



## Systematic Review



# Evaluating the Effectiveness of Telemedicine in Managing Common Conditions in Family Medicine

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## ABSTRACT

Telemedicine has been progressively implemented worldwide for managing common presentations in family medicine, a cornerstone of primary care. Its implementation has accelerated since the COVID-19 pandemic, offering improved healthcare access, cost-effectiveness, reduced hospital visits, and better clinical outcomes. **Objectives:** To evaluate the effectiveness of telemedicine in managing common conditions in family medicine. **Methods:** This systematic review was performed in accordance with PRISMA guidelines. An electronic search of PubMed, Google Scholar, and Science Direct databases was performed for papers published from January 2014 until December 2023. We included studies in English that measured telemedicine efficacy among common acute or chronic conditions in the family medicine setting. **Results:** In the 14 trials included, telemedicine successfully managed a variety of common conditions. Aggregate outcomes revealed that readmission to hospitals among patients with heart failure was significantly decreased, better clinical status in diabetes and obesity, including diet habits, BMI enzymion and blood pressure. **Conclusions:** Telemedicine is an effective tool for managing common conditions encountered in family medicine, boosting care access, cost-efficiency, and clinical outcomes. Targeting the development of evidence-based guidelines for hybrid care models and evaluations of long-term effects on chronic disease outcomes, research is needed.

## INTRODUCTION

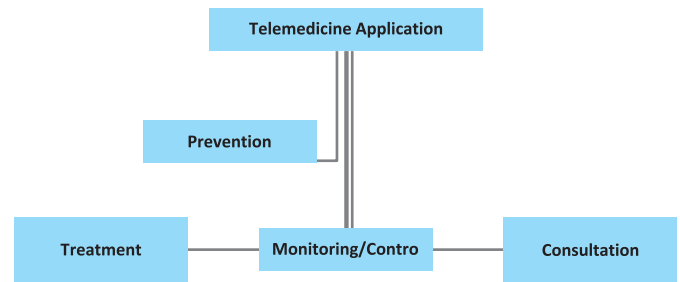
Telemedicine originated from the Greek word 'tele' meaning distance, and is defined by the WHO as the use of communication technology to provide healthcare services across distance by healthcare professionals, for the exchange of reliable healthcare information for treating, diagnosing, and preventing illnesses and injuries [1]. Although telemedicine is also used throughout the broader specialty of primary care, we wanted to examine its effectiveness within family medicine, a specialty that offers a comprehensive focus on the entire spectrum of

health for individuals and families from infancy through all ages [2]. From its mid-20th-century roots in teleradiology and remote monitoring, contemporary telemedicine enables provider-patient connection at any distance [3]. Modes of patient care. There exist multiple modes by which care towards patients is delivered, ranging from mobile apps and video conferencing to websites and virtual reality-based delivery models [4]. It has improved effective access to healthcare [5]. Over the past few decades, telemedicine has grown in popularity and has been

established as a standard component of routine healthcare. In recent years, telemedicine has become increasingly popular and has evolved into a normal practice in everyday healthcare [3]. A majority of hospitals in the U.S. already use telehealth systems to connect with patients. This is seen at a world level, but there are differences in adoption and infrastructure at the continental scale. Highest utilization rates of telemedicine technology were in radiology (39.5%), the emergency department (38.9%), pathology (30.4%), and psychiatry (27.8%)[6]. Telemedicine is also implemented in the field of dermatology, cardiology, oncology, and pre- and post-surgical care [7, 8]. Telemedicine was already widely integrated in medical teaching and learning before the COVID-19 pandemic [9, 10]. Family Practice, to a great degree, utilized telemedicine before the COVID-19 pandemic. Family physicians (FPs) provide full-spectrum care for patients of all ages in the community, including newborns, children, and the elderly [11]. It plays a vital role in prevention, health promotion, chronic care therapy, coordination, and public health support [12]. Telemedicine utilization enables FPs to manage consults, follow up with chronic care, and deliver follow-up care using telehealth, thereby minimizing requirements for in-person visits. The effectiveness of virtual care provided by family doctors within behavioral health programs was highlighted by studies [13]. Telemedicine incorporation in family medicine has exhibited significant capability to improve both accessibility and availability of healthcare, particularly in rural areas where healthcare access has been hindered by long-distance travel [14, 15]. Telemedicine allows patients to consult with family physicians from home, eliminating the need for travel [16]. Despite growing worldwide adoption, there is not enough in the literature to conduct large trials on the efficacy of telemedicine in treating common conditions in family medicine. It considers common conditions encompassing both acute and chronic conditions frequently encountered in family medicine to highlight the efficacy, advantages, usage, and physicians' perspectives in the management of illness-related symptoms via the use of different telemedicine modalities. This review facilitated ed healthcare workers in understanding the effectiveness of telemedicine technology and support evidence-informed decisions, guide efficient care delivery, and encourage the integration of telemedicine to boost patient outcomes and technology access in family medicine.

Telemedicine has rapidly expanded within primary care, particularly following the COVID-19 pandemic; however, its specific effectiveness within the scope of family medicine remains insufficiently synthesized. Existing literature often evaluates telehealth across broad primary care settings without isolating outcomes relevant to

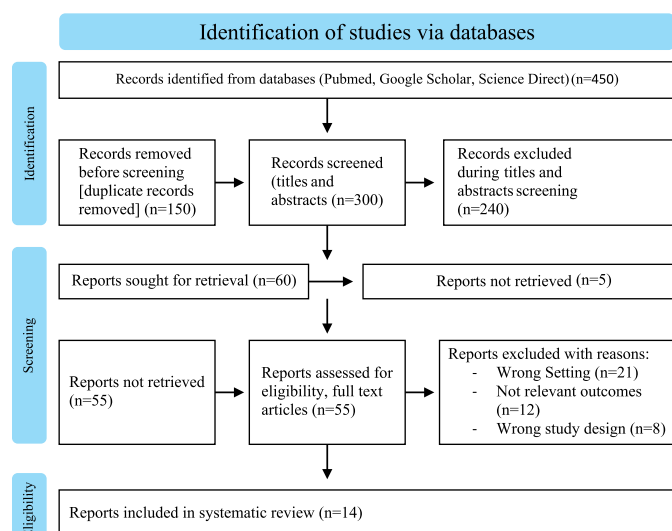
comprehensive, continuity-based family practice. Additionally, variability in study designs, patient populations, and outcome measures limits clear conclusions regarding its clinical effectiveness in managing common acute and chronic conditions. Therefore, a focused systematic evaluation of telemedicine outcomes within family medicine is warranted. This systematic review aims to evaluate the effectiveness of telemedicine in managing common conditions in family medicine (Figure 1).



**Figure 1:** Application of Telemedicine in Family Medicine

## METHODS

This systematic review followed the Preferred Reporting Items for Systematic Reviews and meta-analyses (PRISMA) guidelines. We searched for relevant studies published over the last decade, from January 2014 to December 2023, in various databases (PubMed, Google Scholar, and Science Direct) search of Boolean logic "AND" and "OR", Medical Subject Headings (MeSH Terms), and keywords. The search was supplemented with relevant MeSH terms through the PubMed database. The following representative search string was adapted for each database: ("telemedicine" OR "telehealth" OR "virtual care" OR "remote consultation") AND ("family medicine" OR "primary care" OR "general practice") AND ("effectiveness" OR "outcome" OR "management" OR "evaluation"). In total, we retrieved 105 articles from the included databases. After inclusions/exclusion criteria were met, and duplicates and irrelevant papers were removed, a total of 14 articles were qualified from all the mentioned studies. The methodological quality and risk of bias for all 14 identified studies were evaluated by two reviewers separately. Specific checklists of the Joanna Briggs Institute (JBI) Critical Appraisal Tools were used, according to the design of each study evaluated (eg, JBI Checklist for Randomized Controlled Trials, JBI Checklist for Cross-Sectional Studies). Any disagreements were resolved by discussion and through consensus with a third author. The findings of the quality assessment were used to put evidence in context, not for excluding studies. Included articles were 14; two studies were systematic; four were RCTs; two had mixed methods, two observed the community prospectively or retrospectively, and one was a feasibility and the other was a pilot study (Figure 2).



**Figure 2:** PRISMA 2020 Flow Diagram for Study Selection

## RESULTS

The principal results from 14 included studies were synthesized according to the most identified themes. Evidence is available that telemedicine is effective in the

management of chronic diseases through family practice. There were several randomized controlled trials that found significant changes in clinical outcomes [17]. Data-driven analysis revealed a substantial decrease in non-fatal HF (HR=0.35) [18], better glycemia control in type 2 diabetics (HbA1c variation -0.5%) [19, 20], and reduced BMI z-score value (-0.11, p=0.006) of obese adolescents [21]. Telemedicine changed the use of care-seeking in a positive way. A critical outcome was a reduction in hospital readmission for heart failure (HR 0.39) [18]. For urgent care, one large retrospective study reported that 82% of telehealth visits were resolved without a follow-up in-person visit [22, 23]. Additionally, various studies have corroborated the fact that telemedicine improves access to healthcare in rural areas [24, 25]. Overall, patient satisfaction with telemedicine has been high in multiple studies [26-28], including among older adults. Family physicians reported positive attitudes towards telemedicine, with more than 80% wishing to integrate it as a formal aspect of their practice. The most commonly reported provider challenge was a lack of physical examination [29] (Table 1).

**Table 1:** Summary of Characteristics and Key Findings of Included Studies

References	Country	Study Design	Population and Sample Size (N)	Intervention	Key Findings / Effect Sizes
[17]	Qatar	Cross-Sectional Study	Adults with chronic diseases (N=286)	Telephone Consultations vs. Face-to-Face	Higher follow-up adherence in the telephone group (89%) vs. in-person group (76%).
[18]	Spain	Randomized Controlled Trial (RCT)	Patients with heart failure; sample size not specified here (check full text)	Telemedicine added to multidisciplinary disease management programs	Reduced clinical events and healthcare costs; improved patient outcomes
[19]	N/A	Systematic Review	Pediatric population (25 studies reviewed)	Various (Video, mobile apps, etc.)	Telemedicine outcomes were comparable or superior to in-person care for medication compliance and symptom management.
[20]	France	Randomized Controlled Trial	Type 2 diabetes & abdominal obesity (N=142)	Automated Web-Based Program	Intervention group showed significant HbA1c reduction (-0.5%, p<0.010) vs. control.
[21]	USA	Pilot Study	Overweight adolescents (N=58)	PCP visits + specialist tele-visits	Significant BMI z-score reduction at 6 months in intervention group (-0.11, p=0.006).
[22]	Canada	Mixed Methods Study	Family physicians (N=32)	Hybrid Virtual/In-person Care	Hybrid model associated with positive clinical outcomes and reduced emergency department visits.
[23]	USA	Retrospective Observational Study	Patients with acute illnesses (N=512)	Real-time Telehealth Visits	Telehealth visits resolved issues without an in-person follow-up in 82% of cases.
[24]	Canada	Feasibility Study	Patients & staff in rural practice (N=25)	Electronic Communication System	Electronic communication was feasible and perceived to enhance access and quality of care.
[25]	USA	Randomized Controlled Trial	Rural children with obesity (N=204)	Telemedicine vs. Telephone Intervention	Both interventions were feasible; telemedicine showed a small, non-significant advantage in clinical effect.
[26]	USA	Randomized Controlled Trial	Children with ADHD & caregivers (N=199)	Hybrid Telehealth Model (Video)	Significant reduction in caregiver distress in the telehealth group compared to standard care.

[27]	Italy	Randomised controlled trial (RCT), open-label, multicenter	Older patients with combined COPD and CHF; sample size not specified in abstract	4-month integrated home-based telerehabilitation programme (Telereab-HBP) combining medical/nursing care and physical rehabilitation via telemedicine	Improved exercise tolerance (6MWT) - Reduced hospitalisation and mortality - Decreased dyspnoea (MRC scale) - Enhanced physical activity (PASE) - Improved disability (Barthel Index) - Better quality of life (Minnesota Living with Heart Failure Questionnaire & COPD Assessment Test).
[28]	N/A	Systematic Review	Older adults in primary care (34 studies reviewed)	Telemedicine (Various)	High rates of patient satisfaction reported across studies; feasibility was high for managing chronic conditions.
[29]	Portugal	Cross-Sectional Study	Family physicians (N=134)	Teleconsultation (Survey)	80.6% of physicians wanted to include teleconsultation in their practice; inability to physically examine was the main barrier.
[30]	France	Prospective Observational Study	Patients with suspected COVID-19 (N=150)	Teleconsultation vs. Face-to-Face	Discrepancies noted, but telemedicine was deemed an effective alternative during the pandemic.
[31]	Canada	Mixed Methods Study	Adults with hypertension (N=105)	mHealth Intervention	Intervention led to improved patient engagement and supported blood pressure management.

## DISCUSSION

This systematic review, involving 14 studies, shows that telemedicine is an efficient adaptive system in family medicine. Our results indicate that utilizing telemedicine not only leads to better clinical outcomes in prevalent chronic diseases but also increases access and is acceptable for patients and providers. These findings contextualize the role of telemedicine in transforming healthcare and its practical application for the future of family practice. The most persuasive arguments of the review are those for controlling chronic illnesses, which constitute a defining norm in family medicine. Trials have shown reductions in clinical endpoints such as heart failure and type 2 diabetes [32]. Similar outcomes were identified for hypertension and pediatric obesity [21]. Evidence has also been demonstrated in behavioral health, where researchers successfully treated ADHD and improved patient adherence to drug therapy for a range of chronic diseases [26]. Moreover, varying models of delivery—from telephone to more sophisticated telemedicine platforms were found to be feasible and effective interventions for rural pediatric populations [33]. Beyond chronic care, the study emphasizes that telemedicine is effective in managing acute conditions and alleviating system burden. Evidence shows that a high proportion of acute problems can be managed safely without requiring in-person visits [23]. However, its utility as a triage tool means caution is warranted, as studies identified potential for clinical variability across remote and face-to-face assessments, particularly during the COVID-19 pandemic. User experience significantly influences the optimal use of telemedicine, which was evident in favorable patient and provider opinions. Patients reported high satisfaction, particularly in elderly subgroups. From a service perspective, many family doctors expressed willingness to

integrate teleconsultation formally into practice. This optimism is tempered by the consensus that not being able to physically examine patients represents a limitation, supporting the adoption of a balanced hybrid model of care [29, 34]. Finally, the results highlight the potential for telemedicine to contribute to health equity through increased access. Telemedicine has been demonstrated as a feasible and effective method to improve the quality of care in rural underserved communities [35]. Systematic reviews covering the entire lifespan—from pediatric to geriatric populations—indicate that virtual care can be applied across multiple contexts. The ability of telemedicine to span geographic and population distances is one of its largest contributions to the core values of family medicine [33]. This review has several limitations. First, the relatively small number of included studies (n=14), resulting from strict inclusion criteria, may reduce generalizability across patient samples. Second, the studies were heterogeneous in design, populations, interventions, and outcomes, precluding meaningful meta-analysis. Finally, publication bias is possible, as studies with positive or statistically significant findings are historically more likely to be published. This review also included only peer-reviewed articles in English, potentially missing relevant non-English or grey literature. Prospective research based on quantitative outcomes is needed to fill gaps identified by this review. Longitudinal studies could examine the impact of hybrid care models on chronic disease management and patient-provider experiences. From a health equity perspective, future research should evaluate low-bandwidth solutions in underserved communities and the consistency of outcome indicators to minimize heterogeneity in the literature.

This review is limited by the small number of included

studies and their methodological heterogeneity, which precluded quantitative meta-analysis. Variability in interventions, outcome measures, and follow-up durations may affect the comparability and generalizability of findings. Furthermore, inclusion of English-language peer-reviewed studies only may have introduced publication bias. Future research should emphasize standardized outcome reporting, long-term evaluation of hybrid care models, and rigorous randomized controlled trials to strengthen evidence for sustainable integration of telemedicine into family medicine practice.

## CONCLUSIONS

This review highlights the fact that telemedicine is a promising and sometimes efficient activity in family practice, with strong evidence of use to take care of common chronic diseases and improve access to care. But the procedure is not free of complications. The study results indicate that although telemedicine may facilitate better clinical management and patient satisfaction, its usefulness should be considered in relation to the inherent limitation of not being able to physically examine patients and the potential for diagnostic uncertainty. For this reason, telemedicine is something that should not be considered a panacea for traditional care but rather integrated consciously and critically into a hybrid care model, taking advantage of the benefits of both virtual and Face-to-Face consultations.

## Authors' Contribution

Conceptualization: NS, SA

Methodology: NS

Formal analysis: SA

Writing and Drafting: NUHZ, KS, UK, NK

Review and Editing: NUHZ, KS, UK, NK, NS, SA

All authors approved the final manuscript and take responsibility for the integrity of the work

## Conflicts of Interest

All the authors declare no conflict of interest.

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## REFERENCES

- [1] Jobé C, Carron PN, Métrailler P, Bellagamba JM, Briguët A, Zurcher L, *et al.* Introduction of Telemedicine in a Prehospital Emergency Care Setting: A Pilot Study. *International Journal of Telemedicine and Applications*. 2023; 2023(1): 1171401. doi: 10.1155/2023/1171401.
- [2] Loane M, Wootton R. A Review of Guidelines and Standards for Telemedicine. *Journal of Telemedicine and Telecare*. 2002 Apr; 8(2): 63-71. doi: 10.1258/1357633021937479.
- [3] Stoltzfus M, Kaur A, Chawla A, Gupta V, Anamika FN, Jain R, *et al.* The Role of Telemedicine in Healthcare: An Overview and Update. *The Egyptian Journal of Internal Medicine*. 2023 Dec; 35(1): 1-5. doi: 10.1186/s43162-023-00234-z.
- [4] Liverpool S, Mota CP, Sales CM, Čuš A, Carletto S, Hancheva C, *et al.* Engaging Children and Young People in Digital Mental Health Interventions: Systematic Review of Modes of Delivery, Facilitators, and Barriers. *Journal of Medical Internet Research*. 2020 Jun; 22(6): e16317. doi: 10.2196/16317.
- [5] Gross IT, Whitfill T, Redmond B, Couturier K, Bhatnagar A, Joseph M, *et al.* Comparison of Two Telemedicine Delivery Modes for Neonatal Resuscitation Support: A Simulation-Based Randomized Trial. *Neonatology*. 2020 Jan; 117(2): 159-66. doi: 10.1159/000504853.
- [6] Kane CK, Gillis K. The Use of Telemedicine by Physicians: Still the Exception rather than the Rule. *Health Affairs*. 2018 Dec; 37(12): 1923-30. doi: 10.1377/hlthaff.2018.05077.
- [7] Lin O, Rudomina D, Feratovic R, Sirintrapun SJ. Rapid On-site Evaluation Using Telecytology: A Major Cancer Center Experience. *Diagnostic Cytopathology*. 2019 Jan; 47(1): 15-9. doi: 10.1002/dc.23925.
- [8] Williams AM, Bhatti UF, Alam HB, Nikolian VC. The Role of Telemedicine in Postoperative Care. *Mhealth*. 2018 May; 4: 11. doi: 10.21037/mhealth.2018.04.03.
- [9] Kuhn S, Jungmann F. Medicine in the Digital Age. *The Radiologist*. 2018 Mar; 58(3): 236-40. doi: 10.1007/s00117-017-0351-7.
- [10] Ndwabe H, Basu A, Mohammed J. Post Pandemic Analysis on Comprehensive Utilization of Telehealth and Telemedicine. *Clinical eHealth*. 2024 Feb; 7: 5-14. doi: 10.1016/j.ceh.2023.12.002.
- [11] Garg S, Engtipi K, Kumar R, Garg A. Role of Family Physicians in Providing Primary Healthcare during COVID-19 Pandemic. *Journal of Family Medicine and Primary Care*. 2022 Nov; 11(11): 6687-9. doi: 10.4103/jfmpc.jfmpc\_2209\_20.
- [12] Shams L, Mobinizadeh M, Nasiri T, Mohammadi F. Prioritizing Implementation Solutions for the Urban Family Physician Policy in Iran: A Multi-Criteria Decision-Making Study. *BMC Health Services Research*. 2025 Jan; 25(1): 143. doi: 10.1186/s12913-025-12291-x.
- [13] Hedden L, Spencer S, Mathews M, Gard Marshall E, Lukewich J, Asghari S, *et al.* Technology Has Allowed Us to Do a Lot More but It's Not Necessarily the

- Panacea for Everybody: Family Physician Perspectives on Virtual Care during the COVID-19 Pandemic and Beyond. *PLoS One*. 2024 Feb; 19(2): e0296768. doi:10.1371/journal.pone.0296768.
- [14] Barbosa W, Zhou K, Waddell E, Myers T, Dorsey ER. Improving Access to Care: Telemedicine Across Medical Domains. *Annual Review of Public Health*. 2021 Apr; 42(1): 463-81. doi: 10.1146/annurev-publhealth-090519-093711.
- [15] Klee D, Pyne D, Kroll J, James W, Hirko KA. Rural Patient and Provider Perceptions of Telehealth Implemented during the COVID-19 Pandemic. *BMC Health Services Research*. 2023 Sep; 23(1): 981. doi: 10.1186/s12913-023-09994-4.
- [16] Benjamin I, Idoko JE, Alakwe JA, Ugwu OJ, Ochanya F, et al. The Role of Telemedicine in Rural America: Overcoming Electrical and Technological Barriers to Improve Health Outcomes. *International Journal of Scientific Research Archive*. 2024; 12(2): 188-205. doi:10.30574/ijrsra.2024.12.2.1176.
- [17] AlAhmad YM, Mahmoud Haggeer D, Alsayed AY, Haik MY, AbuAfifeh LM, Hussain Aljaber M, et al. The Effect of Telemedicine on Patients' Compliance in Family Medicine Follow-ups in Qatar. *Avicenna*. 2021 Nov; 2022(1): 3. doi:10.5339/avi.2022.3.
- [18] Comín-Colet J, Enjuanes C, Verdú-Rotellar JM, Linas A, Ruiz-Rodríguez P, González-Robledo G, et al. Impact on Clinical Events and Healthcare Costs of Adding Telemedicine to Multidisciplinary Disease Management Programmes for Heart Failure: Results of a Randomized Controlled Trial. *Journal of Telemedicine and Telecare*. 2016 Jul; 22(5): 282-95. doi: 10.1177/1357633X15600583.
- [19] Do Alfuqhar IM, Khalafalla AE, Ali SH, Adam EI, Osman HM, Alrabie RS, et al. Effectiveness of Telemedicine in Managing Health-Related Issues in the Pediatric Population: A Systematic Review. *Cureus*. 2024 Oct; 16(10).
- [20] Hansel B, Giral P, Gambotti L, Lafourcade A, Peres G, Filipecki C, et al. A Fully Automated Web-Based Program Improves Lifestyle Habits and HbA1c in Patients with Type 2 Diabetes and Abdominal Obesity: Randomized Trial of Patient E-Coaching Nutritional Support (The ANODE Study). *Journal of Medical Internet Research*. 2017 Nov; 19(11): e360. doi: 10.2196/jmir.7947.
- [21] Fleischman A, Hourigan SE, Lyon HN, Landry MG, Reynolds J, Steltz SK, et al. Creating an Integrated Care Model for Childhood Obesity: A Randomized Pilot Study Utilizing Telehealth in a Community Primary Care Setting. *Clinical Obesity*. 2016 Dec; 6(6): 380-8. doi:10.1111/cob.12166.
- [22] Fitzsimon J, Patel K, Peixoto C, Belanger C. Family Physicians' Experiences with an Innovative, Community-Based, Hybrid Model of In-person and Virtual Care: A Mixed-Methods Study. *BMC Health Services Research*. 2023 Jun; 23(1): 573. doi: 10.1186/s12913-023-09599-x.
- [23] Farford BA, Bulbarelli EM, Ricketts I, Nath S, Ahuja AS, Keith J, et al. Accuracy of Telehealth Visits for Acute Care Needs in Family Medicine. *Cureus*. 2024 May; 16(5). doi:10.7759/cureus.59569.
- [24] Chang F, Paramsothy T, Roche M, Gupta NS. Patient, Staff, and Clinician Perspectives on Implementing Electronic Communications in an Interdisciplinary Rural Family Health Practice. *Primary Health Care Research and Development*. 2017 Mar; 18(2): 149-60. doi:10.1017/S1463423616000414.
- [25] Davis AM, Sampilo M, Gallagher KS, Dean K, Saroja MB, Yu Q, et al. Treating Rural Paediatric Obesity through Telemedicine vs. Telephone: Outcomes from a Cluster Randomized Controlled Trial. *Journal of Telemedicine and Telecare*. 2016 Mar; 22(2): 86-95. doi:10.1177/1357633X15586642.
- [26] Vander Stoep A, McCarty CA, Zhou C, Rockhill CM, Schoenfelder EN, Myers K. The Children's Attention-Deficit Hyperactivity Disorder Telemental Health Treatment Study: Caregiver Outcomes. *Journal of Abnormal Child Psychology*. 2017 Jan; 45(1): 27-43. doi:10.1007/s10802-016-0155-7.
- [27] Bernocchi P, Vitacca M, La Rovere MT, Volterrani M, Galli T, Baratti D, et al. Home-based Telerehabilitation in Older Patients with Chronic Obstructive Pulmonary Disease and Heart Failure: A Randomised Controlled Trial. *Age and Ageing*. 2018 Jan; 47(1): 82-8. doi:10.1093/ageing/afx146.
- [28] Ilali M, Le Berre M, Vedell I, Khanassov V. Telemedicine in the Primary Care of Older Adults: A Systematic Mixed Studies Review. *BMC Primary Care*. 2023 Jul; 24(1): 152. doi:10.1186/s12875-023-02085-7.
- [29] Dantas R, Campos N, Castro AC, Santos E, de Sá Laranjeira SM, Silva CR. Teleconsultation, a Tool for the Future? The Portuguese Family Doctors' Perspective. *Atencion Primaria Practica*. 2023 Jan; 5(1): 100169. doi:10.1016/j.appr.2023.100169.
- [30] Verhaeghe H, Chellum N, Tressières B, Ouissa R, Roger PM. Teleconsultation in Family Medicine amid the COVID-19 Pandemic: An Adequate Tool? *Infectious Diseases Now*. 2022 Jun; 52(4): 230-2. doi:10.1016/j.idnow.2022.05.004.
- [31] Barsky J, Hunter R, McAllister C, Yeates K, Campbell N, Liu P, et al. Analysis of the Implementation, User Perspectives, and Feedback from a Mobile Health Intervention for Individuals Living with Hypertension

- (DREAM-GLOBAL): Mixed Methods Study. JMIR mHealth and uHealth. 2019 Dec; 7(12): e12639. doi: 10.2196/12639.
- [32] Ma Y, Zhao C, Zhao Y, Lu J, Jiang H, Cao Y, et al. Telemedicine Application in Patients with Chronic Disease: A Systematic Review and Meta-analysis. BMC Medical Informatics and Decision Making. 2022 Apr; 22(1): 105. doi: 10.1186/s12911-022-01845-2.
- [33] Mahdavi S, Fekri M, Mohammadi-Sarab S, Mehmandoost M, Zarei E. The Use of Telemedicine in Family Medicine: A Scoping Review. BMC Health Services Research. 2025 Dec; 25(1): 1-3. doi: 10.1186/s12913-025-12449-7.
- [34] Butzner M, Cuffee Y. Telehealth Interventions and Outcomes across Rural Communities in the United States: Narrative Review. Journal of Medical Internet Research. 2021 Aug; 23(8): e29575. doi: 10.2196/29575.
- [35] Haleem A, Javaid M, Singh RP, Suman R. Telemedicine for Healthcare: Capabilities, Features, Barriers, and Applications. Sensors International. 2021 Jan; 2: 100117. doi: 10.1016/j.sintl.2021.100117.