app usage according to the study results (AOR = 1.27; 95% CI: 1.16–1.39; $p < 0.001$). Education level was a significant predictor. Primary education participants had 6.18 times higher odds of using mHealth apps compared to those without any education according to the study results (AOR = 6.18; 95% CI: 3.05–12.50; $p < 0.001$). The secondary education level showed a significant association with mHealth usage according to the study results (AOR = 4.54; 95% CI: 1.75–11.79; $p = 0.002$). Income level and daily internet usage were also found to be significantly associated with mHealth usage at the model level ($p = 0.008$ and $p = 0.017$, respectively). Age group failed to maintain its statistical significance after adjustments.

DISCUSSION

This study assessed the prevalence, determinants, digital health literacy and perceived barriers related to mHealth application use among urban adults in Chengalpattu district. We found that 59.4% of adult smartphone users had reported using at least one mHealth application, which is greater usage compared to the study conducted in Rajnandgaon city (48.6%) by Vaishnav et al. [11]. This finding is comparable to a cross-sectional study conducted in an urban locality of Indore, (54.5%) [8].

Internationally, study conducted in Saudi Arabia by Amer et al., reported 47.9% prevalence of mHealth app use in the general Saudi population [12]. Higher prevalence may reflect increased post-pandemic digital health adoption.

Younger age groups showed higher mHealth usage, consistent with previous Indian studies. This was similar to the study by Rajan et al. [13] and Khare et al., [8]. The current research showed that education level had a strong impact on mHealth app usage. Similarly previous studies showed that people with higher education levels used health apps more compared to those with lower education levels [12,14], this association was not retained after

logistic regression, suggesting that its effect may be mediated through factors such as digital health literacy or internet use. The attenuation of higher education in the adjusted model may be due to overlap with digital health literacy, suggesting possible multicollinearity.

The current study found that mHealth application usage showed no significant relationship between users' gender and their smartphone device choice. A study conducted in Maharashtra showed that men and women used digital health technologies at comparable rates just like this study showed no difference between genders [15].

Income showed a positive association with mHealth utilization, with higher-income groups denoting increased adoption rates. This trend is likely due to affordable smartphones, reliable internet, and paid digital services, consistent with national data highlighting socioeconomic disparities in digital health [12].

Similarly, higher daily internet usage correlated with greater mHealth engagement, suggesting that regular online habits and digital familiarity promote uptake. Prior studies have similarly identified internet exposure as an important determinant influencing digital health behaviour [7].

In this study the mHealth use was mostly for fitness and diet/nutrition. This indicates that digital health apps are used predominantly for preventive and lifestyle orientation. Chronic disease monitoring apps were used by only 2.2% of the mHealth users in this study. Similar pattern was reported among several Indian studies [8,16].

Digital health literacy (DHL) was found to be an important determinant of mHealth use. The average DHL score reached 20.9 with a standard deviation of 3.4 and only 31.6 % of participants achieved high literacy. Each unit increase in DHL score was associated with 27% higher odds of mHealth use, indicating an independent association. The findings suggest that more than having a smartphone or internet connection, the ability to search, evaluate and apply the online information plays a critical role in translating digital availability into actual

utilization. International evidence has consistently shown that people who lack digital literacy skills face significant challenges when trying to use mHealth applications [17,18]. The findings also align with local evidence [19]. International research demonstrates that eHealth literacy increases people's intention to use digital technology [20]. Therefore, digital competencies act as a fundamental necessity for ensuring equitable mHealth usage and adoption.

Although 64% of users reported improved adherence to health-related behaviours like diet improvement, sleep improvement and following fitness routine, this was self-reported and not objectively measured. Our findings are consistent with a recent Indian systematic review which reported improved service utilization and health behaviours with mHealth interventions, though effects varied across conditions [21]. Positive user perception of mHealth applications is a key factor that supports ongoing usage of these applications similar to study results [22]. 76.9% of the users are likely to recommend the usage of mHealth apps to others, which is similar to a study done among undergraduate nursing students, where students using more than 2 apps were willing to recommend mHealth apps to patients [23].

This study showed high perceived ease of use because only one-fifth of users encountered problems when they tried to operate or navigate mHealth applications, which resulted in 68.8% user satisfaction. The rural Tamil Nadu study conducted by Rex Vijay et al. showed that users faced greater usability problems because limited literacy skills made it hard to use electronic devices, which in turn caused negative impacts on user satisfaction and perception [24]. Similar TAM adapted model has been used in a national study [12].

The main challenges that people recognized were data privacy problems which affected 52.7% and high subscription fees as reported by 49.5% of users and online doctors lacking trustworthiness (38.2%). Global systematic reviews have identified privacy and security as the two technical obstacles that need to be addressed [17]. Concerns regarding data security, confidentiality, and potential misuse of personal health information may weaken the trust in digital platforms, particularly in contexts where awareness of data protection measures remains limited. Our findings align with Thomas et al., who identified environmental factors such as digital divide, gender disparities, network issues, and privacy concerns as major determinants of mHealth usage in India [25].

Non-users chose their preference for face-to-face consultation as their main reason for not adopting the technology because they wanted to continue using traditional doctor patient interaction. Non-users' resistance seems to be more influenced by their preference for in person consultation than by their total lack of technological proficiency [5].

The incorporation of digital health literacy initiatives into Urban Health and Wellness Centres under Ayushman

Bharat, alongside community outreach efforts and IEC campaigns can address identified gaps. Further, concerns related to privacy, cost, and trust highlight the need for stronger regulation, endorsement of secure government-supported platforms, and local awareness regarding data protection.

STRENGTHS OF THE STUDY

The study was done with community-based multi-stage sampling method, enhancing the representativeness of the urban population. The study used a single research framework to evaluate six elements which included awareness and usage patterns and various determinants and digital health literacy and perceived barriers and satisfaction. Digital health literacy assessment showed quantitative results while its independent relationship with mHealth usage was established through multivariable logistic regression analysis. The research included both user and non-user groups which helped to identify all factors that support or hinder the digital mHealth app adoption.

LIMITATIONS OF THE STUDY

The study included only adults who owned smartphones, limiting the generalizability of finding to all urban adults. The study could not establish causal relationships between the studied factors and mHealth usage due to cross sectional design. Self-reported outcomes including adherence improvement and satisfaction which led to potential biases from both recall and social desirability.

CONCLUSION

Digital adoption is predominantly lifestyle-oriented, focusing on fitness and diet. Digital health literacy and educational status were the strongest independent determinants of mHealth use. Developers should prioritise user centred designs considering variable digital literacy. The current findings show positive outcomes, as the users reported satisfaction and perceived improvement in health-related adherence. However, three key issues, data privacy concerns, cost-related barriers, and limited trust in online consultations must be addressed to enable more engagement with digital healthcare services. The majority of non-users preferred traditional face-to-face consultations, relying on in person health care services. Strengthening digital health literacy, enhancing privacy protection regulations, and promoting affordable, trustworthy, government-endorsed platforms may improve mHealth use among urban smartphone user.

AUTHORS CONTRIBUTIONS

All the authors have contributed equally to this article

CONFLICT OF INTEREST

There are no conflicts of interest.

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