

## INTERNATIONAL JOURNAL OF HEALTH SCIENCE

Link Page: <https://ejurnal.politeknikpratama.ac.id/index.php/ijhs>

Page: <https://ejurnal.politeknikpratama.ac.id/index.php>

### TELEHEALTH AND TELEMEDICINE APPLICATIONS IN THE MANAGEMENT OF DIABETES MELLITUS DURING PANDEMIC COVID 19 : BIBLIOMETRIC ANALYSIS

Nian Afrian Nuari <sup>a</sup>

<sup>a</sup> Medical Surgical Nursing Departement , STIKES Karya Husada Kediri, Kediri, Indonesia

Email: [nian.afrian@gmail.com](mailto:nian.afrian@gmail.com),

#### ABSTRACT

*The Covid 19 pandemic of the past three years has necessitated certain modifications to the management strategy, as health care professionals and diabetic patients cannot communicate directly. Technology is used to ensure that the management of Diabetes Mellitus remains intact. Using a bibliometric methodology, this study intends to examine the breadth of research on the application of telehealth to the management of Diabetes Mellitus during the Covid 19 Pandemic. Google scholar, Pubmed, and Science Direct are used to search for research databases, and VOS-viewer is used to retrieve the search results. The analysis of 902 articles from 2020 to 2022 reveals the existence of three clusters (red, green, and blue) that illustrate the relationship between topics. Bibliometric mapping using three distinct visualization techniques, including network visualization, overlay visualization, and density visualization. The most frequent keywords are Covid, Diabetes Mellitus, and Telemedicine. Telemedicine plays an essential role in the care of Diabetes Mellitus during a pandemic since it is simpler to communicate with patients due to limited interaction during lockdown, as seen by the analysis of the visualization above. Telehealth visits could be the subject of research that could be utilized to future studies.*

**Keywords:** Bibliometric, Telehealth, Telemedicine, Diabetes, Pandemic

#### INTRODUCTION

World health authorities determine the public health emergency status during a pandemic by implementing social restrictions and self-isolation or quarantine (Faleh AlMutairi et al., 2021). Diabetes Mellitus management necessitates dedication and frequently leaves patients feeling exhausted and despondent (Nuari, 2018a, 2018b; Nuari et al., 2018) This has a significant effect on people with Diabetes Mellitus who are unable to receive treatment at

*Received Agustus 30, 2022; Revised September 22, 2022; Accepted Oktober 28, 2022*

hospitals or health centers due to laws restricting visits to health institution (Yang et al., 2020). Self-management is essential for regulating blood sugar levels and preventing microvascular and macrovascular problems in DM patients (Nuari et al., 2018). Therefore, in this age of modernization, efforts are required to assist DM patients in controlling their blood sugar levels, such as the use of technology in enhancing blood sugar control management, such as Telehealth. Telehealth is a technology-based nursing care delivery strategy that can be utilized to improve remote health care (M Tourkmani et al., 2021).

The International Diabetes Federation (IDF) estimates that 537 million adults (aged 20-79) or one in ten individuals globally have diabetes. Indonesia ranks fifth with 19.47 million persons affected by diabetes. With a population of 179.72 million, this means that 10.6% of Indonesians are diabetic. According to the IDF, 81 percent of diabetics reside in low- and middle-income nations. This is another reason why the IDF estimates that 44% of adults with diabetes have not yet been diagnosed (International Diabetes Federation, 2021).

According to the International Diabetes Federation (IDF), the number of diabetics in Indonesia may reach 28.57 million by 2045. This amount is 47% greater than the 19.47 million projected for 2021. Since 2002, the number of persons with diabetes in 2021 has climbed significantly. Compared to 2011, when the number of diabetes reached 7.29 million, the number of diabetics has skyrocketed 167%. This increase is significantly greater than the growth between 2000 and 2011. During this time span, the number of people with diabetes rose by 29% from 5.65 million in 2000 to 7.35 million in 2010. In Indonesia, the number of diabetes-related deaths would reach 236,711 in 2021. Compared to 149,872 in 2011, this number has climbed by 58% (International Diabetes Federation, 2021).

Numerous global research have been undertaken on the application of telehealth and telemedicine to the management of Type 2 diabetes. The introduction of Telehealth prior to the pandemic was hampered by a number of difficulties, such as cultural and societal norms (Borries et al., 2019). People are unfamiliar with Telehealth, prefer face-to-face interactions, and view online education as less dependable (Asante et al., 2020). The Diabetes Mellitus (DM) Telehealth Model is a smartphone application containing education, therapy regimens, and blood sugar control (Sun et al., 2019). There is no video conferencing consultation menu that requires the patient to visit a healthcare institution. Patients with diabetes mellitus can continue to manage their condition unrestrictedly throughout a pandemic phase marked by a lockdown scenario (Lee et al., 2021). To map the research database using a bibliometric technique, a methodical strategy is necessary. In Indonesia, bibliometric research in the health

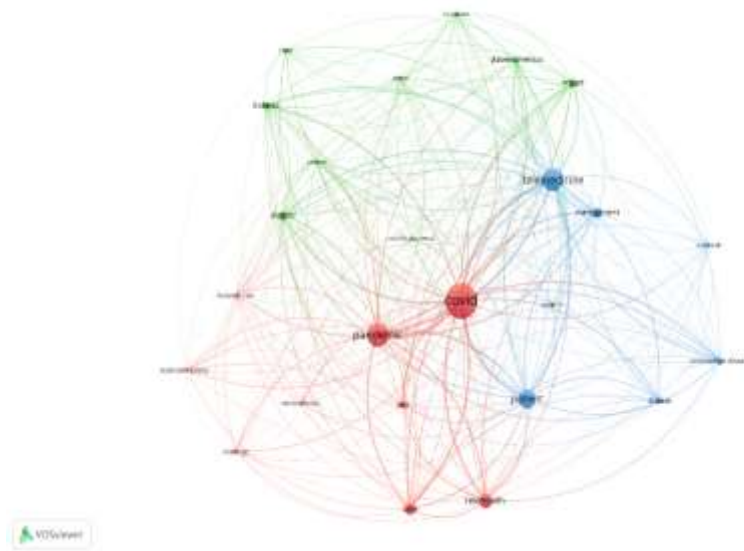
sector has been conducted, however there has not been a single paper describing the use of telehealth or telemedicine in the management of diabetes during a pandemic

## **METHOD**

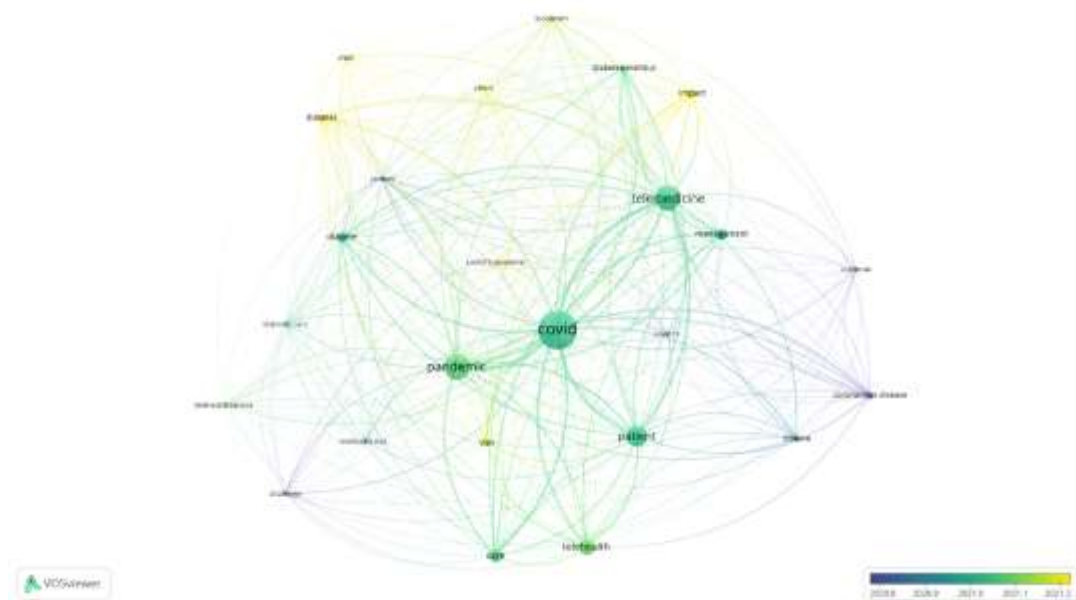
All publications are culled from the Google Scholar, PubMed, and Science Direct databases, and all data is derived from global research. A web search was initiated with the terms "Telehealth in Diabetes Mellitus During a Pandemic" using the criteria "title, keywords, and abstract (subject area)". Included are items that were published between 2020 and 2022. Search the Google Scholar database with the aid of the Publish or Perish Application in order to uncover more articles in Research Journals. Then, articles are sorted by subject and open access status. The required articles are then exported to the Mendeley application in \*.ris format for database maintenance. The completed article is entered into the VOS-viewer for display and trend analysis as a bibliometric map. VOS-viewer permits an overview of publication maps, nation maps, or journal maps based on a network (co-citation) as well as the construction of keyword maps based on a common network. The keyword frequency can be changed as required in order to avoid irrelevant terms. Additionally, VOS-viewer software can be used to perform data mining, mapping, and categorization of articles extracted from database sources.

## **RESULT AND DISCUSSION**

The minimum number of words required to use the VOS-viewer has been set to six. After analysis, there are three clusters (red, green, and blue) that illustrate the association between topics. VOS-viewer is capable of displaying bibliometric mapping in three distinct visualizations, including network visualization (Figure 1), overlay visualization (Figure 2), and density visualization (Figure 3). Keywords are shown by colored circles. There is a positive correlation between the size of the circle and the frequency of keywords in the title and abstract. Consequently, the size of letters and circles is dictated by their occurrence frequency. The typeface and circle size will increase as the frequency of the keyword increases. Extraction findings based on titles, keywords, and abstracts identified 902 articles from 902 publications published between 2020 and 2022, revealing three groups (red, green, and blue). During the tracing process, the acquired data is organized into a journal-style format.



Picture. 1  
Topic area Visualization Using Network  
Visualization



Picture. 2  
Visualization Topic Areas Using Overlay Visualization



into diabetic care to replace many of the typical in-person care appointment (M Tourkmani et al., 2021). Therefore, Saudi Arabia's health policymakers should consider developing thorough rules for telemedicine care in order to ensure the quality of care and address concerns such as financial reimbursement and patient privacy (M Tourkmani et al., 2021; Waller et al., 2021; Yasmin et al., 2020).

## CONCLUSION

The Diabetes Mellitus Telehealth model is a smartphone application containing education, therapy schedules, and blood sugar control; there is no consultation menu in the form of a video conference where the patient is not required to visit a medical facility. This study has demonstrated that there is a dearth of research on the usage of telemedicine in Indonesia. Using a bibliometric methodology, this study aims to organize, describe, and analyze systematic literature sharing.

## REFERENCES

- Alessi, J., Berger De Oliveira, G., Debora, ., Franco, W., Becker, A. S., Carolina, ., Knijnik, P., Gabriel, ., Kobe, L., Bibiana, ., Amaral, B., De Brito, A., Schaan, B. D., & Telo, G. H. (2021). Telehealth strategy to mitigate the negative psychological impact of the COVID-19 pandemic on type 2 diabetes: A randomized controlled trial. *Acta Diabetologica*, 58, 899–909. <https://doi.org/10.1007/s00592-021-01690-1>
- Asante, E., Bam, V., Diji, A. K. A., Lomotey, A. Y., Owusu Boateng, A., Sarfo-Kantanka, O., Oparebea Ansah, E., & Adjei, D. (2020). Pilot Mobile Phone Intervention in Promoting Type 2 Diabetes Management in an Urban Area in Ghana: A Randomized Controlled Trial. *Diabetes Educator*, 46(5), 455–464. <https://doi.org/10.1177/0145721720954070>
- Borries, T. M., Dunbar, A., Bhukhen, A., Rismay, J., Kilham, J., Feinn, R., & Meehan, T. P. (2019). The impact of telemedicine on patient self-management processes and clinical outcomes for patients with Types I or II Diabetes Mellitus in the United States: A scoping review. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 13(2), 1353–1357. <https://doi.org/10.1016/j.dsx.2019.02.014>
- Faleh AlMutairi, M., Tourkmani, A. M., Alrasheedy, A. A., ALHarbi, T. J., Bin Rsheed, A. M., ALjehani, M., & AlRuthia, Y. (2021). Cost-effectiveness of telemedicine care

- for patients with uncontrolled type 2 diabetes mellitus during the COVID-19 pandemic in Saudi Arabia. *Therapeutic Advances in Chronic Disease*, 12, 1–11. <https://doi.org/10.1177/20406223211042542>
- Gong, E., Baptista, S., Russell, A., Scuffham, P., Riddell, M., Speight, J., Bird, D., Williams, E., Lotfaliany, M., & Oldenburg, B. (2020). My diabetes coach, a mobile app-based interactive conversational agent to support type 2 diabetes self-management: randomized effectiveness-implementation trial. *Journal of Medical Internet Research*, 22(11), 1–14. <https://doi.org/10.2196/20322>
- International Diabetes Federation. (2021). International Diabetes Federation. In *Diabetes Research and Clinical Practice* (Vol. 102, Issue 2). <https://doi.org/10.1016/j.diabres.2013.10.013>
- Lee, E. Y., Yun, J. S., Cha, S. A., Lim, S. Y., Lee, J. H., Ahn, Y. B., Yoon, K. H., & Ko, S. H. (2021). Personalized type 2 diabetes management using a mobile application integrated with electronic medical records: An ongoing randomized controlled trial. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105300>
- M Tourkmani, A., J ALHarbi, T., Rashed, A. M. B., Alrasheedy, A. A., ALMadani, W., ALJuraishi, F., AlOtaibi, A. F., AlHarbi, M., AlAbood, A. F., & Alshaikh, A. A. I. (2021). The impact of telemedicine on patients with uncontrolled type 2 diabetes mellitus during the COVID-19 pandemic in Saudi Arabia: Findings and implications. *Journal of Telemedicine and Telecare*. <https://doi.org/10.1177/1357633X20985763>
- Nuari, N. A. (2018a). Diabetes Burnout Syndrom dengan Self Care Agency Pasien Diabetes Mellitus Tipe II. *Journal of Health Science and Prevention*, 2(2), 78–82. <https://doi.org/10.29080/jhsp.v2i2.122>
- Nuari, N. A. (2018b). Diabetes Burnout Syndrom With Self Care Agency Diabetes Mellitus Type 2 Patient \_ Journal of Health Science and Prevention. *Journal of Health Science and Prevention*, 2(2), 2, 78–82. <https://doi.org/10.29080/jhsp.v2i2.122>
- Nuari, N. A., Widayati, D., Lestari, L. P., Destri, C., & Mawarti, H. (2018). Diabetes burnout syndrome and its relationship to the resiliency of efficacy diabetes mellitus type 2 patients. *International Journal of Pharmaceutical Research*, 10(4), 434–438.
- Sun, C., Sun, L., Xi, S., Zhang, H., Wang, H., Feng, Y., Deng, Y., Wang, H., Xiao, X., Wang, G., Gao, Y., & Wang, G. (2019). Mobile phone–Based telemedicine practice

- in older chinese patients with type 2 diabetes mellitus: Randomized controlled trial. *JMIR MHealth and UHealth*, 7(1), 1–9. <https://doi.org/10.2196/10664>
- Waller, K., Furber, S., Bauman, A., Allman-Farinelli, M., van den Dolder, P., Hayes, A., Facci, F., Franco, L., Webb, A., Moses, R., Cook, R., Gugusheff, J., Owen, K., & Colagiuri, S. (2021). Effectiveness and acceptability of a text message intervention (DTEXT) on HbA1c and self-management for people with type 2 diabetes. A randomized controlled trial. *Patient Education and Counseling*, 104(7), 1736–1744. <https://doi.org/10.1016/j.pec.2020.11.038>
- Yang, Y., Lee, E. Y., Kim, H. S., Lee, S. H., Yoon, K. H., & Cho, J. H. (2020). Effect of a mobile phone-based glucose-monitoring and feedback system for type 2 diabetes management in multiple primary care clinic settings: Cluster randomized controlled trial. *JMIR MHealth and UHealth*, 8(2), 1–15. <https://doi.org/10.2196/16266>
- Yasmin, F., Yasmin, F., Nahar, N., Banu, B., Ali, L., Sauerborn, R., & Souares, A. (2020). The influence of mobile phone-based health reminders on patient adherence to medications and healthy lifestyle recommendations for effective management of diabetes type 2: A randomized control trial in Dhaka, Bangladesh. *BMC Health Services Research*, 20(1), 1–12. <https://doi.org/10.1186/s12913-020-05387-z>