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Attitudes, Awareness, and Willingness of Iranians Toward Using Telemedicine in Post-COVID Era: A Cross-Sectional Study

Marsa Gholamzadeh[1,2] | Hamidreza Abtahi[3] | Reza Safdari[1] | Elham Haghshenas[4] | Mehrnaz Asadi Gharabaghi[5] | Besharat Rahimi[3]

[1]Health Information Management and Medical Informatics Department, School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran | [2]Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran | [3]Pulmonary and Critical Care Medicine Department, Thoracic Research Center, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran | [4]Health Care Management Department, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran | [5]Department of Pulmonary Medicine, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Correspondence: Elham Haghshenas (ehagh6767@gmail.com)

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ABSTRACT

Background and Aims: With the increased use of telemedicine during the pandemic, understanding patients' attitudes and readiness to adopt telemedicine is crucial. This study investigates the attitudes, willingness, and usage behaviors of Iranian patients toward telemedicine.

Methods: This cross-sectional study took place in Iran from October 2021 to January 2023. Participants received a web-based questionnaire consisting of five sections. The study aimed to assess Iranians' attitudes toward telemedicine following the COVID-19 pandemic and their readiness to utilize telemedicine services in the post-pandemic period by analyzing the gathered data.

Results: A total of 569 Iranian patients participated in the questionnaire, resulting in a 95% response rate. While 80% of respondents were familiar with telemedicine terms, only 30% had utilized telemedicine services before the COVID-19 outbreak. Overall, Iranians displayed positive attitudes toward telemedicine, with over two-thirds expressing a strong willingness to continue using telemedicine post-pandemic. The analysis revealed a positive correlation between higher e-health literacy scores and favorable attitudes toward telemedicine. Additionally, a significant relationship was observed between having a positive attitude toward telemedicine and prior usage of telemedicine services before the pandemic.

Conclusion: The findings indicated a positive attitude toward telemedicine among public patients. The results highlight a willingness to utilize remote medical services if the required infrastructure is in place to address trust issues among patients. These outcomes can be utilized to assess the feasibility of implementing telemedicine services in Iran.

1 | Background

Following the declaration of COVID-19 on March 11, 2020, the WHO declared a total lockdown to prevent the spread of the infection during the pandemic [1, 2]. As a result, individuals in different countries have had no choice but to utilize telemedicine as a means to access medical services. During the pandemic, telemedicine has proven its ability to provide regular healthcare remotely, reducing the risk of exposure for individuals who are not infected with COVID-19 but are at a high risk of contracting

the disease [3–5]. The progress in digital health technology has allowed for the remote delivery of various medical services during the pandemic, such as outpatient electronic consultations, telephone triage, specialized consultations, and postoperative follow-ups [6, 7]. With the growing acceptance of such services by patients and providers, telemedicine is expected to remain a prominent mode of healthcare delivery [8–10].

Despite various cost-related challenges that developing countries face in implementing telemedicine systems, such services have proven to be successful in low- and middle-income nations during a pandemic [11, 12]. However successful implementation of new technologies and the sustainability of these services depend on feasibility study. The first step of a feasibility study is the acceptance of new technology to continue utilizing them [13]. Thus, to facilitate the shift from in-person appointments to telecare consultations in Iran, it is essential to assess individuals' attitudes toward telemedicine, as well as their level of understanding and readiness to implement these services. Moreover, the extent to which patients are willing to embrace telemedicine technology is considered a critical factor influencing its broad adoption and successful integration with existing healthcare systems [14, 15]. Despite this, there is a lack of research examining public attitudes toward telemedicine in developing countries. Therefore, this study aims to explore the attitudes of Iranians toward telemedicine within the community through a survey conducted during the COVID-19 pandemic.

It is worth mentioning that to assess the acceptance and willingness toward telemedicine, it is crucial to comprehend digital health literacy, perceptions, and usage patterns within the general public [16, 17]. Previous research has highlighted the significant impact of e-health literacy on the adoption of telemedicine services [18].

Therefore, the primary objective is to evaluate the attitudes and willingness of the general public toward using telemedicine, with a focus on understanding their interest in utilizing this technology in the future. The secondary aim of our study is to assess the eHealth literacy levels among Iranian patients and explore how this relates to the attitudes and willingness of the general public to adopt telemedicine services.

2 | Methods and Materials

2.1 | Study Design and Recruitment

A cross-sectional study was carried out among Iranian patients between October 2021 and January 2023 using an anonymous web-based questionnaire. Participants received the electronic questionnaire link, which was designed in Persian language to align with the native language. The study's purpose and objectives were clearly outlined on the first page of the online questionnaire. The target group comprised Iranian patients over 18 years old who consented to take part in the research.

Based on an estimated adult population of approximately 51.6 million of Iranian over 18 in 2023, our initial calculation—using a 95% confidence level, a margin of error of 5%, and a conservative estimate of the proportion ($p = 0.5$)—produced a required minimum sample size of 385, using the following formula [19].

$$n = \frac{(z^2.\ p.\ (1 - p))}{E^2} \quad (1)$$

Confidence level (Z): 1.96 for 95% confidence, estimated proportion (p): Assuming a conservative estimate at 0.5, margin of error (E): 0.05.

Initially, we calculated the minimum sample size to be 385 to ensure adequate statistical power to detect meaningful effects. However, we decided to increase the sample size beyond this minimum for several reasons. First, a larger sample size would enhance the robustness and reliability of our findings by reducing the impact of potential outliers or unusual observations. Second, it would allow for more detailed subgroup analyses and exploration of potential moderating factors. Finally, increasing the sample size provided a buffer against potential dropout or nonresponse, ensuring a sufficient number of completed responses for the planned analyses. Ultimately, increasing the sample size from a minimum of 385−600 participants was a careful decision to ensure the validity and generalizability of our findings, especially given the nature of a web-based survey where response rates can sometimes be lower. Specifically, a survey is only considered acceptable if it reaches a minimum response rate of 70% or 80% [19].

2.2 | Study Instrument

The content validity of the questionnaire was checked by a panel of 12 experts using the content validity index (CVI) and the feedback of experts' opinions was used to improve the questions. In conclusion, the CVI was about 0.79 for the final questionnaire, and the reliability using Cronbach's α coefficient was reached at the acceptance level ($\alpha = 0.\ 837$).

Finally, researchers developed a five-section questionnaire to gather data. The initial part consists of six items, including 28 questions divided into four subcategories, which aim to collect the baseline demographic details of the participants. The second part comprises eight questions on a five-point Likert scale, adapted from the standard eHealth Literacy Scale (eHEALS) questionnaire [20]. This portion helps assess the e-health literacy level of the individuals involved. E-health literacy is defined as the capability to locate, comprehend, evaluate, and utilize electronic health sources to address health issues or enhance one's well-being [21].

The third segment encompassed eight closed-ended inquiries designed to assess individuals' understanding and familiarity with telemedicine, as well as to gather data on the frequency and types of telemedicine services usage during the COVID-19 period. The fourth part of the questionnaire comprised eight questions on a five-point Likert scale, aimed at evaluating people's perspectives on telemedicine. Lastly, the fifth section incorporated four closed questions, which aimed to measure participants' willingness to utilize telemedicine after the pandemic subsided.

2.3 | Data Analysis

Data collected from the electronic form were directly inputted into an Excel spreadsheet. All categorical data is converted into numerical data to prepare for data analysis. IBM SPSS Statistics version 22 was employed for executing descriptive and analytical statistics. Descriptive statistics involved mean values, standard deviations, sum scores, frequencies, and percentages of relevant factors. Given the skewed data distribution, nonparametric tests were applied to identify correlations between target variables and dependent features, as well as to make necessary comparisons. The analysis included examining relationships among demographic characteristics, participants' e-health literacy, and their attitudes and readiness to adopt telemedicine. The Mann–Whitney *U* test was utilized for comparing two categorical variables, while Kruskal–Wallis's test was used for variables with three or more categories. The Mann–Whitney *U* test and Kruskal–Wallis test are useful nonparametric alternatives to parametric tests like *t*-tests and ANOVA when the assumptions of normality and equal variances are not met. The Mann–Whitney *U* test compares differences between two groups on an ordinal variable, while the Kruskal–Wallis test extends this to more than two independent samples. These nonparametric tests rank the data and compare the distributions of the ranks rather than relying on means or variances [22]. For correlation analysis in nonparametric contexts, Spearman's rank correlation coefficient (rho) is commonly used, as it measures the strength and direction of monotonic relationships between variables without making assumptions about the underlying data distribution. In contrast, the Pearson's correlation coefficient is used to measure the linear relationship between two continuous variables when the assumptions of normality are met.

2.4 | Human Ethics and Consent to Participate Declarations

The study was performed in accordance with the Declaration of Helsinki. The research was approved by the Tehran University of Medical Sciences Ethics Committee with reference number (IR.TUMS.SPH.REC.1401.056). (Link to Ethical Review Board: https://ethics.research.ac.ir/EthicsProposalViewEn.php?id=264933). Informed consent was obtained from all participants.

3 | Results

3.1 | Demographic Characteristics of Participants

Out of a total of 600 questionnaires that were sent, 569 questionnaires were completed. Therefore, the response rate was 95%. The baseline demographic characteristics of the participants in this are shown in Table 1. Approximately half of the participants were between 20 and 35 years old and the majority of them had academic education. Concerning disease, 29.5% of participants suffered from chronic diseases. Almost 30% of patients had more than one underlying disease simultaneously. The highest rates of underlying diseases included endocrine diseases (19.9%), mental diseases (8.7%), diabetes (8.1%), and high blood pressure (7.6%).

TABLE 1 | Demographic characteristics ($N = 569$).

Variable	Group	Frequency	Percentage
Gender	Male	150	31.63
	Female	419	68.36
Age groups	Lower than 20	4	0.7
	20–35	209	36.5
	35–50	248	43.4
	50–65	96	16.8
	Over 65	12	2.1
Education level	Under diploma	8	1.4
	Diploma	64	11.2
	Bachelor	203	35.5
	Master degree	208	36.4
	PhD and higher degree	86	15
Job	Private sector	60	10.5
	Retired	43	7.5
	Unemployed	12	2.1
	Housewife	85	14.9
	Student	67	11.7
	Teacher	38	6.6
	Employee	264	46.6

3.2 | Prevalence of Telemedicine Usage and Conception

Among the 569 participants, a significant majority of 491 individuals (86.3%) demonstrated familiarity with telemedicine-related terms such as telemedicine, remote visits, online examinations, online medical consultations, virtual visits, or Televisits. Notably, approximately 29.7% of participants had utilized some form of telemedicine services, including remote medical consultations or tele-visit services, to address their health concerns before the onset of the COVID-19 pandemic.

During the COVID-19 pandemic, our survey revealed that 347 individuals (61%) from the study population actively utilized various forms of telemedicine services or engaged in online medical consultations. As we expected, this indicates a notable increase in the adoption of telemedicine practices during the pandemic period, largely necessitated by lockdown measures and the urgent need for remote healthcare services.

3.3 | Different Modes of Communication

Individuals utilize a variety of means and channels to access telemedicine services. Among these options, telephone visits emerged as a popular choice for teleconsultation and

telemedicine services, with a frequency of 47.5%. Additionally, individuals made use of medical applications (23.1%), text messaging services (14.7%), video conferences (8.7%), and other services (6%) to access telemedicine. This illustrates the diverse range of channels through which individuals engage with telemedicine services, with telephone visits being the most commonly utilized method for teleconsultation.

3.4 | Medical Reasons for Using Telemedicine

Medical reasons for utilizing telemedicine services varied among participants, reflecting a diverse range of healthcare needs. During the COVID-19 pandemic, participants cited several reasons for engaging with telemedicine services. Specifically, 41.7% of subjects utilized telemedicine due to suspected or confirmed COVID-19 infection, 19% for routine checkups, 10.6% to address general health concerns, and 7.2% for managing underlying medical conditions.

3.5 | Perceived Barriers and Challenges to the Effective Use of Telemedicine

Amid the challenges posed by the COVID-19 pandemic, patients encountered difficulties in maintaining routine medical appointments due to illness and lockdown restrictions. Among the 569 participants surveyed, 179 individuals reported having to cancel their appointments or in-person visits with physicians as a result of contracting COVID-19.

Participants cited various reasons for not utilizing telemedicine services, with the most common factors being a lack of trust in telemedicine services and limited availability of telemedicine options provided by specialists. Additional reasons influencing the decision not to use telemedicine services are detailed in Figure 1.

3.6 | E-Health Literacy Level Among Participants

The participants' responses to eight questions in the second part are summarized in Figure 2 aggregating the participants' responses to these eight questions, resulting in a score range of 8–40. A score of eight indicates the lowest level of e-health literacy score, while a score of 40 represents the highest level. The mean eHealth literacy score among participants was 27.166 ± 6.91. The majority of respondents (74%) scored within the 16–32 range on the eHEALS scale.

The results of the Mann–Whitney test showed no statistically significant difference between the eHEALS score with gender and having an illness ($p > 0.05$ for gender and $p > 0.05$ for having any underlying diseases). The Kruskal–Wallis test showed a significant difference between the mean e-health literacy score and age ($p < 0.01$). Younger adults scored significantly higher on the electronic literacy scale compared to other age groups.

Besides, a significant relationship was found between the e-health literacy score and the participant's level of education. Individuals with higher educational degrees tended to achieve significantly higher scores. In addition, analysis showed that those who were students had a significantly higher score on the electronic literacy scale than other groups.

3.7 | Attitudes and Perceptions Toward Telemedicine

The distribution of participants' responses to questions regarding their attitude toward telemedicine is represented in Table 2. In this section, we constructed a tele-attitude scale by summing the responses of each participant to the relevant questions.

The resulting scale is a discrete numerical variable, ranging from 10 to 40. A score of 10 indicates minimal desire or a negative attitude toward telemedicine services, while a score of 40 signifies

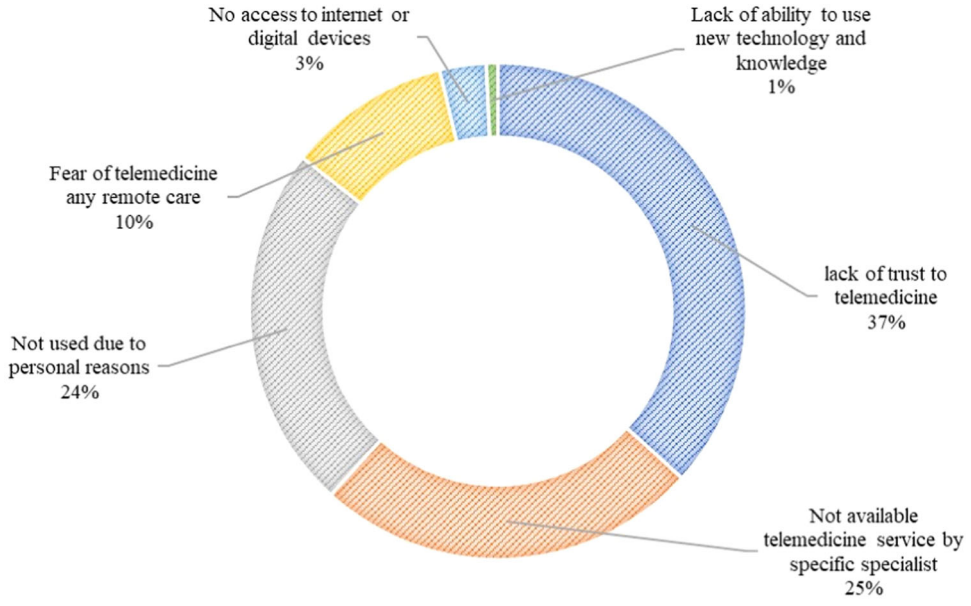

FIGURE 1 | The distribution of reasons for not using telemedicine services.

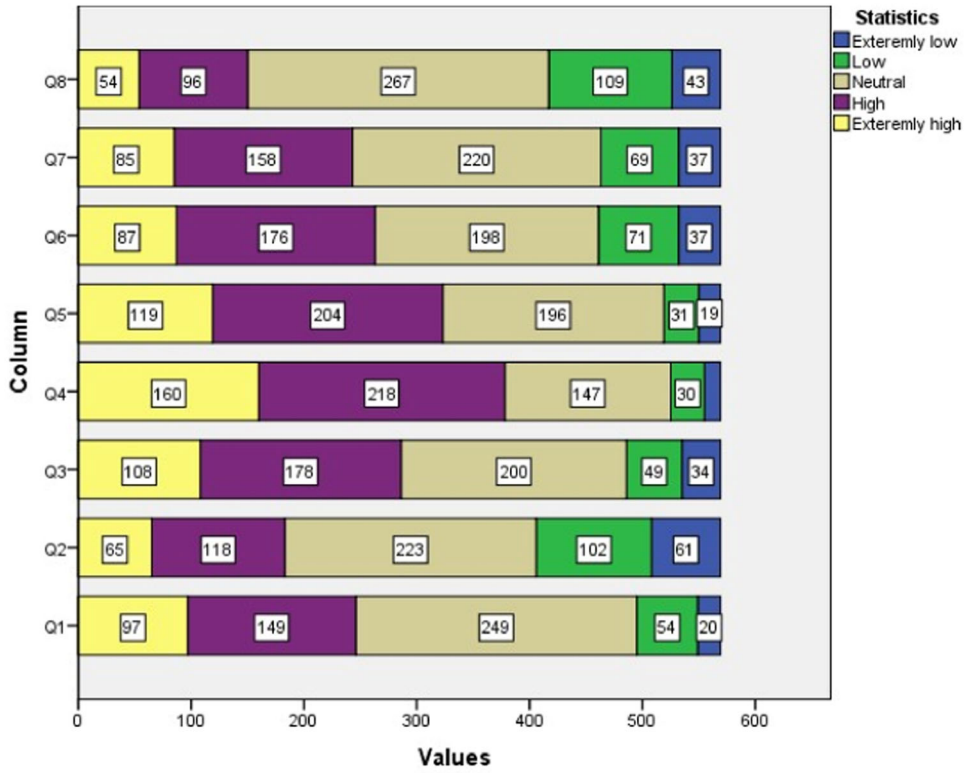

FIGURE 2 | Frequency of respondents to e-health score.

the highest level of desire or an overall positive attitude. This approach allows us to capture participants' attitudes toward telemedicine in a concise and quantifiable manner.

The statistical mean of the tele-attitude score was calculated as 28.32 ± 0.23 with 30 variances. Notably, 57.6% of the participants fell within the 21−30 range of the tele-attitude scale. This data sheds light on the distribution of attitudes toward telemedicine services among the study participants, with a predominant focus on the medium to a positive range of the tele-attitude scale.

The Mann–Whitney test did not show a significant difference between the average tele-attitude scores based on having a disease and gender $p > 0.01$ for gender and $p > 0.99$ for having any underlying diseases). Based on the Kruskal–Wallis test, no significant difference was observed in attitudes toward telemedicine among different age groups ($p > 0.01$), employment status ($p > 0.01$), and education levels ($p > 0.01$).

3.8 | Willingness to Use Telemedicine in the Post-COVID Era

In the final section of the questionnaire, we constructed a willingness scale by combining the responses to four Likert-scale questions. This produced a numerical variable with a possible range from 4 to 16. A score of 4 signifies a minimal willingness to adopt telemedicine services, whereas a score of 16 reflects extreme willingness. We calculated the average willingness score to be 9.311 ± 0.12. Remarkably, 44.1% of participants indicated a moderate willingness to use telemedicine services, with their scores falling within the 10−12 range on the willingness scale.

In the post-COVID era, investigating the preferences for telemedicine services revealed that 32.16% of participants favored its use for nonemergency situations, while 25.31% showed a preference for emergency scenarios. This indicates a slightly higher tendency toward telemedicine for routine health issues over critical conditions.

In terms of engagement with telemedicine modalities, 15.29% of respondents expressed full willingness to involve in video consultations or telephone visits, 25.48% displayed some willingness, 30.93% showed moderate willingness, and 15.82% were not willing to use these services in the post-COVID era.

As for the preference for online medical consultations over traditional in-person visits, 24.96% of participants consistently preferred teleconsultations, nearly half (47.98%) chose this option occasionally, 19.61% demonstrated minimal interest, and a small fraction (7.91%) were completely disinterested in pursuing telemedicine services moving forward. The Mann–Whitney test did not show a significant difference between the mean score of willingness based on having a disease and gender ($p > 0.99$ for gender and $p > 0.99$ for having any underlying diseases.

Based on the Kruskal–Wallis test, no significant difference was observed in willingness to use telemedicine ($p > 0.01$) among different age groups and employment status ($p > 0.01$). Nevertheless, a significant difference was found between the mean willingness score and the education level of participants in the post-COVID era ($\chi^2 = 9.708$, $p < 0.01$).

TABLE 2 | The frequency of attitude-based questions regarding telemedicine.

Questions	Strongly disagree	Disagree	Somewhat	Agree	Strongly agree
1- Telemedicine services can quickly provide me access to specialized medical services that are not available to me in-person service.	3.2%	7.0%	36.1%	31.2%	22.5%
2- If there is no access to a specialist in my area, I prefer to use telemedicine services rather than travel to big cities from long distances or travel to another town to see a doctor.	3.9%	9.5%	20.2%	36.1%	30.3%
3- I think using telemedicine services as a video consultation is complicated.	18.5%	34.0%	31.7%	10.9%	4.9%
4- In a telemedicine consultation, I can better tell my problems to the doctor and talk to a physician.	11.4%	23.6%	40.3%	16.9%	7.7%
5- I prefer to spend less time on appointment wait times using telemedicine rather than waiting a long time for an in-person visit or appointment.	6.5%	8.8%	27.1%	32.6%	25.0%
6- I think doctors and healthcare providers could better comprehend my problems in an online medical consultation. (Audio or video consultations)	10.7%	25.5%	40.8%	15.1%	7.7%
7- I am worried that I will not be able to understand the meaning of the doctor or consultant accurately in online medical consultations.	12.0%	21.1%	39.4%	20.8%	6.7%
8- Telemedicine services save me time and money compared to face-to-face visits, where I must travel a long distance for an in-person consultation.	2.5%	3.5%	21.0%	39.1%	34.0%

3.9 | The Relationship Between Outcome Measures, Familiarity With Telemedicine, and Usage

This study investigated participants' readiness to embrace telemedicine in the post-Covid era by analyzing questionnaire responses. Figure 3 visually represents the willingness to adopt telemedicine, considering participants' prior knowledge of telemedicine terms and usage of remote visits before the pandemic. Furthermore, a significant relationship was found between willingness to use telemedicine and participants' familiarity with telemedicine terms and previous utilization of this technology ($p < 0.001$).

Analysis of the relationship between the telemedicine attitude scale and post-COVID willingness with participants' familiarity with telemedicine terms showed a statistically significant relationship ($p < 0.01$). Pearson's test indicated a weak positive correlation between e-health literacy scores and attitudes toward telemedicine, suggesting that individuals with higher e-health literacy scores had more positive attitudes ($p < 0.001$). Furthermore, a moderate positive correlation was observed between attitudes toward telemedicine and the willingness to use telemedicine in the post-COVID era, indicating that individuals with a more positive attitude were more inclined to use telemedicine in the future (Pearson's $r = 0.619$, $p < 0.001$). The correlation analysis also demonstrated a significant relationship between eHEALS score, attitudes toward telemedicine, and willingness to use telemedicine services in the post-COVID era ($p < 0.001$).

Moreover, the correlation analysis showed a significant correlation between eHEALS score, attitudes to telemedicine, and willingness to use telemedicine services before COVID-19. Correlation analysis revealed that Spearman's rank correlation coefficient (rho) between post-COVID willingness to use telemedicine and telemedicine usage before COVID was 0.190 ($p < 0.001$). The rho values between attitudes to telemedicine and eHEALS score with telemedicine usage before COVID were 0.121 ($p < 0.05$) and 0.163 ($p < 0.001$), respectively.

4 | Discussion

This study offers new perspectives on how Iranians utilize, understand, perceive, and feel about telemedicine services. While our findings revealed that over 70% of participants had a moderate level of knowledge regarding telemedicine, only 30% had prior experience using telemedicine before the COVID-19 outbreak. Despite this, the overall attitude toward telemedicine was positive, with over two-thirds of the population expressing a willingness to embrace telemedicine in the post-COVID era.

4.1 | Telemedicine Usage and Conception

As expected, having positive previous experience with telemedicine or other remote patient care services before the COVID-19 outbreak was strongly associated with more favorable attitudes and readiness to utilize telemedicine in our research group. This finding revealed that individuals who had

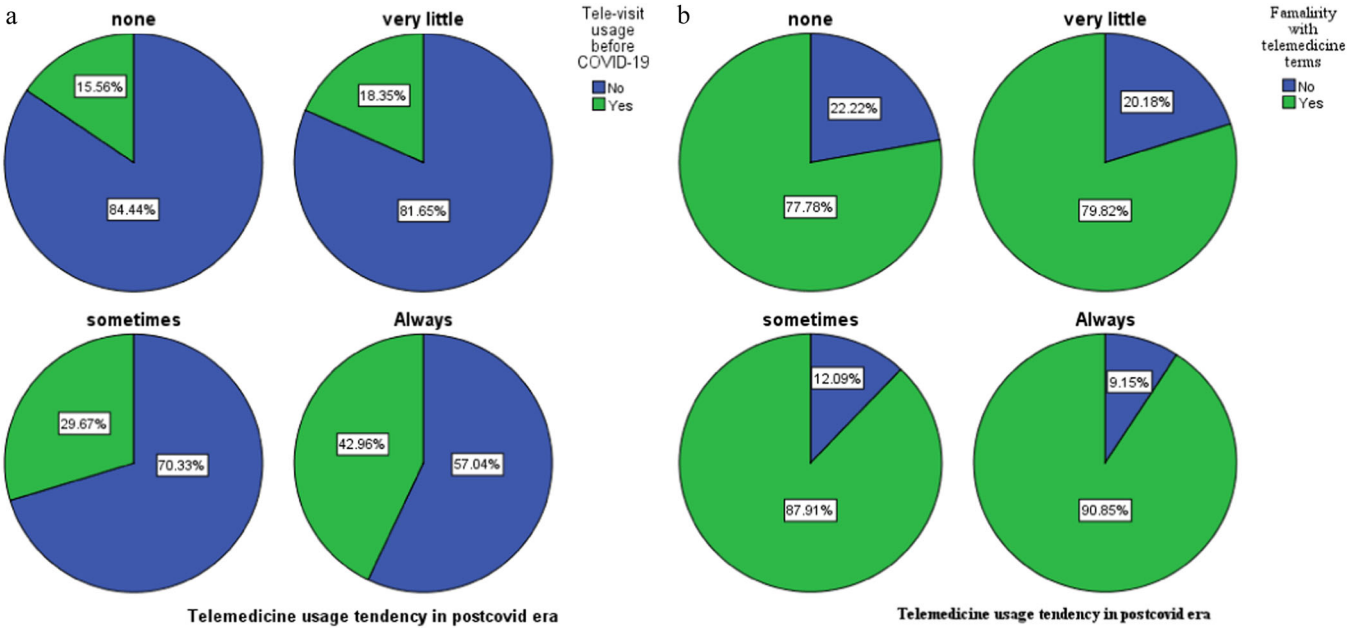

FIGURE 3 | Willingness to use telemedicine and (a) participants' familiarity with telemedicine terms and (b) previous utilization.

prior experience with such services were more comfortable transitioning to telemedicine during the pandemic situation. Overall, these findings are in accordance with the findings reported by Moulaei et al. [23]. They concluded that prior experience with telemedicine influenced the preference for telemedicine. The importance of this factor was pointed out by other researchers in facilitating the adoption of telehealth services [24, 25].

4.2 | Principal Findings

The global trend toward utilizing telemedicine services instead of traditional face-to-face visits has been on the rise since the onset of the pandemic [26]. The first part of the questionnaire revealed that more than 60% of the respondents stated that they used one of the types of telemedicine during the COVID-19 pandemic. Similarly, our survey revealed that around one-third of our studied population had to cancel their in-person appointments due to the COVID outbreak and concerns about exposure.

Various studies have been conducted to examine the impact of the COVID-19 pandemic on shifting to online services. These studies illustrated how patient concerns directly contributed to appointment cancellations across various healthcare settings [27, 28]. This shift can be attributed to the rapid spread of the virus and the necessity for social distancing measures, prompting healthcare organizations to adopt telemedicine as a safer healthcare delivery option [29–31].

Another important finding is that telephone-based visits are the most frequently used telemedicine method. This preference likely stems from the widespread availability and convenience of telephone services, particularly for individuals with limited e-health literacy [32]. Additionally, healthcare providers find telephone consultations easy to implement, as they require only basic equipment such as telephone lines [33]. As expected, medical applications have emerged as the second most popular telemedicine intervention due to their accessibility within the population and are increasingly utilized worldwide to deliver remote patient care [34]. This result ties well with previous studies wherein the telephone is the most commonly used tool for telemedicine visits [35]. In addition, evidence showed that patients feel more comfortable and find telephone-based visits more convenient than other services [36].

Through this survey, several key barriers to the adoption of telemedicine were identified, with the primary issue being a lack of trust in telehealth services. Concerns about patient data privacy and the accessibility of telemedicine services are also significant factors. However, trust and patient concerns regarding privacy and confidentiality in telemedicine services are directly related, a topic that has been highlighted in other studies [37–39]. Evidence shows that an emphasis on patient data protection is essential for building this trust [40, 41]. On the other hand, Brennan et al. [42] indicated in their study that trust is a fundamental component of the patient-provider relationship, and without it, the adoption of telehealth services is likely to remain limited.

Patients also highlighted that limited coverage for specialized care can restrict access to necessary telemedicine-based services, hindering the potential benefits of telehealth. As telemedicine becomes increasingly prevalent, healthcare systems must develop strategies to enable physicians to seamlessly integrate both traditional and telemedicine modalities into their practices without compromising patient care [43, 44]. According to Jang-Jaccard et al. [45], this integration requires physicians to receive appropriate training on telemedicine to effectively deliver these services [45].

4.3 | Attitudes and Willingness to Telemedicine

The present study found that the overall mean score for attitudes toward telemedicine was above 28, indicating a generally

positive to very positive perception among the participants. The majority of respondents expressed a willingness to utilize telemedicine services instead of face-to-face visits, as they strongly agreed that telemedicine saves time and eliminates the need to travel long distances to see a doctor.

The public attitude toward telemedicine services has been investigated in various countries. For example, a survey conducted in Ethiopia in 2023 revealed that nearly three-fourths (71.1%) of the public respondents had a positive perception of telemedicine services, while approximately two-thirds (63.3%) expressed a willingness to utilize them [46]. In a separate survey conducted in India in 2022, participants demonstrated a neutral to positive attitude toward telemedicine [47]. In Saudi Arabia, a total of 87.3% of respondents reported a positive attitude toward telemedicine services [48]. The results obtained in our country indicate that Iranians have a similar perspective on telemedicine when compared to other developing nations.

Among the participants, individuals with higher levels of education generally showed more positive attitudes toward telemedicine and a stronger willingness to use telemedicine services. These findings align with previous research by Stankova, which indicated that university students in Bulgaria were more likely to embrace e-health and telemedicine services [49]. Surveys conducted in countries such as Jordan, Bulgaria, Australia, and Saudi Arabia further support the notion that higher educational achievement is correlated with more favorable perceptions and acceptance of telemedicine [15, 48–50].

Our results also indicated that individuals with higher levels of e-health literacy tend to have a more favorable view of telemedicine, a finding supported by research conducted on various populations [51, 52]. Consequently, the impact of e-health literacy on more effective utilization of telemedicine and a greater willingness was found to be statistically significant. In other countries, a positive relationship was found between eHealth literacy and attitudes to telemedicine [15, 52–54].

The findings of the present study could assist health policymakers in evaluating the potential for implementing e-health and telemedicine services, taking into account the readiness of Iranians to accept telemedicine. Based on these findings, managers can select the most suitable model by considering the necessary prerequisites for implementing telemedicine services. However, our results indicated that telephone consultation services were the most accepted model of telemedicine among the study population.

Nonetheless, several challenges must be addressed to ensure the successful implementation of telemedicine in developing countries. These challenges include the readiness of health organizations, access to technological infrastructure, collaboration among health professionals, and limited budgets which were addressed by other studies too [55].

Fortunately, our study was able to achieve a remarkable response rate of over 95%, which is very high, especially for a web-based survey. This suggests that the study design, recruitment strategies, and participant engagement were very effective. The exceptional 95% response rate we achieved can be attributed to several key factors. First, the web-based questionnaire was designed to be highly user-friendly and accessible, ensuring participants with varying levels of technological proficiency could easily complete the survey. Second, a multipronged distribution strategy was utilized, sharing the questionnaire link across social media platforms as well as in targeted online groups. This broad dissemination approach allowed us to reach a diverse target audience, increasing the likelihood of a strong response rate.

Additionally, we regularly sent reminder messages to the participant groups, reminding them to complete the questionnaire. We also provided participants with valuable information about the objectives of the survey before they engaged with it, which may have served as an incentive. By combining a thoughtful survey design, comprehensive distribution channels, and effective reminders, we were able to create an environment that facilitated high levels of engagement and participation from our target population.

4.4 | Study Limitation and Further Study Suggestion

One primary drawback of cross-sectional studies is the potential for sampling bias. To mitigate this issue, we employed a random sampling technique to enhance the representativeness of the sample and minimize bias. Participants took part in the study anonymously through an electronic questionnaire, which was designed to prevent access to responses after questionnaire completion. Since the present study was limited to the public population, future research could explore various disease subgroups and examine clinicians' perspectives on telemedicine services.

5 | Conclusion

The existing literature on Iranians' attitudes toward and usage of telemedicine during the COVID-19 pandemic is limited. This survey revealed a generally positive attitude among Iranians toward telemedicine, indicating their willingness to utilize remote medical services, provided that proper infrastructure and security measures are in place to address trust issues. The findings offer valuable insights for clinicians and health policymakers regarding attitudes toward telemedicine in the post-COVID era, highlighting the public's willingness to engage with these services. Additionally, the results could aid in assessing the feasibility assessment of implementing e-health and telemedicine services, taking into account the readiness of the population to adopt these technologies.

Author Contributions

Conception and design of the study: Hamidreza Abtahi, Marsa Gholamzadeh, Reza Safdari, Mehrnaz Asadi Gharabaghi, and Besharat Rahimi. Acquisition of data: Marsa Gholamzadeh, Elham Haghshenas, Hamidreza Abtahi, and Reza Safdari. Analysis and/or interpretation of data: Marsa Gholamzadeh, Elham Haghshenas, Hamidreza Abtahi, Mehrnaz Asadi Gharabaghi, and Besharat Rahimi. Drafting the manuscript: Marsa Gholamzadeh, Elham Haghshenas, and Hamidreza

Abtahi. Revising the manuscript critically for important intellectual content: Marsa Gholamzadeh, Elham Haghshenas, Hamidreza Abtahi, Mehrnaz Asadi Gharabaghi, and Besharat Rahimi. All authors have read and approved the final version of the manuscript and Elham Haghshenas had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

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Ethics Statement

The research was approved by the Tehran University of Medical Sciences Ethics Committee (IR.TUMS.SPH.REC.1401.056). All methods were performed according to the relevant guidelines and regulations. Informed consent was obtained from all subjects.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials. The data sets generated and analyzed during the current study are available from the corresponding databases upon reasonable request.

Transparency Statement

The lead author, Elham Haghshenas, affirms that this manuscript is an honest, accurate, and transparent account of the study being reported, that no important aspects of the study have been omitted, and that any discrepancies from the study as planned (and if relevant, registered) have been explained.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.