

Patient Satisfaction With Digital Health Services in Hospital during COVID-19 Pandemic: A Systematic Review

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Abstrak

Pandemi coronavirus 2019 (COVID-19) adalah masalah kesehatan masyarakat yang telah mengganggu sistem perawatan kesehatan di seluruh dunia. Digitalisasi layanan kesehatan menjadi salah satu bentuk penyesuaian untuk menghadapi pandemi. Perubahan metode pelayanan di rumah sakit dapat mempengaruhi kualitas pelayanan kesehatan dan kepuasan pasien. Tinjauan ini akan mengidentifikasi dan menganalisis kepuasan pasien terhadap layanan kesehatan digital di rumah sakit selama pandemi covid-19. Pencarian sistematis dilakukan melalui PubMed, ScienceDirect, Springer Link, dan Pencarian Manual dari publikasi tahun 2019 hingga 2022, mengikuti pedoman PRISMA. Tinjauan sistematis ini mengidentifikasi 42 studi termasuk 34 studi menemukan kepuasan pasien di rumah sakit dan 8 studi membandingkan kepuasan pasien dalam layanan kesehatan digital dan layanan kesehatan langsung. Ada 97% penelitian yang menunjukkan kepuasan pasien dalam layanan kesehatan digital. Sementara itu, masing-masing 1 studi menemukan hasil signifikan dari kepuasan pasien terhadap layanan kesehatan digital dan langsung. Dengan mengimplementasikan layanan kesehatan digital pada platform yang sesuai, aplikasi yang sesuai dengan ketersediaan sumber daya, aplikasi yang sesuai dengan kebutuhan setting klinis diharapkan dapat meningkatkan kualitas layanan kesehatan di rumah sakit.

Kata kunci: *Keputusan Pasien, Digitalisasi, Pelayanan Kesehatan Rumah Sakit, Pandemi COVID-19.*

Abstract

The coronavirus disease 2019 (COVID-19) pandemic is a public health problem that has disrupted health care systems worldwide. Digitalization health services become one form of adjustment to deal with the pandemic. Changes in service methods in hospital can affect health care quality and patient satisfaction. This review will identify and analyze patient satisfaction with digital health services in hospital during covid-19 pandemic. Systematic searches were conducted via PubMed, ScienceDirect, Springer Link and Manual Search from 2019 to 2022, following PRISMA guidelines. This systematic review identified 42 studies including 34 studies find out patient satisfaction in hospital and 8 studies compare patient satisfaction in digital health service and direct health service. There were 97% studies

showed patient satisfaction in digital health service. Meanwhile, 1 study each that found significant results of patient satisfaction with digital and direct healthcare services. By implementing digital health services on the suitable platform, applications according to the availability of resources, applications according to the needs of clinical settings are expected to improve the quality of health services in hospitals.

Keywords: *COVID-19 Pandemic, digitalization, hospital health services, patient satisfaction*

PENDAHULUAN

On March 11, 2020, the World Health Organization (WHO) proclaimed the COVID-19 outbreak a pandemic. The coronavirus disease 2019 (COVID-19) pandemic is a global public health issue that has wreaked havoc on health-care systems. COVID-19 transmission in the community can be reduced by frequent hand washing, reducing population density in healthcare settings, and social distance.

The remote healthcare implementation accelerated by COVID-19 pandemic as become an essential tool for providing healthcare services. Because of the COVID-19 epidemic, efforts to reduce face-to-face contact, reducing procedure and treatment, discontinue patients treatment follow-up and increase treatment dissatisfaction. This condition has affected health services adjustment to minimize face-to-face interaction and applying physical distancing. One of choice health service adjustment in COVID-19 pandemic is digitalization health services. The use of modern information and communication technologies, particularly the internet, to improve health and assist or improve healthcare is known as digitalization.

WHO declare that health care digitalization have proven potential to improve medical diagnosis, digital therapeutics, clinical trials, self-management of care and person-centered, data-based treatment decision. Mobile health (mHealth), health information technology (IT), wearable devices, telehealth and telemedicine, and personalized medicine are all examples of digital health. Nowadays digital health services are needed to bridge the gap in health services caused by the pandemic.

During the coronavirus disease 2019 (COVID-19) pandemic, electronic health (e-health) technologies such as telemedicine, mobile health, virtual healthcare, online consultation, and remote monitoring are thought to be beneficial. e-Health may contribute to maintain social distancing and avoiding direct contacts with health workers. E-health has the potential to reduce operational costs and improve the quality of healthcare services in the event of a pandemic.

Telehealth services became a critical tool for providing healthcare during the COVID-19 pandemic. Telehealth as a kind of e-health application is the use of a virtual platform based on technology to deliver many kinds of health services and information, as well as preventive, monitoring, and medical care. The clinical potential of telehealth is diverse based on the function and specialties including TeleTrauma, TeleBurns, TeleDermatology, TeleICU, Telemedicine, and etc.

Telemedicine use audio and visual communication technology to patient care distantly. This is potential for healthcare practitioners to diagnose and treat patients remotely as one of kind health services. During COVID-19 pandemic, telemedicine has played an important role to provide patient care in social and physical distancing recommended. Telemedicine also expands healthcare coverage by using emails, phone calls, and video chats to reduce patient travel to healthcare institutions, saving time and money while improving patient happiness.

One form of telemedicine is teleconsultation that can give telecare, remote assistance, and help with patient administrative oversight, triage, follow-up, meetings, and professional talks between doctors in different places. Patient satisfaction can be used to gauge the quality of health-care services.

The 2019 coronavirus disease (COVID-19) pandemic is now affecting the quality of health treatment and patient satisfaction.

The objective of this systematic review was to identify and analyze patient satisfaction with digital health services in hospital during covid-19 pandemic. After identifying and analyze patient satisfaction that receiving digital health services at hospitals during the covid pandemic, hospital management can adapt the application of digital health services while maintaining service quality. The application of digital health service is adjusted to the resources and capabilities of each hospital and the resources of the patient.

METODE

PICO

The keywords of this study based on the PICO (Population, Intervention, Comparison and Outcome) model; the population is the patients who receiving digitalization health services in hospital, the intervention / exposure is digitalization health services include telemedicine/ telehealth/ eHealth/ digital consultation that replaced face-to-face consultation. The comparison is the same therapy (as in intervention) delivered face-to-face health services, and the outcome is patient satisfaction.

Design

Search Strategy

The combinations of search keywords and subject headings around the terms “patient satisfaction”, “digitalization”, “hospital health services”, “telemedicine”, “telehealth”, “eHealth”, “digital consultation” and “COVID-19 Pandemic”

The articles were conducted through searching databases including manual Search using Google Scholar, PubMed, ScienceDirect and SpringerLink. The reference lists of related studies from 2019 to 2022 following PRISMA guidelines. Search strategy in PubMed: ((((((patient satisfaction) AND (digitalization)) OR (telemedicine)) OR (telehealth)) OR (eHealth)) OR (digital consultation)) AND (COVID-19 Pandemic). Full text, type of articles was clinical trial, meta-analysis, randomized controlled trial and systematic review, date of publication last 5 years were included in the filter. In SpringerLink: patient satisfaction AND hospital health services AND telemedicine OR telehealth OR eHealth OR digital consultation AND COVID-19 pandemic as a keyword. Using the filter include English language; the discipline was medicine & public health , the subdisciplines were public health , medicine/public health, general and the content type was article. In ScienceDirect: patient satisfaction AND digitalization AND hospital health services AND telemedicine OR telehealth OR eHealth OR digital consultation AND COVID-19 pandemic as a keyword. The filter including 2019-2022 years of publication, research articles for the article type and publication title include International Journal of Medical Informatics. In manual search the writer using Google Scholar with keywords patient satisfaction, digitalization, hospital health services, telemedicine, eHealth, COVID-19 Pandemic and kepuasan pasien, digitalisasi pelayanan kesehatan, rumah sakit, pandemi COVID-19. The filter included 2019-2022 years of publication.

Study Selection and Eligibility Criteria

The research was chosen based on the title, abstract, and full text eligibility of the articles to be reviewed.

Inclusion and Exclusion Criteria

The inclusion criteria in this study were original articles in English or Indonesian languang, which could be accessed in the full text, academic or research articles, and the study assessing patient satisfaction with digital health services include telemedicine, telehealth, digital consultation in hospital

during COVID-19 Pandemic. The study's exclusion criteria were that it was not written in English or Indonesian, that it did not have full-text availability, and that it did not analyze hospital patient satisfaction.

Data Extraction

Relevant data taken based on the study period, the year of publication, telemedicine modality, the research design and research method, and the correlation patient satisfaction with digital health services (telemedicine, telehealth, eHealth, digital consultation) in hospital during COVID-19 Pandemic.

Data Synthesis

Data synthesis in this systematic review using narrative analysis that provide qualitative approach information on the patient satisfaction with digital health services in hospital during COVID-19 Pandemic.

RESULTS AND DISCUSSION

The types of studies examined were research studies, with literature reviews being omitted, but reference lists were searched for additional studies. The study that considered to analyze are the studies that measures patient satisfaction with digital health services in hospitals during the COVID-19 pandemic. Digital health services include medical services between clinicians and patients that are provided through various digital media, including audio, visual, text, or applications. Both quantitative and qualitative results will be considered in this systematic review study.

The initial search identified 1,758 studies that were conducted through searching databases including manual Search using Google Scholar, PubMed, ScienceDirect and SpringerLink. After removing duplicate articles, titles and abstracts were screened, therefor bring out 101 potentially relevant studies. The full text studies assessed for eligibility and resulting 42 studies that include in final review. The literature selection process was resumed in Figure 1.

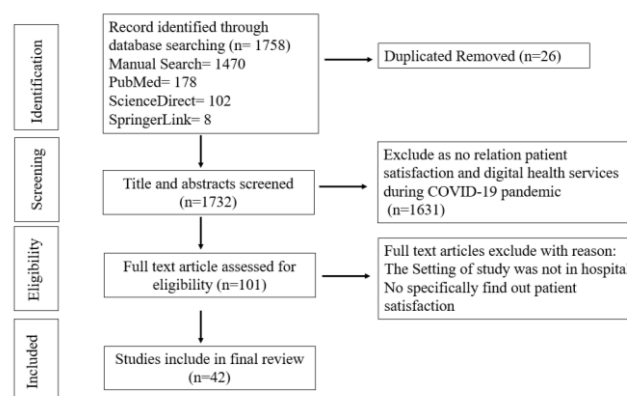


Figure 1. PRISMA Flow Diagram Of Search And Selection Process

The 24 studies were from United States of America, 10 studies were from United Kingdom, 2 studies were from France, and 1 study each from German, India, Iran, Korea, North Macedonia, Spain. The results were resumed in the table 1.

There are various choices of digital platforms that are used as types of digital health services. The selection of digital health service forms can be adjusted to the place of service, the form of service and the availability of patient resources that support the success of digital services in hospitals. There are several choices of platform such as video, sound and text. Each form of platform has a way to be used whether using devices such as telephones, software, computers / laptops, webcams, or others.

The measurement tools used varied among studies such as 30 studies using their own measurement questionnaires, 3 studies using Telehealth Usability Questionnaire (TUQ), 2 studies patient satisfaction questionnaire (PSQ-18), Generic Medical Interview Satisfaction Scale (G-MISS), patient Assessment of Communication during Telemedicine (PACT), Patient Satisfaction Aggregate (PSA), Pediatric Otolaryngology Telemedicine Satisfaction survey (POTSS), Press Ganey patient satisfaction survey, Teleconsultation Satisfaction Questionnaire (TSQ). The result of patient satisfaction in digital health services in hospital and the clinical areas included are listed in table 1.

Patient satisfaction in Digital Health Services

We found 42 studies that sought patient satisfaction in digital health services. There are 34 studies find out patient satisfaction in hospital and 97% showed high satisfaction in digital health service in hospital during COVID-19. Futhermore, there were 8 studies which compare patient satisfaction in digital health services and in person health service.

There were 8 studies compare patient satisfaction in digital health service and direct health service (in term: in-person visit, face-to-face consultation, video visit, virtual visit, telehealth, telemedicine) showed 4 studies not give statistically significant. One study showed statistically significant worse virtual visit compared to in-person visit. One studies showed poor ratings for virtual visit in patient satisfaction survey result but without statistical analitic. According to one study, video visits were linked to higher patient satisfaction than in-person appointments. One study showed but there were not statistical analytic in this study.

Table 1. Summary of Study Characteristics

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
Bhuva S, et al., USA, 2020	172 patient responses	Audio, Video platform using Doxy.me	Spine Physical Medicine and Rehabilitation	Own Measurement Questionnaire	97.6% were very satisfied or satisfied (83.7% of the patients were very satisfied)
Bisson, Leslie J. et al., USA, 2021	748 had telemedicine visits and 1,301 had in-person visits	unspesific	Multispecialty	Patient Satisfaction Aggregate (PSA)	During the beginning of the COVID-19 lockout, there was no difference in patient satisfaction between in-person and telemedicine visits.
Byrne E, et	59	Audio,	orthod	Own	The directions provided to access the

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
al., UK, 2020	patients, 62 clinicians	Video, Text platform using software, webcams, and microphones	oncologic	Measurement tools: Questionnaire	consultation were easy to follow for 93 percent of the patients, and 70 percent of clinicians reported no connection concerns. A virtual appointment was deemed appropriate by the clinician in 90% of situations. Patients expressed high levels of satisfaction, with 76 percent saying a remote consultation was more convenient than a face-to-face consultation and 66 percent stating they would like additional visits like this in the future if appropriate.
Capusan KY, et al., USA, 2021	281 Patients	Audio, Video telehealth platform	Pediatric	Own Measurement tools: Questionnaire	Overall, participants were pleased with their care at first, with 82 percent agreeing or strongly agreeing that they would use telehealth services again.
Chang PJ, et al., USA, 2021	155 patients	Audio, Video platform using phone	Oncology	Own Measurement tools: Questionnaire	94.8 percent of patients said the telemedicine visit was "quite a bit" or "very much" of a favorable experience. For the patient's major concern addressed during the appointment, 83.9 percent of providers said "quite a bit" or "very much."
Chen Y, et al., UK, 2021	36 responded staff, 69 patients	Audio platform using telephone	ophthalmology	Own Measurement tools: Questionnaire	The majority of patients (96%) said their experience with TSS was good to excellent, with 88 percent saying they would use the service again, 91 percent recommending it, and 93 percent recommending that it be continued (telephone triage system). 94 percent of respondents (64 percent) said they had a favorable experience with the TSS, and 100 percent said they would use it again.
Darr A, et al., UK, 2020	200 patients	Audio, Video platform using	Otolaryngology	Pediatric Otolaryngology	In the fields of doctor-patient interaction, privacy, and trust, 99% of respondents said they agreed or strongly agreed. When asked about

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
		telephone and video-linked (NHS approved AccuRx and Zoom platforms)		gy Telemedicine Satisfaction survey (POTSS): GMC, TESS, TUQ, TSUQ	their experience with the consultation process, 98 percent said it was pleasant. When it came to the doctor-patient connection, privacy and trust, and consultation domains, satisfaction was high.
Dhahri AA, et al., UK, 2020	43 patients and 79 clinicians	Video platform using Google Chrome or Microsoft Edge	Multispecialty	Own Measurement Questionnaire	The sound and video quality were rated as excellent by over 90% of clinicians. In that they had communicated what they wanted to, patients were less happy than clinicians (86 percent versus 95 percent)
Dobrusin A, et al., USA, 2020		Audio, Video platform using smartphone/tablet, laptop/desktop, and telephone	Otorhinology	Own Measurement Questionnaire	Patients were very pleased with their telemedicine encounters (more than 80%).
El Ashmawy AH, et al., UK, 2020	1610 patients	Audio platform using telephone	Surgery	Own Measurement Questionnaire	According to the patient satisfaction survey, 89.29% of patients were pleased or extremely satisfied with VJRC follow-up.
Fioux M, et al., France, 2020	100 patients	Video platform using SARA (accessible via	Otolaryngology	Own Measurement survey 5-	Overall satisfaction was 87%

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
		computer, smartphones, Apple, or Android)		point Likert scales	
Futterman I, et al., USA, 2021	104 patients televisits and in-person visits	Audio platform using telephone	Gynecology	The Short Assessment of Patient Satisfaction (SAPS)	The total number of "dissatisfied" and "satisfied" patients in the telehealth group was 10 and 94, respectively. The total number of "dissatisfied" and "content" patients in the in-person group was 7 and 97, respectively (Chi-square calculation of $p = 0.448$). Overall, the median satisfaction score for televisit and in-person visits was 20 (IQR: 20, 25) and 24 (IQR: 22, 26) respectively ($p = 0.008$, Z score = 2.651). While televisit had lower patient satisfaction scores in every area, the differences were not clinically significant because all medians were in the "satisfied" range.
Gan Z, et al., USA, 2021	631 patients	Video platform using telemedicine program based in electronic medical record (EMR), Application MyCHOP, EPIC app on phone (Haiku) or tablet (Canto)	Pediatric urology	Own Measurement Questionnaire	Patient satisfaction survey results showed No issues, everything worked well (81.6%) and Saved travel time (95.2%), the median rate for telehealth visit overall (0-100) was 96.
Gerbutavicius R. et al., Germany, 2020	29 patients	Video platform using link https://	Ophthalmology	Own Measurement	Patient satisfaction with VC was high to very high, with 68.97 percent giving it a grade of 1.6 (1 excellent to 6 insufficient), and 100% said they would

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
		arztkonsultation.de/		Questionnaire	suggest it. Patient satisfaction is excellent, with 95% of patients rating their overall experience with the VCs as good or very good. Everyone in the research said they would suggest the VC strategy to others.
Haxhihamza K, et al., North Macedonia, 2021	28 participants	Video platform using videoconferencing software	Psychiatry	patient satisfaction questionnaire [PSQ-18]	satisfaction with psychiatric care was high (80.22%).
Hentati F, et al., USA, 2021	45 Patients	Audio, Video platform using video conferencing platforms: Doxy.me (Doximity Inc.) and MDLive (MDLive Inc.) and telephone	Otolaryngology	Own Measurement Questionnaire	36 (80%) patients said their needs were met during their telemedicine appointment, whereas 32 (71.1%) patients said nothing was overlooked or unaddressed.
Horgan TJ, et al., UK	109 patients	Audio platform using telephone	Oral and maxillofacial surgery	Generic Medical Interview Satisfaction Scale (G-MISS)	In all, 83.48 percent of patients answered they would be open to a phone consultation in the future. In this study, the majority of patients expressed high levels of satisfaction with telephone consultations.
Itamura K,	1284	Video	otolar	Own	When compared to in-person visits,

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
et al., USA, 2021	in-person visits 221 virtual PS surveys.	platform using Doximity Dialer™ (San Francisco, CA), Facetime™ (Cupertino, CA)	otolaryngology	Measurement tools: Questionnaire	virtual visit evaluations of provider listening, information conveyance, likelihood to refer, and overall provider ratings were statistically considerably lower.
Itamura K, et al., USA, 2020	195 virtual visit and 4013 in-person visits with surveys	Video platform using Doximity Dialer, Facetime	Otolaryngology	Own Measurement tools: Questionnaire	Patient Satisfaction Survey Results from Virtual Visits: Virtual visits had unsatisfactory ratings (from 0 to 100) for ease of connection to the provider (65.6), video quality (68.1), wait durations (66.7), medical history knowledge (64.7), and patient understanding of what to do for follow-up inquiries (65.2). Higher ratings were given for provider trust, provider listening, probability to recommend, and overall rating. Virtual visits received dismal ratings for provider-patient communication. In the United States, telehealth has become the new standard for most health care professionals. This study highlights some of the early flaws of telehealth in an otolaryngology practice, as well as interpersonal communication issues.
Kaur D, et al., UK, 2020	106 patients	Audio platform using telephone call	Endocrinology	Own Measurement tools: Questionnaire	During the usage of telemedicine in the management of hyperthyroidism, 97 percent of respondents were satisfied with the overall level of service offered.
Kumar S, et al., India, 2020	450 patients	Audio, Video platform using telephone,	Orthopedics	Own Measurement tools: Questionnaire	Only 7.2 percent of patients had difficulties comprehending or following telemedicine-based advice, while overall satisfaction with telemedicine was 92 percent.

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
		email and Whatsapp		online	
Layfield E, et al., USA, 2020	100 patients	Audio, Video platform using BlueJeans, Doximity video dialer (beta, Doximity Inc., San Francisco, California), Apple FaceTime (Apple Inc.).	Otolaryngology	Telehealth Usability Questionnaire (TUQ)	The greatest marks were given to questions on telehealth satisfaction, while the lowest were given to questions about reliability. Telemedicine is often well received by patients. On a scale of 1 to 7, with 7 indicating the highest level of patient agreement, the average score across all questions was 6.01. The greatest marks were given to questions on telehealth satisfaction (6.29), while the lowest were given to questions about reliability (4.86).
Mohanty, et al., USA, 2020	607 patients and 85 providers	Audio, Video platform using telephone	Neurology	Own Measurement Questionnaire	92 percent of patients agreed or strongly agreed that their telehealth visit was satisfactory, and 88 percent thought that their telehealth appointment was more convenient than an in-person visit.
Morisada MV, et al., USA, 2021	69 patients	Audio, Video platform using MyUCDavis Health or EpicMyChart application	Rhinology	Patient Satisfaction Questionnaire-18	In the COVID-19 epidemic, patient satisfaction with telemedicine is comparable to that of regular in-person consultations. Video visits can be a good substitute for clinic visits while still providing a high level of satisfaction.
Orange S, et al., USA, 2020	365	Audio, Video platform using telephone	Internal medicine	Own Measurement Questionnaire	The was 47.4% very satisfied and 35.3% satisfied. Higher physician trust was associated with higher patient satisfaction (Spearman correlation $r=0.51, P<.001$).

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
Park HY, et al., Korea, 2021	6,840 patients, 320 clinicians	Audio platform using telephone	Unspecified	Telehealth Usability Questionnaire (TUQ)	Overall, 86 percent of patients were satisfied with telemedicine, while only 52.7 percent of doctors and 48.0 percent of nurses were (p = 0.000 for both doctors and nurses compared to patients). Finally, 85.1 percent of patients said they would utilize telemedicine again, although only 32.7 percent of doctors and 37.0 percent of nurses said they would (p = 0.000 for doctors and nurses, respectively). For all five TUQ components (all p = 0.000), patient satisfaction with telemedicine was much higher than medical staff satisfaction.
Pinar U, et al., France, 2021	105 patients	Video platform using Doctorib@ website	Urology	Teleconsultation Satisfaction Questionnaire (TSQ)	The median overall TSQ score was 67 (IQR: 60–69); 88 patients (83.8%) and four physicians rated teleconsultation as a positive experience (80 percent). Patients who had never met their surgeon before were more likely to have a positive encounter.
Ramaswamy A, et al., USA, 2020	620 video visits, 37,989 in-person visits)	Video platform using Unspecific device	Multispecialty	Press Ganey patient satisfaction survey	video visits were associated with greater patient satisfaction when compared to in-person visits. Video visit Press Ganey patient satisfaction scores were significantly higher than in-person visits (94.9% vs 92.5%; P<.001)
Rizzi AM, et al., USA, 2020	612	Audio, Videoplatform using telephone and unspesific video platform	unspecified	Own Measurement Questionnaire	During the new coronavirus (COVID-19) epidemic, patients and orthopaedic surgeons reported high levels of satisfaction with telemedicine contacts. Patients regarded the surgeon's attentiveness to their needs and response to their concerns as 'excellent' or 'very good' in 95 percent of cases. Patients said they would participate in a telemedicine

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
					encounter again 93% of the time. Surgeons expressed significant levels of satisfaction with telemedicine interactions (80 percent for phone and 86 percent for video), and 78.4 percent of the time, a telemedicine contact was successful in substituting an in-person visit.
Satin AM, et al., USA, 2020	772	Audio, Video platform using telephone or webcam	Surgey	Own Measurement Questionnaire	Overall, 87.7% of patients were happy with their telemedicine visit, and 45 percent would choose a telemedicine consultation over an in-person appointment if given the choice. During the COVID-19 epidemic, spine telemedicine sessions were linked to high patient satisfaction.
Schuster-Bruce AT, et al., UK, 2021	31	Audio using telephone	oncology	Own Measurement Questionnaire	Patient satisfaction with telephone consultations in general. One signifies extreme dissatisfaction, while ten represents extreme satisfaction. Patients expressed high levels of satisfaction with the consultation format (8.7 1.55/10), with 90 percent scoring 8 or higher, with 59 percent scoring 10. The consultation itself had a high mean satisfaction score of 9.5 0.81/10; 60% of patients gave it a 10/10 rating, and no patient gave it a rating lower than 7/10.
Shafi K, et al., USA, 2020	84	Video using videoconferencing platform (Zoom Inc., San Jose, CA, USA)	orthopedics	Own Measurement Questionnaire	Overall, patients were pleased with telemedicine; 81.0 percent of respondents said they were "very satisfied" (5/5) with their visit. The remaining patients were either very satisfied (16.7 percent) or somewhat satisfied (2.4 percent). With a mean score of 4.71 (SD = 0.55), the majority of patients said they were "very satisfied" with their treatment plan, while the remainder patients said they were "highly satisfied" (4/5, 19.5

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
					percent) or "moderately satisfied" (4.9 percent).
Shiff B, et al., USA , 2021	96	Audio platform using telephone	Urology	Own Measurement Questionnaire	During the coronavirus illness pandemic of 2019, patients were mostly satisfied with telephone appointments as an alternative to in-person appointments. Despite this, a significant number of patients stated that they would prefer in-person appointments in the future.
Singh A, et al., USA , 2021	224	Audio, Video platform using phone call, Zoom (Zoom Video Communications), Doxy.me	Cardiology	Patient Assessment of Communication during Telemedicine (PACT)	Both in-person and telemedicine were evaluated well, but in-person patient satisfaction was greater across the board. The clinical competence domain had the only substantially lower mean score for telehealth (3.7 vs 4.2, P=.007). Travel time was cut in half, visit wait times were cut in half, and costs were cut in half. Poor internet connectivity was cited by 33.0 percent (35/106) of respondents as at least somewhat of a factor.
Smrke A, et al., UK, 2020	18 clinicians, 283 patients	Audio platform using telephone	oncology	Own Measurement Questionnaire	Telephone consultations were rated higher than face-to-face consultations (8.99/10 vs. 8.35/10, respectively). The vast majority of patients (n = 86; 80%) expressed an interest in having at least some future appointments conducted via telemedicine.
Swaminathan R, et al., UK, 2022	304	Audio platform using telephone	Otorhinolaryngology	Own Measurement Questionnaire	High clinician and patient satisfaction were reported by 90% and 96%, respectively. Patient and clinician satisfaction was high.
Taxonera C, et al., Spain , 2021	171	Audio platform using telephone	gastroenterology	Own Measurement	Telephone consultations were rated as quite satisfying by patients. Patients reported very high satisfaction with telephone consultations in closed

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
				Questionnaire	questions, with no differences between scheduled (n = 123) and urgent (n = 48; P = NS) sessions. Overall satisfaction with telephone consultations was 94 percent for scheduled consultations and 93 percent for urgent consultations, according to the numerical description scale.
Tenforde AS, et al., USA, 2020	205	Video platform using camera/device	rehabilitation	Own Measurement Questionnaire	Across telerehabilitation appointments, all patient-centered outcome indicators (range from 93.7 to 99 percent) and value in future telehealth visits (86.8%) received high evaluations ("excellent" or "very good" responses). / Overall satisfaction was unaffected by age, therapist type, visit type, duration, normal travel time, presence of a patient care advocate, or any other stated reason for the visit.
Thirunavukarasu A, et al., Iran, 2021	396 patients	Audio, Text platform using Ministry of Health (MOH) Kingdom of Saudi Arabia (KSA) telemedicine care platforms	Multi-specialty	Own Measurement Questionnaire	Teleconsultation was rated as satisfactory by 172 patients (43.43%), but it was rated as unsatisfactory by more than half of the patients (56.57%).
Waqar-Cowles LN, et al., USA, 2021	597	Video platform using the built-in telehealth capabilities of the health	rheumatology	Telehealth Usability Questionnaire (TUQ)	The median total TUQ score was 4 (IQR: 4–5), with 81 percent of items receiving positive replies.

Author, Year of Publish, Country	Sample Size	Digital Health Service Platform	Setting of studies	Measurement tools	Patient Satisfaction
		system's EHR (mobile phone, tablet, laptop, or desktop computer)			
Yoon EJ, et al., USA, 2021	310 patients	Video platform using Google Meet	neurology	Own Measurement Questionnaire	The average score for overall patient satisfaction with the visit was 6.32 out of 7.
Zhu C, et al., USA, 2020	36 providers, 187 patients	Audio, Video platform using Cisco Webex (Cisco Systems)	Surgery	Own Measurement Questionnaire	The majority of patients (180/187, or 90.9 percent) said they could communicate with their health care providers as effectively as a clinic visit and evaluate testing results adequately. The majority of physicians believed they could successfully respond to patients' concerns (23/26) 88.5%, examine laboratory testing and results with patients (22/26) 84.6%, and see and hear patients properly (20/26) 76.9%.

DISCUSSION

This systematic review identified 42 studies that find out patient satisfaction with digital health services in hospital during covid-19 pandemic. Finding from this systematic review showed most of digital health service in hospital presented high level patient satisfaction.

Patient satisfaction indication

Each study found out patient satisfaction with various of measurement and indication. There are several indications which reflected patient satisfaction with digital services in hospital such as easy to participate in the consultation doctor-patient relationship, privacy & trust, convenience of the telehealth interface, patient satisfaction of understanding the explanation, treatment plan, patient ability to ask questions and receive answers.

Patient satisfaction indication in studies using Telehealth Usability Questionnaire (TUQ), including usefulness scale (3 questions), ease of use scale (6 questions), effectiveness scale (5

questions), reliability scale (3 questions), satisfaction scale summary (4 questions). Patients give respond using the Likert Scale: 1: severely disagree; 2: disagree; 3: slightly disagree; 4: neutral; 5: agree; 6: highly agree; 7: extremely agree.

General satisfaction, technical quality of care, interpersonal way of physician, communication, financial aspects of care, time spent with doctor, accessibility and ease of care are all measured in the patient satisfaction questionnaire (PSQ-18).

Press Ganey patient satisfaction survey have score (0%-100%) evaluate background inquiries (3 things), access (8 items), moving through your visit (4 items), nurse/assistant (3 items), care provider (6 items), personal difficulties (4 items), and overall assessment are among the seven domains of patient care.

The G-MISS (Generic Medical Interview Satisfaction Scale) questionnaire has sixteen questions organized in three dimensions that analyze the patient's experience in comparison to direct consultation. Relief, communication, and compliance are the three dimensions. All items were responded on a five-point Likert scale, with 'strongly disagree,' 'disagree,' 'neutral,' 'agree,' and 'strongly agree' ranging from 1 to 5.

Patient-centered communication, clinical competence, interpersonal skills, and supportive environment are four dimensions of the physician-patient experience in PACT.

The Patient Satisfaction Aggregate (PSA) score was calculated by adding the averages of the five questions with 5-point interval scales and converting to a 0 to 1 continuous scale. Race, length of patient-physician relationship, provider type, and provider subspecialty were all predictors of PSA score.

Otolaryngology in Children the General Medical Council (GMC) patient questionnaire, the telehealth satisfaction scale (TESS), the telehealth usability questionnaire (TUQ), and the telemedicine satisfaction and usefulness questionnaire were all adapted into the Telemedicine Satisfaction Survey (POTSS) (TSUQ). The doctor-patient connection (politeness, ease during consultation, listening skills, and involvement in decision-making process), privacy and honesty, and the consultation procedure were all included in the questionnaire (reservations prior to use, ease of use, convenience, length, improvement by use of video-conferencing, overall experience and likelihood of recommendation).

The validated 14-item Teleconsultation Satisfaction Questionnaire (TSQ) was used to measure patient satisfaction objectively. The questionnaire is divided into three sections: care quality, resemblance to a face-to-face meeting, and perception of the interaction. The TSQ uses a 5-point Likert scale, with 1 being "Strongly disagree" and 5 being "Strongly agree" (5). A total TSQ score of > 56 was considered a positive patient experience.

Patients Satisfaction In Digital Health Services

Based on the variation in patient satisfaction, there are results of patient satisfaction with digital health services in hospitals. There were 33/34 (97%) studies showed high patient satisfaction in digital health services.

Patient Satisfaction With Digital Health Services Compare To Direct Health Service

There were 8 studies compare patient satisfaction in digital health service and direct health service (in term: in-person visit, face-to-face consultation, video visit, virtual visit, telehealth, telemedicine) showed 4 studies not give statistically significant. One study showed statistically significant worse virtual visit compared to in-person visit. One studies showed poor ratings for virtual visit in patient satisfaction survey result but without statistical analitic. One study showed video visit

were associated with greater patient satisfaction than in-person visits. One study showed mean satisfaction with telephone consultation was higher than face-to-face consultation but there were not statistical analytic in this study.

From the studies comparing patient satisfaction in digital services and direct health services, there is a balanced comparison between the two. We analyzed in study which showed video visit Press Ganey scores were significantly higher than in-person visits (94.9% vs 92.5%; $P < .001$) was the largest study of patient satisfaction comparing video to in-person visits. In this retrospective observational cohort study had sample of study including clinic encounters (620 video visits vs 37,989 in-person visits) at a single-institution, urban, quaternary academic medical center in New York City. There were 40 specialties and 200 visit types. The type of digital health service in the form of video using unspesific platform and device. Overall patient satisfaction is higher in the COVID-19 period, according to the study. However, other characteristics were linked to decreased patient satisfaction, including younger age, female gender, and new visit type. In the last year and during the COVID-19 pandemic, patient satisfaction with video visits compared favorably to in-person appointments, according to the findings of this study.

Meanwhile in study that show that direct health services provide a higher level of patient satisfaction, we analyzed some points. There were 1284 partial or complete patient satisfaction surveys from in-person visits and 221 partial or complete virtual patient satisfaction surveys. The study was held in spesific field of otolaryngology including general otolaryngology and subspecialty pediatric, otologic, laryngologic, rhinologic, and oncologic visits. The type of digital health service in the form of video platform using Doximity Dialer™ (San Francisco, CA), Facetime™ (Cupertino, CA). Patient discomfort with the platform and inability to be seen in person, rather than a judgment of the actual clinical contact, may have contributed to dissatisfaction with digital health services. Patient satisfaction is measured using an overlapping and comparable questionnaire that includes questions about attentive listening, medical history knowledge, information delivered to the patient, recommendation, and overall provider rating. Both In-Person and Virtual Patient Satisfaction Survey Questions with Responses Categorized as “yes, definitely,” “yes, mostly,” “yes, somewhat,” and “no.”

Statistically test with Chi-squared tests yielded significantly higher satisfaction scores for patients of in-person visits compared to those of virtual visits. The questions regarding careful listening ($\chi^2 = 12.0$, $P < .001$), the patient’s satisfaction with the amount of information offered by the provider ($\chi^2 = 97.9$, $P < .001$), likelihood to recommend to family and friends ($\chi^2 = 88.2$, $P < .001$), and overall provider rating ($\chi^2 = 4.3$, $P = .04$). On the other hand there were knowledge of the patient’s medical history by the provider was also associated with higher satisfaction scores ($\chi^2 = 3.8$, $P = .05$) however this point had not statistically significant. Mann-Whitney U tests yielded significantly higher satisfaction scores for patients of in-person visits compared to those of virtual visits. The questions regarding careful listening by the provider ($U = 117\ 132$, $P = .003$), knowledge of the patient’s medical history by the provider ($U = 96\ 072$, $P < .001$), and patient’s satisfaction with the amount of information offered by the provider ($U = 103\ 049$, $P < .001$). When compared to in-person visits, virtual visit evaluations of provider listening, information conveyance, likelihood to refer, and overall provider ratings were statistically considerably lower.

The choice of digital health service platform

Patient satisfaction can also be affected by several reasons especially on the platform. Kind of platform that used and give good satisfaction. There are several platforms using audio, video, text and the combination of these. There are specific platform that use in several studies in this systematic

review including BlueJeans application, Cisco Webex (Cisco Systems) application, Doctolib© website, Doximity video dialer, Doxy.me, Email, EPIC application, EpicMyChart application, Facetime, Google Chrome, Google Meet, Microsoft Edge, MyCHOP application, MyUCDavisHealth application, SARA platform, Text platform using Ministry of Health (MOH) Kingdom of Saudi Arabia (KSA) telemedicine care platforms, video conferencing software, WeChat software, WhatsApp applications and Zoom Inc. The device which used to get digital health service including computers/laptop/desktop, tablet, smartphone, webcam, and microphone depending on the platform were used.

Advantages of application Digital Health Services in Hospital

Advantages of application digital health services in hospital include time saving through less time taken off from work and school, lower visit wait time even no need to wait for long time that offered time efficient manner. Cost savings through decreased travel costs even no need to travel. Patients convenient through flexible scheduling/rescheduling, no infection risks and helpful as in-person treatment.

Limitation of Digital Health Services in Hospital

Besides these advantages, there are limitations that need to be anticipated when applying digital health service in hospitals. There are several evaluations of digital health service applications to provide the optimal impact of digitizing health services, hospital managers need to consider this and find solutions that are relevant to the condition of the hospital in questions.

In audio platform such as telephone consultation have challenges include maintaining effective and clear communication in the absence of nonverbal cues. In digital health services using internet connection should be considered several factors including the internet speed, device availability both in clinicians and patients. Several Patients complained of difficulties in communication. Patients preferred video-telephone consultation over telephone consultation because they could see the doctor's face and express their problems more easily. In specific health services the clinicians were more likely to prefer direct health service for a new or worsening problem. The most commonly disadvantage to a virtual visit was technological difficulties and poor internet connectivity.

Another challenge in digital health services were the lack of a physical exam, but lack of physical examination did not significantly correlate with reduced overall satisfaction (OR = 0.30, P-value = 0.027). Clinicians said that while employing telemedicine, a lack of physical examination had no impact on care. In other case patients did not feeling as connected to their doctor/nurse/therapist also become frequently reported challenges. Telemedicine does not appear to be a substitute for all direct health services in clinical encounters, however, when used in appropriate contexts has shown beneficial results.

Further efforts in expanding the use of telemedicine and overcoming its limitations, provide alternative options for digital health services to patients that are the most feasible. In addition, it is also necessary to analyze the types of services that can be carried out through digital as a whole or only partially. the type of service at the clinic that requires a physical examination, it is better to get a combination of services so that the examination can still be carried out by clinicians.

CONCLUSION

Due to the COVID-19 crisis, health care providers need adjustments to health services especially in hospitals. Digital health service is a promising option to held health services in line with government regulations to face covid-19 pandemic. Health care alteration from direct health service to digital

health service make an impact on hospital performance including patient satisfaction with health care services.

There are several choices of digital platforms that can be used to provide digital health services in hospitals. Kind of digital platform in audio, video and text such as BlueJeans application, Cisco Webex (Cisco Systems) application, Doctolib© website, Doximity video dialer, Doxy.me, Email, EPIC application, EpicMyChart application, Facetime, Google Chrome, Google Meet, Microsoft Edge, MyCHOP application, MyUCDavisHealth application, SARA platform, Text platform using Ministry of Health (MOH) Kingdom of Saudi Arabia (KSA) telemedicine care platforms, video conferencing software, WeChat software, WhatsApp applications and Zoom Inc.

Overall studies (97%) showed high patient satisfaction in digital health services. Based on this result can be considered for hospitals to adopt appropriate digital health service method. There are several considerations for implementing digital health services from some of the limitations which found from several studies. Limitation of application digital health service in hospital including internet connection, internet speed, device availability both in clinicians and patients. The lack of a physical exam in digital health services need to be adjusted in clinical setting necessity.

Hospital management needs to analyze the types of services that can be carried out through digital as a whole or only partially. By implementing digital health services on the right platform, applications according to the availability of resources, applications according to the needs of clinical settings are expected to improve the quality of health services in hospitals. Furthermore, it is necessary to carry out continuous evaluation to maintain the quality of health services, one of which is the level of patient satisfaction.

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