

PHYSICIANS AND DISRUPTION ON TELEMEDICINE: A SYSTEMATIC LITERATURE REVIEW

Dokter dan Disrupsi dalam Telemedisin: Tinjauan Literatur Sistematis

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Abstract

Background: Telemedicine has developed rapidly since the COVID-19 pandemic. Telemedicine applications have marked significant transformations in healthcare. Rapid changes in healthcare services inevitably affect health service providers, specifically physicians.

Aims: This study examines physicians' responses to a disruptive era in the healthcare industry.

Methods: This paper applies a systematic literature review approach to characterize physicians' experiences, challenges, and obstacles in managing disruption in the health service delivery context. A comprehensive literature review was conducted using the Scopus database and borrowing PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method. There were 78 articles included in the analysis.

Results: This study found that doctors who use telemedicine experience several types of disruption. The studies that examine physicians' experience in health service disruption tend to be dominant in 4 (four) out of 5 (five) disruption types. First, disruption to the current delivery mode. Second, disruption to clinical practice role and responsibility. Third, disruption to clinical practice role and responsibility. Fourth, disruption to the work environment. Meanwhile, the disruption in personal life becomes less elaborated in the telemedicine studies debate.

Conclusion: It is essential to pay close attention to the disruptions that have an effect on physicians' personal lives. Personal life is essential because it benefits physicians and directly supports the quality and sustainability of telemedicine services.

Keywords: disruption, physician, and telemedicine.

Abstrak

Latar Belakang: Telemedisin berkembang pesat sejak pandemi COVID-19. Implementasi telemedicine menjadi tanda transformasi yang signifikan dibidang pelayanan kesehatan. Perubahan cepat tersebut tidak terelakkan dan mempengaruhi penyedia layanan kesehatan, khususnya dokter.

Tujuan: Studi ini mengkaji pengalaman dan anggapan dokter terhadap era disrupsi dalam industri perawatan kesehatan.

Metode: Makalah ini menggunakan pendekatan tinjauan literatur sistematis untuk mengkarakterisasi pengalaman, tantangan dan hambatan, serta tanggapan dokter dalam menghadapi disrupsi dalam konteks pemberian layanan kesehatan. Tinjauan literatur dilakukan dengan menggunakan database Scopus dan meminjam metode PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Ada total 78 artikel termasuk dalam analisis.

Hasil: Studi ini menemukan bahwa dokter yang menggunakan telemedicine mengalami beberapa jenis disrupsi. Studi yang mempelajari pengalaman dokter dalam disrupsi pelayanan kesehatan cenderung dominan pada 4 (empat) dari 5 (lima) tipe disrupsi. Pertama, disrupsi pada aspek pengalaman dokter. Kedua, disrupsi dalam cara penyelenggaraan pelayanan. Ketiga, disrupsi tata kelola klinis. Keempat, disrupsi lingkungan kerja. Sementara itu, disrupsi pada kehidupan pribadi menjadi studi yang paling sedikit dielaborasi dalam perbedatan akademik pada studi-studi yang membahas telemedisin.

Kesimpulan: Perhatian dalam mengelaborasi disrupsi pada kehidupan pribadi pada penerapan telemedisin menjadi penting. Terlebih kehidupan pribadi merupakan faktor penting dalam penyelenggaraan pelayanan kesehatan, karena bermanfaat bagi dokter dan mendukung kualitas dan keberlanjutan layanan telemedisin.

Kata kunci: disrupsi, dokter, dan telemedisin.



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Introduction

The disruption in the delivery of health services is inevitable. Especially when entering the era of the COVID-19 pandemic, endorse the rapid change of conventional health service to settle up with the significant role of technology usage (Chen *et al.*, 2022). Breakthrough conditions that interrupt the existing delivery service approach show the disruptions in health services, one of them is telemedicine usage. Telemedicine increasingly plays a vital role during a pandemic (Valentino, Skinner and Pipe, 2020; Sharaf and Muthayya, 2021). Telemedicine is becoming increasingly popular as a method of providing health care.

On the side of the recipient of health services, the patient, the benefits of telemedicine are felt. Telemedicine enables people, as patients, to access health services without being limited by space and time (Singla *et al.*, 2021). Or at least people now have additional options in choosing health services.

On the provider side, telemedicine encourages rapid changes, called disruption in health service patterns. As providers of health services, disruption forced physicians to adapt a relatively new method of providing health services in short period (Bagot *et al.*, 2015). Moreover, the world of medical education in developing countries must be comprehensively equipped with debriefing to deliver health services to technological developments adopted in telemedicine and its infrastructure (Suzuki *et al.*, 2020).

In the development of telemedicine, there are several areas for improvement in its implementation. Several legal and ethical issues remain a big question mark in delivering health services through telemedicine (Fields, 2020). For example, in Indonesia, there are no specific rules that manage patient-physician interactions, which are not only social but also have legal and ethical aspects (Kuntardjo, 2020). Even in a country like Ethiopia, there is still resistance to the existence of telemedicine (Sagaro, Battineni and Amenta, 2020).

The development of telemedicine in the world then became diverse. Some have begun to adapt; others are still experiencing obstacles and challenges. Not only facilities and infrastructure but the environment has been unable to support full implementation optimally. There needs to be more clarity between developing telemedicine technology and managing existing health services.

The gap between existing developments and the inadequate healthcare management system raises questions. How does the physician, as one of the service implementers, perceive, respond, and adapt to the disruption that occurs? In telemedicine services, not only are physicians confronted with rapid changes, but they also require more support for expertise and protection for the practice of health services.

In the Bagot study on swift transformations necessitating the adoption of telemedicine or other technological applications in healthcare, five categories of disruption were identified (Bagot *et al.*, 2015). First, disruption to the circle of influence. Second, disruption to the work environment. Third, disruption to clinical practice role and responsibility. Fourth, disruption to personal life. Fifth, disruption to the current delivery mode. Borrowing terms and classifications on disruption in telemedicine implementation in health care, this systematic literature review elaborates on the study that attempts to elaborate on physicians' perspectives on the disruption they are currently experiencing. Through previous studies related to the experience of physicians in telemedicine, this paper intended to look further not only at the challenges and obstacles experienced but also at the context of developing health care delivery.

Method

This systematic literature study was administered adopt PRISMA in screening method. The literature search is based on Scopus the data base source. Applied search query TITLE-ABS-KEY ((physician) OR (doctor) AND (perspective) AND (telemedicine)) AND (LIMIT-TO (

PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010)) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")). Search was enrolled on April 14th, 2022.

Table 1. Eligibility criteria

Inclusion criteria	Exclusion criteria
Peer review	Not elaborating physician experiences/ perspective in telemedicine
Journal article	

Using the query and automation tools provided by the Scopus web, the results of a database search were eliminated. In addition, this investigation utilized a manual screening procedure to identify eligible articles. Initially, filtering consisted of determining double article and topic suitability. Second, authors use inclusion and exclusion criteria to scan titles and abstracts for eligible articles (Table 1). The third and final screening procedure was designed to identify full-text access. Each author independently performs the screening phase, which is then discussed to determine the selected article. In the end, 78 articles passed the screening procedure and were included in the study (Figure 1).

This paper is divided into two analysis sections to clarify disruption responses and physician perspectives. First, based on the abstract and using the Vozviewer tools, we elucidate the physician's experience with telemedicine concerns.

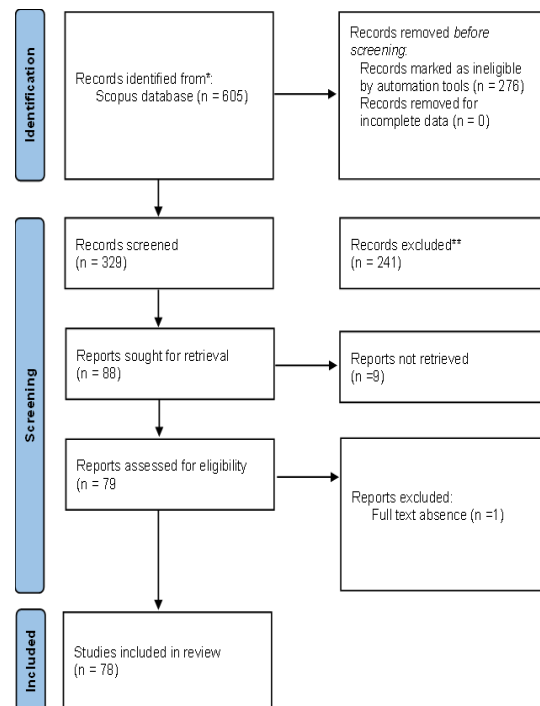


Figure 1. Identification of studies via Scopus database using PRISMA (Page et al., 2021)

Second, this study is doing comprehensive reading forms each piece of literature, and to classify the result, this study does double analysis feedback. It is, furthermore, conducting web surface searching about the same issue worldwide to reduce bias and simple comparison analysis.

Result and Discussion

Trend in Telemedicine Study: Physician Perspective

Over a decade, telemedicine has shown significant growth, especially after the pandemic conditions that enable leverage telemedicine utilization (Hussain, 2021). This study found that telemedicine also demonstrates its expansion. The amount of study in the last two years significantly doubled.

The pandemic is the main reason for increasing the use and study of telemedicine (Lubis, 2021). The need to reduce physical encounters to prevent transmission is the main reason. The developing pandemic condition invites academics to study telemedicine. Studies

The Diverse Context of Telemedicine Advance

The rapid development of the use of telemedicine varies in each region. This variation arises due to several factors. This study finds at least the main issues that become the context of variations in the use of telemedicine. Not everyone has sufficient access to current information and technology. There needs to be more information technology growth, known as the digital divide. This gap is not only a matter of the existence of access but also related to the skills of the public in accessing available information technology.

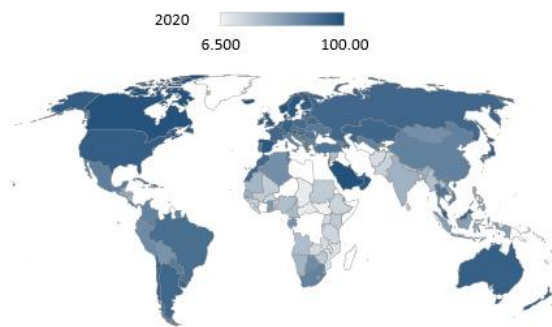


Figure 3. Individuals Using the Internet 2020 (% of Population). (World Bank, 2020)

In this study (Table 2), the digital divide emerges two issues: infrastructure related to information technology and its supporting facilities. Telemedicine is undoubtedly very dependent on facilities and infrastructure. In addition to equipment, an internet connection or telephone is essential for telemedicine. Globally, individual access to the internet still has a fairly wide gap (Figure 3).

Second is the human resource condition, not only people who use health services but also health service providers themselves. There are various types of health workers, including a doctor. The number of human resources that utilize information still needs to be competent and accept the new patterns presented.

This study found that some doctors needed to fully accept or could apply telemedicine properly. There is some

background to the condition of acceptability and the application of telemedicine. In addition to information technology literacy issues, and medical ethics issues, there are issues with the acceptability of telemedicine for doctors. Telemedicine presents new facilities for providing health services and changes the pattern of interaction and skills required by health service providers.

The challenges doctors face are pretty varied in applying telemedicine, as seen from the studies studied in this study. In the context of developing countries, where the level of information technology literacy is relatively more adequate, showing elaboration not only on implementation, but several studies have also even discussed how improvement could create and encourage the sustainability of services via telemedicine. On the other hand, in less developed and developing countries, telemedicine studies still need to focus on issues of acceptability, infrastructure, and implementation alone.

Table 2. Study Context on Telemedicine Country Background

Classifi- cation	Digital Infrastruc- ture	Issues
Least developed	+	Acceptance, and access, infrastructure
Developing	++	Implementation, infrastructure
Developed	+++++	Implementation, enhancement, and sustainability

Note: Classification based on The Word Bank (World Bank, 2022)

The development of telemedicine in health care benefits areas with a supporting context. Telemedicine has indeed contributed to reduce the degree of inequality in health. However, regions with limited access to telemedicine are becoming increasingly left behind. Telemedicine has become very diverse in use in various areas depending on the context of the region.

Disruption Challenge for Physicians

The rapid development of telemedicine in the provision of health services is unavoidable. The acceleration of its development, which is relatively fast, is directly proportional to the advancement of technology, requiring the stakeholders to adapt (Sasangohar *et al.*, 2020). Significantly, the application of telemedicine has experienced a massive increase during the pandemic.

Table 3. Type of Disruption experience of physicians

Type of disruption experience	Σ Article
Disruption to circle of influence	4
Disruption to work environment	17
Disruption to clinical practice role and responsibility	20
Disruption to personal life	2
Disruption to current delivery mode	34

Disruption of health services becomes inevitable. The disruption raises new challenges for physicians as one of the actors in health services (Table 3). The difference in service media applied in telemedicine changes the implementation of health services. It requires not only adjustment (Barney *et al.*, 2020) but also a change of approach to running health services (Payán *et al.*, 2022).

Based on Kathleen Bagot's categorization of disruption in telemedicine, this study found that most of them elaborated on disruption at the level of changing patterns of healthcare delivery. The study shows the different approaches and patterns of health service delivery with or without telemedicine. There are indeed many adjustments that health service stakeholders must make, where change is not just the medium but also the way to a different working mindset.

In this study, the findings on disruption in the changing pattern of health service delivery are not only experienced

by developed countries but also by developing countries, the least developed countries (Table 2). There was no difference in the experience of the disruption that occurred. The difference lies in the response of health practitioners to the disruption that occurs. Health practitioners like physicians are more likely to refuse in least-developed countries. This study represents the case described through the Ethiopian experience (Sagaro, Battineni and Amenta, 2020). The experiences of physicians in developed countries are more responsive to acceptance, even though they have concerns regarding several issues in the implementation of telemedicine, such as inequality, ethics, and safety concerns (Bakhtiar, Elbuluk and Lipoff, 2020; Jain *et al.*, 2020; Phimphasone-Brady *et al.*, 2021).

The challenge of disruption to physicians in implementing telemedicine next found in this study is related to changes in clinical practice roles and responsibilities. During the examination, physicians often find things that require adjustments and even changes to carry out the examination. Telemedicine makes clinical processes and stages in health services require tools and different approaches.

The most significant problem doctors encountered when implementing telemedicine was the work environment. The work environment is related to changes in the workflow/ work system. Some changes occur not only in the clinical process but also require some support for the service process via telemedicine. Those work system changes may take time to make some adjustments. Unfortunately, it happened in a relatively short period.

The disruption experiences related to physicians' circle of influence and personal life are the least elaborated in telemedicine studies. Only a few studies have focused interest on these issues. There is not enough evidence to elaborate how physicians make a deal with swift adjustments on telemedicine implementation.

In fact, with the disruptive changes that have occurred, these last two things

also significantly impact the delivery of health services.

Disruption of the circle of influence, for example, affects the physician-patient relationship. Moreover, physician-patient relation grows in the increasing patient's role in the delivery of health services. Influences and relationships in communication that run under examination are crucial things that become more important than the development of technology itself.

Moreover, physicians also experience disruption in their personal life, which indirectly links to how they will build relationships with patients. This disruption to personal life comes from the burden of changes in various aspects of service, and adjustment efforts are necessary even if it will take time and change the working pattern of physicians. Those changes can be seen in the conditions that show diminishing the boundaries between private and professional life. There are differences between conventional healthcare and telemedicine. The conventional one requires physical presence as a prerequisite, delimited by time and space. On the other hand, telemedicine tears down the time and space boundaries. Telemedicine enables physicians to be accessed anywhere and anytime. So, the boundaries of a physician's professional and personal life become an essential challenge to find a way out. The potential problem as a consequence of work-life balance emerges and indirectly will affect the quality of health services provision (Alblihed and Alzghaibi, 2022).

The experience of physicians in dealing with disruptions explains that changes occur not only have an impact on changes in methods or ways of service. There is a domino effect from the widespread application of telemedicine from the system level and organization to individual stakeholder health service providers.

Cultural Change and Innovation

Healthcare services appeared to have been in the same condition for decades. In healthcare services, a culture of the status quo prevails. The fact that the

pandemic has prompted innovation in healthcare technology demonstrates a confluence of forces that may cause leapfrogging and encourage physicians to adopt a new work culture.

While work culture influences innovation positively and vice versa, innovation encourages changes in new workplace cultures (Kostis, Kafka and Petrakis, 2018). These positive influences include confidence, discipline, work ethic, and honesty. Meanwhile, innovation is unaffected by a culture of routine and repetition at work.

Physicians must understand that innovation in healthcare services forces them to participate in an ecosystem that disrupts the formerly monotonous work culture in the context of technological disruption. On occasion, they must assist in the comprehension of transitions and the management of these cultural adjustments. Individual effort is crucial to adapting to technological disruptions because failure or difficulty catching up may cause depression, anxiety, and helplessness (Kostis, Kafka and Petrakis, 2018).

Physicians play a game-changer role because health services are related to the issue of transferring services and not selling products (Avelino *et al.*, 2017). Even though technological innovation is prevalent, physicians must be able to utilize it effectively. Recognizing that innovation in work performance and health services will provide broader changes in healthcare governance and grounding it as a service that educates the community about outstanding healthcare services makes these innovative technologies invaluable. Intelligent decision-making and innovative technologies may result in more effective solutions. Ultimately, innovation creates an obstacle-free healthcare governance system for all individuals.

This research shows the condition and experience of physicians in running telemedicine services worldwide via academic elaboration. Various contexts explain physicians' struggle with telemedicine disruption. According to the disruption condition, the overloaded burden experienced by physicians, the result differs in responses.

Further discussions about personal factors related to the quality of service are needed. It will indirectly impact on the quality of service produced. Studies that examine the disruption and burden of adaptation effect on the quality of telemedicine service delivery are encouraged.

Little concerns about the personal aspects of physicians in conducting telemedicine were found in this study, followed by questions about quality issues shortly. The disruption that occurs in various aspects faced by physicians has a large enough impact. As a professional, keeping abreast of developments and changes is vital. These demands will affect their burden not only as professionals but also impact their personal lives. Especially in the era of disruption, making changes happen so quickly requires an adaptation process that is not easy (Chen *et al.*, 2022).

The need for adjustment to disruption is a significant burden for professionals. These adjustments are, of course, time-consuming. Under conditions of limited time, it creates a double burden on a professional such as a physician to adjust to the disruption. Facing various aspects of the disruption

The question of service quality is the basis for how telemedicine can build trust for its users and affect the sustainability of telemedicine itself. The problem of personal life disruption experienced by stakeholders in telemedicine then becomes something that must be unconsidered for its effect on the quality and sustainability of telemedicine.

Conclusion

Disruption faced by physicians is a necessity in the application of telemedicine. Especially during the pandemic, telemedicine is growing quite rapidly in its implementation. This study found at least 5 (five) disruptions related to clinical practice roles and responsibilities, current delivery modes, work environment, circle of influence, and personal life. The latter mentioned still needs to be revised. Problems related to personal life related to telemedicine encourage concern about the quality of telemedicine itself because apart

from relying on technology, the role of physicians in telemedicine is also essential.

The problem of disruption of physicians in personal life also raises concern because it may have triggers mental health issues. Workload and work-life balance patterns should be applied because may affect the physician's mental health.

Abbreviation

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; COVID-19: Coronavirus disease 2019.

Declarations

Ethics Approval and Consent Participant
Not Applicable

Conflict of Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance.

Availability of Data and Materials

The availability of data and materials is based on demand from authors.

Authors' Contribution

APN conceptualized the study; APN and AAP created the methodology, wrote, reviewed, and edited the manuscript; APN wrote the original draft.

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