# Public Awareness and Acceptance of Telemedicine in Japan

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**Abstract—Telemedicine seeks to improve the quality, efficiency and cost of healthcare by a variety of electronic means. It is originally designed to serve patients in remote areas. The service involves the use of technologies to support the connection between doctors and their patients without the need for in- person meetings. Nowadays, the COVID-19 outbreak could put a spotlight on Telemedicine as an important tool to avoid the community from infection. This study aims to examine public awareness and acceptability of telemedicine in Japan. Furthermore, it determines the main reasons which hinder the growth of the service in the COVID-19 era from the public's views. To achieve our goals, 84 participants in the age ranging from 20 to 64 years were randomly selected, and data were collected from them using a questionnaire survey. The survey reveals that all participants are not telemedicine users. Fifty-nine (70%) participants are somewhat aware of telemedicine service, and 51% of them are very much interested in telemedicine. Only 3 (4%) participants are quite satisfied with the amount of information available on telemedicine. This is obvious as 50% of them have no detailed information about the service. Fifty-two (37%) participants state that online telemedicine education program is an effective way to raise awareness of telemedicine. The survey results also identify the major reasons for not using telemedicine service in the COVID-19 era. At present, there are various issues for a slow growth of telemedicine in Japan. Recommendations to increase awareness of telemedicine service have been made.**

***Keywords-telemedicine; service development; Japanese people; awareness and perceptions; COVID-19 era***

## I. INTRODUCTION

Telemedicine is defined as the use of Information and Communication Technologies (ICTs) to improve patient outcomes by providing accessible, cost-effective, and high-quality healthcare services [1]. Telemedicine uses ICTs mainly to liberate patients and medical professionals from geographical barriers and time restrictions. The recent concept of telemedicine is extremely wide, ranging from diagnosis to therapeutics [2][3]. With the world-wide dissemination of telemedicine, as well as its clinical benefits and cost effectiveness, the Japanese Ministry of Health, Labor and Welfare (MHLW) has made efforts to promote telemedicine since 2015 [4]. In 2018, the service became available across the country but was limited to patients with certain chronic conditions who had already received prescriptions for medication [5]. Studies have been published showing the effectiveness of telemedicine in the treatment of various chronic diseases, such as hypertension, dyslipidemia, and diabetes [4]. In April 2020, the COVID-19 crisis has prompted Japan to ease regulations on telemedicine [6][7]. However, the use of deregulated telemedicine has been sluggish compared to the US and UK [8]. Therefore, the present study aimed to examine public awareness and acceptability of telemedicine. Furthermore, it determined the major reasons which hinder the growth of telemedicine from Japanese people's views. The rest of this paper is organized as follows. Section II explains the method of this study. Section III shows the major results of the survey. Section IV includes discussion and limitation of a study. Section V includes both conclusion and future work.

## II. METHOD

To carry out this study, semi-structured questionnaire (12 multiple-choice questions) was undertaken with 84 participants (63 Female and 21 male) between February and April 2021. Selecting the survey participants was based on their busy works with limited vacations time (about 10 days in a year) to visit hospitals. Participants were provided with an explanation of telemedicine and all information regarding the study, including the reasons for undertaking the survey. The questionnaire sheets had been given to the person of charge by hand in order to distributed among the employees. The questionnaire guide was informed by a literature survey in this study area [9][10] and piloted on 5 individuals. Following this process, questions were revised and determined. Probing questions were used to explore public awareness, and acceptability of telemedicine. Furthermore, the questions were used to find out the main reasons that hinder the use and growth of telemedicine in the COVID-19 era. Ethical approval for this study was obtained from the Kyushu University Hospital, Permission No 2021-15.

## III. RESULT

A total of 84 administrative employees of which female (63) and male (21) completed the questionnaire. The following are the main results of the questionnaire.

### *A. The Characteristic of Participants*

The participants' ages are ranging from 20 to 63 years. They are administrative employees working (full-time job)

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TABLE I. CHARACTERISTICS OF PARTICIPANTS (N=84)

| Gender N=84 | Age N=84 | Physical Disability | City | Occupation N=84 | Hospital visit | (in a year) | N=84 | Experience of Telemedicine |
|---|---|---|---|---|---|---|---|---|
| Female N 63 (75%) | 20-29 17 (20%)<br>30-39 16 (19%)<br>40-49 28 (34%)<br>50-59 17 (20%)<br>60-69 6 (7%) | No | Fukuoka | Administrative employees<br>University A N 53 (63%)<br>University B N 31 (37%) | Once a week<br>Once every 2 weeks<br>Once a month<br>Once every 2 months<br>Once every 6 months<br>Once a year<br>No visit<br>No answer | 52 times<br>26 times<br>12 times<br>6 times<br>2 times<br>One time<br>0<br>— | 2 (2%)<br>2 (3%)<br>16 (19%)<br>6 (7%)<br>24 (29%)<br>12 (14%)<br>0<br>22 (26%) | No |
| Male N 21 (25%) | | | | | | | | |
| 100% | 100% | | | 100% | | | 100% | |

in different business sectors at 2 public universities in the Fukuoka city. The survey results indicated that all participants have no physical disabilities, and they had never experienced telemedicine. The majority (29%) visit the hospitals about 2 times a year (Table I).

*B. Awareness of Telemedicine*

About the levels of participants' awareness of the service, 59 (70%) participants were somewhat aware of telemedicine (Table II). Participants' awareness of telemedicine developed through various means. The majority (53%) of participants indicated that media is the main source to know about telemedicine. Only 3 (4%) participants were quite satisfied with the amount of information available on telemedicine. This is obvious as 43 (50%) participants had no detailed information about the service. Furthermore, 68 (56%) participants requested to clearly know about the regulations, cost, benefits, and risks of telemedicine service.

Concerning the acceptability of telemedicine, about 42 (51%) respondents were quite interested in telemedicine concept, technologies and communication mode (Table III). Seventy-two out of eighty-four participants believed that telemedicine has various benefits. In Figure 1, the majority (30%) of participants indicated that it is an effective tool to avoid a risk of hospital-acquired infections.

Regarding the possibilities to raise public awareness of telemedicine, 52 (37%) participants called for setting up online education programs to teach people about telemedicine service (Table II).

TABLE II. PARTICIPANTS' AWARENESS OF TELEMEDICINE (N=84)

| Issues | Responses (N=84) | | | | |
|---|---|---|---|---|---|
| | To a great extent | Somewhat | Not at all | | |
| Current perception of telemedicine | 14 (17%) | 59 (70%) | 11 (13%) | | |
| People satisfaction with the amount of information available on telemedicine | 3 (4%) | 59 (70%) | 22 (26%) | | |
| Information sources | Media | Hospital | Website | No answer | Friends |
| | 51 (53%) | 20 (21%) | 12 (12%) | 11 (12%) | 2 (2%) |
| Available information | Positive perception | Negative perception | No detailed information | Other | |
| | 31 (36%) | 6 (7%) | 43 (50%) | 6 (7%) | |
| Additional required information | Telemedicine regulations, benefits, risks, cost, etc. | Patients' experiences and satisfactions with telemedicine | How telemedicine is worked; such as tools, types, etc. | Other | |
| | 68 (56%) | 36 (29%) | 16 (13%) | 2 (2%) | |
| Possibilities to raise the awareness of telemedicine | Set up telemedicine education program for public | Encourage the use of eHealth through social media, website, email, brochures, etc. | Make the use of telemedicine mandatory by policy or other means | Other | |
| | 52 (37%) | 51 (36%) | 29 (21%) | 8 (6%) | |

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TABLE III. ACCEPTABILITY OF TELEMEDICINE (N=84)

| Issues | Responses | | |
|---|---|---|---|
| | Very much | Not much | Not at all |
| **Accepting to the concept of telemedicine** | 48 | 24 | 12 |
| **Impressed with telemedicine technology** | 37 | 41 | 6 |
| **Interested in virtual/online communication** | 41 | 38 | 5 |
| Average | 42 (51%) | 34 (41%) | 7 (8%) |

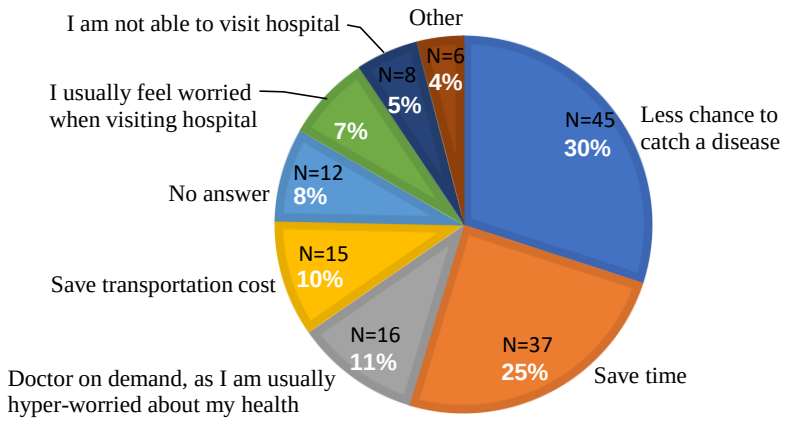


Figure.1 Benefits of Telemedicine from the Japanese People's Perspectives (N=72) - Multiple-choice Question

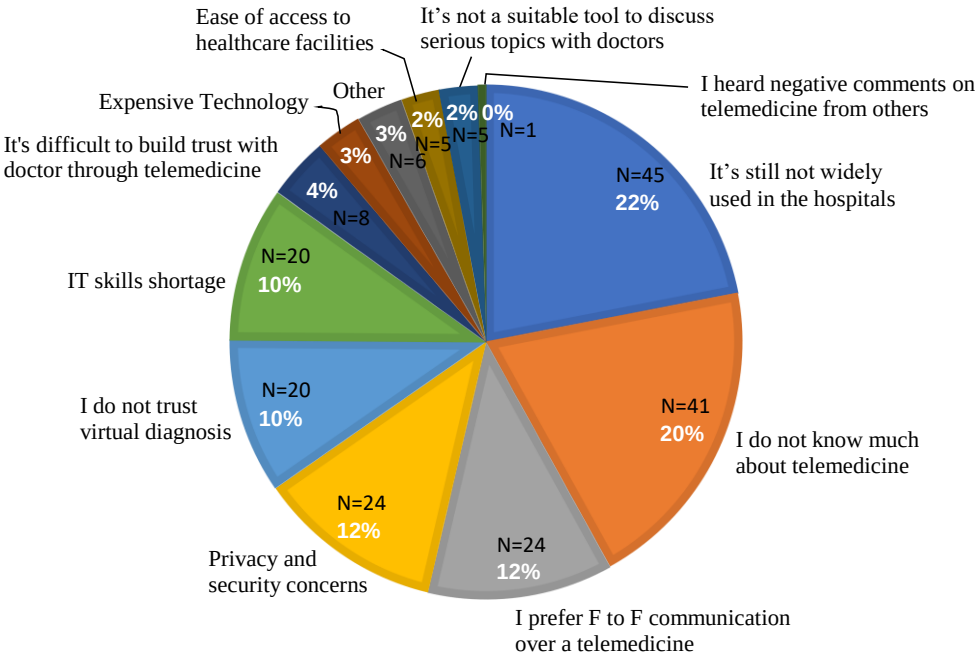


Figure. 2 Why Japanese People Aren't Using Telemedicine at Present (N=84) - Multiple-choice Question

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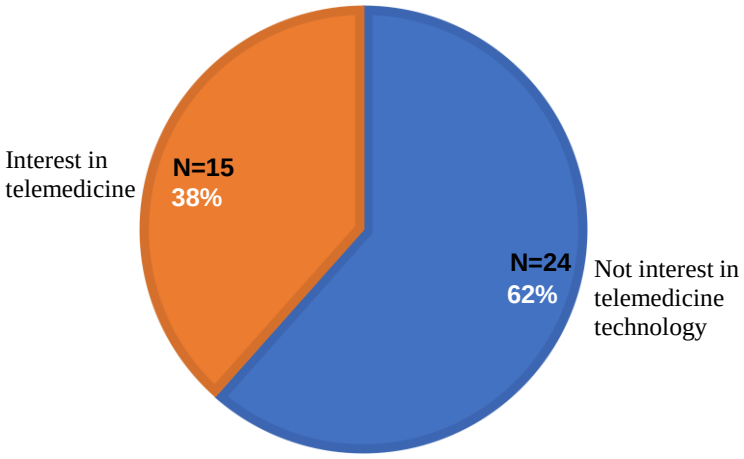


Figure. 3 Participants' Ages (from 45 to 63 years) and Acceptability of Telemedicine (N=39)

### C. *Major Reasons for Not Using Telemedicine in the COVID Era*

This study detected that there are different reasons (see Figure 2) led participants to not use telemedicine services. The majority (22%) of participants indicated they do not use telemedicine because it is not widely provided in the hospitals. The study findings show that 20% of participants do not know much about telemedicine services. About 12% of participants preferred to use in-person visit over a telemedicine, while some (12%) participants have concerns about their data privacy in telemedicine. About 10% of participants do not trust virtual diagnosis, whereas other (10%) participants indicated their ICT skills shortage. Furthermore, 4% of survey participants responded that it is difficult to build trust with doctors through telemedicine, while 3% of them mentioned about high cost of telemedicine technology.

On the other hand, 3% of participants chose 'Other'. A few (2%) participants mentioned about ease of access to healthcare facilities, while other (2%) participants indicated that telemedicine is not a suitable tool to discuss serious topics with doctors. Only one participant pointed out that she did not use the service because of receiving negative comments on the service from others.

## IV. DISCUSSION

The survey results revealed that the majority of participants are interested in telemedicine. They indicated that telemedicine might be an effective tool to reduce the risk of infection. However, they are not using it at present due to some important reasons. One of these reasons is about providing telemedicine services in a few hospitals. In Japan, there is a slow spread of telemedicine in the hospitals partly due to reimbursement challenges, lack of economic advantage, and a lack of clinical evidence [4][11][12]. According to the MHLW, only 65 telemedicine-based episodes of medical care are performed per month in Japan [4]. Furthermore, a recent study reported that among the 110,898 medical institutions that exist, the number of medical institutions implementing telemedicine increased slightly from 10,812 (9.7%) in April 2020 to 16,202 (14.6%) in June. Of this number, only 6,801 (6.1%) medical institutions implement telemedicine for a patient's first visit [13]. Second major reason is related to limited information available about telemedicine service. Regarding this issue, the survey results detected that a few (4%) participants were quite satisfied with the amount of information avaliable on the service. This is obvious, as the majority (50%) did not have detailed information about telemedicine regulations and risks. Similar findings showed in our pervious study that the majority of Japanese physicians (39%) had no detailed knowledge about telemedicine, and only 3% of them quite satisfied with available information. Furthermore, the majority (32%) of them wanted to know about telemedicine guidelines and standards [12].

Third reason is concerning communication preferences. Although a recent study demonstrated that patients can achieve the same level of communication effectiveness with their physicians using IT communication as they would in comparable Face-to-Face communications [14], about 12% of our participants preferred in-person meetings over telemedicine for promoting conversation through body language, while 4% of them indicated the importance of F-to-F communication for establishing trust in relationship with doctors. Furthermore, a few (2%) participants believed that telemedicine is not an adequate tool for discussing deep and serious topics. Fourth reason is about lack of confidence in the service among the participants. The study revealed that 12% of participants had concerns about protection of their medical information collected by telemedicine. Furthermore,

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10% of them did not trust the accuracy of diagnosis by telemedicine. Similar finding showed in other articles that healthcare professionals distrust a diagnosis made via telemedicine [12][15]. Regarding this issue, if patients don't trust the diagnoses made during telemedicine calls, they may ignore the advice given, fail to take preventative steps, or seek additional in-person appointments, which defeats the point of telemedicine [16]. For many e-services, end-user trust is a crucial prerequisite for use [17]. The fifth reason is related to the ICT skills shortage. About 10% of the participants did not have a sufficient technical skills to use telemedicine services. Regarding the acceptability of telemedicine technology, the present study found that the majority (62%) of older participants with ages ranging from 45 to 63 years were not somewhat interested in the telemedicine technology (see Figure 3). Similar finding showed in other study that the elderly had a difficult time adjusting to the new technology of telemedicine [18]. Regarding the last reason, a few (2%) participants indicated that they did not use the service due to the ease of access to healthcare facilities and getting high-quality care at a low fee. Actually, Japan's health system is well known for achieving one of the world's highest life expectancy with universal health coverage. The important feature of the healthcare system in Japan is "free access." Patients are completely free to choose any healthcare facilities, regardless of the severity of their disease and their insurance status [19]. Due to COVID-19 pandemic, a recent survey by the Association of Japan Medical Colleges revealed that the number of patients fell during April and May 2020 because many people opted not to visit the hospital due to fears they might become infected. The number of outpatients in April 2020 dropped by 21 percent over April 2019, while the decrease in May 2020 was 27 percent [20].

Based on the above-mentioned findings, it can be said that a slow growth of telemedicine in the COVID-19 era is due to many issues. Comparing to the results of other studies [11][15], the present study revealed that the major reasons are not only link to the lack of infrastructure or reimbursement challenges but also due to other various reasons, and the most important of which is related to a lack of detailed information provided for all (including ordinary people and clinicians) about the service.

For people to ask for telemedicine service, they need to understand well its possibilities and limitations. According to the participants' opinions, the most effective way to promote the level of awareness of telemedicine is through education programs. Although international remote training programs for medical engineers have been implemented, there are no evidence reports on conducting online education programs for the public in Japan [21]. Therefore, this study recommends establishing telemedicine education program to teach people about telemedicine as an option for 'a quick way' to receive care. One of the necessary roles of the program is providing individuals with appropriate and complete information on when, and how to use telemedicine, as well as legal and ethical aspects associated with the service delivery. This would probably change their opinions about the service.

Regarding the limitation of this study, the survey was done with limited number of Japanese participants, and the results cannot be generalized beyond the participants of a study. The participants expressed their own perspectives for raising public awareness of telemedicine. These may not express views of the majority of Japanese people.

## V. CONCLUSION

The present study examined public awareness and acceptability of telemedicine service in Japan. Furthermore, it determined the main reasons which hinder the growth of telemedicine in the COVID-19 era. Based on the survey results, it can be said that limited awareness of telemedicine plays an important role in a slow growth of the service. Greater public awareness about the service's regulations, benefits, and risks is an essential step for improving telemedicine market in Japan. Therefore, this study recommended setting up education programs to provide people with detailed information about telemedicine service. Further researches are recommended to discuss the development of telemedicine education and training programs for all, including ordinary people and clinicians.

In the future, the authors would seek to run a large-scale survey in order to pick up major and minor barriers to telemedicine development in Japan, considering details about the chronic diseases of the population sample.

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