

## Bibliometric review of telemedicine using by patient and healthcare perspective

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### Abstract

This study uses bibliometric analysis techniques. This study aims to see how telemedicine is designed from the perspective of health workers. The study found 305 scientific papers indexed worldwide (Scopus), where the citations were from the article's conference paper. Keywords ("Telehealth") were used to collect data, which is limited to 2010 to 2022. The topic structure is generally determined using bibliometric indicators such as citations. The VOSviewer analysis tool helps to carry out the data analysis steps. VOSviewer maps patterns of major topics in the study domain, enabling new models. Authors, institutions, and infographic topics were found in the following keywords: In the last three years, research on Telehealth has increased; Telehealth studies based on network analysis consider two main issues of concern to the authors, namely interventions and perspectives.

**Keywords:** Telemedicine; Telehealth; Perspective; Bibliometric

### 1. Introduction

According to Bertonecello in 2018, he thinks that currently technology, information and communication is an appropriate solution for dealing with problems related to public health, just as technology, information and communication can detect an increase in the number of sufferers of chronic diseases, the number of elderly populations, the number medical personnel, and also a good solution to reduce the cost of health services. This health service model can be connected in an integrated manner by offering an online forum where fellow medical personnel in a medical service unit can interact with their colleagues for the purpose of co-patient health care to help improve patient clinical improvement and increase adherence to a therapy [1]. Telemedicine is a strategy that is very appropriate to current conditions because we know that we are currently living in a period of industrial development 4.0 with information systems that are very embedded in social life. Another reason is also because telemedicine has the ability to collect and manage patient data, and allows clinical decision making that is timely and adapted to remoteness without having to face to face with the patient [2]. The telemedicine system can provide clinical outcomes that are the same or even better than conventional care because telemedicine can be reached by patients who live in remote areas, who can receive treatment from medical personnel without having to travel to visit health facility providers [3]. Due to advances in technology, the existence of a telemedicine system as a health practice facility has reduced patient treatment costs, the reasons for which have been explained in the previous paragraph. Telemedicine intervention actually started several years ago and is progressing well so far. Previous studies have concluded that telemedicine is quite effective and has positive effects including therapeutic effects on patients, increased efficiency in health services, and practical use by both patients and medical personnel. Studies say that 83% of the effectiveness of clinical practice through telemedicine is as effective as face-to-face care, and 39% of the cost-effectiveness of telemedicine systems can save patient treatment costs [4].

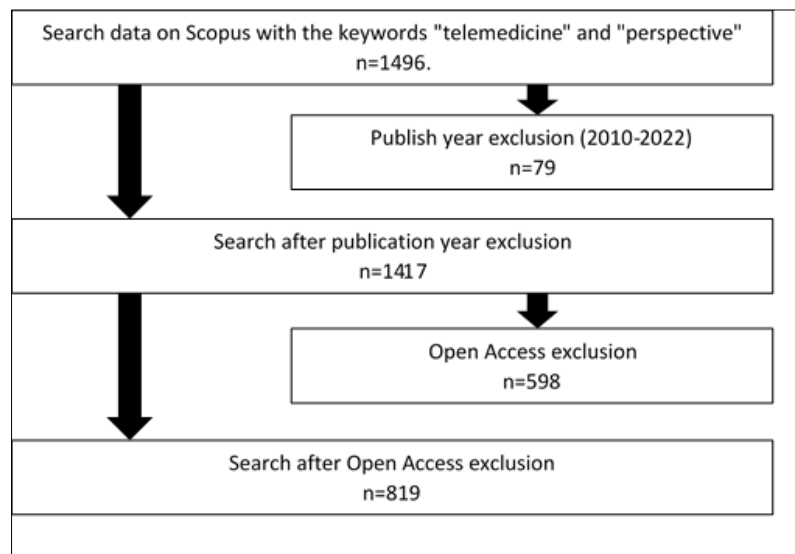
The ultimate goal of using the telemedicine system is to facilitate the provision of health services to patients without face-to-face meetings so that these patients can actually obtain data or information that describes their condition in real

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time, and health service providers can also take immediate action if needed. and additional motivation to manage patient health more adequately. The main point is that the earlier the patient understands about their health condition, the better the prognosis for the patient's condition in the future. Health care providers must be able to access and interpret health data sent from patients and patient families, and filter it into important points for carrying out a medical action. In the past, doctors often made unilateral decisions regarding medical action and did not ask for active participation from the patient's side. By using a patient- or patient-family-centered approach by utilizing data or information obtained from wearable devices, health care providers have the opportunity to work closely with patients or patient families to provide measurable skills and behaviors according to the patient's ability to track clinical conditions on an ongoing basis. real time from time to time. When patients are engaged in active, patient-centered discussions about their health and well-being, compliance and satisfaction levels increase, leading to a more effective doctor-patient relationship [5].

## 2. Research Method

This research approach uses a qualitative literature review study. Research data was collected by searching the database (<https://www.scopus.com/>), an internationally recognized peer-reviewed journal. Searching the Scopus database using the keywords “Telehealth” and “perspective” was 1496 with publication years 2012 to 2022 and found 1417 documents. Then, based on open access to the journal, 819 documents were obtained. This research considers only journal articles and conference papers resulting in 305 documents. All data was retrieved during the same period, October 2022, to eliminate bias caused by database upgrades. The steps involved in this investigation are described in (Figure 1) below to give a clear picture of what was done.



**Figure 1** Publication Selection Scheme

Data is exported in RIS export file format to distribute research map information. Then, bibliometric leadership maps were determined using two types of analysis: Scopus menu search results analysis and VOSviewer software analysis. Scopus search results were analyzed descriptively based on year of publication, publishing institution, country of publication, name of publication, and research topic. Meanwhile, VOSviewer defines a bibliometric map of research development based on the big subject of security and information assurance for big data.

### 2.1. Research Strategy

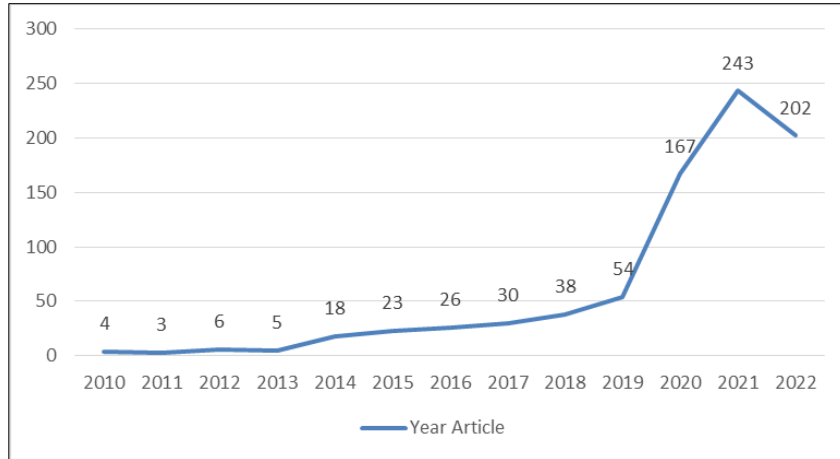
(TITLE-ABS-KEY (telehealth) AND TITLE-ABS-KEY (perspective)) AND PUBYEAR > 2009 AND (LIMIT-TO (OA, "all"))

## 3. Results

### 3.1. Development trends in telehealth research studies

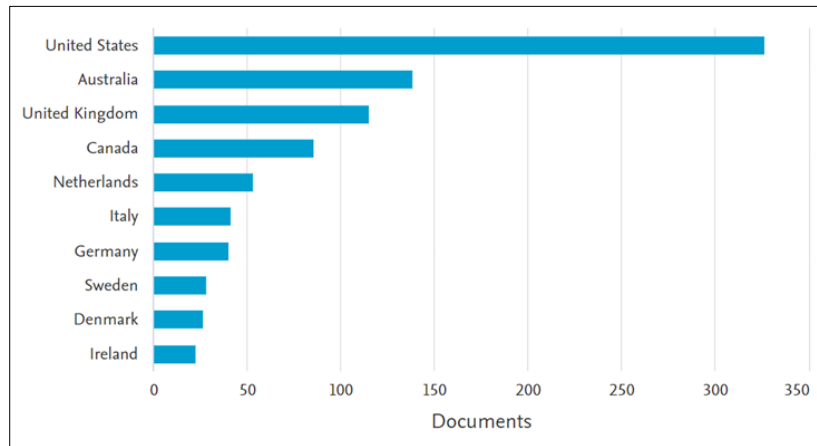
Research development with the theme of telehealth published in Scopus. Figure 2 shows that in the last 4 years (2019-2021), there has been an increasing trend compared to 2010 to 2015, especially in 2020 and 2021, where there has

been an increase even in the era of the COVID-19 pandemic. During the COVID-19 pandemic, research needs for Telehealth increased, presumably because of the need for technology development, especially health services, in providing remote consultation specifically for COVID-19.



**Figure 2** Number of publications by year

Figure 2 also depicts annual trends in publications related to Telehealth. Data for this study were collected from 2010 to 2022. In the previous twelve years, 819 data points were collected. Data for 2010 consisted of 4 documents, 2011 3 documents, 2012 6 documents, 2013 5 documents, 2014 18 documents, 2015 23 documents, 2016 26 documents, 2017 30 documents, 2018 38 documents, 2019 54 documents, 2020 is 167 documents, 2021 is 243 documents and from 2022 is 202 documents.



**Figure 3** Country Analysis with Publications Related to Telehealth

Figure 3 shows the distribution of the number of publications by country. Scopus search results show that the United States (US) produced 326 documents from 2010 to 2022, as shown in (Figure 2). The United States has one of the best education systems globally, and some of the authors come from the best universities there. Therefore, it is not surprising that the United States ranks first among other European and Asian countries. The second most published country is Australia, with 138 publications, followed by the United Kingdom with 115 documents.

Table 1 categorizes articles based on the number of citations received. This was applied to map the research publications that are most relevant to telehealth. Published publications cover the implementation of telemedicine designs, implementation implications, acceptance of applications, and evaluation of use.

**Table 1** Citation of publications by subject area

Title	Author and Year	Sources	Cited by
Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: A qualitative study	Sanders, C., Rogers, A., Bowen, R., (...), Bardsley, M., Newman, S.P.	BMC Health Services Research 12(1),220	317
Health equity and COVID-19: Global perspectives	Shadmi, E., Chen, Y., Dourado, I., (...), Uribe, M.V., Willems, S.	International Journal for Equity in Health 19(1),104	286
Ambient Assisted Living healthcare frameworks, platforms, standards, and quality attributes	Memon, M., Wagner, S.R., Pedersen, C.F., Aysha Beevi, F.H., Hansen, F.O.	Sensors (Switzerland) 14(3), pp. 4312-4341	261
Diabetes management via mobile phones: A systematic review	Holtz, B., Lauckner, C.	Telemedicine and e-Health 18(3), pp. 175-184	231
A systematic review of economic analyses of telehealth services using real time video communication	Wade, V.A., Karnon, J., Elshaug, A.G., Hiller, J.E.	BMC Health Services Research 10,233	214
Telehealth in the context of COVID-19: Changing perspectives in Australia, the United Kingdom, and the United States	Fisk, M., Livingstone, A., Pit, S.W.	Journal of Medical Internet Research 22(6),e19264	210
A qualitative systematic review of studies using the normalization process theory to research implementation processes	McEvoy, R., Ballini, L., Maltoni, S., (...), Mair, F.S., MacFarlane, A.	Implementation Science 9(1),2	195
Telemedicine, the current COVID-19 pandemic and the future: a narrative review and perspectives moving forward in the USA	Kichloo, A., Albosta, M., Dettloff, K., (...), Solanki, S., Chugh, S.	Family medicine and community health 8(3)	193
Ageing-in-place with the use of ambient intelligence technology: Perspectives of older users	van Hoof, J., Kort, H.S.M., Rutten, P.G.S., Duijnste, M.S.H.	International Journal of Medical Informatics 80(5), pp. 310-331	193
Use of telehealth during the COVID-19 pandemic: Scoping review	Doraiswamy, S., Abraham, A., Mamtani, R., Cheema, S.	Journal of Medical Internet Research 22(12),e24087	165

### 3.2. Map of research development is displayed on telehealth

The VOSviewer study found a total of 9082 keywords, 340 of which met the data analysis criteria of 819 Scopus indexed documents published between 2010 and 2022. Three hundred and thirteen (313) keywords were filtered out, and 168 keywords connected one connecting point to another. selected in 819 documents. VOSviewer was used for Telehealth bibliometric mapping, divided into 5 clusters, as shown in Table 2.

The topics resulting from the cluster density display are shown in Figure 4, which shows a list of the salient concepts of each cluster (viewed using the color code applied to each cluster) to find as many of the themes that have been discussed in previous studies as possible for use in future studies. Figure 4 illustrates the density of each cluster as seen by using the color code applied to each cluster, namely red, green, yellow, blue, and purple. In Figure 4, research on reviews, covid, surveys, interventions, and terms is often carried out in 2010-2022. Covid is a theme that is often discussed because since the pandemic began, people have been required to further develop technology to support better health services.





Cluster analysis in Table 2 is expected to be able to read documents related to topics of interest in certain divisions. Intervention, chronic disease and artificial intelligence are interrelated ideas in Cluster 1, while convenience, agreement, service, connection and personal care are important concepts in Cluster 2. Cluster 3 deals with cost, effect, baseline and efficacy, while Cluster 4 relating to indicators of account and adaptation. Cluster 5 is also related to combination and content.

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#### 4. Discussion

In many systems used for health care, the value of telehealth interventions has grown towards a focus on improving the quality and cost-effectiveness of long-term care for people in need [6]. Telehealth interventions enable the remote exchange of data (e.g. blood glucose and blood pressure readings) and additional information between patients and healthcare professionals to aid in the diagnosis and management of healthcare conditions [7]. Telehealth interventions have been evaluated in various international settings. Some evidence of positive outcomes has been reported including improved clinical indicators and reduced use of health services [8], as well as increased feelings of security and increased satisfaction with health and social care services [9]. However, a number of studies have shown that this type of intervention often fails to be successfully implemented and adopted in routine healthcare [10].

The success of telemedicine as a means of providing high-quality healthcare has been well documented in recent research. In the context of primary care, Powellet al interviewed patients after telemedicine visits with their primary care providers and found that all interviewed patients found telemedicine visits satisfactory for their primary care needs, and further, the majority stated that they preferred telemedicine over in-person visits. future [11].

Despite the increasing utilization of telemedicine services, legal and regulatory challenges prevent their further expansion. The Office of the UN High Commissioner for Human Rights lists six key aspects of the right to health: accessibility, availability, participation, accountability, acceptability and good quality. Medicaid considers telemedicine to be an acceptable alternative to more traditional in-person patient encounters, but further laws and regulations governing the other five main aspects are controlled individually by states [12]. In the most widely conducted research these citations raise important issues with policy implications in an era where there is increasing emphasis on implementing telehealth interventions to support self-care for those with long-term conditions and with social care needs. Of particular interest is the finding that such interventions are often perceived as a major potential threat to identity and existing management routines and use of services for respondents [13]. In addition, evaluation studies and trials have reported recruitment difficulties with rejection rates of up to 80% [14]. Survey studies have been able to summarize and quantify some of the reasons why potential participants refuse to take part in the trial, with reasons often described as participants being too busy and uncomfortable with technology. More broadly, there has been an increasing focus on health-related technology use in older age, questioning the assumptions made about the necessity, use, and phobia of such technologies [13,15].

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#### 5. Conclusion

With the development of technology and information making health services significantly improved, the existence of telehealth is very helpful and supports this development. Over the past decades, we have been hit by many pandemics, including H1N1, Ebola, SARS-CoV, MERS-CoV, and currently, COVID-19. In the future, it is possible that more new pandemics will emerge. The development and utilization of telemedicine services is important, because these services allow us to continue to provide high-quality health services while maintaining physical distancing practices to prevent the spread of this virus. The benefits of telemedicine include convenience, increased access to remote care, especially for patients living in rural areas, and reduced health care costs. There needs to be a special approach for other developments so that this technology can be fully accepted by all people and used easily so that all users feel safer and easier to use it to support their health.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

No conflicts of interest exist that we need to mention.



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