

# Contribution of mobile health technologies to public health in rural areas: Accessibility and education methods

Gönül Gökçay<sup>1</sup> Ali Uğurlu<sup>2</sup> Eda Ersarı Şen<sup>3</sup> Arzuv Hudaykulyyeva<sup>4</sup> <sup>1</sup> Department of Public Health Nursing, Faculty of Health Sciences, Kafkas University. Kars / Türkiye<sup>2</sup> Health Research and Application Center, Kafkas University. Kars / Türkiye<sup>3</sup> Zübeyde Hanım Vocational and Technical Anatolian High School. İzmit Kocaeli / Türkiye<sup>4</sup> Department of Public Health Nursing, Faculty of Health Sciences, Kafkas University. Kars / Türkiye

## Abstract

In today's rapidly advancing world, mobile health services have become influential in various aspects of our lives. It is anticipated that mobile applications, especially in rural areas, can play a significant role in the delivery of healthcare services. In this context, it is essential to examine the applications of mobile health services in rural areas and the education methods employed in these applications. The main objective of this study is to explore the contributions of mobile health services applications in rural areas to public health and to examine the education methods used in these services in light of current literature. The focus of this study is on how mobile health applications can be utilized in rural areas, the impact of this usage on public health, and the effectiveness of the education methods employed. The research was conducted through searches using key terms such as "mobile health" and "public health nursing" or "mobile health technologies" and "nursing" or "telehealth" on important academic databases like Google Scholar, PubMed free fulltext, Science Direct, Ebscohost, Sage, Scopus, and CINAHL. The information obtained from literature searches was analyzed to understand the impact of mobile health applications on public health in rural areas and the education methods employed. The study results indicate that the use of mobile health applications in rural areas can contribute significantly to public health. Advantages such as rapid diagnosis and treatment, effective monitoring of chronic diseases, and quick access to emergency services stand out among the potential impacts of mobile health applications. Mobile health applications can contribute significantly to public health in rural areas and increase their usage, particularly in primary healthcare services.

**Keywords:** Mobile applications, rural areas, public health, nursing

**Citation:** Gökçay G, Uğurlu A, Ersarı Şen E, Hudaykulyyeva A. Contribution of mobile health technologies to public health in rural areas: Accessibility and education methods. Health Sci Q. 2024;4(2):127-36. <https://doi.org/10.26900/hsq.2280>

**Corresponding Author:**  
Gönül Gökçay  
Email: gokcaygonul22@gmail.com



This work is licensed under a Creative Commons Attribution 4.0 International License.

## Introduction

In today's rapidly evolving world, technology is advancing swiftly and finding its place in every aspect of our lives, including healthcare services. Simultaneously, the increasing use and cost-effectiveness of mobile technologies have made them attractive for use in healthcare services [1]. Mobile applications are programs encompassing software, hardware, and internet connectivity on portable devices such as smartphones and tablets, becoming almost integral to people's lives [2]. Mobile health, in brief, involves the execution of health services through programs installed on devices like phones and tablets [3]. Digital health is defined as the field of knowledge and application related to the development and use of digital technologies to improve health across the spectrum of health technologies and services offered in care, including telehealth, mobile health applications, wearable technologies, and online health [4]. Digital health technologies serve as a significant transformational tool in public health nursing. Technologies such as telehealth, mobile health (mHealth), electronic health records, and artificial intelligence facilitate nurses in providing patient monitoring, health education, and counseling services. For instance, telehealth applications allow nurses to conduct remote patient assessments and provide support for the management of individuals with chronic illnesses [5]. Furthermore, technological innovations enhance the accessibility of health services, especially for individuals residing in rural and hard-to-reach areas. Telehealth and mobile health applications contribute to reducing health inequalities by facilitating access to specialized health services for these individuals [6]. The primary aim of this study is to examine the contributions of the implementation of mobile health services in rural areas to public health and to explore the education methods used in mobile health services, considering the current literature.

## Materials and Methods

Searches were conducted on major academic databases such as Google Scholar, PubMed free fulltext, Science Direct, Ebscohost, Sage, Scopus, and CINAHL using keywords including "mobile

health" AND "public health nursing" OR "mobile health technologies" AND "nursing" OR "telehealth" AND "public health nursing" OR "m-health" AND "nursing" and their Turkish translations.

## Literature Review

### *Definition of Mobile Health*

Mobile health is an integrated health service covering a wide range of electronic devices, including smartphones, tablets, web pages, message services, and all wireless portable electronic devices. It aims to expand the capabilities of both healthcare providers and recipients for interactive integration, with the goal of rapid diagnosis, effective treatment, and low cost [7,8]. In other words, it is an innovative application with benefits such as remote disease management, collection of health-related data, and early warning systems related to diseases and symptoms using mobile communication technology and infrastructure [9].

### *Expected Effects of Mobile Health*

The expected effects of mobile health include faster diagnosis and treatment, increased awareness among individuals for better health, strengthening preventive healthcare services, more rigorous monitoring of individuals with chronic diseases, and easier access to general data and statistics, enabling cost-effective planning, implementation, and measures [10]. Prior to the COVID-19 pandemic, numerous studies demonstrated the benefits of telehealth services. In relation to the cardiovascular community, a meta-analysis conducted in 2017 found that heart failure patients treated via telemedicine in addition to standard in-person care visits had lower all-cause mortality rates, lower rates of heart failure admissions, and a reduction in length of hospital stay compared to patients treated solely through face-to-face approaches [11,12]. This has been attributed to the earlier recognition of symptoms and consequently linked to earlier interventions and guided self-management [12]. Similarly, research in primary care settings has shown that levels of glycosylated hemoglobin (HbA1c) were lower in the telemedicine group compared to standard care settings [12,13]. Technological

innovations, particularly telehealth and mobile health services, are increasing the accessibility of healthcare services, especially for individuals residing in rural and hard-to-reach areas. By delivering specialist healthcare services to individuals in these regions, telehealth and mobile health services contribute to reducing disparities in healthcare access. Consequently, public health nurses are able to serve a broader patient population by overcoming geographical barriers [14,15].

#### *Stakeholders in Mobile Health Services*

Stakeholders in mobile health services include healthcare professionals (nurses, physicians, midwives, laboratory technicians, etc.), healthcare recipients (patients, family members, healthy individuals), healthcare institutions (nursing homes, retirement homes, hospitals, pharmacies), reimbursement institutions (social security institutions, health insurance companies), pharmaceutical and medical device companies, health-related civil society organizations, and medical call centers [16].

#### *Applications of Mobile Health*

The applications of mobile health include education (training for healthcare students and care education for patients and their families), point-of-care support and diagnosis (supporting healthcare professionals in the diagnosis and diagnostic process), patient monitoring (tracking response to treatment, checking if medications are taken at the right times, monitoring medication dosages), disease and outbreak surveillance (monitoring infectious diseases and taking precautions against epidemic risks), emergency medical response systems (issuing alerts in accidents and disaster situations), and health information systems (storage and management of all health data) [17,18].

#### *Mobile Health Applications*

Expanding the scope of healthcare to facilitate 'the ease and comfort of receiving medical care anywhere and anytime' should be our main goal. To achieve this, it is necessary to overcome both geographical barriers and facilitate access to technology [19]. According to data from the International Telecommunication Union, the number of mobile phone users worldwide

has exceeded 6 billion, equivalent to 75% of the world's population. In Türkiye, this rate is 96% [20]. An environment where high-quality healthcare is provided with low-cost mobile devices has the potential to change the familiar healthcare world. The potential and spreading opportunities of mobile health are promising, ranging from raising awareness about HIV/AIDS in developing countries to calculating the calories in a "cheeseburger" with various applications [16,21].

#### *Advantages of Mobile Health Applications*

While there are numerous advantages to mobile health applications, a few are listed below:

- Encourages users to engage in physical activity and take their medications regularly and on time.
- Facilitates the monitoring and recording of individuals' vital signs.
- Reduces healthcare expenses, thus lowering costs.
- Enables individuals to monitor their own health, enhancing their knowledge and skills related to health [7,22].

#### *Disadvantages of Mobile Health Applications*

- May lead to internet and phone dependency.
- Insufficient cognitive levels of the elderly population may lead to misunderstandings [23,24].
- Excessive or abuse of the Service
- Inadvertent overuse of healthcare resources due to unnecessary visits
- Inequalities in internet use and access to technology between rural communities and ethnic minority groups
- Concerns across personal medical devices [12].

#### *Effects of Mobile Health Technologies on Rural Areas*

The World Health Organization predicts a global shortage of approximately 13 million skilled health workers by 2035. Additionally, while developed countries have a high number of skilled health workers, this ratio is insufficient in developing countries. Mobile health technologies will serve as a strong driving force in addressing

this inadequacy, especially in rural areas of developing countries [25,26].

Mobile technologies offer numerous opportunities to shape the future of primary healthcare services and provide effective public health action. With improved communication of mobile technologies over time, supported by education, it is possible to create and strengthen a healthy community. The humanitarian problems faced by the rural population in accessing health facilities, such as extreme weather conditions, difficult terrain, lack of roads, transportation difficulties, time loss, financial challenges, crowding, and traffic, will no longer be obstacles addressed by mobile health. Therefore, barriers between healthcare providers and recipients will be lifted, and new bridges will be established for a fast, active, accessible interaction [27,28].

#### *Measures for the Development and Proliferation of Mobile Health Services*

Mobile health applications and service delivery will complement, and in many places, supplement traditional healthcare services where they fall short. The integrated health paradigm with mobile technologies covering all healthcare services is in the development stage and gaining momentum. Country leaders, by acting swiftly and not only educating healthcare professionals but also their citizens in this direction, can avoid the concerns of countries at risk of collapse in the future healthcare sector [25,29]. Recommendations for the development and proliferation of mobile health services include:

- Setting new goals in the field of mobile health, creating a strategic plan and roadmap, and increasing government support.
- Strengthening communication infrastructure and increasing mobile health literacy.
- Implementing joint plans and programs with the education sector for all ages and disciplines.
- Conducting activities to promote mobile health awareness among the public.
- Encouraging entrepreneurs and supporting R&D projects to increase the development and use of smart health applications.
- Never neglecting security and privacy issues [7,25].

Randomized controlled trials conducted in the last five years on mobile health technologies are listed in table 1.

#### **Recommendations for Public Health and Nursing Regarding the Use of Mobile Health in Rural Areas**

Mobile health applications can contribute significantly to public health in rural areas and increase their usage, particularly in primary healthcare services. The following recommendations should be considered:

##### *Education and awareness*

Prioritize the education of individuals and healthcare professionals in rural areas to enhance the use of mobile health applications. Healthcare service providers should raise awareness among the public about the benefits of mobile health applications and encourage their usage.

##### *Infrastructure development*

Strengthening internet access and mobile infrastructure in rural areas is crucial. Healthcare service providers should collaborate with local governments and telecommunications companies to establish robust internet infrastructure in these regions.

##### *Patient monitoring and chronic diseases*

Mobile health applications can serve as effective tools for monitoring chronic diseases in individuals residing in rural areas. Healthcare professionals can facilitate patient monitoring using mobile health applications, allowing for early intervention.

##### *Emergency services*

Mobile health applications can assist in the effective delivery of emergency services to rural areas. Quick alert and assistance systems can be established through mobile health applications in accidents, natural disasters, and other emergency situations

##### *Accessibility for the elderly population*

Ensuring that mobile health applications are user-friendly for the elderly population is essential. Applications should feature simple interfaces, large fonts, and user-friendly functionalities to enable the elderly to benefit more from this technology.



**Table 1.** Randomized Controlled Studies Conducted in the Last Five Years on Mobile Health Technologies

General information	Population and sample	Methods	Measured criteria	Results
<p>Yuting &amp; Xiaodong, (2023) [30] Effectiveness of a mHealth intervention on hypertension control in a low-resource rural setting: a randomized clinical trial</p>	<p>Participants (n = 134; 66 in the intervention group and 68 controls)</p>	<p>The intervention group participants were instructed to use the Wearable Monitoring Device and download a Smartphone Application, which included reminder alerts, adherence reports, medical instructions, and optional family support, for a period of 12 weeks to complete the study.</p>	<p>Individuals from low-resource rural settings in the Hubei province of China were included in the study from health centers, home visits, and community centers.</p>	<p>Among participants with uncontrolled hypertension, individuals randomized to use a monitoring wearable device with a smartphone application had a significant improvement in self-reported hypertension compliance, self-efficacy, life quality, weight loss and diastolic blood pressure, but no change in systolic blood pressure compared with controls.</p>
<p>Alsaqer, &amp; Bebis, (2022) [31] Self-care of hypertension of older adults during COVID-19 lockdown period: a randomized controlled trial</p>	<p>Participants (n=120)</p>	<p><u>A total of 120 participants were randomly allocated to three groups (n = 40): interventional group (public health nursing interventions plus m.Health applications) and two control groups (m.Health applications alone group and standard care group).</u></p>	<p>Participants were enrolled in the study if they were (1) 55 years and above, (2) have follow-up as out-patients of KAUH, (3) had been diagnosed with HTN, (4) on anti-HTN medication—at least one drug, (5) reported that he/she has a personal smartphone (Android)—internet access is not important, and (6) able to read and understand the Arabic language.</p>	<p>This study supports the adoption of technology with nursing intervention as a method of supporting continuity of self-management of chronic illness during the pandemic, and its potential implications for future delivery of health care, not just in Jordan, but across the world.</p>
<p>Ebrahimabadi, Rafiei &amp; Nejat, (2021) [32] Can tele-nursing affect the supportive care needs of patients with cancer undergoing chemotherapy? A randomized controlled trial follow-up study</p>	<p>This study focuses on patients undergoing chemotherapy who have sought treatment at the oncology clinic. The total number of participants in the study is 60.</p>	<p>Experimental Group: For the experimental group, a telephone support service was provided twice a week for 15-30 minutes over a two-month period. Control Group: For the control group, the same service was delivered through face-to-face training.</p>	<p>The effects of tele-nursing on the supportive care needs of cancer patients have been measured.</p>	<p>The support service provided via telephone has been found to particularly enhance access to support services for individuals residing in rural areas and reduce the supportive care needs of oncology patients. The average score of supportive care needs in the intervention group was found to be significantly lower than the control group after the intervention (p&lt;0.05).</p>

Tablo 1. Randomized Controlled Studies Conducted in the Last Five Years on Mobile Health Technologies- continue

General information	Population and sample	Methods	Measured criteria	Results
Karagöl,(2021)[33] Çevrimiçi eğitim ve danışmanlık yoluyla yapılan postpartum izlemin postpartum depresyon ve postpartum uyuma etkisi: Randomize kontrollü bir çalışma	62 Women in the Postpartum Period (Experimental: 31, Control: 31)	Experimental Group: Women in the experimental group underwent three online follow-ups (education and counseling) as follows: First Follow-up: Between Postpartum Days 2-5, Second Follow-up: Between Postpartum Days 13-17, Third Follow-up: Between Postpartum Days 30-42. Control Group: Women in the control group received routine follow-ups.	Measurement of the Impact of Online Education and Counseling on Postpartum Depression and Postpartum Sleep	The study concluded that online postpartum education, counseling, and follow-up were effective in preventing postpartum depression and enhancing postpartum sleep.
Cai, Gong, He, Hughes, Simoni, Xiao, & Xu. (2020). [34] Mobile texting and lay health supporters to improve schizophrenia care in a resource-poor community in rural China (LEAN trial): randomized controlled trial extended implementation.	277 community-dwelling villagers (intervention, n=139; wait-listed control group, n=138)	The intervention group received (1) lay health supporters (medication or care supervisors), (2) e-platform (mobile-texting reminders and education message) access, (3) a token gift for positive behavioral changes, and (4) integration with the existing government community-mental health program (the 686 Program) while the wait-listed control group initially only received the 686 Program. Subsequently (in the extended period), both groups received the LEAN intervention plus the 686 Program. The secondary outcomes were symptoms measured during visits to 686 Program psychiatrists using the Clinical Global Impression scale for schizophrenia and functioning measured by trained student assessors using the World Health Organization Disability Assessment Schedule 2.0. Other outcomes included data routinely collected in the 686	The patient participants of the program were required to (1) be community-dwelling, (2) be enrollees of the 686 Program, (3) have a primary diagnosis of schizophrenia according to the International Statistical Classification of Diseases, Tenth Revision [19] (diagnosis reconfirmed by the 686 Program psychiatrists while they were enrolled), (4) be on oral psychotropic medication, and (5) be residents of 1 of the 9 rural townships.	In an expanded application, interventions involving mobile messaging and healthcare workers in a resource-constrained community setting were found to be more effective than the 686 Program alone in improving medication adherence, alleviating symptoms, and reducing hospital readmissions.
Ghodsbin, Javanmardifard, Kaviani&Jahanbin, (2018)[35]. Effect of tele-nursing in the improving of the ultrasound findings in patients with nonalcoholic fatty liver diseases: A Randomized Clinical Trial study	This study focused on 60 patients with non-alcoholic fatty liver disease (NAFLD) who presented to the Gastroenterology outpatient clinic.	The experimental group underwent a 12-week intervention consisting of diet and physical activity monitoring. During the first month, they received bi-weekly phone calls, followed by weekly calls for the next three weeks. The control group did not receive any intervention.	The impact of physical activity and diet monitoring on patients' ultrasound findings was assessed.	Results revealed that the tele-nursing intervention significantly accelerated the improvement process in both liver size and tissue for patients with NAFLD. The findings emphasize the positive effects of remote nursing care in managing and monitoring non-alcoholic fatty liver disease through dietary and physical activity interventions.

Table 1. Randomized Controlled Studies Conducted in the Last Five Years on Mobile Health Technologies- continue

<b>General information</b>	<b>Population and sample</b>	<b>Methods</b>	<b>Measured criteria</b>	<b>Results</b>
Zhou, Liao, Feng, Ji, Zhao & Wang (2018) [36] Effects of a nurse-led phone follow-up education program based on the self-efficacy among patients with cardiovascular disease	403 patients with cardiovascular disease:	During a six-month period, the experimental group received telephone follow-up education, with weekly sessions in the first month, bi-weekly sessions in the second and third months, and monthly sessions in the last three months. The control group, on the other hand, received face-to-face education. The patients' self-efficacy levels were measured for the prevention of cardiovascular risks.	Measurement of Patients' Self-Efficacy Levels for the Prevention of Cardiovascular Risks:	The results indicated that telephone follow-up education positively influenced patients' self-efficacy and healthy lifestyle behaviors.

### *Privacy and security*

Ensuring the privacy and security of data collected through mobile health applications is of paramount importance. Healthcare service providers should implement strict security protocols and educate users on these measures.

### *Collaboration and stakeholders*

Effective collaboration among healthcare professionals, local governments, telecommunications companies, and other stakeholders is crucial for the successful implementation of mobile health applications in rural areas.

### *Community engagement*

The design and implementation of mobile health applications should focus on the needs of rural communities. Community engagement and feedback can contribute to making applications more effective and user-friendly.

### *Relevant legislation and policies*

Establishing and implementing relevant legislation and policies to support the use of mobile health applications is essential. Healthcare service providers should stay informed about regulations supporting mobile health applications and monitor developments in this field.

These recommendations aim to enable the effective use of mobile health applications in rural areas, making significant contributions to public health.

### *Funding*

The authors declare that no funds, grants, or other support were received during the preparation of this paper.

### *Conflict of interest*

There is no conflict of interest.

## References

1. Ardahan M. Mobil sağlık ve hemşirelik. STED. 2018; 27(6): 427-433. <https://dergipark.org.tr/en/download/article-file/629407>.
2. Soner G, Aydın Avcı İ. Engellilere yönelik uzaktan sağlık bakım uygulamaları. Kitiş Y, editör. Sağlık Bakımının Sürekliliğini Sağlamada Uzaktan Bakım Hizmetleri ve Teknolojik Olanaklar. 1. Baskı. Ankara: Türkiye Klinikleri; 2023. p.51-6.
3. Mansur F, Aydın İ. Teletıp araştırmalarının görsel haritalama tekniği ile bibliyometrik analizi. Bilişim Teknolojileri Dergisi. 2021;14(2):115-28. [doi: 10.17671/gazibtd.813629](https://doi.org/10.17671/gazibtd.813629).
4. Crawford A, Serhal E. Digital health equity and Covid-19: The innovation curve cannot reinforce the social gradient of health. Journal of Medical Internet Research. 2020;22(6):e19361. [doi: 10.2196/19361](https://doi.org/10.2196/19361).
5. Smith AC, Thomas E, Snoswell CL, Haydon H, Mehrotra A, Clemensen J, Caffery LJ. Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). Journal of Telemedicine And Telecare. 2020;26(5):309-13. [doi: 10.1177/1357633X20916567](https://doi.org/10.1177/1357633X20916567).
6. Gupta P, Choudhury R, Kotwal A. Achieving health equity through healthcare technology: Perspective from India. Journal of Family Medicine and Primary Care. 2023;12(9):1814-7. [doi: 10.4103/jfmmpc.jfmmpc\\_321\\_23](https://doi.org/10.4103/jfmmpc.jfmmpc_321_23).
7. Kopmaz B, Arslanoğlu A. Mobil sağlık ve akıllı sağlık uygulamaları. Sağlık Akademisyenleri Dergisi. 2018;5(4):251-5. [doi: 10.5455/sad.13-1543239549](https://doi.org/10.5455/sad.13-1543239549).
8. Doğanığiit PB. Sağlık hizmetlerinde yenilik yaklaşımı. J Health Man. 2022;2(1):43-54. <http://jhealthmgmt.com/index.php/JHM/article/view/14/10>.
9. Karakuş Z, Özer ZC. Kronik hastalığa sahip yaşlı bireylerde mobil sağlık uygulamalarının kullanımı. İKÇÜSBFD. 2022;7(2):391-5. <https://dergipark.org.tr/en/download/article-file/1855233>.
10. Hoyt RE, Yoshihashi AK. Health informatics: practical guide for healthcare and information technology professionals. Lulu. Com. 2014.
11. Lin MH, Yuan WL, Huang TC, Zhang HF, Mai JT, Wang JF. Clinical effectiveness of telemedicine for chronic heart failure: A systematic review and meta-analysis. J Investig Med. 2017;65(5):899-911. [doi: 10.1136/jim-2016-00019](https://doi.org/10.1136/jim-2016-00019).



12. Mahtta D, Daher M, Lee MT, Sayani S, Shishehbor M, Virani SS. Promise and perils of telehealth in the current era. *Cur Cardiol Rep.* 2021;23:1-6. doi: [10.1007/s11886-021-01544-w](https://doi.org/10.1007/s11886-021-01544-w).
13. Flodgren G, Rachas A, Farmer AJ, Inzitari M, Shepperd S. Interactive telemedicine: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev.* 2015;9: CD002098. doi: [10.1002/14651858.CD002098.pub2](https://doi.org/10.1002/14651858.CD002098.pub2).
14. Isakadze N, Marvel FA. What are the features promoting and deterring engagement in mobile health intervention use. *JACC Adv.* 2023;2(8):100615. doi: [10.1016/j.jacadv.2023.100615](https://doi.org/10.1016/j.jacadv.2023.100615).
15. Siddiqui, A. T. (2022). Successful conditions in implementing telehealth support to remote areas. In *Information and Communication Technology (ICT) Frameworks in Telehealth* (pp. 13-29). Cham: Springer International Publishing.
16. Tezcan C. Sağliça Yenilikçi Bir Bakış Açısı: Mobil Sağliık. 2016. TÜSİAD-T/2016-03/575. ISBN: 978-605-165-015-9.
17. Uysal B, Ulusinan E. Güncel dijital sağliık uygulamalarının incelenmesi. *Selçuk Sağliık Dergisi.* 2020;1(1):46-60. <https://dergipark.org.tr/en/download/article-file/1087430>.
18. Deęerli M. Mobil Sağliık uygulamalarına genel bir bakış ve özgün bir mobil sağliık uygulaması geliştirilmesi. *EMO Bilimsel Dergisi,* 2021;11(21):59-69. <https://dergipark.org.tr/en/download/article-file/1606724>.
19. Bhuyan S, Lu N, Chandak A, Kim H, Wyant D, Bhatt J, Kedia S, Chang C. Use of mobile health applications for health-seeking behavior among us adults. *J Med Syst.* 2016;40:153. doi: [10.1007/s10916-016-0492-7](https://doi.org/10.1007/s10916-016-0492-7).
20. TÜİK. (2021c, Ağustos 26). Hanehalkı bilişim teknolojileri (BT) kullanım araştırması, 2021. TÜİK Kurumsal. [https://data.tuik.gov.tr/Bulten/Index?p=HanehalkiBilisim-Teknolojileri-\(BT\)-Kullanim-Arastirmasi-2021-37437](https://data.tuik.gov.tr/Bulten/Index?p=HanehalkiBilisim-Teknolojileri-(BT)-Kullanim-Arastirmasi-2021-37437).
21. Henriksen A, Issom DZ, Woldaregay AZ, Pfuhl G, Årsand E, Sato K, Hartvigsen G. Dataset of motivational factors for using mobile health applications and systems. *Data Brief.* 2023;50: 109589. doi: [10.1016/j.dib.2023.109589](https://doi.org/10.1016/j.dib.2023.109589).
22. Waalen J. Mobile health and preventive medicine. *Medical Clinics.* 2023;107(6):1097-108. doi: [10.1016/j.mcna.2023.06.003](https://doi.org/10.1016/j.mcna.2023.06.003).
23. Kayyali R, Peletidi A, Ismal M, Hashim Z, Bandeira P, Bonnah J. Awareness and use of health apps: a study from England. *Pharmacy.* 2017;5(2):33. doi: [10.3390/pharmacy5020033](https://doi.org/10.3390/pharmacy5020033).
24. Altındağ Ö, Yıldız A. Türkiye’de sağliık politikalarının dönüşümü. *Birey ve Toplum Sosyal Bilimler Dergisi.* 2020; 10(1):157-84. doi: [10.20493/birtop.742637](https://doi.org/10.20493/birtop.742637).
25. Şimşir İ, Mete B. Sağliık Hizmetlerinin Geleceęi: Dijital Sağliık Teknolojileri. *JOINHP.* 2021; 2(1): 33-39. [https://www.researchgate.net/profile/Buse-Mete/publication/354951070\\_The\\_Future\\_of\\_Healthcare\\_Services\\_Digital\\_Health\\_Technologies/links/61559bbeabde032acb9d3c8/The-Future-of-Healthcare-Services-Digital-Health-Technologies.pdf](https://www.researchgate.net/profile/Buse-Mete/publication/354951070_The_Future_of_Healthcare_Services_Digital_Health_Technologies/links/61559bbeabde032acb9d3c8/The-Future-of-Healthcare-Services-Digital-Health-Technologies.pdf).
26. Isakadze N, Marvel FA. What are the features promoting and deterring engagement in mobile health intervention use. *JACC Adv.* 2023;2(8):100615. doi: [10.1016/j.jacadv.2023.100615](https://doi.org/10.1016/j.jacadv.2023.100615).
27. Long L-A, Pariyo G, Kallander K. Digital technologies for health workforce development in low-and middle-income countries: a scoping review. *Glob Heal Sci Pract.* 2018;6(1):41-8. doi: [10.9745/GHSP-D-18-00167](https://doi.org/10.9745/GHSP-D-18-00167).
28. Gordon NP, Hornbrook MC. Differences in access to and preferences for using patient portals and other ehealth technologies based on race, ethnicity, and age: A database and survey study of seniors in a large health plan. *J Med Internet Res.* 2016;18(3):e50. doi:10.2196/jmir.5105.
29. Sun L, Buijsen M. Mobile health in China: Does it meet availability, accessibility, acceptability and quality standards? *Health Policy Technol.* 2022;11(3):100660. doi: [10.1016/j.hlpt.2022.100660](https://doi.org/10.1016/j.hlpt.2022.100660).
30. Yuting Z, Xiaodong T. Effectiveness of a Health intervention on hypertension control in a low-resource rural setting: a randomized clinical trial. *Frontiers in Public Health.* 2023;11:1049396. doi: [10.3389/fpubh.2023.1049396](https://doi.org/10.3389/fpubh.2023.1049396).
31. Alsaqer K, Bebis H. Self-care of hypertension of older adults during COVID-19 lockdown period: a randomized controlled trial. *Clinical Hypertension.* 2022; 28(1): 21. doi: [10.1186/s40885-022-00204-7](https://doi.org/10.1186/s40885-022-00204-7)
32. Ebrahimabadi M, Rafiei F, Nejat N. Can tele-nursing affect the supportive care needs of patients with cancer undergoing chemotherapy? A randomized controlled trial follow-up study. *Supportive Care in Cancer.* 2021; 29: 5865-5872. doi: [10.1007/s00520-021-06056-5](https://doi.org/10.1007/s00520-021-06056-5).

33. Karagöl, B. Çevrimiçi eğitim ve danışmanlık yoluyla yapılan postpartum izlemin postpartum depresyon ve postpartum uyuma etkisi: Randomize kontrollü bir çalışma (Master's thesis, Ufuk Üniversitesi). 2021.
34. Cai Y, Gong W, He H, Hughes JP, Simoni J, Xiao S, ... Xu D. Mobile texting and lay health supporters to improve schizophrenia care in a resource-poor community in rural China (LEAN trial): randomized controlled trial extended implementation. *J Med Int Res*. 2020;22(12):e22631. doi: [10.2196/22631](https://doi.org/10.2196/22631).
35. Ghodsbin F, Javanmardifard S, Kaviani MJ, Jahanbin I. Effect of tele-nursing in the improving of the ultrasound findings in patients with nonalcoholic fatty liver diseases: A randomized clinical trial study. *Invest Educ Enferm*. 2018;36(3):1-12. doi: [10.17533/udea.iee.v36n3e09](https://doi.org/10.17533/udea.iee.v36n3e09).
36. Zhou Y, Liao J, Feng F, Ji M, Zhao C, Wang X. Effects of a nurse-led phone follow-up education program based on the self-efficacy among patients with cardiovascular disease. *J Cardiovasc Nurs*. 2018; 33(1): E15-E23. doi: [10.1097/JCN.0000000000000414](https://doi.org/10.1097/JCN.0000000000000414).