

Original Article

Telehealth in Sri Lanka: Stakeholder perspectives on knowledge, practices and future requirements

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Abstract

Background and Objective:

The pandemic caused many to re-think Telehealth. Understanding the key features underlying the required cultural shift is necessary to maintain sustainability of Telehealth programmes. The objective of the study was to understand the underlying user needs which are necessary to maintain sustainability of Telehealth programmes as well as enhancing healthcare via Telehealth services.

Methods:

The characteristics of three key stakeholder groups were studied using a web-based survey questionnaire, which included 224 doctors, nine telehealth programs and 235 registered telehealth consumers.

Results:

A majority of the doctors (91.1%, n=204) used a telephone to communicate with patients while a few (14.7%, n=33) used a Telehealth vendor platform. A minority (4.5%, n=10) thought Telehealth is not a need in Sri Lanka and from those who thought otherwise, 68.7% (n=147) were interested in using Telehealth for future consultations. The most popular reason given for this interest was physician convenience (136, 92.5%). Meanwhile, eight of the nine Telehealth programmes surveyed, anticipated better coordination of healthcare and improvement of patient convenience. Three had electronic medical record systems, Six offered primary healthcare and health promotion services while only one issued internet-based prescriptions. Of the registered consumers, a majority (78.7%, n=185) had received Telehealth care and 70.8% (n=131) agreed that the availability of an internet-based prescription option is important. Further, 56.2% (n=104) stated that use of Telehealth enabled them to reduce healthcare expenditures. Overall satisfaction about their experience was average (61.1%, n=114) and 69.2% (n=128) were willing to reuse Telehealth.

Conclusions/recommendations:

Addressing consumer needs, expanding access to specialized clinical care, updating medical legislation and incorporating telehealth education into medical curricula could enhance the use of telehealth.

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Introduction

Pandemic and epidemic situations which emerge from time to time including the recent COVID-19 pandemic have caused healthcare providers and patients to change their thinking regarding Telehealth[1,2]. During the pandemic, the majority of health users and staff began to avoid face-to-face consultations and embraced online health services[3]. However, this cultural shift in acquiring new technology[4,5] will have to lead to a better provision of health care in order to have an enduring impact. Also, understanding user needs in a non-pandemic situation is important in planning for a sustainable, undisrupted Telehealth solution.

At the time of the research, only a few multi-stakeholder surveys had been performed on Telehealth needs in the world [6–8]. and none had been conducted in Sri Lanka. Unavailability of specific guidelines and updated Acts related to Telehealth practices is a disadvantage. Planning health services cost-effectively is important for Sri Lanka as a lower middle-income country [9]. The transformation of traditional healthcare into a digital stream can lead to unprecedented challenges for policy-makers if they are planned without assessing stakeholder needs [10]. Further, equality in healthcare access, information privacy and security, transparency of practices and adhering to international protocols needs to be followed. We report a systematic multi-stakeholder study on the provision of Telehealth care services in Sri Lanka.

Objective

The objective of the study was to understand the underlying the user needs of the main stakeholders, i.e. doctors, programme vendors and consumers, which are important for the sustainability of Telehealth programmes as well as enhancing healthcare via Telehealth services.

Method

Knowledge, self-claimed practices and needs of Telehealth stakeholders in Sri Lanka were assessed using three different, web-based, voluntary self-administrated questionnaires; for doctors, vendor managers of Telehealth programmes and for consumers of Telehealth services. Doctors' and consumers' identities were kept anonymous in the questionnaire.

Model for Assessment of Telemedicine (MAST) [11,12] was used to develop the three separate questionnaires. MAST is a widely used evaluation methodology in Europe for assessing the efficacy of telehealth, having been created by the European Commission in 2009. The questionnaires for institute/programme managers and doctors were developed in English which is their working language. The consumers' questionnaire was in Sinhala, Tamil and English languages as it was meant for the general public. The validity of the questionnaires was tested in November/December 2018, using judgmental validity methods to evaluate attitudes and behaviours. Later, all three questionnaires were converted to web-based self-administered questionnaires using the open-source LimeSurvey™ web survey tool. Informed consent was obtained from all participants prior to their accessing the web-based questionnaire. The web-based questionnaires were

pretested on appropriate groups that were not included in the central survey to avoid bias in the main study.

The doctors' questionnaire was emailed in November 2018 to a group of registered medical doctors who are on the Sri Lanka Medical Council (SLMC) register via the contact list from the Health Informatics Society of Sri Lanka (HISSL). Google keyword search was used to identify a contact list of institute/programme vendors providing Telehealth services in Sri Lanka by November 2018. The institutes/programme managers' questionnaire was emailed the same month to a group of identified Telehealth vendors to gather relevant information about Telehealth services provided by them. Finally, the web-based self-administered trilingual questionnaire for consumers was sent to the registered Telehealth consumers the same month, upon agreement with the participant Telehealth vendor institutes/programme managers. Descriptive statistics were calculated using SPSS software.

Results and Discussion

Only a few research were available in the Asian region about the features of Telehealth programmes. Stakeholder opinion towards Telehealth in Sri Lanka was slightly different compared to Western countries. Overall, the Sri Lankan Telehealth sector was interested in preventive care while other countries were more towards acute clinical management.

Doctors' opinion on Telehealth

Demographic features of the participant doctors

Most of the doctors 58% (224 out of 387) of those who clicked on the invitation link finished the questionnaire. The average age of the participating doctors was 38.6 years (SD 6.7). Respondents' composition was House Officers/SHO's (34.4%, n=77), Residents/Registrars (46.9%, n=105) and Consultants (12.5%, n=28). A high percentage of participating doctors 63% (n=141) had postgraduate qualifications. 93.3% (n=209) of the participants use smartphones.

Doctors' knowledge on Telehealth concepts and current practices using Telecommunication

Of the doctors who responded, 92% (n=206) claimed knowing Telehealth. However, 65.2% (n=146) incorrectly identified some Sri Lankan channelling payment gateways as a Telehealth modality.

Most, 91.1% (n=204) of doctor-respondents used the telephone to communicate with their patients. Further, 77.7%(n=174) used Viber™ and 69.9% (n=157) used email. For doctor-doctor communication, the telephone 68.8%(n=154) was the most used followed by Viber™ 39.3% (n=88). The usage of telecommunication for clinical care discussions with patients by Sri Lankan doctors was higher than its use between doctors.

Only 14.7%(n=33) declared they were practising Telehealth through an official vendor. In Europe, 30% of medical residents have experience in routine Telehealth practice[6] in 2019. In the USA, By 2016, 63% of medical professionals [13] were utilising a telehealth platform of some kind. Both percentages were much higher than in Sri Lanka (14.7%)

with USA leading Europe. However, participating Sri Lankan doctors' average age was 12.7 years less compared to a separate study in the USA [14].

Physicians in the USA [15] and Europe [6,7] used the telephone as the favoured mode of Telecommunication among themselves as well as with patients. While email was the second favourite mode, mobile messaging applications were rarely used. However, Sri Lankan doctors participating in this study use more video-compatible mobile applications for communication even though the use of telephones is almost the same. This lesser use in other countries may be due to the availability of records in a visual format through web-based electronic health record systems.

Willingness to use Telehealth

Telehealth is considered an important modality all over the world. Only a minority 4.5% (n=10) thought telehealth is not needed for Sri Lanka even in the future. 68.7%(n=147) out of the 214 who thought otherwise were willing to use online teleconsultations. The main reasons being convenience 92.5%(n=136) and efficiency of follow-up 83 %(n=122) (Table 01). However, only 10.3%(n=22) claimed that they knew the regulations related to Telehealth in Sri Lanka.

In Europe, among medical faculty deans, 97.7% of respondents' attitudes were in favour of Telehealth practice [7]. Further, 82.8% of medical students and residents in Europe [6] thought Telehealth would improve access to healthcare showing some similarity to trends in Sri Lanka.

Table 01: Reasons behind the willingness of doctors to do online teleconsultations

Reasons	Relative preference percentages (n=147)
Ability to do consultations from a convenient place and time	136 (92.5%)
Ability to make patient follow-up easier	122 (83 %)
Income by after-duty consultations	86 (58.5 %)
Ability to retain existing patients by addressing their concerns	83 (56.5 %)
Attract new patients to the practice	62 (42.2 %)

Willingness for online teleconsultations was slightly lower (57%) for the USA in 2015 [15] even though the USA has a better Telehealth structure than Sri Lanka. However, only 38.7% of medical residents in Europe agreed that they would like to participate in Telehealth consultations in the future [6]. The main reasons expressed by US physicians [15], for selecting online consultations were flexible scheduling time and place, and convenient patient follow-up (74%).

The majority of the Sri Lankan doctors who thought internet-based prescription is an essential factor in Telehealth practice were more willing to do online teleconsultations than the participants who did not think so. The Pearson Chi-Square value of 9.878 and significance level p is less than 0.01. This shows the willingness to prescribe online.

The main reasons for Sri Lankan doctors' unwillingness to Teleconsultations included: the inability to perform a clinical examination, weak/lack of legislation, concerns over doctor shopping, increased risk of diagnostic error and inability to access patients past medical history. The reasons for doctors' unwillingness to use Telehealth in the Western world were poor knowledge of Telehealth legislation, [7] lack of training of doctors on clinical protocols, inadequate regulations and uncertainty about consultation fee reimbursement [15], concerns about data security, associated high implementation costs, need for training and the potential for extra work load [16].

Poor knowledge of legal provisions on Telehealth services is well identified. In Europe, only 31.2% of medical faculty deans [7] and 16.9% of medical residents [6] knew about Telehealth regulations. This value was 10.3% for Sri Lanka.

Preferences on Telehealth

Key aspects that doctors felt should be included in any Telehealth system are listed below in Table 02. Sri Lankan doctors felt that primary care/general practice 73.8% (n=158), dermatology 66.4% (n=142), cardiology 50% (n=107), psychiatry 48.6% (n=104), infectious diseases 48.6% (n=104) and radiology 48.1% (n=103) would benefit most from Telehealth. Meanwhile, doctors in the USA [15] selected dermatology (76%), psychiatry (54%) and infectious diseases (46%). However, in Europe, most practised Telehealth activity was on emergency triage (34.2%) [6].

Table 02: Expected features of the Telehealth programme by the doctors

Expected features)	Frequency (%) (n=214)
Type of Telehealth application you prefer to use	
Web-based only	19 (8.9%)
Mobile App based only	31(14.5%)
With both above capabilities	159 (74.3%)
Expected abilities of the Telehealth system	
Ability to read a ' 'patient's history	191(89.3%)
Ability to visualise lab tests online	194 (90.7%)
Ability to visualise radiological images	191(89.3%)
Ability to do video consultations/discussions	177 (82.7%)
Ability to write prescriptions online	155 (72.4%)
Ability to save current patient treatment details	181(84.6%)
Suggested technology suggested to be important	
Availability of an Electronic Health Record (EHR)	205(97.7%)
Secured methodology on the transfer of information	183 (85.5%)
Methodology to stop unauthorised access to patient data	179 (83.6%)
Regular audits to ensure the process is safe and secure	163(76.2%)
User password and multiple identity checks in system logging	157(73.4%)
Coordination of Telehealth services by a doctor specialized in health informatics	162(75.7%)

Sri Lankan doctors felt health education/promotion 91.6%(n=196) was the most important area in the health sector that Telehealth applications should concentrate on. Other identified sectors were chronic disease management 80.8% (n=173), home care and monitoring 80.4% (n=173), post-discharge follow up 77.6% (n=166) and urgent contraception/birth control advice 70.1% (n=150).

In the USA[15] the most important were, prescription renewal (86%) and minor urgent care (85%), while chronic condition management, home care and monitoring, follow-up after discharge, and emergency contraception received a similar level of importance. The renewal of the prescription was not identified as an important factor by Sri Lankan doctors; most probably due to some Sri Lankan private sector pharmacies issuing medication for outdated prescriptions without an official renewal. Sri Lankan doctors are reluctant to use Telehealth for acute care, probably due to insufficient knowledge of legislation.

Telehealth programme features

Demographic features of the programmes

We identified twenty functioning Telehealth programmes in Sri Lanka via internet search and other available sources. Of these, only nine fully completed our questionnaire and were selected for the study.

Seven programmes used Sinhala, Tamil and English language to communicate with patients in their Telehealth programmes. All, except one, provide island-wide Telehealth services. Five of the responding Telehealth programmes were owned by tertiary care level state institutes and funded and maintained by the public sector providing free healthcare. Leading mobile service providers in Sri Lanka owned two of the other four private Telehealth programmes.

Teaching hospitals in the USA [17] and Taiwan [18] were more likely to adopt Telehealth programmes. Also, studies in Australia [19] and the USA [17] revealed that profit-oriented health institutes were less likely to adopt Telehealth programmes compared to the public sector.

American and Sri Lankan Telehealth programmes were more interested in improving patient convenience, improving patient outcomes and better healthcare coordination [20]. However, priorities addressed by the USA such as reducing the cost of care delivery, expanding services by rare specialities, improving rural patients' healthcare access and reducing hospital readmissions [13,20] had not gained much attention in Sri Lanka.

Most of the responding Sri Lankan Telehealth programmes were providing services on health promotion, and coordination while the rest of the world was concentrating on general practice, acute care, clinic management and remote monitoring [20].

Telehealth programme priorities

Most (77.8%, n=7) programmes had a hotline which functioned 24/7. None were giving attention to compensating local health scarcities like specialist care.

Most of the Telehealth programmes were providing services related to health education and promotion 66.7% (n=6) and primary care 44.4% (n=4). Only a few institutes were interested in clinical care. (Figure 01)

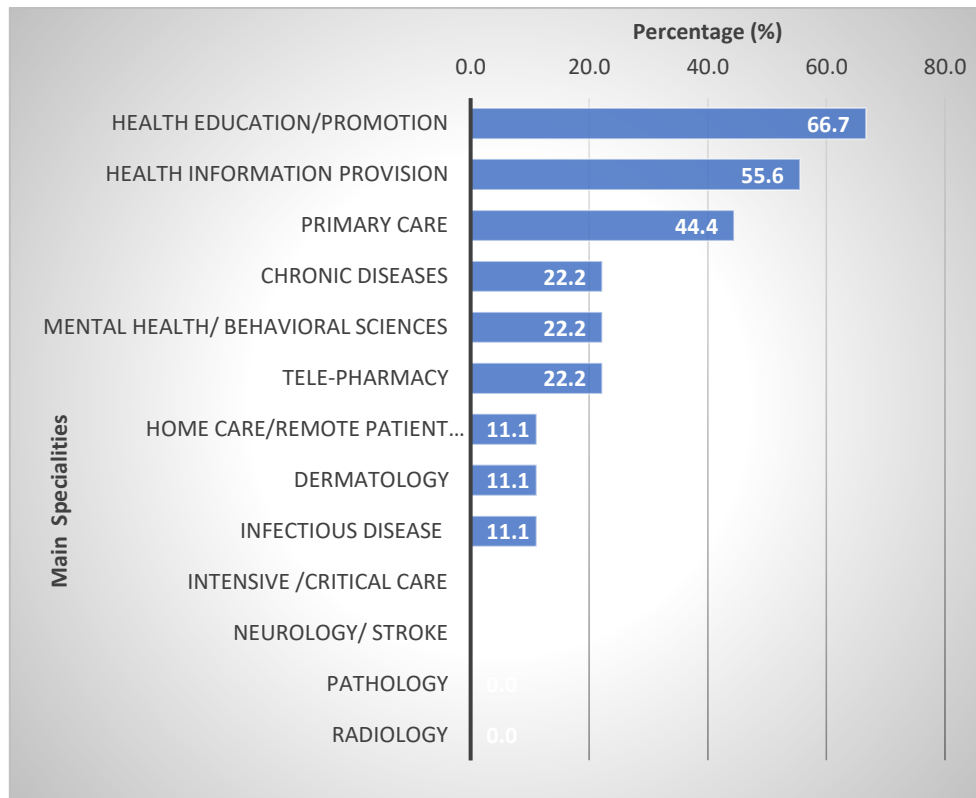


Figure 01: Main service provision speciality areas by the Telehealth programmes

44.4% (n=4) programmes had medical consultants in their service panel while three (33.3%) were involved in synchronous video consultations. Only one institute issued internet-based prescriptions and had their own dedicated software for it. All the others were using regular telephone lines to communicate.

88.9% (n=8) were anticipating better healthcare coordination, better patient outcomes and improved patient convenience. All programmes had planned to reduce the healthcare costs of the patients by saving time. Further, 77.8% (n=7) were focused on reducing costs by proper health education and second opinion with follow-up. They have not given much attention to reducing costs by expanding diagnostics 22.2% (n=2) or acute care 33.3% (n=3), primarily because of the lack of an Electronic Medical Record (EMR) in many settings. Programme managers commented that consumers preferentially seek Telehealth services for conditions related to sexual health, acute infections, psychological issues and oral health.

Telehealth programme technical features and challenges

All programmes agreed that Telehealth services should be provided by an SLMC registered doctor and clinical use of Telehealth must be applied only for selected appropriate cases. At the time of the study, only some used advanced data security

measures such as multi-factor authentication, end-to-end encryption of data and intrusion detection inside the network. However, regular audits have been done in 77.8% (n=7) of programmes. Only three programmes (33.3%) had their own EMR systems for providing Telehealth services. However, EMRS solutions of these programmes were not interoperable and functioned as standalone solutions. In contrast, in the USA [20] 20-30 % of Telehealth programmes had 'interoperable' EMR systems.

Inadequate guidelines and legislation on Telehealth were the highest challenges identified by the managers in executing Telehealth programmes in Sri Lanka. However, in the USA, the main challenges in Telehealth implementation were regulation of professional licensing, reimbursement, verifying doctors' qualifications and broadband connectivity to rural areas [21]. Some other common challenges reported in studies in the USA were privacy/data security issues, malpractice issues, high cost, technological deficiencies and lack of interoperability [8,13].

Consumer Opinion on Telehealth

Demographic features of the consumers

The email link was opened by 411 consumers and completed fully by 235 resulting in a 57% completion rate. The majority were males 77% (n=181) and the average age of the consumers was 35.4 years (SD +/-10.6) with only 5% of participants were above 60 years of age. Consumers must be above 18 years old for service registration. Previous Sri Lankan studies also showed that males are more attracted to Telehealth services [22,23]. Most consumers 71.4% (n=132) were from the Western Province (with the capital city), similar to previous Sri Lankan studies [22,23]. Most, 54% (n=126) used English as the language to answer the questionnaire, followed by Sinhala 41% (n=97), and Tamil 5.11% (n=12).

In contrast, in USA and Europe more females were using Telehealth ranging from 59% to 74% [24–26]. The mean age of Telehealth consumers in Sri Lanka was 35.4 years and was similar to values of 38-39 years in Europe [24,26].

Out of all consumers (235) who completed the questionnaire, 21.3% (n=50) did not have any experience in receiving Telehealth treatment even though were registered for services. The opinions from the remaining 185 (78.7%) who had experience in Telehealth were selected for further analysis. Among them, the use of the English language alone or in combination with other languages to receive Telehealth service was preferred by 61.6% (n=114). However, Sinhala language alone is favoured for teleconsultations by 32.4% (n=60) and Tamil language alone by 5.9% (n=11) of consumers.

Importance of the availability of an Internet-based prescription

In Sri Lanka, 70.8%(n=131) agreed that the 'ability to receive an internet-based prescription' is vital in a 'teleconsultation' which is almost the same as in a US survey demonstrating that 70% of telehealth users prefer to use online teleconsultation to receive a prescription rather than travelling to a doctor [27]. However, in Europe [28] only 37.3% used Telehealth to request online prescriptions. In the USA, most Teleconsultations

ended up issuing an internet prescription at a percentage between 53-69% [25,29]. However, in Europe, [24] internet prescription issue rate was 7.2 %.

Sri Lankan consumers commonly needed internet-based prescriptions for continuation of medicines 64.3% (n=119), antibiotics 56.2% (n=104), chronic diseases (e.g. hypertension, asthma, diabetes) 46.5% (n=86). (Figure 02). Consumers in the USA too preferred similar types of online prescriptions [25,27]. Some of these medications are not given over the counter, and prescriptions are essential.

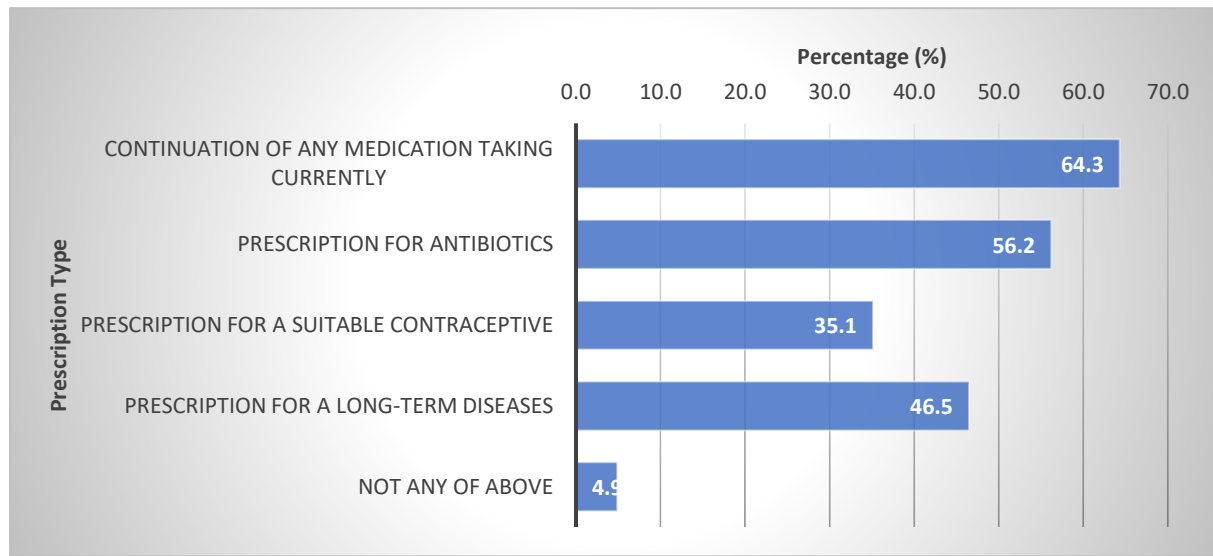


Figure 02: Most demanded internet-based prescription types by the consumers

Consumer satisfaction with Telehealth services provided

Our study showed that 61.6% (n=114) of consumers were satisfied with the Telehealth service they received. (Table 03). It was statistically significant ($p < 0.01$) that consumers who need internet-based prescriptions were more satisfied with Telehealth services than consumers who don't need them, with a Pearson Chi-Square value of 70.65. Surprisingly research in the USA [25] demonstrated that patients who were able to obtain a prescription were more satisfied (69 %) than those who did not.

In Sri Lanka, around 56% agreed to the questionnaire statements 'overall benefited by Telehealth services obtained' and 'helped to reduce expenditure when accessing health services' (Table 03). In the USA, 79% agreed that Telehealth helped to reduce personal expenditure as well as 88% agreed that Telehealth helped to improve their health status. [30].

Table 03: Consumer agreement level on satisfaction

Survey Question	Proportion agreed (n=185)
I was partially or totally benefitted by Telehealth services obtained	103 (55.7%)
Telehealth helped me to save travel time and waiting time	131(70.8%)
Telehealth services have helped me to reduce my expenditure	104(56.2%)
Overall, I am very satisfied with Telehealth consultations	114(61.6%)
I am hoping to use Telehealth services again in the future	128(69.2%)
Ability to get an internet-based prescription is very important in a teleconsultation	131(70.8%)

Of the Telehealth consumers our study 61.1%, (n=114) were satisfied with Telehealth consultations made. However, a systematic review study highlights that the average consumer rate of satisfaction for teleconsultations was 92% (n=38 research papers) [31]. Therefore, in comparison, Sri Lankan consumers were less financially benefitted as well as less satisfied by Telehealth consultations compared to other countries.

However, Sri Lankan Telehealth consumers' willingness to reuse Telehealth services in the future 69.2% (n=128) was almost the same as 75% in the USA [32]. Also, our results showed that a high percentage of consumers 70.8% (n=131) agreed that Telehealth' helped to save waiting time and travel time while accessing health care services. In a nationwide survey in the USA [27], most Telehealth consumers (62%) mentioned that they prefer Telehealth consultation only if its cost is lesser than for an in-person visit.

Conclusion and Recommendations

Planning digital health services like Telehealth platforms without stakeholder opinion can reduce consumer usage as well as satisfaction. Sri Lankan Telehealth programmes and doctors were more concerned with providing services targeting primary care and health education/promotion and coordination. They did not concentrate on acute clinical care and improved access to specialists compared to other countries. Sri Lankan doctors were reluctant to enter Telehealth due to a lack of available legislation and knowledge on it. Overall satisfaction and benefits by use of Telehealth claimed by the Sri Lankan consumers in our study were less compared to the world. The programmes need to identify consumer needs on improving health and methods of reducing patient healthcare costs.

Females, rural communities and elderly populations who are unable to travel long distances seeking healthcare as well as who need long-term follow-up care should be empowered to use Telehealth. Sri Lanka's existing health-related guidelines and legislation must be updated to keep abreast with digital health technologies which are growing rapidly. Guidelines addressing healthcare service delivery via

Telehealth/Telemedicine modalities need to be developed to enhance patient care. Medical curriculums should be included with Telehealth concepts and technology. Telehealth services should provide specialist care and acute medical management to expand the customer base. Medical insurance schemes should incorporate reimbursement of teleconsultation costs and the charges should be less than physical consultations. Telehealth programme EMR systems should communicate with each other as well as enhance information security protocols to expand services. More healthcare providers, as well as consumers, will embrace the Telehealth applications, once particular user features are provided.

Policy makers should contemplate the overall Telehealth requirements of stakeholders in each country using research data. This will enable redirecting of Telehealth services to overcome the challenges, improve programme sustainability and include Telehealth in the mainstream of healthcare services.

Way Forward

This study's findings were used for the planning of multi-stakeholder focus group discussions in, which ultimately contributed to the development of the National Telemedicine Guidelines as a circular by the Ministry of Health in 2024. (<https://www.health.gov.lk/wp-content/uploads/2023/11/Telemedicine-Guidelines-Final-9.05.2024-for-MoH-Web-site.pdf>)

These guidelines are currently being considered by the Sri Lanka Medical Council to update the medical ordinance in line with the current digital health practices.

Limitations

It could have been ideal to have a wider sample of individuals for the study. Also, about half of invited telehealth coordinating programmes (11 out of 20) did not answer the questionnaire most probably due to commercial competitiveness. Although the results/findings of the study cannot be generalized to the entire country, triangulation of the information collected by previous studies and opinions from different stakeholders have strengthened the validity of the findings and mitigated any weaknesses related to subjectivity and generalizability.

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Ethics committee approval

Ethics approval for this research was obtained from the Ethics Review Committee Postgraduate Institute of Medicine, the University of Colombo (Ref. No. ERC/PGIM/2018/51).

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