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Telemedicine Awareness, Information Sources and Utilization among Urban Residents of South Kolkata, India: A Community-Based Cross-Sectional Study

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ABSTRACT

Telemedicine can improve access to healthcare through remote consultations, but its effectiveness depends on public awareness, digital readiness, trust and actual use. India's eSanjeevani and West Bengal's Swasthya Ingit provide public-sector telemedicine options; however, availability does not guarantee community awareness. To assess awareness of eSanjeevani and Swasthya Ingit, identify information sources, describe telemedicine utilization and barriers, and examine digital readiness and future willingness**.** A descriptive, community-based cross-sectional study was conducted among residents of South Kolkata. Data were collected through a structured Google Forms questionnaire during April–May 2026 using convenience sampling. Of 177 responses, 7 incomplete questionnaires were excluded, leaving 170 valid responses. Frequencies and percentages were used; item-specific denominators varied because of missing responses and skip patterns. Awareness of eSanjeevani was reported by 79/170 respondents (46.5%), and awareness of Swasthya Ingit by 55/170 (32.4%). Among respondents aware of eSanjeevani, social media (36/79; 45.5%) and family/friends (29/79; 36.7%) were prominent information sources. Telemedicine use was reported by 59/162 respondents with valid utilization data (36.4%);

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103/162 (63.6%) had never used it. Among users, 49/59 (83.1%) had used telemedicine one or two times. App downloading was easy or very easy for 136/170 (80.0%); 111/170 (65.3%) reported ease with video calling. A total of 114/170 (67.0%) considered telemedicine mostly or completely time-saving. Future willingness was uncertain for 68/170 (40.0%); 57/170 (33.5%) were probably or definitely willing. Respondents demonstrated substantial smartphone and internet access but limited awareness of the two platforms and relatively low telemedicine utilization. Targeted awareness, assisted onboarding, familiar-provider involvement, reliable connectivity and clear communication about clinical suitability and privacy may help narrow the awareness-to-use gap.

1. Introduction

Telemedicine refers to the delivery of healthcare services over distance through information and communication technologies. It can support clinical consultation, follow-up, health education and selected monitoring activities, particularly where travel, time or geographic barriers restrict access. Its value is not determined by technology alone: patients must know that services exist, understand how to access them, trust the provider and platform, and recognize when remote consultation is clinically appropriate [1,2].

India has incorporated telemedicine into its digital health strategy. The Telemedicine Practice Guidelines issued in 2020 provided a regulatory framework for registered medical practitioners delivering teleconsultations [3]. eSanjeevani has become a major national telemedicine service, while West Bengal has promoted Swasthya Ingit as a state-level platform. Platform availability, however, does not automatically translate into community awareness or routine use.

Telemedicine adoption is influenced by individual, interpersonal and system-level factors. Digital literacy, age, education, perceived usefulness and prior experience may shape use. Family recommendations and trust in a familiar clinician may influence willingness. Connectivity, platform usability, privacy safeguards, clinical quality and referral pathways are also important. Reviews of telemedicine implementation in India have highlighted infrastructure, training, privacy and acceptability challenges [4,5].

This study examines awareness, information sources, utilization, barriers and future willingness among respondents living in South Kolkata, focusing on eSanjeevani and Swasthya Ingit.

2. Literature Review

2.1 Telemedicine implementation and health-system access

WHO guidance emphasizes that telemedicine should be planned as part of a wider service-delivery model rather than introduced as a stand-alone technology. Implementation requires appropriate clinical workflows, trained staff, suitable infrastructure, referral arrangements and ongoing monitoring [1,2]. Telemedicine may improve convenience and extend access for selected consultations, but it is not a universal substitute for in-person assessment. Clinical suitability depends on the presenting condition, the information available remotely and whether examination, investigations or emergency intervention are required [2,11].

2.2 Indian policy and public-sector telemedicine initiatives

The 2020 Indian Telemedicine Practice Guidelines address the professional responsibilities of registered medical practitioners and matters such as patient identity, consent, records, privacy, prescribing and continuity of care [3]. eSanjeevani is the national telemedicine service developed by the Ministry of Health and Family Welfare. In West Bengal, Swasthya Ingit was launched as a state telemedicine initiative and supported by operational guidance issued by the State Health and Family Welfare Department [4]. A recent qualitative study of Swasthya Ingit in rural West Bengal describes a facility-linked, hub-and-spoke arrangement in which community health officers provide on-site assessment and connect patients with remote medical officers or specialists [8]. This service context matters when designing public information: a state telemedicine initiative should not automatically be described as a stand-alone consumer app.

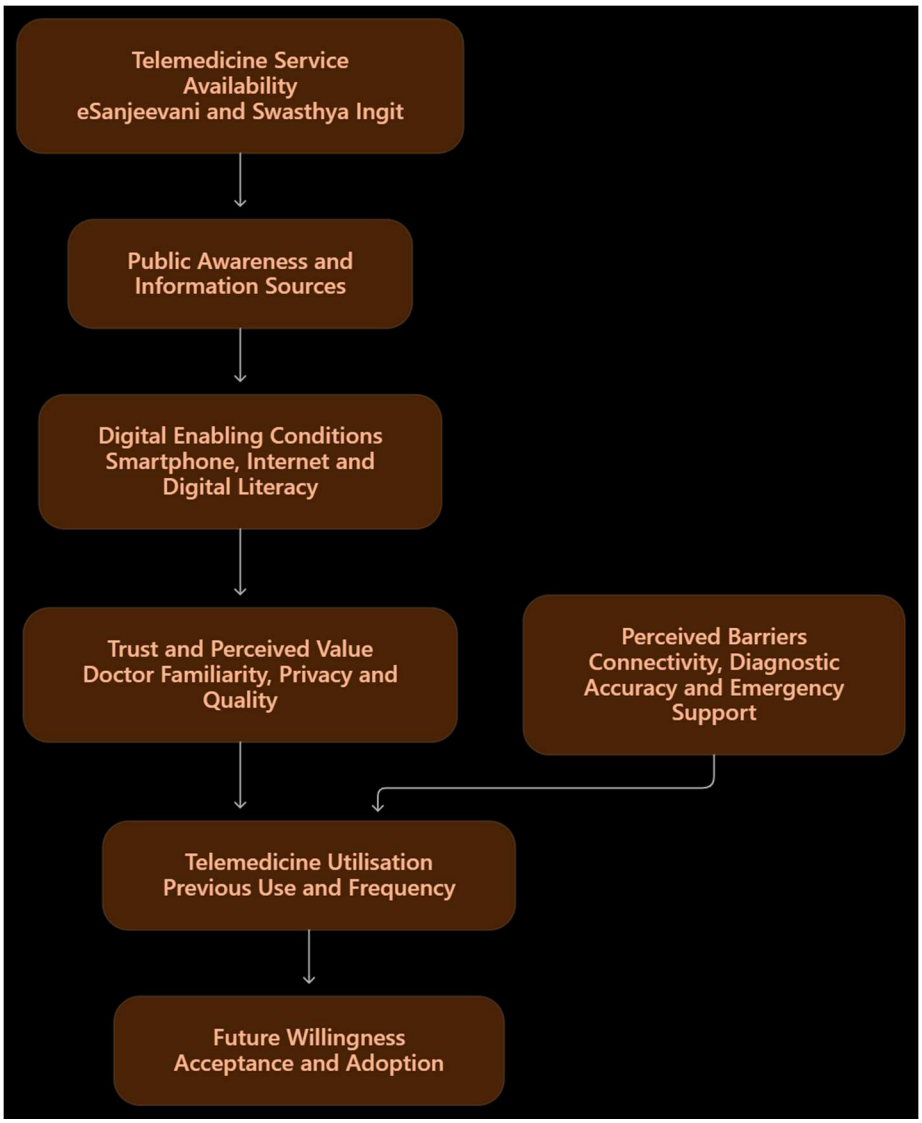

Figure 1. Conceptual Framework of Factors Influencing Telemedicine Awareness, Perceived Barriers and Utilization among Urban Residents of South Kolkata.

2.3 Empirical evidence on awareness, acceptance and use

A community-based cross-sectional study in rural Karnataka included 273 participants and reported awareness of eSanjeevani OPD of 2.2%; none of the participants reported using the service in the preceding year, although approximately 56% expressed willingness to use it. Lack of familiarity was a prominent reason for unwillingness [6]. These results demonstrate that willingness, awareness and actual use can differ, although the rural setting and sampling approach mean that the estimates should not be compared directly with the present South Kolkata convenience sample.

A 2026 cross-sectional study among 89 outpatient attendees at a tertiary-care hospital in Eastern India found that online sources were important for telemedicine awareness. The authors reported that 82% accepted telemedicine for follow-up consultations and 92% considered it convenient, while 55% felt that a full consultation was not feasible remotely. Younger participants had more favorable perceptions [7]. This hospital-based study is geographically relevant but differs from the present community-based survey in its sampling frame and participant context.

In a 2026 qualitative study involving 23 health-system personnel in two rural West Bengal districts, Mandal and colleagues described the Swasthya Ingit model as a hybrid system linking on-site community health officers with remote clinicians. Participants identified benefits for access and continuity of care as well as constraints involving clinician availability, incomplete clinical information and digital infrastructure [8]. Because that study explored staff experiences rather than public awareness among urban residents, it provides implementation context rather than a direct comparator for the present survey.

A scoping review of 26 Indian telemedicine implementation studies identified individual-level challenges such as limited digital and health literacy, unreliable connectivity and preferences for face-to-face consultations; provider and system barriers included training, infrastructure, workflow integration and data security [5]. Earlier work on patient and doctor perceptions in an Indian telehealth service also highlighted the relevance of perceived service quality and user experience [9]. Collectively, the evidence indicates that public awareness, digital capability, trust, clinical suitability and actual utilization should be assessed as related but distinct dimensions.

2.4 Synthesis and conceptual framework

The literature supports a pathway in which service availability is followed by awareness and access to understandable information. Digital and practical enabling conditions, including devices, connectivity and assistance, influence whether people can attempt a consultation. Trust, perceived usefulness and confidence in clinical communication may then shape initial use and repeat use. The present study uses this pathway to organize its descriptive assessment; it does not test a causal model.

Service availability	Awareness and information	Enabling conditions	Trust and perceived value	Use and future intention

Service availability	Awareness and information	Enabling conditions	Trust and perceived value	Use and future intention
eSanjeevani; Swasthya Ingit	Social media; family/friends; mass media; health workers	Smartphone; internet; digital skills; assistance	Familiar provider; privacy; quality; convenience	Previous use; frequency; concerns; willingness

Figure 2. Conceptual pathway used to organize the study variables.

3. Objectives

1. To determine the level of awareness of eSanjeevani and Swasthya Ingit among the surveyed residents of South Kolkata.
2. To identify the principal sources through which respondents receive information about telemedicine.
3. To describe telemedicine utilization patterns and reasons for use or non-use.
4. To identify perceived barriers and concerns related to telemedicine adoption.
5. To describe digital readiness, perceived benefits and willingness to use telemedicine in the future.

4. Research Gap

The literature summarized in the paper covers national telemedicine expansion, rural awareness, hospital-based patient experience, healthcare-provider perspectives and implementation barriers. However, evidence specifically describing awareness and information channels among residents of urban residential communities in South Kolkata is limited in the reviewed material. There is a need for local evidence that considers both eSanjeevani and Swasthya Ingit alongside information sources, actual utilization, digital readiness and perceived barriers.

The present study addresses this contextual gap by providing a descriptive snapshot of 170 valid survey responses collected in South Kolkata during April–May 2026. It should be interpreted as a local convenience-sample assessment, not a representative estimate for all residents of Kolkata or West Bengal.

5. Methods and Methodology

5.1 Study design and setting

A descriptive, community-based cross-sectional study was conducted among residents of South Kolkata. Data collection took place during April–May 2026, as reported in the dissertation.

5.2 Study population and sampling

The study population comprised residents of South Kolkata who responded to the online survey. Convenience sampling was employed. A total of 177 responses were initially received; 7 incomplete questionnaires were excluded during data screening, leaving 170 valid responses. The paper does not describe a probability-based sampling frame; therefore, the sample should not be treated as statistically representative of the wider population.

5.3 Data collection instrument and procedure

Primary data were collected through a structured questionnaire administered using Google Forms. The questionnaire covered demographic characteristics, smartphone and internet access, awareness of eSanjeevani and Swasthya Ingit, sources of awareness, previous telemedicine use, reasons for use or non-use, perceived barriers, concerns, ease of using digital tools, perceived time-saving benefits and future willingness.

5.4 Data management and statistical analysis

Responses were screened for completeness and categorical answers were standardized where required. The dissertation reports frequency and percentage distributions presented through tables and charts. This manuscript retains a descriptive analytical approach. No inferential tests, confidence intervals or adjusted associations are reported because respondent-level data were not available for independent reanalysis. Denominators vary across items because of missing answers and questionnaire skip patterns; item-specific denominators are stated wherever known.

5.5 Ethical Considerations

Participation in the study was voluntary, and respondents were informed that the data collected would be used only for academic purposes. Since the questionnaire was administered online through Google Forms, a brief introductory statement was displayed at the beginning of the form before the questions. This statement informed participants about the purpose of the study, assured them that their participation was entirely

voluntary and that they could withdraw at any time, and guaranteed that all responses would remain confidential and anonymous. No personal identifying information, such as names or email addresses, was collected. By proceeding to answer the questionnaire after reading this introductory statement, participants implied their informed consent to take part in the study. Confidentiality of the respondents was maintained throughout the research process, and all responses were analyzed only in aggregate forms.

6. Results

A total of 170 valid responses were included. Item-level response counts differed, so results are reported with specific denominators. Percentages below are recalculated from the counts where possible; small differences from the dissertation's rounded percentages require final checking against the original dataset.

6.1 Awareness of telemedicine platforms

Platform	Aware, n/N (%)	Not aware, n/N (%)
eSanjeevani	79/170 (46.5%)	91/170 (53.5%)
Swasthya Ingit	55/170 (32.4%)	115/170 (67.6%)

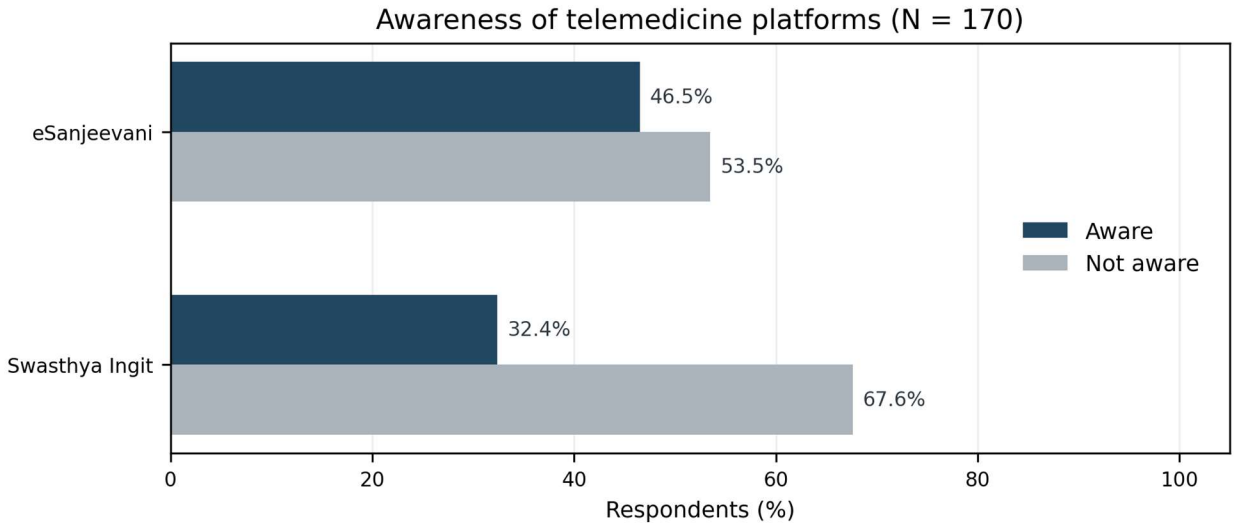

Figure 3. Awareness and non-awareness of eSanjeevani and Swasthya Ingit among all respondents (N = 170).

Awareness of eSanjeevani was reported by 79 of 170 respondents (46.5%), compared with 55 of 170 (32.4%) for Swasthya Ingit. Thus, awareness of eSanjeevani was higher by approximately 14.1 percentage points. Nevertheless, neither platform was known to a majority of the respondents: 53.5% were unaware of eSanjeevani and 67.6% were unaware of Swasthya Ingit. The findings indicate a substantial information and programme-visibility gap, particularly for Swasthya Ingit. This gap is important because awareness is a prerequisite for potential service consideration, although awareness alone does not establish access, trust or actual use. The present descriptive data do not identify why respondents were unaware; targeted communication and community-level orientation may therefore be considered, but their effectiveness would need to be evaluated.

6.2 Sources of information

Information source among respondents aware of eSanjeevani	n/N (%)
Social media	36/79 (45.5%)
Family and friends	29/79 (36.7%)

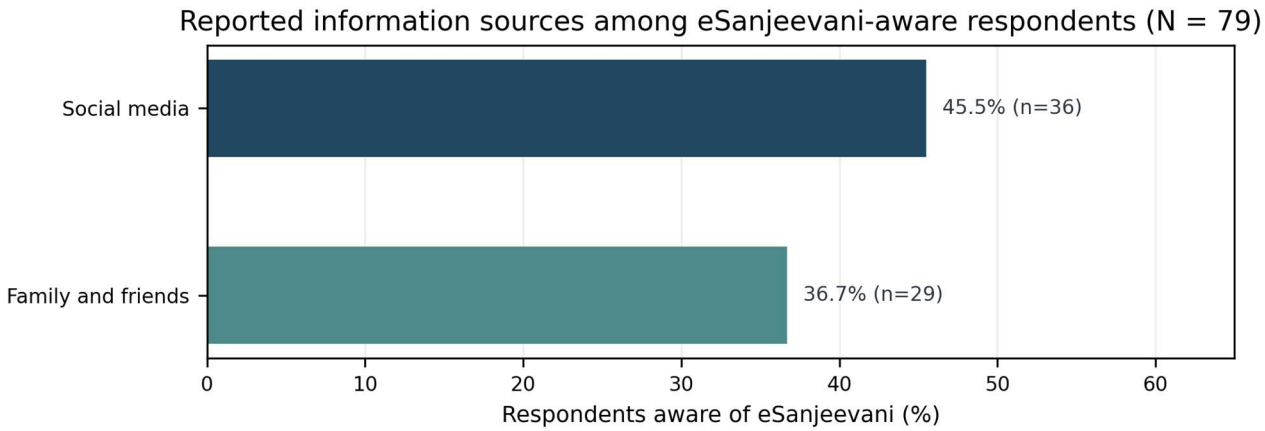

Figure 4. Reported information sources among respondents aware of eSanjeevani (N = 79).

Among the 79 respondents recorded as aware of eSanjeevani, social media was reported by 36 respondents (45.5%) and family and friends by 29 (36.7%). Social media was therefore the more frequently reported of the two information sources presented, with an 8.8-percentage-point difference. The result points to the potential importance of digital peer communication and interpersonal networks in disseminating information about telemedicine. However, the table supplied includes only these two source categories; it does not establish whether they were the only response options or the two most frequently reported options. The findings should consequently be described as the sources listed in the available results, rather than as an exhaustive ranking of all possible information channels.

6.3 Previous telemedicine utilization

Utilization status	n/N (%)
Ever used telemedicine	59/162 (36.4%)
Never used telemedicine	103/162 (63.6%)

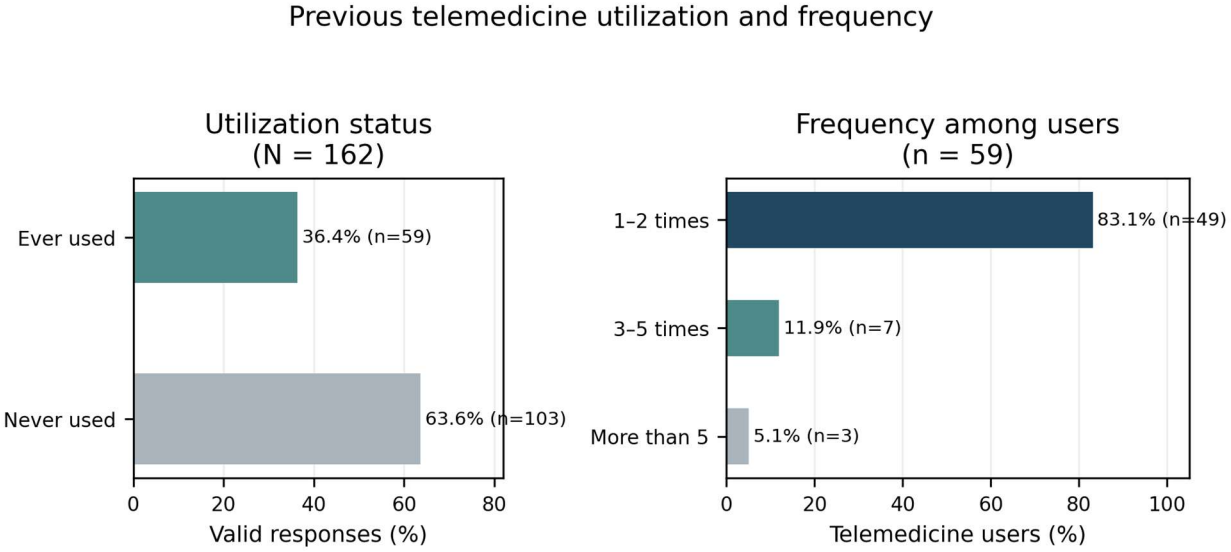

Figure 5. Previous telemedicine utilization among valid respondents and frequency of use among the 59 users.

Of the 162 respondents who answered the utilization item, 59 (36.4%) reported having used telemedicine, whereas 103 (63.6%) had never used it. Eight of the 170 overall respondents did not provide a response to this item. Among the 59 users, 49 (83.1%) had used telemedicine only one or two times, seven (11.9%) had used it three to five times, and three (5.1%) had used it more than five times. The pattern therefore indicates that prior use was not widespread in the responding sample and that use among those with experience was generally occasional. These descriptive findings distinguish initial uptake from repeated engagement: the presence of some prior use does not necessarily indicate routine adoption. The available results do not identify the timing of use or whether respondents were satisfied with the consultations.

6.4 Reasons for using telemedicine

Reported reason among users	n (%) of 59 users
Fever/cough consultation	17 (28.8%)
Other reasons	17 (28.8%)
No time to travel	15 (25.4%)
Follow-up consultation	11 (18.6%)
Blood pressure/diabetes check-up	10 (17.0%)

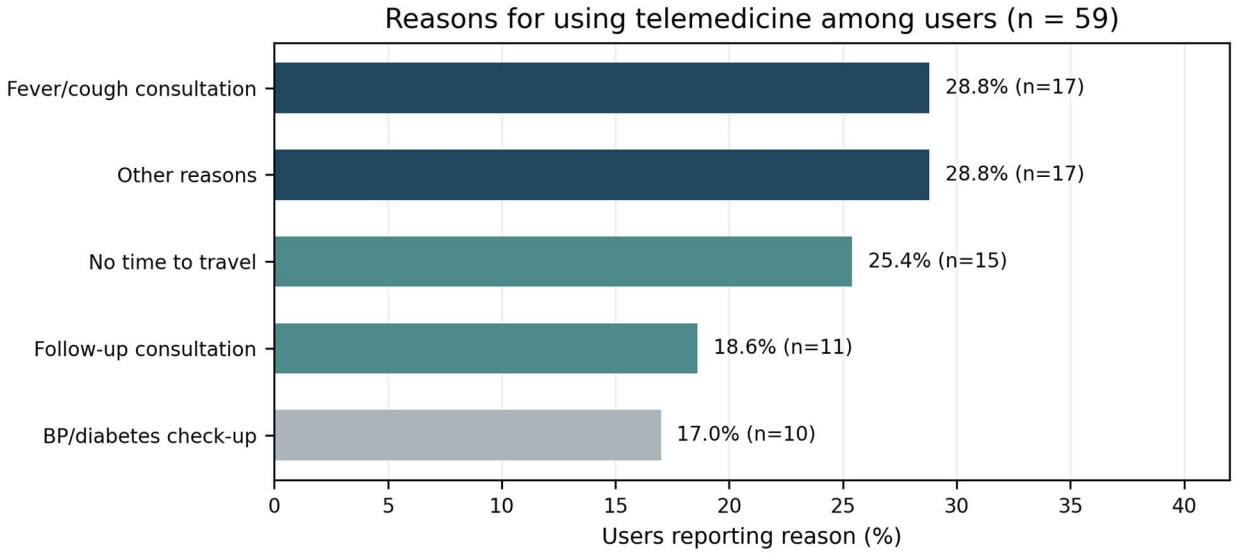

Figure 6. Reasons reported for using telemedicine among respondents who had ever used the service (n = 59).

Among the 59 respondents who had used telemedicine, fever or cough consultation and the category "other reasons" were each reported by 17 respondents (28.8%). Lack of time to travel was reported by 15 (25.4%), follow-up consultation by 11 (18.6%), and blood-pressure or diabetes check-up by 10 (17.0%). The results suggest that telemedicine was used both for symptom-related consultations and for convenience-sensitive or follow-up purposes. The travel-time finding is particularly relevant to the service's potential role in reducing the need for physical travel for selected consultations. However, the reported counts total 70, exceeding the 59 users, and the percentages total approximately 118.6%. This indicates that multiple responses may have been permitted, or that the item requires verification. The questionnaire instructions should be checked before these categories are described as mutually exclusive reasons.

6.5 Perceived barriers and concerns

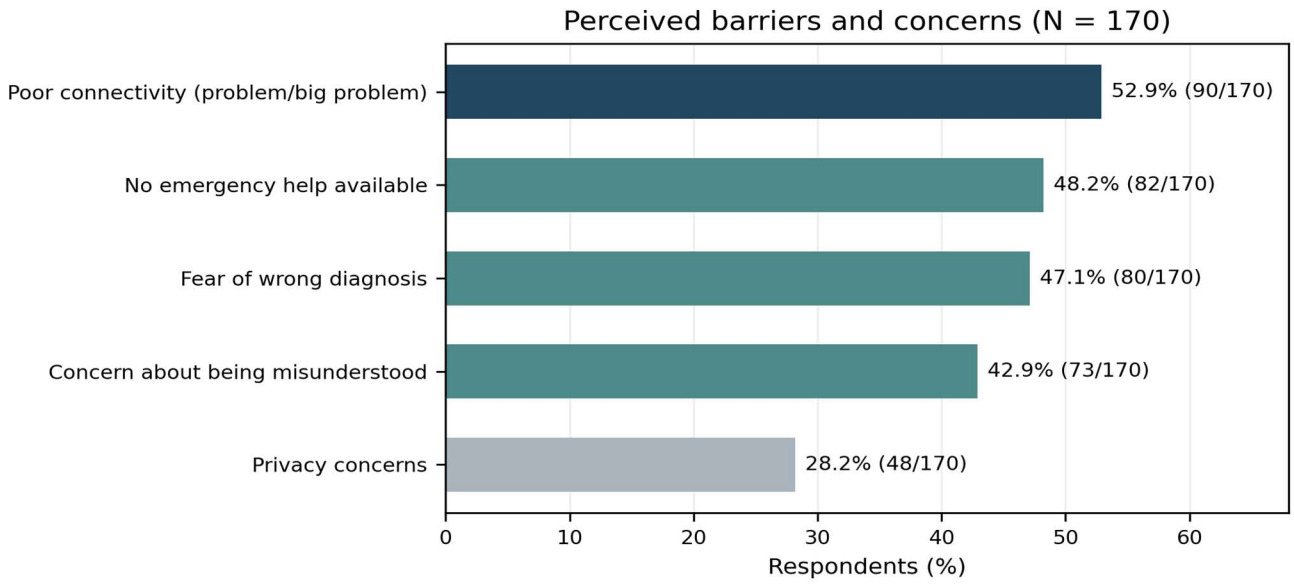

Figure 7. Reported telemedicine concerns and poor connectivity rated as a problem or big problem (N = 170).

6.6 Perceived time-saving benefit and future willingness

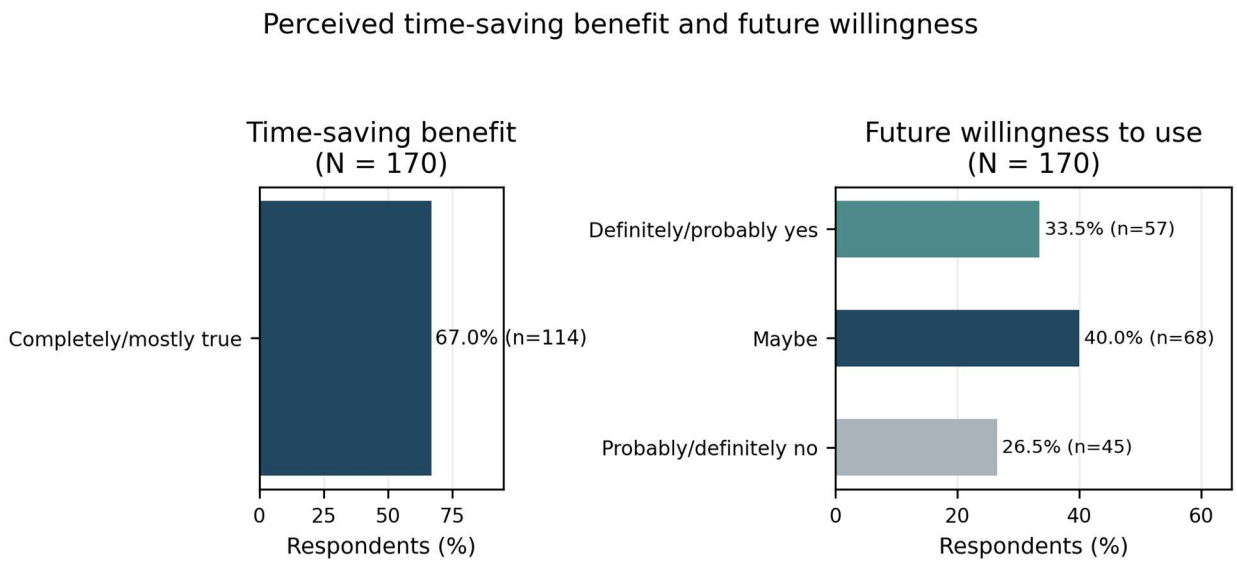

Figure 8. Perceived time-saving benefit and stated future willingness to use telemedicine (N = 170).

7. Discussion

The present study highlights a considerable gap between digital accessibility and actual telemedicine utilization among surveyed residents of South Kolkata. Although smartphone ownership (94.7%) and home internet access (93.5%) were relatively high, only 36.4% of respondents with valid utilization data had previously used telemedicine. This indicates that technological accessibility alone may not ensure the adoption of digital healthcare services.

Awareness of eSanjeevani (46.5%) was higher than that of Swasthya Ingit (32.4%), suggesting limited public awareness of both government-supported platforms. Social media (45.5%) and family and friends (36.7%) emerged as important information sources, highlighting the potential role of digital and interpersonal communication in promoting telemedicine awareness.

Among previous users, most (83.1%) had accessed telemedicine only once or twice, indicating predominantly occasional utilization. Lack of travel time, fever and cough consultations, and follow-up services were among the reported reasons for use, reflecting the perceived convenience of remote healthcare.

Although 80.0% of respondents found application downloading easy and 67.0% considered telemedicine time-saving, concerns regarding symptom communication, preference for face-to-face consultations, diagnostic accuracy, emergency support and privacy remained important considerations. These findings

emphasize that digital readiness involves not only technical accessibility but also confidence in remote clinical communication.

Overall, the findings suggest that improving telemedicine adoption requires targeted awareness programmes, patient education, assisted digital onboarding and greater involvement of familiar healthcare providers. Telemedicine should be promoted as a complementary healthcare delivery mechanism, supported by appropriate clinical assessment and referral pathways.

8.Conclusion

The study highlights a significant gap between digital accessibility, awareness and actual utilization of telemedicine services among urban residents of South Kolkata. Despite high smartphone and internet accessibility, awareness of eSanjeevani (46.5%) and Swasthya Ingit (32.4%) remained limited, while only 36.4% of respondents with valid utilization data had previously used telemedicine. Poor internet connectivity, concerns regarding diagnostic accuracy, privacy and the lack of emergency support emerged as important barriers. Nevertheless, the perceived time-saving benefits indicate the potential of telemedicine to improve healthcare accessibility and convenience. Strengthening public awareness, digital literacy, internet infrastructure and patient trust is essential for improving adoption. Telemedicine should therefore be promoted as a complementary approach to conventional healthcare services to support more accessible, inclusive and patient-centred healthcare delivery.

9. Limitation

The study was limited to residents of South Kolkata and employed convenience sampling, which may restrict the generalizability of the findings. Data were collected through an online, self-reported questionnaire, making the study susceptible to selection and response bias. The cross-sectional design provides information only for a specific period and does not establish causal relationships. Furthermore, the analysis was primarily descriptive, limiting the assessment of associations between study variables.

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Appendix

The following questionnaire was used to collect primary data from residents of South Kolkata for the study entitled "Telemedicine Awareness and Information Sources Among Residents of South Kolkata: A Post-2025 Community Assessment."

Appendix I: Participant Information Sheet and Consent Statement

You are invited to take part in a short research survey on telemedicine. The survey takes about 2–3 minutes. Your participation is voluntary, and you may stop at any time before submitting the form. By continuing, you indicate your consent to participate.

Appendix II: Survey Questionnaire

A. DEMOGRAPHIC INFORMATION

1. What is your age group? *(Select one)**

○ 18 to 25 years

○ 26 to 40 years

○ 41 to 60 years

○ Above 60 years

2. What is your gender? (Select one) *

○ Male

○ Female

○ Other

○ Prefer not to say

3. What is your education? *(Select one)**

○ Studied up to class 12

○ Graduate

○ Post Graduate

○ PhD

4. Distance to nearest clinic from home? *(Select one)**

○ Less than 1 km (walking distance)

○ 1 to 5 km

○ 5 to 10 km

○ More than 10 km

5. Do you own a smartphone? *(Select one)**

○ Yes

○ No

6. Do you have internet at home? *(Select one)**

○ Yes

○ No

B. AWARENESS LEVEL

7. Have you heard about eSanjeevani (India's national telemedicine service)? *

○ Yes

○ No

8. Have you heard about 'Swasthya Ingit' (a telemedicine service in West Bengal)?*

○ Yes

○ No

9. Where did you first hear about it? (Select all)

☐ Newspaper

☐ TV

☐ Social Media

☐ Family and Friends

C. USAGE EXPERIENCE

10. Have you ever used telemedicine (online doctor consultation over phone/video call)?

○ Yes → Continue

○ No → **Go to Q13 (Section D - Barriers) **

11. How many times have you used telemedicine (Online doctor consultation)?

○ 1-2 times

○ 3-5 times

○ More than 5

12. Why did you use telemedicine? (Select all that apply)

○ Fever/cough

○ BP/diabetes checkup

○ Follow-up visit

○ No time to travel

○ Other:

D. BARRIERS TO USAGE

13. Main reason for not using telemedicine? (Select One)*

○ Don't know it exists

○ Don't know how to book

○ No smartphone/internet

○ Don't trust online doctors

○ Prefer face-to-face

○ Other:

14. Rate these problems as Big problem, Problem, Neutral, Slight Problem and No Problem

	Big Problem	Problem	Neutral	Slight	Problem	No Problem
No smartphone	○	○	○	○	○	○
Poor internet	○	○	○	○	○	○
Don't know how Don't trust	○	○	○	○	○	○
doctors Prefer	○	○	○	○	○	○
clinic visit	○	○	○	○	○	○

15. What scares you the most about using telemedicine? (Select all that apply)*

○ Wrong diagnosis

○ Privacy concerns

○ Doctor won't understand

○ No emergency help

○ Other:

16. What would make you try telemedicine? (Select one)*

○ If someone teaches me

○ Better Internet

○ If I know the doctor

○ I will never use

17. How comfortable are you with these tasks?

	Very Easy	Easy	Neutral	Difficult	Very Difficult
Downloading App	○	○	○	○	○
Video Call	○	○	○	○	○
Showing Symptoms	○	○	○	○	○

ATTITUDES & FUTURE USE

18. Do you think telemedicine (Online doctor consultation) saves time for working people. *(Select one)*

○ Completely true

○ Mostly true

○ Not sure

○ Mostly false

○ Completely false

19. Will you try online doctor next time you're sick? *(Select one)*

○ Yes definitely

○ Yes probably

○ Maybe

○ No probably not

○ No definitely not

E. SUGGESTIONS

20. How should government tell more people? *(Select all that apply)*

○ Newspaper ads

○ TV ads

○ Social Media

○ Health workers visit homes

○ Other: