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Systematic Review

Telehealth Interventions for Patients with Cardiovascular and Metabolic Disorder during COVID-19 Outbreak: A Systematic Review

Yasaman Zaviyeh[1], Elham Maserat[2], Zeinab Mohammadzadeh[1*]

[1]Department of Health Information Technology, School of Management and Medical Information, Tabriz University of Medical Sciences, Tabriz, Iran
[2]Department of Medical Informatics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

ABSTRACT

Background:
During the COVID-19 pandemic, the implementation of social distancing and public fear of the virus postponed follow-up visits to manage patients' underlying medical problems, especially cardiovascular diseases and diabetes. Telehealth provides accessible and cost-effective care for vulnerable patients. The aim of this early study was to review the telehealth interventions for patients with cardiovascular and metabolic disorders during Covid-19 outbreak.

Materials and Methods:
This study used rapid review to provide an accurate review of the articles. Study selection was based on the Preferred Reporting Items for Systematic Reviews (PRISMA) guideline. A systematic review was conducted on studies published from January 2020 to July 30, 2020, in PubMed, Web of Science, Google Scholar, and Scopus databases, and the update was done on October 31, 2020

Results:
Technology-based interventions were performed in various countries: two studies in the USA, three in Europe (Italy, Germany, and London), two in Asia (China and Pakistan), and one in South America. Most Telehealth approaches used in the included articles are video consultations using mobile applications such as Skype, face time, and regular phone calls.

Conclusion:
According to the results, the application of technology in the management of cardiovascular and metabolic disorders can be used to provide healthcare to patients regardless of distance, detection of disease, monitoring disease progression and complications, reducing healthcare costs, saving available resources, preventing readmission of patients, reducing the provider workload, and increasing family participation in disease management, quality of life, and patient satisfaction.

Keywords: COVID-19, Metabolic disorder, Cardiovascular, Telehealth

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Corresponding author:
Zeinab Mohammadzadeh, PhD
Department of Health Information Technology,
School of Management and Medical Information,
Tabriz University of Medical Sciences, Tabriz, Iran.
Tel: + 98 04131775971
Fax: + 98 04131776002
Email: mohammadzadehz@tbzmed.ac.ir

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INRODUCTION

The world health organization, on March 11, 2020, confirmed that the world was facing a coronavirus pandemic (1). Coronaviruses belong to a large family of viruses that cause respiratory infections. These can range from the common cold to more serious diseases. COVID-19 is the disease caused by a new coronavirus. It was first reported in December 2019 in Wuhan, China (2, 3). As of December 14, 2020, 70,829,855 confirmed cases have been reported, with 1,605,091 deaths globally from 216 countries (4). It has also been reported that there is a higher risk of COVID-19 related death among people with diabetes and cardiovascular comorbidities (5).On March 28, 2020, the United States Center for Disease Control (CDC) reported that the prevalence of underlying comorbidities such as diabetes, *cardiovascular disease* (CVD), and lung disorder among patients infected with COVID-19 was 10.9%, 9.0%, and 9.2%, respectively (3). People with both heart disease and diabetes have a higher risk of developing respiratory illnesses such as flu (2).

People with heart disease and diabetes have a 2-3 times higher risk of developing coronavirus (6). Vice versa, patients infected with COVID-19 underlying CVD and diabetes are at a higher risk of morbidity and mortality rate (3,6-9). The cohort study was conducted on 1099 patients infected with coronavirus in January 2020 in China, and the results showed that 24% of the patients had comorbidities. 15% of the patients had hypertension, and 36% of them died or required intubation. 7.4% of patients had diabetes mellitus, and 24% of them died or need intubation. 2.5% of the patients had coronary heart disease, and 9% of them died or needed intubation (10).

Chinese Center for Disease Control and Prevention case series report that the case fatality rates among people with diabetes and heart disease are 7.3% and 10.5%, respectively, compared to an overall CFR of 2.3 % (11). COVID-19 impacts risk factors, lab results, and the mechanism of the heart organ. Viral-related cardiac complications included arrhythmias and myocardial injury (12, 13). Studies in China reported myocardial injury in 7-17% of patients with Covid-19 (14-17). Many patients with arrhythmias infected with Covid-19 were admitted to intensive care units (ICUs) (18). Cardiac events like acute coronary syndrome, heart failure (HF), and shock increased mortality risk in patients infected with COVID-19 (19,20).

New solutions are required to overcome the global COVID-19 pandemic, and technological advances in recent years have provided new options and opportunities to overcome the problems and challenges of this pandemic (21). Telehealth (telemedicine, e-health) is the delivery of healthcare services outside the healthcare setting. Telehealth uses information and communication technology (ICT), such as remote monitoring, videoconferencing, and electronic consultations (22). Telemedicine enables specialists to continue medical care by maintaining social distancing, and it allows vulnerable patients at a high risk of infection with COVID-19 to undergo a medical assessment at their homes (23). This technology is a revolutionary tool to manage populations while minimizing the risk of virus transmission to both healthcare workers and patients (24). There is significant pressure to use telemedicine rapidly and on a large scale (25). This significant pressure demonstrates the benefits of telemedicine (25,26).

With the current lockdown situation related to the COVID-19 pandemic, glucose control is a key approach to prevent and minimize the severity and morbidity of COVID-19 in patients with diabetes (27,28). Eye examinations are an important part of diabetes management (29). Postponing follow-up appointments for diabetic retinopathy (DR) makes DR monitoring and timely treatment difficult (30). Teleophthalmology is a good option for facilitating DR screening by utilizing digital retinal imaging with a mobile camera (31). To reduce face-to-face contact during the COVID-19 pandemic, the suggested method for the patient with diabetes is using remote continuous glucose monitoring devices (CGM), and diabetes self-management (32-37).

During the COVID-19 pandemic, the implementation of social distancing and public fear of the virus postponed follow-up visits to manage patients' underlying medical problems, especially cardiovascular diseases and diabetes (38). The medical system and society, including the European Society of Cardiology, British Cardiovascular Society, Cardiac Society of Australia, New Zealand (CSANZ), High Blood Pressure Research Council of Australia (HBPRCA), Australian National

Heart Foundation (NHF), and the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS), recommended using technology-based approaches (33).

Telehealth provides accessible and cost-effective care for vulnerable patients. The aim of this early study was to remotely support people living with cardiovascular and diabetic diseases during COVID-19 isolation.

MATERIAL AND METHODS

Study design

This study used rapid review to provide an accurate review of the articles. Study selection was based on the Preferred Reporting Items for Systematic Reviews (PRISMA) guideline.

Search strategy and data

A systematic review was conducted on studies published from January 2020 to July 30, 2020, in PubMed, Web of Science, Google Scholar, and Scopus databases, and the update was done on October 31, 2020. Then, we identified available evidence on using telehealth tools to support patients with metabolic disorders (diabetes and cardiovascular disease) during the COVID-19 outbreak.

Search terms were identified based on medical subject heading (MeSH) terms. The combination of MeSH and various keywords with Boolean operators (AND, OR, and NOT) were used in the search of the databases

(((((((“COVID-19”[Mesh])) OR “Coronavirus”[Mesh]) OR “SARS-CoV-2”[Mesh]) AND “Telemedicine”[Mesh]) AND “Cardiovascular Diseases”[Mesh]) OR “Diabetes Mellitus”[Mesh]) OR “Metabolic Diseases”[Mesh] and other search term were included:

(((COVID-19) OR Coronavirus) OR Novel coronavirus) AND (((((((Telehealth) OR e-health) OR telemedicine), digital health) OR remote monitoring) OR m-Health) OR mobile health) AND (((((cardiovascular disease) OR CVD) OR diabetes) diabetes mellitus) OR metabolic disorders.)) AND management

Web-based resources that published key articles include Google, Google Scholar, journals (WHO, https://www.who.int, Centers for Disease Control and Prevention, https://www.cdc.gov, National Institute for Health and Clinical Excellence and clinical recommendations from institutes like Cardiac Society of Australia and New Zealand (CSANZ) Consensus Statement and American Society for Preventive Cardiology.

Eligibility criteria

All studies with primary sources of evidence reported the role of telehealth services in supporting patients with metabolic disorders (diabetes and cardiovascular patients) during the COVID-19 outbreak. Studies were included if they clearly defined the type of telehealth tools to provide clinical services, like management, follow-up, prevention, diagnosis, education, and treatment of patients with metabolic disorders (cardiovascular and diabetes patients) during COVID-19 pandemic and quarantine, published from December 1, 2020, to July 30, 2020, written in English language and published in a peer-reviewed journal. We specifically selected studies related to recent years and the onset of the corona pandemic. Experiences related to the use of information technology tools, especially telemedicine in previous years, even in 2019, were excluded from the study to share the experiences of patients and physicians in disease management during the pandemic.

Exclude criteria: Irrelevant and non-English studies, duplicate publications, review articles, opinion articles, and studies that provided recommendations and suggestions were excluded from the study.

Study selection and data extraction

Web-based resources were researched by a reviewer. Results were entered into Excel software. Duplicate records were removed. A reviewer performed screening titles and abstracts of retrieved studies for inclusion criteria. Retrieved records were entered into Endnote software. Eligible studies were obtained, and the full text of them was examined to determine whether they met the inclusion criteria. The authors assessed the title and abstract of articles for consistency with this research. If there was any conflict, it was discussed and resolved based on inclusion criteria. All articles were reviewed by an observer.

The data extracted from the eligible articles included: first author, country, study design, type of telehealth technology, intervention, and effect of telehealth services.

RESULTS

Figure 1 shows the result of the early review and screening process. After removing duplicate records, studies were selected by their abstract and title. We evaluated full-text articles that met our inclusion criteria and excluded the other studies.

Characteristics of the included criteria

For each study, general characteristics included: first author, country, method, type of telemedicine service, intervention, key output, and the effects of technology. General characteristics were extracted and summarized in Table 1. Table 1 shows an article published between December 1st And July 30th, 2020. In table 2 presents telehealth interventions for patients with cardiovascular disease during COVID-19.

Technology-based interventions were performed in various countries: two studies in the USA, three in Europe (Italy, Germany, and London), two in Asia (China and Pakistan), and one in South America. Articles were about the experience of using telemedicine technology for patients with diabetes and cardiovascular diseases during the COVID-19 pandemic. Two of the studies were original. The other studies included a case report, two retrospective studies, one prospective study, one descriptive study, and one pilot study. Most telehealth approaches used in the included articles were video consultations using mobile applications such as Skype, Face time, and regular phone calls.Technology-based approaches during the COVID-19 pandemic have been a great option for physicians to slow the virus transmission and keep social distance. Technology-based approaches

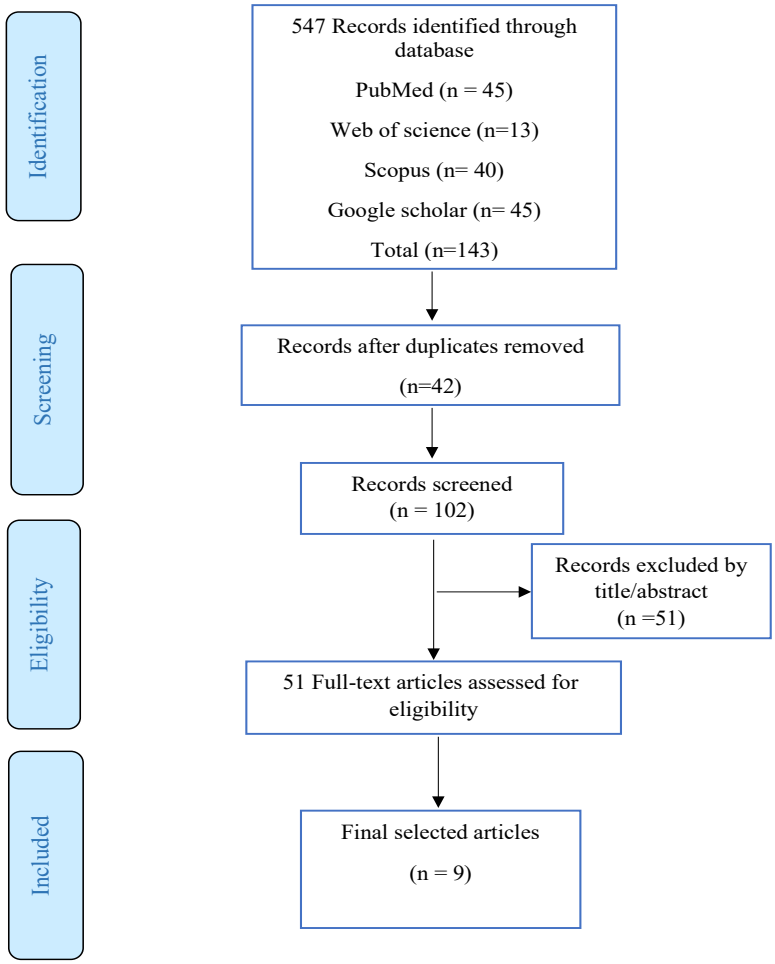

Figure 1. The result of the early review and screening process

Table 1. Telehealth interventions for patients with metabolic disorder during COVID-19

Author	Setting	Purpose	Technology	Method	Intervention	Result
Garg et al, (39)	Western Slopes of Colorado USA	Management of new-onset of diabetes for pediatric and adult.	Email, Internet via Zoom and telephone calls	- Type of study: case reports - sample size: 2 new-onset diabetes patients (adult, pediatric) - Method: Using telemedicine to educate persons who have - New-onset diabetes and telehealth visit for follow-up. - Follow-up time: 2 weeks	1. Adult: glucose monitoring and adjusted insulin dosage by CGM APP in the first week and tele-visit by a certified diabetes educator in the second week. 2. Pediatric: Daily dosing adjustments by a physician via phone and/or email. Educating family to send alert and insulin pump information.	The use of telemedicine was able to help manage the disease well in two cases of new-onset diabetes. Education and insulin dosage management.
Queiroz et al, (40)	Brazil.	Evaluating using a smartphone for diabetic retinopathy screening in the urban primary health setting. Educating healthcare personnel on retinal imaging and evaluating them.	Remote image reading at the EyerCloud platform	- Type of study: Prospective study - Sample size: 627 adults aged over 18 years old with 10 or 7 years of T2DM. - 63.2% female individual - The average age was 66.	1. Health care personnel trained by an ophthalmologist in 4 hours. 2. Retinal images acquisition by personals. 3. Image forward to EyerCloud. 4. Images divide into gradable and un-gradable. 5. Image evaluation by an ophthalmologist.	Clinical decision-making in 81% of patients. 439 have some degree of DM, and 70 patients were referred to the specialized.

provide medical care by phone, videoconferencing, and text messages for monitoring patients who have underlying diabetes and cardiovascular disease (46,47). We reviewed the technology-based approaches, especially telemedicine, during the COVID-19 pandemic for patients with metabolic disorders (diabetes and CVD). Smartphone-based retinal camera by trained nurses and specialized remote feedback with ophthalmologists. Utilizing this approach was effective for 80% of patients (40). CHF patients need a very close follow-up to prevent hospitalization. In Pakistan, 31 patients were followed up on defined CHF monitoring parameters, including weight changes. New or worsening ankle edema or breathing difficulty CHF symptoms were reported in 14 patients. 11 patients required adjustment of diuretic dose with successful management (44).

Two cases reported of new-onset of diabetes during the COVID-19 pandemic in Colorado Stay at Home Order at the Barbara Davis Center [BDC] were managed by telehealth successfully. Insulin dosage management and education about new-onset diabetes were provided using a combination of email, internet via Zoom, and telephone calls (39).

In China, video consultation was provided for vascular patients to evaluate the effectiveness and patients satisfaction of using telemedicine. The result showed 95% of patients were satisfied with this approach, but it was not better than a traditional office visit (38). The screening of COVID-19-related cardiac conditions for reducing decontamination time during the COVID-19 pandemic, Tablet-Based Limited Echocardiography, was done. This method provides necessary cardiac complication information for physicians. Scan time decreased from 24 min in the control group to 5.4 min in the case group (42).

Table 2. Telehealth interventions for patients with cardiovascular disease during COVID-19

Author	Setting	Purpose	Technology	Method	Intervention	Result
Klum et al, (41)	Germany	Multimodal patch stethoscope to estimate Einthoven's electrocardiogram (ECG) to extract respiratory parameters	phonocardiogram-derived Wearable Cardiorespiratory Monitoring	- Study type: Original - Sample size: 10 healthy people.	Cardiorespiratory monitoring in cardiovascular disease with a sleep disorder.	A wearable device is applicable for estimating ECG, PEP, LVET. and system in the supine, lateral, and prone positions and Both the respiration rate and the flow estimation performances were dependent on the subject position
McMahon et al, (42)	Hartford U.S	Assessing handheld tablet-based for echocardiography. It provides essential information for the diagnosis of heart disease for minimizing the contact between the health worker and patients	Tablet sonographer	- Study type: Retrospective, single-center, observational study. - sample size - two groups: - control:90 intensive care unit patients without COVID-19 - Test group: 90 patients suspected or with COVID-19. - time of examination:36 Days	- Traditional sonography for the control group - Tablet-based sonography for the test group. - Time of duration and information like examination indication, length of the examination, estimated. Ejection fraction, presence or absence of wall motion abnormalities, moderate or greater mitral regurgitation, presence or absence of pericardial effusion, and occurrence of follow-up transthoracic echocardiography.	1. in 99% of patients, tablet-based sonographers provide essential information. 2. average time for examination decrease in 24 min in the traditional method to 6 min in tablet-based approaches.

Table 2. Continued.

Author	Setting	Purpose	Technology	Method	Intervention	Result
Li et al, (43)	China	Evaluate the effectiveness and vascular patient's satisfaction with using virtual visits.	Video calls using WeChat software	- Type of study: a pilot study - Sample size:114 patients - patient age between 25 and 60 - 142 remote communication between 2 surgeons and 114 patients. - Men = 65% - Women = 22%	1. Videoconference interview between the surgeon and patient: asking about new symptoms, virtual visit, medical management, and providing treatment plans 2. patient fill at the end of each interview a questionnaire about the quality of the video call	95% of patients preferred a virtual visit instead of postponing the appointment. All the patients were satisfied with using telehealth during follow-up.
Ashraf1et al, (44)	Lahore Pakistan	Manage CHF patients in their homes by telemedicine to prevent exacerbation of CHF and keep them safe from viruses.	Telephone What Sapp	- Type of study: a descriptive study - Sample size:31 HF patients, mean age was 54.4 - 47% = diabetes - 67% = hypertension - 64% of coronary artery disease - Follow-up time = 8 weak	1. Vital signs like (BP), pulse monitoring, and weight ankle swelling record. Vital sign report by the patient to the cardiologist via What's App. 2. Electrolytes and serum creatinine were noted by patients. 3. tele-visit every 2 weeks. 4. Telephone interview between patient and cardiologist. 5. Lab results and daily vital records. Vital signs, symptoms, and medicine list evaluation during an interview. 6. Changing medication and recommend repeating lab tests if needed.	14 patients reported vital signs. Management of diuretic dose done successfully in 11 patients. 2. Patients were admitted to the hospital because of exacerbation of CHF...

Table 2. Continued.

Author	Setting	Purpose	Technology	Method	Intervention	Result
Solzano et al, (45)	Italy	HF hospitalization /death rate from 11th March -4th May of 2020 compared with the same time in 2019.	Telemedicine service: phone call, e-mail, chat, and videoconference services	- Type of study: Cross-sectional - Sample size: 103 HF patients in 2020 - control group:104 HF patients In 2019	HF hospitalization / death rate from 11th March -4th May of 2020 compared with the same time in 2019.	1. Telemedicine provides the medical decision in 51% of contact. 2. The result shows a significant difference in HF patient hospitalization rate. 3. No difference was observed in the death rate between the case and control group
Shaw et al, (25)	University of Oxford London	Analyze communication strategies to produce a recommendation for physicians and patients in video consultation.	Skype and FaceTime	- Type of study: Original Mixed methods design - Setting: 4 clinical settings across 2 trusts, London and Oxford. - Type of patients: diabetes, antenatal diabetes, cancer, and heart failure patients. - Method: Qualitative Analysis of Remote Consultations between patient and specialist	- Create a video dataset consisting of 37 recorded video consultations and 37 interviews with staff and 26 interviews with the patient, and 26 audio-recorded face-to-face interviews. - -video consultation between specialists and patients. - weekly telephone visit - recorded video and audio for video dataset	1. Selective patients and specialists used video technology, typically not always. 2. Patients and clinicians adapted quickly and easily to the video-mediated context. 3. identified some challenges like technical issues during a video consultation And. conducting a physical examination via video.

A result of a study about video consultation on diabetes and CVD patients showed that patients and clinicians adapted this technology quickly and easily. Video application is a novel form of communication for many users, particularly for older participants. The most important challenges to using telemedicine are

the absence of physical examination, technical issues, and technological literacy during the COVID-19 pandemic. The wearable device was used for monitoring cardiorespiratory function (ECG, PEP, and LVET). The wearable device is applicable by using a 55 mm single lead ECG integrated into a patch stethoscope system in the supine, lateral, and prone positions (41).

DISCUSSION

The present early review aimed to study information technology usage in the management of patients with diabetes and cardiovascular diseases during the COVID-19 pandemic. According to recent studies on metabolic disorders, the prevalence of diabetes mellitus and cardiovascular diseases was 11% and 8%, respectively. We described the influence of telemedicine services on diabetes and the cardiovascular population during the COVID-19 outbreak.

COVID-19 pandemic provided opportunities for technology-based approaches like telehealth to access safety and qualitative medical care for patients who have an underlying medical problem (48). Telemedicine uses capabilities of communication means, like a text message, video, audio, synchronous (real-time text, video, or audio), or asynchronous (by e-mail) for communication between the health worker and patients (49).

There are few studies about using telehealth for the management of patients with metabolic disorders during COVID-19. The results show that telehealth is an effective approach to managing patients with metabolic disorders. The type of technology approach shows that technology helps us to manage patients with metabolic disorders (49).

In most studies, patients use different applications to manage their health situation. The challenge in the management of patients with metabolic disease include: limited access to the internet, low knowledge to access the internet, and older adult need help to use these applications, do not have an internet-connected device or smartphone. Patients feel uncomfortable using new technology (5, 50).

Patients with cardiovascular diseases are at high risk of infection with COVID-19 (11, 35, 36), and this population is faced with severe morbidity and mortality (51). Telehealth is a good option for diabetes patients to access continuous glucose monitoring (CGM) and take part in disease management. Satish's gag and his partners used CGM app for the management of new-onset diabetes during an online visit successfully (52). Matthews et al., in a study on patients with diabetes during COVID-19 mentioned glucose control decreases COVID-19 severity and morbidity in diabetes patients (53).

Marcia Silva Queiroz and his partners studied technological tools in diabetic pediatric patients. Technological revolutionary tools in diabetes management included: insulin pumps, integrated sensors, automated insulin delivery, and dosage advice. These tools can help to establish a virtual diabetes clinic to deliver standard outpatient care (40).

In Mohammed E. Al-Soriano's study, the disadvantage of telemedicine was that telemedicine minimized the risk of being infected with COVID-19 in 74% of patients. Other advantages included decreased waiting time to visit with a health care provider, saving a cost (16%), the same quality of care in comparison to traditional visits. Disadvantage: lack of technical skill in 13% of patients, low care quality in 6.9% of patients, and telemedicine is more expensive than a traditional visit in 0.7 appointments.

Problems in most studies are: Poor Wi-Fi connection in areas far from hospitals and delayed audio, and interrupted video during the video consultation. Patients and healthcare workers could not solve the communication problems (such as lack of audio). Reimbursement is a main barrier to home-based telemedicine. A major barrier for large centers is Medicare and Medicaid reimbursement.

The challenge explained in Sara E Shaw and his colleagues' study in video consultation between patients and clinicians:

1: Establishing the technical connection and video consultation between patients and clinicians.
2: Disruption to **conversational flow's impact on the quality and outcome of the consultation.**
3: Conduct physical examination via video safely and appropriately.

The summary type of telehealth services, application, and name of the country show in the figures 2,3 & 4.

CONCLUSION

COVID-19, caused by SARS-CoV-2, is a global

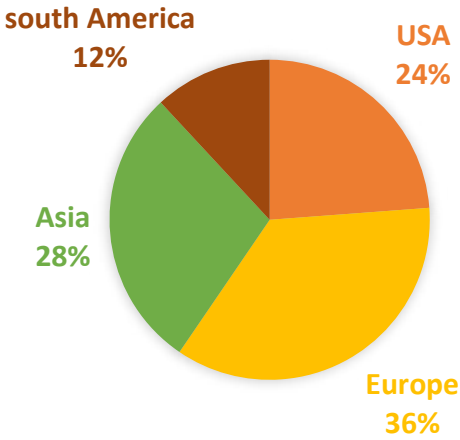

Figure 2. Distribution of reviewed studies based on continents

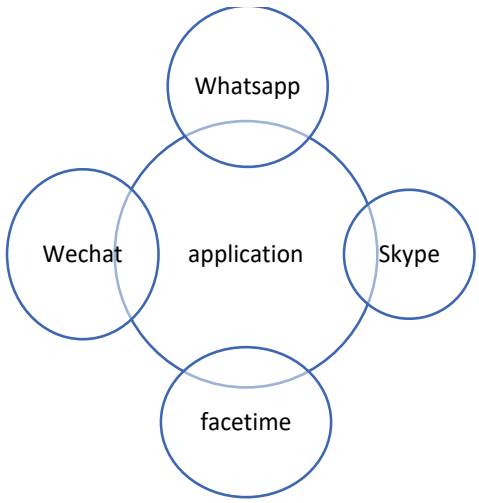

Figure 3. Most popular social network applications for telehealth purposes

pandemic. Patients with underlying medical problems like cardiovascular diseases and diabetes are at a greater risk of morbidity and mortality. Like all crises, the COVID-19 pandemic could offer the opportunity to put technology-based tools into practice to provide continuous medical care for vulnerable people. Telehealth is a good option for clinicians to deliver health care during COVID-19 while maintaining social distancing. Telehealth helps to manage cardiovascular and metabolic disorders, remote monitoring, and consultation to better treatments and interventions for patients.

Telehealth provides patients who have an underlying medical problem the ability to get medical assessments in their homes. It leads to a reduction in mortality and hospitalization. The distribution of reviewed studies based on continents, social network applications, and types of telehealth services are shown in figure 1, figure 2, and figure 3, respectively.

The Royal College of Surgeons of England recommended hospitals and surgical teams utilize virtual visits for outpatient appointments during the COVID-19 outbreak. A study about video consultations on diabetes and CVD patients showed that patients and clinicians adapted this technology quickly and easily. Video application is a novel form of communication for many users, particularly for older participants. The most important challenges to using telemedicine are the absence of physical examination, technical issues, and technological literacy. During the COVID-19 pandemic, the wearable device was used for

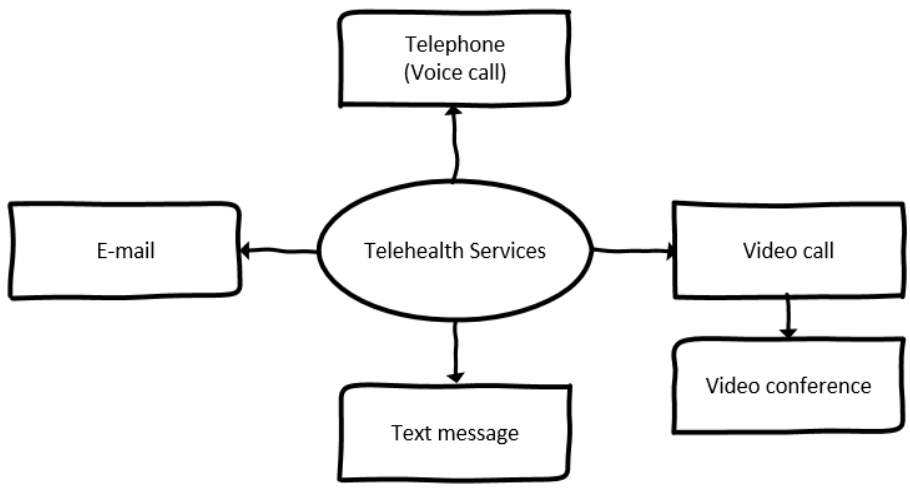

Figure 4. Different types of Telehealth services

monitoring cardiorespiratory function (ECG, PEP, and LVET). This type of wearable device is applicable by using a 55 mm single lead ECG integrated into a patch stethoscope system in the supine, lateral, and prone positions. Overall, this result indicates that telehealth can be an appropriate option for the management of patients with cardiovascular diseases and diabetes during the COVID-19 pandemic.

According to the results, the application of technology in the management of cardiovascular and metabolic disorders can be used to provide healthcare to patients regardless of distance, detection of disease, monitoring disease progression and complications, reducing healthcare costs, saving available resources, preventing readmission of patients, reducing the provider workload, and increasing family participation in disease management, quality of life, and patient satisfaction.

Telehealth projects must be economical, legal, and consistent with patient privacy. It should be noted that although the short-term effects of these technologies have been proven for optimal management of diseases in multiple studies; however, more studies should be done to prove the long-term effectiveness of these technologies.

Declarations

Ethical Approval and Consent to Participate:

- The study was approved by the Ethics Committee of Tabriz University of Medical Sciences (TUoMS) (IR.TBZMED.REC.1399.169).
- All methods were carried out in accordance with relevant guidelines and regulations.
- Informed consent was obtained from all participants involved in the study.

CONSENT FOR PUBLICATION

Not applicable

AVAILABILITY OF DATA AND MATERIALS

All data generated or analyzed during this study are included in this published article

COMPETING INTERESTS

No conflict of interest declared.

AUTHORS' CONTRIBUTIONS

Conceptualization: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Data curation: Yasaman Zaviyeh, Zeinab Mohammadzadeh.

Formal analysis: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Funding acquisition: Yasaman Zaviyeh, Zeinab Mohammadzadeh.

Investigation: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Methodology: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Project administration: Zeinab Mohammadzadeh.

Resources: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Software: Yasaman Zaviyeh.

Supervision: Zeinab Mohammadzadeh.

Validation: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Visualization: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

Writing–original draft: Yasaman Zaviyeh, Zeinab Mohammadzadeh.

Writing–review & editing: Yasaman Zaviyeh, Elham Maserat, Zeinab Mohammadzadeh.

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