# Artificial intelligence and Mobile Gaming

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## ABSTRACT

Game making as an industry, requires important steps and requirements such as having a roadmap, choosing the right software to design different parts of the game, having a range of mastery of programming languages, graphic design, elevating the game, publishing and developing. With these requirements, in order to succeed in this field, one must look at one of the most important and pervasive concepts in the digital world, Artificial Intelligence (AI). AI has had a tremendous impact on gaming, and gaming has been almost the first field to be integrated with AI. The use of artificial intelligence in the gaming industry can lead to amazing results, including smarter games, self-learning ability, achieving a more realistic experience, a different experience of blending reality and AR/VR, increasing developer skills in making games which is more user friendly. An example of such an experiment is the NVIDIA DLSS algorithm, which helps game developers create details beyond their design. On the other hand, with the help of artificial intelligence, most of the graphic design can be done intelligently, and in fact, the main part or all of the graphic design process can be automated. These are examples of using AI in gaming, but undoubtedly, with the advent of new technologies such as quantum computers, we are expected to witness a much larger changes in the near future. Of course, having a glimpse of the future may be one of the keys to survival in this area.

## Keywords
Game, Mobile Gaming, Artificial Intelligence

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# Serious Games and mHealth

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## ABSTRACT

Game is a physical or mental, individual or group-based activity which has principles and rules and is usually intended for entertainment or fun. Based on *Maslow's* hierarchy of needs, game by acquiring skills and leading to honor, can cause esteem and self-actualization. Reduction of stress and anxiety, stimulates interaction, promotes teamwork, enhances motivation and increase of knowledge are some examples of game advantages. The concept of serious game was first introduced in 1970 by Clark C. ABT.

This technology can train and educate while entertaining users. Serious games by digital technologies such as virtual reality (AR) and augmented reality (AR) can simulate the real life to achieve implicit objectives, including skill improvement, get knowledge and experience, and physical improvement and recovery. Reasons such as behavioral changes, reduced workload, inexpensive technology and scientifically validated, lead us to use serious games in healthcare. Games for health (G4H), offer opportunities in health monitoring, clinical detection, treatment, rehabilitation and recovery, tracking, professional and non-professional training, and education. The recent advances to use mobile technologies in healthcare and the emergence of mobile health (m-Health), have led to many serious games to develop in these platforms. Mobile serious games provide reliable information and qualified content while offering interactivity to the user and, according to the studies, have successful experience in the physical therapies, chronic disease control, cognitive rehabilitation and medication management.

## Keywords

Game, Serious Game, Mobile Health, m-Health, Games for health (G4H)

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# Usability Evaluation of Web-based COVID-19 Dashboard: A Heuristic Evaluation

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## ABSTRACT

**Background:** Information dashboards are the main tool for understanding and extracting knowledge from large data sets. Dashboards should have capabilities such as usability to provide better quality health data.

**Objective:** The purpose of this research was to evaluate the usability of management dashboard of COVID-19 by Heuristic method.

**Material and Methods:** This research is a practical, descriptive, and cross-sectional study, which was conducted in Shiraz University of Medical Sciences in 2020. The evaluation was performed independently with the participation of three medical informatics specialists using the Xerox Heuristic Evaluation Checklist, whose validity and reliability were confirmed. Then the problems were identified, combined and a single list was prepared. Finally, the evaluators determined and reported the severity of the problems. Data analysis was performed with Excel software.

**Results:** The results of this study, a total of 80 usability problems were identified. The features of "Help and Documentation" with 12 items (15%) were the most and the features of "Aesthetic and Minimalist design" and "privacy" with two items (2.5%) were the least non-compliance with the principles of usability. The average severity of the problems ranged from 2.05 (Minor problem) to "Pleasurable and Respectful Interaction with the User" to 3.83 (Catastrophe problem) to "privacy".

**Conclusion:** The heuristic assessment method identifies the problems of the user interface of information systems and dashboards using predetermined standards. If these problems are not solved, they will waste users' time, increase errors, reduce information quality, dissatisfaction and confusion of users.

## Keywords
Dashboard, Usability, Heuristic Evaluation, COVID-19

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# Main Steps to Develop a Successful Mobile Health Application

Azita Yazdani[1]*

## ABSTRACT

**Background:** With the outbreak of the COVID-19, investment in mobile health has grown significantly over the past. And the number of applications downloaded from mobile application markets such as Google play and Apple app store has increased dramatically. The results of studies show that the level of user loyalty of mobile health applications is low after the first use. Therefore, it is important to pay attention to the principled development of this type of applications in the initial steps.

**Objective:** The purpose of this study is to review the main steps in the development of mobile health applications.

**Material and Methods:** This paper provides an overview of important software engineering research issues related to the development of health applications that run on mobile devices.

**Results:** According to the results, the main steps of development are: target audience definition, design clickable prototype, building a secure and integrated application, analyzing usage metric and building an ecosystem around health care app.

**Conclusion:** Identifying the audience and their needs is the most important step that determines the required hardware and software infrastructure. Prototyping allows software designers and developers to receive users feedback and accurately understand what customers expect from an application under construction. Using APIs in health application development in order to integration with other electronic systems such as electronic health records, laboratory systems, etc. is important. In a pandemic, access to quality news and information is possible through APIs. Agile and continues delivery is a suitable strategy for developing mobile health application. Key trends in the M-Health ecosystem includes: cloud-based M-Health services, digital medicine, connected drug delivery.

## Keywords
COVID-19, Development, Mobile health application.

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# Mobile Solutions for Home Health Care / monitoring

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## ABSTRACT

Health care has traditionally been given at home. It is also the newest. Because of the aging population and changing lifestyles, providing healthcare-at-home can become the primary method of receiving care if organized and integrated system is established. Mobile and wearable devices with capabilities of caring handy and easy have become essential tools for health monitoring. In this regard, Patient- physician communication is one of the important parts in patient care. Immediate access to various health care data improved communication between patients and providers by making readily available instructions for patients. Tele Home Care (THC) is Health care services deliver to patients at home through the use of telecommunications technologies.  By creating a secure, confidential and effective THC system, healing promotion, preventing to postpone institutionalization, preparing online data, restricting exposure and the need for protecting equipment in pandemics, improving the access of patients in deprived and remote area, reducing cost, improving quality of life, involving the individual and the family in health care, and chronic disease management could be possible. In specific aspects Information Technology can be introduced in home care in a multitude of ways. Active monitoring, such as Telehealth Applications, Web-based communities and Personal Health Records; and Passive monitoring such as Robotic Applications and Smart homes. Mobile infrastructure, wireless sensor devices coupled with mobile communication technologies, biometric authentication, a risk analysis engine, information and communication technology, security standards are some of the THC requirements. To sum up, mobile technology increasingly makes home health care the preferred mode of health care delivery. Mobile health alongside telehealth systems link patients and their families to their health care providers. Thus, using mobile devices especially in patient monitoring seems inevitable. This opens new horizons for both practitioners and engineers to deliver innovative solutions that improve the health and wellbeing of users.

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# Mobile Health in the COVID-19 Pandemic Era: Opportunities, Threats and the New Horizons Ahead

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## ABSTRACT

Today, there are growing global concerns over COVID-19 pandemic. Almost all initial predictions about the control of the spread of the infection were at least to some extent wrong. As of Feb 28, 2021 more than 2.5M lost their lives due to the pandemic. Global job losses reached 114 million in 2020. According to UN, due to the COVID-19 pandemic, the global economy will lose about 8.5 trillion USD in output over the next two years. Moreover, the pandemic has caused increasing stress and burnout among healthcare workers. A basic question is how long the COVID-19 pandemic last? Simply, some health experts believe that SARS-CoV-2 is here to stay! Currently, mhealth technologies have provided great opportunities in fields such as prevention of diseases, diagnosis, treatment and medical education. Creation of awareness, health survey, health surveillance, virtual screening and monitoring, communication and collaboration among health care providers, supporting clinicians in decision making, data collection and patient records, are only some of the great advantages of mHealth. Despite undeniable threats, the pandemic has provided several major opportunities to improve mHealth, including but not limited to: 1) Smartphone applications can be used for testing, mass screening, etc. 2) Telemedince has received more attention globally. 3) People care more about their health 4) People are spending more time on their smartphones 5) People more trust doctors and healthcare workers. There are also some challenging issues such as data privacy and confidentiality which limit mHealth technologies in managing the pandemic crisis. These issues lead us to focus on the health data quality from the lens of health information management (HIM). Moreover, contamination of smart phones, mobile phone addiction and sedentary life style associated with heavy smartphone use, EMF and blue light risk issues, should be controlled. Regarding mHealth threat management, current situation (current needs, marketing strengths and threats, potential plans, etc.) should be carefully analyzed. Then a well-designed plan can turn the pandemic threats into significant opportunities for mHealth.

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# Steps to start a startup

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## ABSTRACT

Part of living and working in the startup world is about learning from mistakes, both your own and others' mistakes. You have the chance to see what sets successful companies apart from those that have ultimately failed, and we hope you can learn these lessons before you make the same mistakes yourself. Although sometimes it is better to let others make mistakes and learn from their mistakes, there is no harm in sharing the collective wisdom of the business world. The ultimate goal of this series of articles is to avoid making mistakes that hurt not only the founders of startups but also the lives of those who follow them in their economic activities. In this article, we will present 20 key steps of startup training.

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# Mobile Solutions for Home Health Care / monitoring

Roxana Sharifian[1]*, Peivand Bastani [2], Somayyeh Zakerabasali[3], Mohsen Zamani[4], Azita Yazdani[3]

## ABSTRACT

Health care has traditionally been given at home. It is also the newest. Because of the aging population and changing lifestyles, providing healthcare-at-home can become the primary method of receiving care if organized and integrated system is established. Mobile and wearable devices with capabilities of caring handy and easy have become essential tools for health monitoring. In this regard, patient- physician communication is one of the important parts in patient care. Immediate access to various health care data improved communication between patients and providers by making readily available instructions for patients. Tele Home Care (THC) is health care services deliver to patients at home through the use of telecommunications technologies. By creating a secure, confidential and effective THC system, healing promotion, preventing to postpone institutionalization, preparing online data, restricting exposure and the need for protecting equipment in pandemics, improving the access of patients in deprived and remote area, reducing cost, improving quality of life, involving the individual and the family in health care, and chronic disease management could be possible. In specific aspects Information Technology can be introduced in home care in a multitude of ways. Active monitoring, such as Telehealth Applications, Web-based communities and Personal Health Records; and Passive monitoring such as Robotic Applications and Smart homes. Mobile infrastructure, wireless sensor devices coupled with mobile communication technologies, biometric authentication, a risk analysis engine, information and communication technology, security standards are some of the THC requirements. To sum up, mobile technology increasingly makes home health care the preferred mode of health care delivery. Mobile health alongside telehealth systems link patients and their families to their health care providers. Thus, using mobile devices especially in patient monitoring seems inevitable. This opens new horizons for both practitioners and engineers to deliver innovative solutions that improve the health and wellbeing of users.

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# Evaluation Methods of Mobile health Applications: Content, Usability, and Efficacy

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## ABSTRACT

Mobile health (mHealth) is the use of mobile technologies to improve health care and public health. With the increase in the number of mobile users and the expansion of smartphones and their applications in the field of health, the use and applications of mobile health is increasing. Although health apps have been received public attention and used by the general public and health care providers, there is little information about the usability and efficacy of most available apps on the market. Therefore, it is essential for physicians to evaluate existing programs and select the best ones.

Continuous evaluation of these applications is essential to ensure that the overall goals of health care systems are met, including conducting epidemiological research, management, avoiding overwork, and helping to improve the quality of care and reduce costs. This paper discusses methods for evaluating the content, usability, and efficacy of available mHealth apps. By comparing and using one of the clinical guidelines, evidence-based protocols, and behavior change techniques, it is possible to evaluate the content analysis of applications.

Usability testing as a critical tool can be used for identifying existing problems in apps, saving time in development of the software, decreasing human errors and medical errors. There are several types of testing methods for the usability evaluation of the apps such as think aloud, Heuristic, Cognitive walkthrough, interview and Questionnaire. Observational studies that explore associations between app use and outcomes, while not establish causality. Finally, efficacy testing is a key step in determining whether using mHealth apps leads to significant changes in behavior and clinical outcomes. Randomized controlled trials (RCT) is the gold standard approach to efficacy testing. Evidence in all of these methods indicates an increase in the acceptance of mobile health applications in clinical settings and an increase in their reliability.

## Keywords

Evaluation, mobile Health application, Content, Usability, Efficacy

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# Architecture and Standards of Mobile health applications

Somayyeh Zakerabasali[1]*

## ABSTRACT

A system architecture is the conceptual model that defines the structure behavior and more views of a system. Mobile health apps architecture consist of system components and the sub systems developed, that work together and collaborate with others. Mobile Health apps Architecture include four layers: Service and Application, Identity and Access, Data and Records, and Communications. Each layer performs some of the functions necessary to achieve interoperability and communication between systems. Service and Application layer; consisting of the functional healthcare specific application components such as Health application, Billing and Cost, and Service management that interface with existing systems. Identity and Access; consisting of the non-functional components such as patient consent, patient identity, and confidentiality, privacy and security management. Data and Records; consisting of the data, information and record management. Communications consisting of the communications and messaging protocols, network and services interfaces.

Failure to use accepted standards for the design and development of mobile health applications will pose problems and risks for developers, health care providers, patients, and the public. A standard can be defined as 'a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose'. The standards required the development of mobile health applications include data standards (ICD-10, SNOMED CT, LOINC), communication devices standards (Bluetooth, ZigBee, Wi-Fi), data transfer standards (HL7, DICOM, IEEE11073), and security standards (Data Encryption, Authentication). As a result, the use of mobile health architecture and related standards as a roadmap can have a positive impact on the development of high quality mobile health apps and the integration of health care information systems.

## Keywords
Architecture, mobile Health application, Standards, Components

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# Asnapshot of the Mobile Health And Social Services In Elderly People; Policy And Problem Oriented Approach

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## ABSTRACT

**Background:** Social, welfare, economic and biological changes have made the elderly an important and growing group in society. Paying attention to information technology and designing services based on it is an effective and new strategy in managing old age affairs.

**Objective:** Explain the Use of Telemedicine and Mobile-based Care for the Aging and Recognize Opportunities, Strengths and Challenge.

**Material and Methods:** Articles were extracted, using PubMed, EMBASE, Scopus, and Google Scholar search engines, searching terms: "elderly people", "mobile health", "mobile health services", "Elderly Mobile Health" in titles, abstracts and keywords. We focused our search on papers published after the year 2010 with sample sizes greater than ten.

**Results:** In conducting a literature review, the result divided Opportunities, Strengths into four sections: Awareness, self-care and independence of the elderly; Accessibility and availability; Management and productivity and cognitive function. We also divided the obstacles into 3 parts: Structural; Legal; Costs and tariffs and Cultural, informational and cognitive.

**Conclusion:** Such strategies: Promoting the empowerment of the elderly according to the rapid growth of technology, Promoting new educational technologies to gain new knowledge and skills, using modern technologies for improving service provision and Justice in the distribution and allocation of resources, Clarifying the mechanism to establish needs-based data banks for older persons, Evidence-based policy making and planning with a future-oriented approach can help the development of mobile health technology.

## Keywords

Mobile Health, Elderly People, Telemedicine

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# Prevalence of Using Mobile and Internet by Elderlies and Its Association with Quality of Life and Self-Care: A Field-Based Cross-Sectional Study in Shiraz, Iran

Behnam Honarvar[1]**\***

## ABSTRACT

**Background:** In Iran, population of elderlies will reach to 25.1% in 2061 compared to 10% in 2010, while increasing use of mobile phones provides a great opportunity for improvement of quality of life (QOL) in them.

**Objective:** Determination of prevalence of using mobile phones and internet and their associations with QOL.

**Material and Methods:** As a cross-sectional study, elderlies which covered by the health centers of Shiraz, Iran were selected by a multi-stage cluster random sampling and interviewed individually. Mobile and internet using were queried. Core Component of Quality of life (CCQOL) and self-care component (SCC) were assessed by LIPAD questionnaire. Analysis of data was done in SPSS 25 using one-way ANOVA (LSD method).

**Results:** Mean age of 412 participants was $68.12 \pm 6.24$ years. Mean of CCQOL was $70.2 \pm 10.5$ (out of 93), while mean of SCC was $16.5 \pm 2.4$ (out of 18). Out of all, 122 (29.6%) did not use mobile phones daily, while 270 (65.5%) used mobiles without internet and 20 (4.9%) used mobiles with internet. CCQOL of these three groups were $67.7 \pm 11.5$, $71 \pm 10$ and $74.4 \pm 8.6$ (P=0.004) and SCC was $15.7 \pm 3.3$, $16.9 \pm 1.75$ and $17 \pm 2.5$, respectively (P<0.001). In these two scales, the difference was noted between non-mobile users and mobile users, while no statistical difference was found between users of mobile phones with or without internet.

**Conclusion:** Using of mobile phones has a significant association with increasing QOL in the elderlies, however such difference was not found between users of mobile phones with internet or without it.

## Keywords
Elderlies, Mobile phone, Internet, Quality of life

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# Aging Friendly E-Banking

Abdolrahim Asadollahi[1,2]*

## ABSTRACT

**Background:** Turning demographic change into a Global, national, and local opportunity, Transforming Health and Care, Transforming industries and the economy, and Transforming Worklife are the our changing world reagrding aging population i.e. older adult population in US to increase from 35 million in 2000 to 72 million in 2030, older adult population in iran to increase from 9% in 2018 to 25% in 2030, about 8,598,100 Iranian older people in 2021, and by 2050, about 2,100 million around the globe.

**Objective:** The age friendly & dementia friendly communities, bank safe, fraud watch and caregiving initiatives are issue in the later life.

**Discussion:** By aging friendly banking (AFB) we mean banking services, products and facilities that remain accessible and easy-to-use as people age, assist caregivers and prevent financial exploitation. Also, empowers financial institutions by educating them on the importance of fighting exploitation of the vulnerable, providing necessary tools and training so they can protect consumers, designed to help strengthen the partnership between financial institutions, consumers and those in the community and government whose jobs are to protect the interests of older people. Additionally, it needs to customer service, physical design, systems, products, and how a bank sees itself.

## Keywords
Aging Friendly Banking, Elderly Customers, Financial Exploitation, Aging Population

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# Entrepreneurial opportunities in health of elderly through mobile health

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## ABSTRACT

**Background:** An aging population tends to have a higher prevalence of chronic diseases, physical disabilities, mental illnesses, and other co-morbidities. Due to many types of applications, most people especially the elderly will use them to take control of their own healthcare.

**Objective:** This study conducted to discover the entrepreneurial opportunities in the health of the elderly through mobile health.

**Material and Methods:** We review the related references about entrepreneurship in the health of the elderly through mobile health in PubMed and Google Scholar and Google search engine. Data gathering was done by using a data-gathering form. The retrieved data was analyzed through the content analysis method and summarized and reported based on the study objectives.

**Results:** The results showed that there are many successful mobile health products and applications in the field of health of the elderly, such as "Steadiwear", "Cake", "Silvernest", and "Rendever". Results showed that home care is one of the most interesting fields for entrepreneurship in the health of the elderly. At-home care, mobile health productions "Hometeam", "CareLinx", "Honor" and "Homecare.com" were some of the successful products in this field. The results showed that the most common chronic conditions of the elderly are included heart disease, depression, Parkinson's, Alzheimer's, stroke, cancer, arthritis, and diabetes.

**Conclusion:** The results of this study can be used in the entrepreneurial of mobile health for the elderly as a main part of society. Mobile health has the potential to transform the healthcare provided by improving patient outcomes, increasing the quality of health care, and reducing costs. Digital health and especially mobile health offers a way to resolve many of the current issues in health care provider. Also, these entrepreneurial opportunities in this field, can boost the economy and improve the business environment.

## Keywords
Mobile health, elderly, business

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# Reducing the Burden of Chronic Disease in the Elderly by Using Mobile Health: Follow-Up Nurse Program

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## ABSTRACT

**Background:** Health telematics has become one of the most important aspects of health improvement among people, especially the elderly and patients with chronic diseases and disabilities. In this regard, these groups of people have better access to optimal care as a result of Mobile Health, regardless of geographical boundaries, individual limits, and organizational barriers.

**Objective:** With the spread of Covid-19 pandemic and the restrictions imposed on in-person visits, and on the other hand, recommending vulnerable people to stay at home and not to visit medical centers, these approaches are widely implemented in health policies in an organized manner. An example of such approaches is the communication of regulations for the establishment of telemedicine clinics and the launch of the follow-up nurse program.

**Material and Methods:** The follow-up nurse program was developed with the aim of promoting self-care in patients and the elderly with three chronic conditions including Cerebro-Vascular Accident, Heart Failure and Chronic Obstructive Pulmonary Disease after discharge from hospital. This program is currently being implemented in seven centers affiliated to three universities of medical sciences in Iran, in order to evaluate its feasibility and effectiveness. The principles of this program are based on telenursing and periodic patient follow-ups would be performed by the follow-up nurse at regular intervals after discharge for one year, depending on the type and the severity of the disease. At each telephone follow-up, the patient's condition is assessed and, if needed, the necessary training is provided. Risk assessment is also done based on pre-designed charts and depending on which of the red, yellow or green zones is assigned to the patient's condition, remote recommendations are provided for continuing or changing the care protocol or referring the patient to the hospital.

**Results:** One of the advantages of the program is the connection of patient follow-up data to the hospital's HIS system, and data on the patient's condition after discharge is systematically added to the previous and inpatient data. The effectiveness indicators of the program are designed as quantitative and qualitative indicators .The indicators will be evaluated at least four times during the project.

**Conclusion:** The increasing population of the elderly with chronic diseases, as one of the vulnerable groups in need of health services, requires new care protocols through using technologies such as m-Health, one of which is the follow-up nurse program. Monitoring the effectiveness of this program and expanding it to cover other chronic diseases of the elderly can be a step towards promoting self-care for the elderly and fair and cost-effective access to health services.

## Keywords
Telenursing, Mobile-Health, Follow-up, Nursing

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# Opportunities and Challenges of Mobile Health Education in Aging Society

Masoud Karimi[1]*

## ABSTRACT

Nowadays, mhealth plays an important role in bridging health disparities and unmet needs of populations. Population ageing and growth of using mobile phone among elders, provide a unique opportunity to use mhealth as a platform for health interventions for elders and lead to overcome their social exclusion, expanding information access, enhancing autonomy and self care and improving their quality of life. The aim of this narrative review was investigating opportunities and challenges of mobile health education in elders.

Mobile learning, expands the reach and equity of health education, facilitates personalized learning, enables anytime anywhere learning, builds new communities of learners, supports situated learning, assists disabled learners, and maximizes cost-efficiency.

During the covid-19 epidemic, the use of mhealth education provides an opportunity to access and educate the elderlies who advised to stay home. Although there is a stereotype that older adults are afraid, unwilling, and unable to use mobile phones, some evidences indicated that, after overcoming initial resistance, they will enjoy and motivate for using it.

Factors such as low functional capacity, knowledge, technical confidence, negative attitudes, Physical safety beliefs, Privacy and confidentiality concerns about technology, cognition decline and limited attention, influence engaging elders with mobile technology. Older adults have slower adaptation capability with rapidly changed light and sound levels, impaired divided and selective attention, and reduced processing speed (max. 102-120 WPM), so it should be used short sentences with one simple idea per sentence and Reducing volume of information.

Some Principles of andragogy such as active learning (through discussion, feedback and activities), problem-centric and relevance (expecting to solve their problems), self-learning (deciding on how to learn) are some of the most important challenges in designing mhealth education programs. Elderlies are non-homogenous groups with age variation of about five to ten years or even more, and different Previous education experiences and learning styles (Self-directing or dependent).

So, elders' mhealth educators should try to Involve their audiences in all aspects of planning, need assessment, formulating learning objectives, conducting and evaluating their learning program.

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# Access to Health Care Services for Low Socioeconomic Populations based on Application and GIS

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## ABSTRACT

**Background:** Population ageing has implications for the health of the population and the number of people requiring extended care due to disability or functional limitation is likely to increase in all countries and has important implications for sustainable development. Health systems need to be transformed so that they can ensure affordable access to evidence-based medical interventions that respond to the needs of older people and can help prevent care dependency later in life. Developing interventions for older people is a community health priority. Geographic Information Systems (GIS) offer the possibilities to determine location trends of an older people population. Mobile application (MA) is a new and fast developing Segment of the Communication Technology. MA is user friendly, downloadable, run able and has wide uses for its vast functioning area like calling, messaging, browsing, chatting, social network communication, audio, video, game etc. This information is being used to help reduce health disparities by informing policy.

**Objective:** Access to Health Care Services for Low Socioeconomic Populations based on Application and GIS.

**Material and Methods:** This paper is a review article and uses resources and journals and sites such as Science Direct, Pub Med and Web Med from years 2000 to 2020.

**Results and Conclusion:** GIS mapping is an effective community health tool for helping to prevent of diseases, the improvement of interventions, evaluating, appraising population risks, and for displaying health indicators.

## Keywords
Application, GIS, Health Care Services, Low Socioeconomic Populations

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# Role of mHealth technology in promoting self-care and improving treatment adherence among elderly patients

Mohammad Hossein Kaveh[1]*

## ABSTRACT

**Background and Aim:** Inequalities in access to, use of, as well as low adherence to health care services among elderly patients require effective solutions. The purpose of this article is to identify and introduce the applications of m-Health technology in promoting a healthy lifestyle, improving self-care and increasing adherence to treatment in the sick elderly.

**Material and Methods:** This is a short review of authoritative articles and other prominent scientific documents that have been purposefully selected by focusing on m-Health applications and/or interventions aiming at promoting self-care, treatment adherence, or quality of life among older adults suffering from chronic diseases.

**Findings:** Most vulnerable, disadvantaged and vulnerable groups in society, such as the elderly, have limited access to health care services. Studies show that access to, use of, and health inequalities worsens with epidemics. Under normal circumstances, 40 to 50 percent of patients with chronic health conditions do not follow their treatment. Also, only a small percentage of adults follow a healthy lifestyle. Advances in mobile-based technologies have provided valuable opportunities to increase health service coverage and reduce health inequalities. This technology plays an important role in educating and empowering people and patients. Mobile-based health measurement tools allow patients and healthcare providers to monitor health status and take appropriate measures to maintain health and prevent the complications of diseases. M-Health improves communication between the patient and the caregiver. In addition, mobile-based interventions help reduce health care costs and increase quality of life.

**Conclusion:** So far, valuable M-Health capacities have been provided and this is constantly expanding. These capabilities and practical evidence suggest reorienting health policy and planning initiatives to increase coverage of health care services and reduce health inequalities.

## Keywords
m-health, elderly, chronic disease, self-care, adherence

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# Structural Requirements and Successful Experiences of Using mHealth for Elderly Care

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## ABSTRACT

The percentage of the elderly population that searches the Internet for health information in the USA was small but increased faster, from 17% to 24% in 2018. Telecare, Telehealth &Telemedicine, AI and Chatbots, Blockchain, Virtual and Augmented Reality, Internet of Medical Things, Cloud-based solutions, Social media and gamification, and Voice Technologies are the most well-known information technologies for telecare of elderly. Smart home systems allow older adults to live in the environment of their choice and protect them against institutionalization or placement in a nursing home. There are different structural requirements to improve elderly telecare system development and deployment, as follow:
• Elderly Training and encouragement
• Culture Building and improve apps adoption
• Providing the devices by charities and family members as a gift
• Improving the level of systems security and data privacy through standardization of telehealth systems
• Electronic Health Record Development and deployment
• Designing the systems based on the category of elderly (young, middle, old) to choose the right device, right apps, right minimum features for the right senior
• Legal and regulations to be set by the Ministry of Health and to be approved by the related officials
• Insurance companies' cooperation will be inevitable
• Using new tech for easier us
Besides, there is a requirement that the telecare systems be designed with the following characteristics especially for the elderly based on their capabilities:
• The font size should be between 36pt and 48ppt
• One-level navigation instead of using menu structures
• Arrange the buttons at the bottom of the interface, so the input-hand will not hide the screen
• Color-neutral displays for visually impaired users
• Redundant user guidance by color-coding and blinking boxes
• Slow animation speed

**Conclusion:** Telehealth and other emerging new technologies are promising solutions to improve the level of elderly life quality. Various changes and improvements in the layouts, care systems, and system structures are required.

## Keywords
Elderly, Old Adult, seniors, Telemedicine. mHealth, Mobile Health

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# CeliacPlus: A Nutrition-Based Mobile Phone Application for the Management of Celiac Disease

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## ABSTRACT

**Background:** Celiac disease (CD) is the most recognized inflammatory small intestine disorder that occurs as a result of an immune response to ingested gluten proteins of wheat, barley, and rye in genetically predisposed individuals. Adhering to a strict gluten-free (GF) diet is required to be assured of nutritional sufficiency and prompt healing the CD manifestations. Therefore, regarding the popularization of mobile technologies, using mobile health (mHealth) applications provide a favored opportunity to encourage patient interest in personal nutrition education and disease symptomatology.

**Objective:** The goal of our study was to develop a Persian-language smartphone application (CeliacPlus; $C^+$) by user-centered design for individuals with CD, to improve adherence to GF diet and enhance patients` knowledge.

**Material and Methods:** This project was a developmental-applied study which involved three phases of analysis, design, and development. At first, a scientific review was performed on existing CD related mobile applications. Also, celiac patients were consulted to realize their preferences, barriers, and facilitators in the use of mHealth. Then, the main learning menu of $C^+$ was designed based on the collected information. Eventually, the final version of $C^+$ was developed under the supervision of the team consists of nutritionists, gastroenterologist and expert app developers.

**Results:** The mobile software can provide consumers with easy-to-understand nutrition information, FAQs, and practical tips for the disease management and also support the selection of GF choices when shopping or cooking food.

**Conclusion:** $C^+$ may be a potentially helpful approach in empowering patients to acquire self-care abilities and ensure overall gut health.

## Keywords

# The role of cyberspace in promoting nutritional knowledge in the Corona era

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## ABSTRACT

The use of virtual communications in the treatment process has been intertwined with the title of telehealth. The use of this space in crises has been considered in the past, but the global corona pandemic has increased attention to this goal with the aim of preventing the presence of People, especially people with chronic underlying diseases such as hypertension, diabetes, hyperlipidemia, etc., in high-traffic places such as medical centers to decrease the rate of infection especially in people who are likely to be infected with the Covid-19 virus more seriously and to reduce the risk of mortality in these patients.

In the field of nutrition, the use of tele-health is possible with three methods: one-person visits, group visits and visits of hospitalized patients. Studies have shown that the use of virtual communication in the treatment of obesity, dietary changes and the treatment of diseases such as celiac disease and drug-resistant epilepsy is effective.

However, disadvantages such as lack of public access to the Internet network and the refusal of virtual visits by patients and some specialists, lack of cooperation of health insurance with specialists in this regard and lack of supervision over the counseling process can be mentioned. Nevertheless, the benefits of this method, especially with the aim of social distance during the corona pandemic, are still much more significant than its disadvantages by many specialists and patients, including in the field of medical nutrition therapy, and it seems to be used after the crisis. In conclusion, tele-health and the virtual world can be considered as an option along with the usual methods of care in the health system and diet therapy.

## Keywords

Tele-Health, Diet therapy, Covid-19 pandemic

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# Nutritional Applications Growing Trend in the world

Seyed Jalil Masoumi[1]*ⓘ

## ABSTRACT

Mobile phone technology plays a large role in our daily lives. By the end of 2015, about seven billion people around the world were using mobile phones. World Health Organization defines mobile health, m-health, as the medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices. M-health facilitates providing health services, speeds up the process, and reduces the costs and complications of direct services. Also, m-health can be used in epidemic and pandemic outbreaks because of its accessibility, ease of use, and attracting many users. M-health is viewed as an attractive approach to foster behavior change and found to be effective in promoting physical activity and healthy diets. The use of mobile devices in the nutrition field has grown rapidly in line with digital technology developments. The market and growth nutritional apps have seen an increase in their engagement of over 330%. A Grand View Research clarifies that the global mobile health market will grow at a compound annual growth rate (CAGR) of 29.2%. It is believed that the market will reach $ 316.8 billion by 2027. Reports indicated that people between the ages of 18 and 29 regularly use these programs to follow their diet. Statistics showed that 53% of people use apps to track their physical activity, 48% to track their eating habits, 47% to lose weight, and 37% to learn sports. Also, the global fitness app market size was valued at USD 4.4 billion in 2020 and is expected to expand at a CAGR of 21.6% from 2021 to 2028. According to an article published in the World Economic Forum in September 2020, the global downloads of fitness and health apps increased by 46%. Indeed, the COVID-19 pandemic lockdown has led to a transition to virtual fitness from traditional studios and gyms and increased downloads and usage of fitness apps. Thus M-health is an opportunity for better service to patients and knowledge promotion of world people.

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# The role of mHealth in diet management of patients with inherited metabolic diseases

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## ABSTRACT

Inherited metabolic diseases are mainly caused by a genetic defect in the production or function of one of the proteins in the body. These diseases often present in early infancy with life-threatening metabolic decompensation attacks. In most cases vital organs such as the CNS, eye, liver, spleen, kidney, heart, and musculoskeletal system can be involved. Because metabolic diseases have an autosomal recessive inheritance, countries with a high prevalence of consanguineous marriages have a high incidence of these diseases. For example, the prevalence of phenylketonuria in Japan is 1: 108,822 and in the United States is 1: 10,000. Turkey, with an incidence of 1: 6,000, and Iran, with an incidence of 1: 4,698, are among the countries with the highest incidence of phenylketonuria. Nutrition management and nutrition therapy in patients with inherited metabolic diseases are very important and vital. Therefore, the diet of this group of patients needs careful and continuous analysis and follow-up. Since cell phones are used by many people on a daily basis, using mobile applications can be an effective and cost-effective way to adjust and follow the diet of this group of patients. In this regard, several applications have been designed to help people with metabolic diseases. These applications allow patients to set reminders to remind them of protein substitutes, follow-up their protein intake, record their protein metabolites levels in their blood, and send reports to their nutritionist and health professional. These Apps have been shown to save time and money. They can also help the health care system in many situations, such as pandemic conditions (ex: COVID-19 pandemic), inability of the patient to go to medical centers due to financial problems or long distances and other problems. Therefore, using mobile-health in hereditary metabolic patients can be very helpful as a companion guide for these patients.

## Keywords
Inherited metabolic diseases, Mobile-Health, mHealth, Application, Diet

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# Inborn Error of Metabolism

Zohreh Mazloom[1]*

## ABSTRACT

Inborn errors of metabolism (IEM) are inherited traits that result in the absence or reduced activity of a specific enzyme or cofactor that is required for catabolism of amino acids (AAs), lipids, or carbohydrates which lead to pathologic buildup of upstream substrates and or metabolites. Most genetic metabolic disorders are inherited as autosomal- recessive traits.

It occur in 1 out of 2500 births. Due to their heterogeneity, different disorders have different distinct epidemiology, presentations, and heritability.

They often have elevations in ammonia phenylalanine and other metabolites. Patients with difficulty in pathways involved in accessing stored energy may become hypoglycemic. However, as long as they have an ongoing intake of carbohydrates they may be asymptomatic.

The management of patients with inborn errors of metabolism is very complex and challenging. Because there is no cure, the disorders are best managed by a professional team that includes Doctors, dietitians, nurses, and therapists. In many cases, there is no specific treatment and symptoms are managed by medical nutrition Therapy, with intervention specific to the disorder. The goals of MNT are to maintain biochemical equilibrium for the disrupted pathway while providing adequate nutrients to support growth and development for growing child.

Nutrition interventions included circumvent the missing or inactive enzyme by restricting the amount of substrate available, supplementing the amount of product, and supplementing the enzymatic cofactor, or combining any or all of these approaches.

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# Virtual media and games for nutrition and life-style education

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## ABSTRACT

To make health promotion campaigns more effective, the motivation of the people to whom they are directed is required, that can be achieved by gamification through electronic devices. One of the areas that are interesting especially for the children and adolescents are games designed for health (G4H). These games can be used for all ages, especially for children and adolescents and can be implemented for prevention, treatment, and rehabilitation. Game design features include interactivity, feedback, agency or control, identity, and immersion. There are 5 types of G4H. These include the games used for increasing knowledge, changing behavior, incorporating the behavior (exer-games), changing health precursors, and educating health professionals. Exer-games are effective in managing obesity and are the best forms of G4H. According to guidelines, due to the concerns for inactivity, screen time should be lower than 2 hours a day, even for the beneficial ones. Only for exer-games that include physical activity, time limitation is not necessary. Although the beneficial effects of face-to-face family-based treatment have been described, it remains uncertain whether such treatments can be effective when delivered to potentially greater numbers using a mobile health approach. Educational experiences by G4H seem beneficial and mobile app-based interventions are effective health promotion strategy among the general disease-free population, especially among teenagers. Mobile devices are considered a way of increasing knowledge and producing a behavioral modification.

## Keywords
Games for health, Virtual media, Nutrition Education, Nutrition counseling

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# Development of 'The comprehensive mobile application (App) of advanced carbohydrate counting and diet- and insulin-regimen planning'for type 1 diabetic patients

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## ABSTRACT

**Background:** Nowadays, the introduction of the so-called 'diabetes technology' (either hardware/device or software) to different aspects of day-to-day living in patients with diabetes aims to improve blood glucose control and thus, various lifestyle features. Since medical nutrition therapy has long been considered as the corn stone of chronic management of the disease, the coordination of vast context of diabetes education/training, particularly in the area of carbohydrate counting regarding insulin regimen, is of great concern. On the other hand, as many other food cultures, Iranian food culture consist of a set of traditional dietary patterns and food consumption habit, depending on the country natural environment and available food items.

**Objective:** The study was aimed to develop "*the Comprehensive Mobile Application (App) of Advanced Carbohydrate Counting and Diet- and Insulin-Regimen Planning*" to help type 1 diabetic patients improving their health status.

**Material and Methods:** The programming language of Kotlin, JavaScript, Node JS, and HTML5 was used for the mobile app development.

## Results and Conclusion: The app was developed with the following abilities:

1) Educate users on different aspects of disease control (including, updated general treatment guidelines on physical activity, medical nutrition and insulin therapy, stress management; and the patient's specific goals and dietary needs),
2) Perform advanced carbohydrate counting utilizing both picture-represented and kitchen-scale of carbohydrate foods as well as traditional Iranian foods,
3) Recommend the patient's specific insulin dose (either short- or rapid-acting), based on the carbohydrate content of the selected meal or the selected amount of Iranian foods,
4) Recommend the personalized insulin dose needed for decreasing the high blood glucose levels, and
5) Perform both 3 and 4 simultaneously to recommend the insulin dosage required for covering the carbohydrate content of selected meal and lowering high blood glucose.

## Keywords
mobile applications, diabetes mellitus, insulin, carbohydrates

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# Online nutritional counselling: chances and challenges

Azadeh Nadjarzadeh[1,2]*

## ABSTRACT

The most common ways of counselling clients and patients carry out in a private practice, hospital, or other clinical setting. Due to the rapid advances in technology more and more dietitians are branching out of the traditional office and clinical setting and are offering virtual nutrition counselling services remotely. Technology has made the provision of nutrition counselling more convenient and accessible for both the provider and the client. The best way to conserve clients is the way that best suits their needs to receive information. If a client prefers to stay home and is willing to chat by phone or computer it makes sense to accommodate them. Some benefits of online counselling is quick sessions saving time lower prices flexibility no limit for location, more family time family engagement, benefits the young and tech-savvy, enough demand for service and greater privacy. However, it is challenging to establish an empathetic relationship with clients and it isn't appropriate for every counselor or client and we need to be good judges of when to refer out to somebody for a face-to-face consult also no verbal physical cues and the absence of eye-contact during online counselling sessions isn't ideal for all clients. Finally, including innovative technologies into dietetic practice could assist nutritional counselling by not only enhancing the efficiency and quality of nutrition care but also increasing adherence to self-monitoring of patient centered goals. Thus it is suggested that the online counselling alongside individualized dietetic support while performance for long term weight management should be assessed.

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# 'Medical Nutrition Therapy and the Principal of Diet Planning in Inborn Errors of Metabolism (IEM)' and 'the appliccation of the Comprehensive Software of Growth Assessment and Diet Planning for Inborn Errors of Metabolism_(Metabolic Nutri-Expert System)': A Nutrition Workshop

Seyedeh Maryam Abdollahzadeh[1]*

## ABSTRACT

More frequently diagnosed due to widespread newborn screening programs (NSPs), inborn errors of metabolism (IEMs) are expected to be less neglected in developing countries, including Iran. Improved medical practices have led such patients to have more chance of longevity, as well. Phenylketonuria (PKU), identified as the most common inborn errors of amino acid metabolism (IEAAM), has attracted the most attention. In this regard, in the 4th Shiraz International mHealth Congress, Feb 2021, a nutrition workshop was held to introduce medical nutrition therapy (MNT) and the principles of diet planning for IEAAM with special focus on PKU. Both international and national consensus on disease global incidence, NSPs, classification, laboratory and clinical finding, recommended duration of diet therapy, rational of MNT, as well as medical and nutritional goals were discussed. The step-by-step process of diet prescription by two different methods of PKU exchange list and PHE-exchange list were also disserted, each with example. The application of "*the Comprehensive Software of Growth Assessment and Diet Planning for Inborn Errors of Metabolism (Metabolic Nutri-Expert System)*", developed by the workshop presenter, was further discussed.

## Keywords

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# Short review on mhealth application in rehabilitation during last 10 years

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## ABSTRACT

**Background:**  Today, with respect to Covid-19 and the importance of management and treatment by means of telerehabilitation, this work was done to review the latest evidences with respect to mhealth in the field of rehabilitation.

**Objective:** This work was done in order to find and suggest new ideas about telerehabilitation and mhealth to improve any work in this branch such as research and application production.

**Material and Methods:** This short review was carried out from 20 December 2020 to 28 January 2021. It included journals published in English. Standard Internet search engines such as Google and Yahoo were used. First time 35 articles were found and then 15 articles were chosen.

**Results:** The results showed that progression of technology caused using mhealth applications in the rehabilitation field progressively. Only few randomized clinical trials were done in this field. Also small sample size used in the previous works and there is loss of evidence on pediatrics and vulnerable population in these studies.

**Conclusion:** It needs to do new interventional researches on larger population and on children with neurological problems by using mhealth applications.

## Keywords
Rehabilitation, Health, Mobile, Applications

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# Life balance during early phase of COVID 19 physical isolation among Iranian society: A mixed method study

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## ABSTRACT

**Background:** Occupational life balance is a complex multifactorial concept that be influenced by different status in the life.

**Objective:** To investigate the life balance during covid-19 Quarantine, this study was designed.

**Material and Methods:** A mixed method study was designed, 403 participants completed the internet base Life Balance Inventory (LBI) with five dimensions including; health; relationship; identity; challenging/interesting activity and daily activities. Also they answered an open ended question related to daily activities. For analyzing qualitative data, descriptive statistics, t-test and One-way ANOVA was used. For quantitative analysis, directed content analysis was applied.

**Results:** The total mean scores (Standard Deviation: SD) of LBI in all 401 participants was 1.51 (0.38). Significant association was found between some demographic characteristics and the total mean scores of LBI such as gender (P=0.001), chronic comorbidity (P-value =0.029) and Job (P-value=0.044). Health subscale was not different in demographic factors, males were more balanced in daily activity including driving and social transportation (p=0/001). Married people (p=0.001) and participants with age more than 40 (y), (p= 0.001) were more balanced in relationship subscale. Teachers and faculty members as a branch of the job were more balanced in identity (p=0.014) and relationship (p=.0/001). Participants with higher income were more balanced in challenge/interesting subscale (p=0.033). Results related to the nested phase showed that the main category of occupation participants mentioned during isolation was related to activity of daily living and instrumental activity daily living.

**Conclusion:** The results indicated that during the early phase of COVID 19 isolation, participants had an unbalanced lifestyle as a whole. All participants do a huge amount of activity for adaptation to change, safety and emergency health maintenance.

## Keywords
Covid19, Isolation, Life balance, Occupation, Relationship, Adaptation, Health

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# Mobile applications for medical image analysis

Mehran Yazdi[1]*

## ABSTRACT

**Background:** Mobile phones are increasingly being used by people in the world. Nowadays, advances in mobile phone technologies including cost-effectiveness, high processing system, high quality display and user friendly graphical interface enable mobile phones to be used in many image analysis applications. These apps involve object detection, recognition and identification, classifying and potentially modifying elements or features of an image. Many of these apps are accessible and can be downloaded freely which provide good image analysis performances for users. Meanwhile, the recent advances in characteristics of mobile phones such as high power cpu, computer like platform, easy programmability, various types of built-in sensors, and the ability to collect information through external sensors have promoted the usage of mobile phones for providing solutions for medical image analysis. Developing apps for medical image diagnosis helps in accurately detecting and providing rapid treatment for many diseases. The increasing processing power of the mobile phones will definitely enable the development of more sophisticated algorithms for complex and accurate medical image diagnosis in near future. This lecture introduces the recent advances in image analysis apps, especially for medical applications using mobile phone. The lecture also analyzes the challenges in implementing mobile phone-based medical image analysis algorithms and provides some avenues for future research in this area.

**Material and Methods:** Although there are different tools available for creating medical image analysis apps, software developers still have to cope with numerous difficulties and limitations, starting from image resolution and distortion, up to processing power and memory available on mobile devices. Nonetheless, more and more applications use advanced solutions to run medical image/sequence analysis with great results.

**Results:** Thanks to advanced solutions implemented both by mobile device manufacturers and software developers, it is now possible to turn a mobile phone into a powerful image analysis tool. Mobile devices have a great potential when it comes to image processing and medical image diagnosis, and some apps are already using it to the fullest.

**Conclusion:** In this lecture, some practical apps are introduced which can be used for medical image analysis. Although well-developed systems offer a lot of possibilities when it comes to image analysis, they require sufficient computing power and graphics processing units which are still difficult to provide by mobile phones.

## Keywords

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# Artificial intelligence and medical imaging in diagnosis of COVID-19

Omid Pournik[1]\*, Leila Ghalichi[2]

## ABSTRACT

**Background:** With the emergence of COVID-19 outbreak, various types of AI-assisted medical imaging has been applied to help in screening, diagnosis and management of the disease.

**Objective:** We aim to describe computed tomography and radiography as two popular AI-assisted medical imaging modalities in diagnosis and management of COVID-19.

**Material and Methods:** We provide an overview of AI-assisted CT and AI-assisted radiography projects and their applications. We also discussed some relevant projects in Iran. Our models formed with an innovative preprocessing approach to remove possible batch effects and artifacts and also to deploy data from multiple sources for end-to-end training of Deep Neural Networks (DNN).

**Results:** This projects showed that the use of artificial intelligence in the analysis of plain chest radiographs (CXR) can be very helpful in the rapid screening of suspected individuals (Sensitivity >95%) and the diagnosis of Covid-19 disease, especially in areas or cases where CT scan is not easily accessible. In addition, the system designed for AI-assisted CT was successful in calculating the size and volume of the infected areas for a more effective treatment of COVID-19 patients. The accuracy score of the models in AI-assisted CT is above 95%.

**Conclusion:** AI-assisted medical imaging has been applied in COVID-19 pandemic both to improve accuracy of the diagnosis and to help answer the increased workload.

## Keywords

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# Acute Care at Home: Home Hospital

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## ABSTRACT

**Background:** Hospitals are the standard of care for management of acute illness, but hospital care can be unsafe, uncomfortable, and expensive. Providing substitutive hospital-level care in a patient's home potentially reduces cost while improving quality and safety.

**Material and Methods:** We present the first US randomized controlled trial of hospital-level care at home versus usual care at an academic medical center and a community hospital. Patients who presented to the emergency department with any infection, heart failure exacerbation, COPD/asthma exacerbation, and various other medical diagnoses were eligible to enroll and be randomized only after an admission decision was made. Patients were excluded if they lived over 5 miles away or were medically unstable by applicable disease-specific risk scores. Patients randomized to home received at least 1 daily physician visit, 2 daily nurse visits, 24/7 video and text contact with clinicians, continuous vital signs monitoring, medications by any route, and portable diagnostics. Additional services were tailored to each patient as needed, such as physical therapy, social work, and food delivery. Our primary outcome was direct cost of the acute care episode. We calculated cost by totaling non-physician labor, supplies, medications, labs, radiology, and transport. We secondarily studied utilization (e.g., labs, consultations), 30-day readmission, and quality and safety (e.g., adverse events, physical activity via vital signs monitor).

**Results:** Ninety-one patients enrolled and were generally frail and chronically ill; were frequent users of hospital care; and had excellent emotional support, fair health literacy, fair health-related quality of life, and functional status limitations. The adjusted mean direct cost of the acute episode for home patients was 38% lower (95% CI, 24% to 49%) than for control patients. During the acute episode, home patients had fewer lab orders (median per admission: 3 vs 15), less often received imaging (14% vs 44%), and less often received consultations (2% vs 31%; $p<0.01$ for all comparisons). Home patients spent less of the day sedentary (12% vs 23%; $p=0.02$) or lying down (18% vs 55%; $p<0.01$). Global satisfaction with care was higher for home patients (median, 10 vs 9 out of 10; $p=0.04$). Adjusted mean direct cost for the acute plus 30-day post-discharge period for home patients was 36% lower (95% CI, 20% to 49%). Home patients were readmitted within 30 days significantly less than control patients (7% vs 23%; adjusted OR, 0.11 [95% CI, 0.02 to 0.61])..

**Conclusion:** The use of substitutive home hospitalization compared to usual care in the hospital reduced cost, utilization, and readmission, while increasing physical activity and patient experience.

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# Sleep & Mental Health: Examples of Virtual Health for Health Tourism

Azita Tavallaei[1]*

## ABSTRACT

Telehealth is the new face of healthcare and has improved access to medical care. Telehealth overcomes distances between specialized medical services and patients. Our initial effort in telehealth started with establishing a modern state of the art and comprehensive sleep disorders centre in Ordibehesht hospital, Shirza, Iran. This centre was established in close collaboration with Professor A. Sharafkhaneh, MD, PhD from Texas Medical Centre. Up to now we have provided comprehensive sleep services to more than 350 patients.

Subsequently, we focused our attention to a much needed tele-mental health service for Iranian expatriates. There are many Iranians leaving abroad that deal with mental health issues related to moving to a new culture. Mental health is culturally affected and having an experienced mental health expert from your own language and culture may be very effective. With this in mind, we established the Global Virtual Mental Health (GVMH.net) (globalvirtualmentalhealth.com) connecting experienced experts in mental health from Iran to Iranians abroad that are seeking mental health services.

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# Virtual hospital in COVID-19 pandemic: challenges and strategies

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## ABSTRACT

Emerging COVID-19 pandemic has affected countries globally. High transmissibility, rapid mutation and lack of definite treatment have made the Corona virus a monster which has imposed a great burden on healthcare systems. Incremental need for protective equipments including surgical masks, gloves, and shields as well as the sanitizer was demanding specially at the beginning of the pandemic. Also, COVID-19 pandemic was accompanied by an unexpected need for hospitalization, and ICU care which affected the quality and quantity of survives delivered was routinely by the hospitals to their inpatient customers. Furthermore, healthcare workers had to handle a higher workload which resulted in a remarkable burnout of healthcare staff. On the other hand most patients and their families had to struggle with catastrophic cost of care which was not accounted in the routine expenditure.

Iran has also been affected by the COVID-19 pandemic significantly. According to the world meter site, the mortality rate due to COVID-19 infection is estimated to be 4%, while 2% of the active cases have reported critically ill patients. All abovementioned points show the necessity of using an innovative method to overcome the problems. One of the most cost-effective strategies could be designing virtual hospitals in which the patient's home is used as the care unit and the family members are the responsible for taking care of their patient while they themselves are supervised by an expert and trained healthcare team. By adopting virtual hospitals, the capacity of the hospitals is reserved for the patients who are critically ill. Although some countries have reported promising results by using the virtual hospitals, adopting and implanting this program impose the health care systems with great challenges. In the lecture we are going to discuss the pros and cons of implementing virtual hospital in Iran for overcoming the COVID-19 4th wave.

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# Lessons Learned in Pakistan: mhealth and Covid-19

Nadeem Mahmood[1]*

## ABSTRACT

The spread of Covid-19 pandemic has almost affected all parts of the World and it has halted almost all domains of life for a certain period. The countries have to adapt the alternative strategies to cater this spread of Corona virus. The health sector has been on the forefront of this pandemic and various strategies have been adopted by the countries to provide health services in the most difficult circumstances. Pakistan has also suffered from Covid-19 spread out and more than 5.5 million cases were recorded, more than 12000 deaths occurred and around 30000 active cases in various hospitals. There are various extraordinary measures have been taken by the Government to handle this pandemic which includes the formation of National Command and Control System (NCOC), dissemination of protection kits for health workers, provision of PCR tests kits for masses, huge media campaign including electronic and print media, public service health messages and caller tunes, creation of isolation centers and provision of basic health facilities to the people in the lockdown and post lock down phases. This pandemic created an opportunity for public and private health institutions to develop and launch mobile health (mHealth) applications to access vast population and to provide them health services at various levels. Pakistan has a population of 200 million which ranked making it the fifth most populous country of the World. The 70% population lives in the rural areas and 30% population lives in urban areas. According to Pakistan Telecommunication Authority we have around 176 million cellular subscribers, 91 million 3G/4G subscribers and 93 million broadband subscribers.

The growing mobile and internet infrastructure helped the health sector to launch various mHealth applications such as Covid-19 mobile application launched by the Government of Pakistan which gives the update statistics on Covid-19 with reference to the given location. Coronacheck which has been launched by Agha Khan University Hospital (AKUH), which is a self-assessment tool based on an interactive chatbot driven by artificial intelligence to assess an individual based on given symptoms the possibility of Covid-19. Another application of telehealth launched by the Government to provide basic health services and guidance to the people to avoid unnecessary rush in the hospitals during pandemic.

Pakistan has successfully managed the dangerous spread of Corona virus and realized that the decisions must be based on an 'integrated framework' of top-down and bottom-up policymaking, adopt disaster preparedness and build resilience across the entire governance structure and to develop reliable health data integrated system and invest in health information technology infrastructure. The in depth analysis of Covid-19 situation in Pakistan leads to various recommendations which includes the registration of health profile of every citizen using National Health Card (like CNIC), Establishment of Emergency response units for health emergencies, Regulatory framework for mHealth and eHealth applications, Extensive training of information and communication technology to the healthcare professionals and to minimize the digital divide.

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# A matching mechanism between the type of business and business model for E-health start-ups

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## ABSTRACT

**Background:** This paper reviews and summarizes different e-health business models (BMs) and provides practical advice for start-ups to match their businesses with a proper BM. E-health businesses are divided into five different categories: Personalized Health Solutions, data on request, patient experience, care-anywhere networks, and telehealth. A given BM does not work equally well for all types of businesses. Thus, start-up teams need to carefully determine the type of their businesses, carefully study different E-health BMs, and select one or a mix of applicable BMs.

**Objective:** The purpose of this study to find a proper match between BMs and type of the business for e-health start-ups.

**Material and Methods:** The six most applied BMs of e-health reviewed and summarized; Freemium, multi-sided, crowdsourcing, razor and blade, inverted razor and blade, and as a service. All these BMs are widely and successfully used in the e-health industry, but the question is when and how should we apply them? To answer the question, the paper proposed a matching mechanism between the type of the business and BM.

**Conclusion:** Freemium seems a proper BM for companies that provide Personalized Health Solutions, however, to be successful they need to keep the balance between free and premium features. In the same vein, as a service, crowdsourcing, both direct and inverted razor and blade, and multi-sided BMs have been matched with data on request, patient experience, care-anywhere network, and telehealth types of business. It is worth mentioning that companies could also combine the BMs to be better matched with their major activities. This matching mechanism reveals the main challenges for companies and helps them to find the bottlenecks in their business activities.

## Keywords

E-health, business model, type of business, and matching mechanism

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# Mobile health for the management of nutrition in gestational diabetes mellitus: a review

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## ABSTRACT

**Background:** Gestational Diabetes Mellitus (GDM) affects up to 16% of pregnant women and the main complications of GDM on new born babies are higher incidence of macrosomia and hypoglycemia. Tele-medicine with unique features such as: overcoming the distance and time boundaries, online access to a huge amount of health and medical information, as well as ease of sharing these information on social networks by establishing fast and safe communication between pregnant women and nutritionists, can be used in health care as mobile health (mHealth) tools especially in Covid-19 pandemic.

**Objective:** The aim of this study was to investigate the use of Tele-medicine in the nutritional management and control of GDM.

**Material and Methods:** The present review study conducted according search in search engines such as: Scopus, Google Scholar, and PubMed. English language and keywords such as: Gestational Diabetes Mellitus, Tele-medicine, Applications, Mobile health, Smartphone and their combinations were used for the search. The time period from 2010 to 2021 was considered for the selection of articles.

**Results:** Telemedicine was associated with significantly fewer unscheduled GDM clinic visits. Quality of life, glycemic control, and nutritional care process knowledge were similar between the telemedicine and usual care groups. Women using telemedicine systems were more compliant and satisfied than women in traditional care groups. They recorded more blood values than did the standard protocol group. Indeed they appreciated the possibility to contact the physician whenever they needed as well as mentioning the time saving as the most common perceived advantage particularly with the ease of use, personalization, motivation, and self-efficacy.

**Conclusion:** Mobile health applications are the most frequent current telemedicine implementations which has the potential to simplify GDM nutritional management without compromising maternal and fetal outcomes. Its advantage may lie in the convenience of reducing face-to-face and unscheduled consultations, which in turn can aid less Covid-19 worries for pregnant women.

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## Keywords

# A Stethoscope with Portable ECG Monitoring Device in Cellular Connection with Internet Service

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## ABSTRACT

**Background:** Nowadays, the emergence of Tele-healthcare via Internet Of Things (IOT) remotely have paved the way for decreasing mortality of patients suffering from heart diseases.

**Objective:** The aim is to decrease the amount of huge costs and present a user-friendly device to make communication easy.

**Material and Methods:** The proposed system include: recording sensor, Analog Front-end (AFE), processing unit, wireless interfacing and monitoring. To record heart sound (PCG) and signal (ECG) respectively, piezoelectric and skin surface electrodes were utilized. AFE extract, amplify, and filter small bio-potential heart signals in noisy conditions by AD8232. In order to go faster through built in design in 1st phase we uses two processing unit of AVR and ARM microcontrollers' family. The former acquires sensors' data while latter sends these information to the server. The wireless interfacing block, based on the SIM800L module, is configured as a Data Communication Equipment (DCE). It implements an HTTP multi-client server allowing sensors to be easily configured and monitored through Serial port interface.

**Results:** The primary prototype device, based on the SIM800L, is configured as a standard cellular connection with internet service. Patients' heart data transfer to server using POST method in HTTP protocol at 96KB SRAM, besides call and SMS service communications.

**Conclusion:** Components are integrated into a comfortable, easy to wear compact system which can acquire a bipolar ECG signal and heart sound simultaneously from the chest of the user over a period of 15Min requested interval according to doctor protocol.

## Keywords
Stethoscope, Portable ECG, Tele-healthcare, Remote health monitoring, IOT

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# CeliacPlus: A Nutrition-Based Mobile Phone Application for the Management of Celiac Disease

Saeed Sherafatmanesh[1] , Ali Bakhshi[2], Najmeh Maayeshi[3], Naser Honar[4], Manoosh Mehrabi[5], Maryam Ekramzadeh[6]*

## ABSTRACT

**Background:** Celiac disease (CD) is the most recognized inflammatory small intestine disorder that occurs as a result of an immune response to ingested gluten proteins of wheat, barley, and rye in genetically predisposed individuals. Adhering to a strict gluten-free (GF) diet is required to be assured of nutritional sufficiency and prompt healing the CD manifestations. Therefore, regarding the popularization of mobile technologies, using mobile health (mHealth) applications provide a favored opportunity to encourage patient interest in personal nutrition education and disease symptomatology.

**Objective:** The goal of our study was to develop a Persian-language smartphone application (CeliacPlus; $C^+$) by user-centered design for individuals with CD, to improve adherence to GF diet and enhance patients` knowledge.

**Material and Methods:** This project was a developmental-applied study which involved three phases of analysis, design, and development. At first, a scientific review was performed on existing CD related mobile applications. Also, celiac patients were consulted to realize their preferences, barriers, and facilitators in the use of mHealth. Then, the main learning menu of $C^+$ was designed based on the collected information. Eventually, the final version of $C^+$ was developed under the supervision of the team consists of nutritionists, gastroenterologist and expert app developers.

**Results:** The mobile software can provide consumers with easy-to-understand nutrition information, FAQs, and practical tips for the disease management and also support the selection of GF choices when shopping or cooking food.

**Conclusion:** $C^+$ may be a potentially helpful approach in empowering patients to acquire self-care abilities and ensure overall gut health.

## Keywords
Celiac Disease, Mobile Health, Disease Management, Mobile Applications, Gluten-Free Diet

# Design and Evaluation of Mobile Based Self-Management System For covid-19

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## ABSTRACT

**Background:** Mobile health (mHealth) apps have played an important role in mitigating the coronavirus disease (Covid-19) response. However, there is no resource that provides a self-management system for covid-19 in Iran.

**Material and Methods:** The data required in this research for evaluating the information and designing the application were collected in two steps: first, the data required for information needs about Covid-19 assessment and application design were collected by searching in electronic databases. A questionnaire was applied by physicians to validate and determine the significance of these elements. Afterwards, based on information elements and the self-care, application was designed in the Android Studio environment.

**Results:** Information elements and functional capabilities required by the program were determined. Web-based services as a system interface, not only provided the communication between the patient and the care provider, also allowed for patient monitoring and disease control. Then evaluation of the performance and performance of the program was done by physicians and software experts. The findings showed user satisfaction (86%) with the application.

**Conclusion:** Monitoring of treatment electronically allows for less costly monitoring of the patient. In this study, a prototype of the relationship was presented between self-care application and portal and its potential benefits, which will allow future studies to improve and add new capabilities.

## Keywords

Covid-19, Self-Management, Mobile, Smartphone

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# How can children take advantage of mobile health during pandemic?

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## ABSTRACT

**Background:** The spread of the coronavirus disease (COVID-19) outbreak globally poses a public health threat and has affected people in various unprecedented ways especially in pediatric health care delivery. Innovative digital health approaches play vital roles as reliable resources to overcome restrictions and challenges imposed during pandemic increasing access to effective, accessible, and consumer-friendly healthcare. Given the restrictions and limitations of in-person interact, many patients, families, clinicians and pediatricians, are increasingly realizing the potential use of telehealth tools providing opportunities to offer care for pediatric populations. Health education and promotion are important components of disease prevention activities in general, particularly during disease outbreaks, by offering well-established tools such as digital health.

**Objective:** The purpose of this study is to determine the role of Digital Health particularly integrated telemedicine and virtual health in facilitating children healthcare and also highlight some of the available digital approaches that can continue to be used for young people in light of the COVID-19 pandemic.

**Material and Methods:** This study, using valid sites and databases, is a review-analysis based on the library sources and online articles. Data were collected using the resources available in some databases such as PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar searched until December 7th, 2020. The searches were not limited by language. The search strategy was based on a combination of following these concepts: mobile health (m-health), pediatrics and the COVID-19 pandemic. A total of 25 full text studies were included in the final analysis.

**Results:** Telemedicine may play a crucial role in preventing and mitigating childhood stress in the COVID-19 time. Self-management interventions for some disease like type 1 diabetes may be more effective with clinician support or when they involve videogames. Furthermore, to address childhood obesity, self-monitoring is often a key treatment component in behavioural interventions for weight loss. However, in light of these considerations, a small but significant effect size has been reported. Moreover, other novel digital interventions are being developed and tested in various health care fields such as interactive power toothbrushes to improve plaque removal, and eye-gaze control technology for cerebral palsy. Based on scholars when children are in their own homes, they open up to providers more quickly which can take advantage of game heath in order to provide efficient care.

**Conclusion:** Effective telemedicine infrastructure development and initiatives will be essential to alleviate childcare problems created during pandemic era between health provider and patient. Telemedicine facilitates the use of alternatives to face-to-face encounters and may include online visits, live video conversations, store and forward technology, mobile health applications and messaging through text or email. Telemedicine is a useful tool for long-distance clinical care and can be used for education, counselling parents and health management. The COVID-19 pandemic crisis created the opportunity to innovate a solution to help youth who developed health problems during the crisis. It seems that telemedicine can be an effective way to bridge the gaps creating by COVID-19 pandemic.

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## Keywords
Public health, pediatric, coronavirus, telehealth, mobile health

# The effect of mobile-based self-care program on balance of people with Multiple Sclerosis

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## ABSTRACT

**Background:** Nowadays the use of mobile health technology to improve health is a great opportunity for developing countries, to have a more efficient health system by telemedicine education. So the purpose of this study was.

**Objective:** to investigate the effect of mobile-based self-care application on the balance of people with multiple sclerosis.

**Material and Methods:** The present study is a clinical trial study performed in Chaharmahal and Bakhtiari province in 2019. The study units were selected by convenience sampling and were divided into two groups of experimental and control. At first, balance level of the patients was measured by Tinetti (Tinetti Performance Oriented Mobility Assessment) questionnaire. Then, for the experimental group, the self-care application was installed on their cell phone and for two months was used by patients. The control group received no intervention during this period. The application usage rate was measured by self-report checklists. After two months balance level was again measured in both groups. Data were analyzed by using SPSS-21 software and chi-square and independent and paired t-test.

**Results:** Participants in two groups had no significant difference in terms of demographic characteristics and underlying variables including: Age (p=0.736), age groups (p=0.995), gender (p=0.772), education (p=0.880), marital status (p=0.358), and occupation (p=0.172). Before intervention, the mean of balance score was 10.61±3.78 in the control group and 10.55±2.96 in the experimental group, that was not statistically significant (p=0.945). It was while, two months after intervention the mean balance score in the control group was 10.52±3.63 and in the experimental group was 12.00±2.47 and the difference was statistically significant (p=0.049).

**Conclusion:** The results show that an implementation mobile-based self-care application is effective in improving the balance of the patients with multiple sclerosis. Therefore, mobile applications of this supportive method could be useful to manage their disease and to obtain self-care skills.

## Keywords
Self Care, Mobile Application, Balance, Multiple Sclerosis

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# The Effectiveness of telerehabilitation in patients with speech, sound disorders: A systematic review

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## ABSTRACT

**Background:** Telerehabilitation refers to the remote providing of rehabilitation assistances by information technology or telecommunication. One of the applications of rehabilitation is the treatment of people with speech disorders. Sometimes geographical barriers prevent these people from accessing treatment services promptly.

**Objective:** This study aimed to evaluate the technologies used in the telerehabilitation of speech sound disorders patients.

**Material and Methods:** A systematic review of articles through databases of PubMed, Scopus, Web of Science and Science Direct, from December 2000 to December 2020, was conducted using main keywords included, Telerehabilitation and Speech Sound Disorders. Finally, 16 main articles were selected based on inclusion, exclusion, and quality evaluation criteria.

**Results:** These studies demonstrate that telerehabilitation has roles in people with speech and voice disorders caused by post-stroke aphasia, Parkinson's disease, motor speech disorder, acquired neurologic, and stuttering in children was pointed out. The telerehabilitation in people with speech and voice disorders included perceptual measures of voice and orometer function, articulatory precision, speech intelligibility, sound pressure level, acoustic measures of vocal sound pressure level, phonation time, and pitch range. The majority of therapy by videoconference was given in participants' own homes that provided opportunities to participate in the conversation. The major of challenge telerehabilitation with videoconference is access to high-quality broadband connectivity across most countries.

**Conclusion:** Results suggest that online handing over of a multi-purpose group intervention for patients with speech, sound disorders can result in improved communication, communicative participation. Also, suggest that healthcare planer invests on increasing bandwidth to improve the success rate telerehabilitation programs.

## Keywords
Telerehabilitation, Speech Sound Disorder, Telemedicine

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# Development of 'the comprehensive mobile application (App) of advanced carbohydrate counting and diet- and insulin-regimen planning' for type 1 diabetic patients

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## ABSTRACT

**Background:** Nowadays, the introduction of the so-called 'diabetes technology' (either hardware/device or software) to different aspects of day-to-day living in patients with diabetes aims to improve blood glucose control and thus, various lifestyle features. Since medical nutrition therapy has long been considered as the corn stone of chronic management of the disease, the coordination of vast context of diabetes education/training, particularly in the area of carbohydrate counting regarding insulin regimen, is of great concern. On the other hand, as many other food cultures, Iranian food culture consist of a set of traditional dietary patterns and food consumption habit, depending on the country natural environment and available food items.

**Objective:** The study was aimed to develop "*the Comprehensive Mobile Application (App) of Advanced Carbohydrate Counting and Diet- and Insulin-Regimen Planning*" to help type 1 diabetic patients improving their health status.

**Material and Methods:** The programming language of Kotlin, JavaScript, Node JS, and HTML5 was used for the mobile app development.

**Results and Conclusion:** The app was developed with the following abilities:
1) Educate users on different aspects of disease control (including, updated general treatment guidelines on physical activity, medical nutrition and insulin therapy, stress management; and the patient's specific goals and dietary needs),
2) Perform advanced carbohydrate counting utilizing both picture-represented and kitchen-scale of carbohydrate foods as well as traditional Iranian foods,
3) Recommend the patient's specific insulin dose (either short- or rapid-acting), based on the carbohydrate content of the selected meal or the selected amount of Iranian foods,
4) Recommend the personalized insulin dose needed for decreasing the high blood glucose levels, and
5) Perform both 3 and 4 simultaneously to recommend the insulin dosage required for covering the carbohydrate content of selected meal and lowering high blood glucose.

## Keywords
mobile applications, diabetes mellitus, insulin, carbohydrates

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# Adoption and application of mobile learning: A case from Iran

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## ABSTRACT

**Background:** The successful implementation of mobile learning is mainly impacted by learners' attitudes to accepting and applying mobile learning systems.

**Objective:** In current study an m-learning application was developed and implemented for university students and their attitude toward adoption and application of m-learning was investigated.

**Material and Methods:** This cross-sectional study was carried out in 2020. The participants were 114 university students in Abadan school of medical sciences. Data were collected by means of a valid questionnaire containing 42 questions in 13 subscales in addition to an open-ended question about positive and negative aspects of the m-learning application. The validity and the reliability ($\alpha$=0.914) of the questionnaire have been confirmed in a previous study.

**Results:** There was a significant relationship between acceptance and major (p-value= 0.001), mobile usage (p-value= 0.035), and familiarity with m-learning (p-value< 0.001). The total mean of m-learning application acceptance was $3.95 \pm 0.32$ which is a good level. Self-efficacy, perceived ease of use, user interface, and behavioral intention to use were respectively the most influencing factors on acceptance of the m-learning application. Mobile device limitation and governmental support were the least influencing factors. According to the students "direct communication with the teacher/instructor" and "Internet disconnection during video teaching" were amongst the positive and negative aspects of applying the m-learning application respectively.

**Conclusion:** The m-learning application was well adopted among the students. Mobile devices limitations are a reason for the students concerns. "Usability features" can be a point for covering mobile device limitations.

## Keywords

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# Development of a mobile application for data collection in a nationwide survey measuring COVID-19 pandemic effects on Iranians' nutritional status and food security

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## ABSTRACT

**Background:** The lockdown situation created by coronavirus disease 2019 (COVID-19) has also provided an opportunity to rethink the standard survey and data collection approaches to incorporate remote sensing and mobile phone records.

**Objective:** To evaluate how the lockdown has influenced nutritional status and food security of Iranian households a mobile application was developed for data collection in a nationwide survey in Iran.

**Material and Methods:** It was a cross-sectional, descriptive-analytical study using a web-based electronic self-administered questionnaire. The questionnaire included questions about food security, socio-economic (SES), and nutritional status of the household before and during the pandemic. The content validity of the questionnaire was assured by internal and external experts. A previously developed platform was applied to develop the electronic questionnaire. A web link for uploading the electronic questionnaire was created.

**Results:** A total of 21,290 households, who were distributed unevenly by provinces, participated in the survey. In random contact with some participants, it was found that they spent little time to complete it. The participants also found the questionnaire user-friendly. No bug was reported. Using the new approach led to significant savings in the time and costs (i.e. paper, interviewers wages, transportation and server) for conducting the survey. Furthermore, the findings were accessible with high accuracy in a very short time.

**Conclusion:** The study implied the superiority of the mobile application over paper questionnaires in terms of accuracy and saving in time and cost. The use of mobile phones for similar nationwide surveys is strongly recommended.

## Keywords
community survey, nutritional status, pandemic, on line system

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# Evaluation of Mhealth-based rehabilitation for Respiration Disorders: descriptive review

Shamim Kiani[1], Azita Yazdani[2], Sanaz Abasi[3]*

## ABSTRACT

**Background:** The majority of decisions impacting an individual's health occur outside of hospital and clinic settings. This demonstrates the necessity for tools to empower people to make healthy decisions at home. Mobile health (mHealth) technologies have emerged as primary drivers of improving patient health by facilitating behavioral change and are increasingly utilized in healthcare delivery. Smartphones have become ubiquitous, and mHealth apps have the potential to transform elements of chronic disease management. mHealth apps offer new opportunities for access to care, disease specific education, monitoring and disease management, personalized goal setting, adherence reminders, and communication. Pulmonary rehabilitation (PR) is a multidisciplinary, comprehensive treatment intervention for patients with chronic respiratory diseases. Pulmonary rehabilitation is defined as "a comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies that include, but are not limited to, exercise training, education, and behavior change designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors".

**Objective:** According to the International Telecommunication Union, there are currently nearly 5 billion mobile subscriptions in the world. Given the unprecedented proliferation of mobile technologies in healthcare, our aim in this study is to evaluate the effectiveness of mobile health in pulmonary rehabilitation.

**Material and Methods:** This study is a descriptive review study conducted in 2020. The literature search was performed in PubMed, Web of Scienc, scopus using keywords and no time limit. The following Medical Subject Headings terms were used for searching publications: (("mhealth" OR "mobile health") AND (rehabilitation OR "Breathing exercises" OR "Chest therapy")) AND (lung OR "Respiration Disorders" OR Pulmonary). We studied 137 articles by examining 23 articles. Inclusion criteria: Mobile health programs for pulmonary rehabilitation. Exclusion criteria: (1) Report based on systematic review and meta-analysis. (2) Mobile-based interventions by telephone or text message only. (3) Cardiopulmonary studies. (4) Studies have only been implemented and have not evaluated effectiveness.

**Results:** This study is a descriptive review study conducted in 2020. The literature search was performed in PubMed, Web of Scienc, scopus using keywords and no time limit. The following Medical Subject Headings terms were used for searching publications: (("mhealth" OR "mobile health") AND (rehabilitation OR "Breathing exercises" OR "Chest therapy")) AND (lung OR "Respiration Disorders" OR Pulmonary). We studied 137 articles by examining 23 articles. Inclusion criteria: Mobile health programs for pulmonary rehabilitation. Exclusion criteria: (1) Report based on systematic review and meta-analysis. (2) Mobile-based interventions by telephone or text message only. (3) Cardiopulmonary studies.(4) Studies have only been implemented and have not evaluated effectiveness.

**Conclusion:** The majority of studies showed the positive impact of Mhealth-based to enhanced pulmonary rehabilitation outcomes. Mhealth-based rehabilitation programs for pulmonary patients can complement traditional health care-based rehabilitation programs and improve exercise capacity, symptoms of shortness of breath and quality of life, and more. MHealth technology is now a powerful and complementary tool for self-management, remote monitoring and rehabilitation for patients in need of chronic care. According to the World Health Organization, the need for rehabilitation is currently largely unmet. Rehabilitation services in 60-70% of countries are disrupted by the COVID-19 epidemic. According to the results of this study on the positive impact of mobile health technology on pulmonary rehabilitation and the importance of pulmonary rehabilitation, especially in Covid 19 patients, the development and use of mobile health-based programs is suggested.

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# Nursing Stretch Break (NBS): A Unique Mobile-based Application for Management of Musculoskeletal Disorders in Nurses

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## ABSTRACT

**Background:** Musculoskeletal disorders are one of the most common problems related to work in nurses in over the world, which can lead to decreased productivity and effectiveness, dissatisfaction, and burnout. m-Health technologies have the potential to manage musculoskeletal disorders; also, they could have beneficial effects on information and services delivery to nurses.

**Objective:** The purpose of this paper is to introduce the web-based mobile application "Nursing Stretch Break" to manage musculoskeletal disorders in nurses.

**Material and Methods:** This applied developmental study has been conducted at in 2020 the four phases: 1- information requirements extraction, 2- information requirements analysis, 3- determining the minimum data set for mobile application, and 4- mobile application design; also, the application was implemented with Mean Stack. Angular and Node JavaScript)JS) frameworks derived from the JS programming language were also used. Moreover, Mongo DB was used as a database.

**Results:** "Nursing Stretch Break" was designed as a web-based mobile application for nurses to deliver exercise programs and manage their musculoskeletal disorders. It consists of two sections: the admin section and the nurse section. The main components of this application for both sections, include: 1. Register, 2. Exercise programs in three groups, 3. User panel, 4. Question from the researcher, 5. About us, 6. Contact us, 7. Report, and 8. Answer the questions.

**Conclusion:** Considering the fact that mobile technologies could be a powerful medias for providing supports to health care consumers; therefore, the "Nursing Stretch Break" as musculoskeletal disorders management application can be one of the effective ways for delivering exercise programs and managing these disorders in the nurses.

## Keywords
Mobile-based application, musculoskeletal disorders, nurse, stretch break

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# A Mobile Application for Appointment Scheduling: A Development And Feasibility Study

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## ABSTRACT

**Background:** Improving appointment scheduling is one of the most important priorities in hospitals and clinics that can improve patients' satisfaction.

**Objective:** The present study aimed to develop a mobile application for appointment scheduling and to evaluate the feasibility of end-user adoption.

**Material and Methods:** The current study was conducted in two-phased. First, the system was designed based on medical informatics experts' perspectives. The system quality was evaluated by the Mobile Apps Rating Scale (MARS). Second, the feasibility of end-user adoption was measured using the Technology Acceptance Model (TAM2) questionnaire. Content validity was measured using a Content Validity Index (CVI) and Content Validity Ratio (CVR). The data analysis was conducted using descriptive statistics.

**Results:** The system quality was evaluated by three experts using MARS. The score means of MARS sections including app targets, engagement, functionality, aesthetics, information, app subjective quality, and app-specific were 3.89, 3.89, 4.67, 4.11, 4.56, 4.75, and 4.78, respectively. The results of the TAM questionnaire showed that the system had a high adoption rate by end-users. The mean of the proportion of most evaluation items encompass perceived usefulness, voluntariness, subjective norm, job relevance, result demonstrability, output quality, and intention to use was more than 70%. Only one item "image" acquired a score of less than 70%.

**Conclusion:** Our results showed that designed appointment scheduling according to quality standards can highly adopt by end-users.

## Keywords
Usability Testing, mHealth, Design, Software

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# The Effect of a tele- Health system on the Number of Referrals to a Polyclinic Affiliated to Fars and Hormozgan Petroleum Industry Health Organization

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## ABSTRACT

**Background:** Older people are at higher risk of contracting Covid-19 and the disease may increase by referring to health care facilities. This study aims to investigate the effectiveness of a tele-health counselling system on the number of unnecessary referrals of elderly people with non-communicable diseases to medical centers.

**Objective:** The effect of a tele- health system on the rate of referrals.

**Material and Methods:** In this interventional study without control group, patients with non-communicable diseases with ASCVD (atherosclerotic cardiovascular disease) risk score $\geq 10$ who were receiving health care services from a polyclinic affiliated to Petroleum Industry Health Organization, Shiraz, Iran, were informed about the existence of a newly established telephone medical counseling facility through SMS. In this system, patients received telephone counseling with the medical team (general practitioner, pharmacist and nurse) and if needed and approved by the physician, their drugs were sent to their home. The number of referrals to general and specialized clinics from April to September 2019 (before implementation of the system) was compared with the same period in 2020 (after implementation of the system).

**Results:** A total of 71,564 more than 55 years old patients were covered by general and specialized clinics. The number of referrals to general clinics decreased from 46595 in 2019 to 37554 in 2020 (20% decrease). The number of referrals to specialized clinics decreased from 24968 in 2019 to 9366 in 2020 (63% decrease). In total, a decrease of about 35% was observed in both clinics. The differences were statistically significant (p val<0.05.

**Conclusion:** Providing tele-health care services can substantially decrease the number of unnecessary referrals to clinics among elderly people and decrease the chance of disseminating the covid19.

## Keywords
Telehealth, Reduce, Referrals

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# PreventOsteo: Providing dietary and exercise recommendations to prevent osteoporosis based on users' age, height, weight, and gender

Ehsan Jamshidi[1]*

## ABSTRACT

**Background:** To reduce the risk of osteoporotic fracture, one should build strong bones before age 30. Afterwards, reducing the speed of natural bone loss is the best practice. For this purpose, adequate calcium, vitamin D, and protein intake, as well as performing weight-bearing exercises, are recommended. Learning about the above factors requires reviewing several articles from various resources to which most people do not have access.

**Objective:** Developing an application to provide users with reports containing quantifiable dietary and exercise recommendations tailored individually concerning preventing osteoporosis.

**Material and Methods:** Using articles published by peer-reviewed journals in the field of osteoporosis, we created an application from which users can receive exercise and nutritional advice based on their age, height, weight, and gender.

**Results:** Having access to a mobile phone and a minimal internet connection, any person can receive a report informing them about their daily requirement of calcium, vitamin D, and protein besides their minimum physical activity to reduce the risk of osteoporotic fracture. They can also calculate the amount of calcium, vitamin D, and protein in their daily diets.

**Conclusion:** Using PreventOsteo application, users aged 3 and over can obtain nutritional and physical activity advice concerning the prevention of osteoporosis.

## Keywords
Osteoporosis, Nutritional Requirements, Physical Activity, Mobile Health

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# Design and development of a mobile-based application for self-care of pregnant women with preeclampsia during coronavirus(COVID-19) outbreak

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## ABSTRACT

**Background:** The outbreak of coronavirus (COVID-19) has raised serious concerns for pregnant women with preeclampsia. Self-care applications can be a useful solution to control and manage preeclampsia during coronavirus outbreaks.

**Objectives:** The aim of this study is to design and development of a mobile-based application for self-care of pregnant women with preeclampsia during coronavirus (COVID-19) outbreak.

**Material and Methods:** The present study was conducted in two stages. First, the needs assessment was performed according to the opinions of 20 obstetricians and pregnant women. The results of this step were analyzed by descriptive statistics and SPSS software version 23. Then, based on these results, a prototype of a mobile-based application was designed and developed.

**Results:** According to obstetricians and pregnant women, out of 45 information needs, 30 data elements were introduced in the essential needs assessment stage. Features of the designed application were divided into four sections: profile of a pregnant woman with preeclampsia, disease information, disease management and control, and application capabilities.

**Conclusion:** The designed application can provide various services for pregnant women with preeclampsia, such as diagnosing coronavirus, introducing specialized coronavirus treatment centers, and how to manage anxiety and stress against preeclampsia and coronavirus. The app also provides various capabilities to encourage pregnant women to perform self-care and self-management processes during coronavirus outbreaks and to control and manage preeclampsia.

## Keywords
Mobile-based application, Preeclampsia, Coronavirus(COVID-19)

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# Telehealth-Based Services to Support COVID-19 Patients and Healthcare Providers During the COVID-19 Pandemic: A Systematic Review

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## ABSTRACT

**Background:**  Telehealth systems can significantly improve the triage, treatment and care of COVID-19 patients. Both patients and health providers are strongly motivated to use telehealth services, due to the quarantine and social distancing policies.

**Objective:** This study aimed to systematically review the characteristics of telehealth-based services developed to support COVID-19 patients and/or healthcare providers.

**Material and Methods:** A comprehensive search for the English language articles had been conducted up to 13 May 2020 using PubMed and Scopus electronic databases. In this review paper, only studies have been included that focus on a telehealth-based service to support COVID-19 patients and/or healthcare providers. Later, the general and detailed characteristics of the included studies were extracted.

**Results:** In this review, fifteen out of the 1,291 retrieved articles met the study eligibility criteria. The studies came from 7 countries, where most of them (9, 56.25%) were conducted in the United States, and 3 (18.75%) of them implemented in China. The majority of studies (n=14, 93.4%) addressed patients as the telehealth recipients. Seven studies (46.6%) introduced a mobile application as the main means of the needed communication, followed by videoconferencing or video calls (6, 40%), and phone calls (5, 33.3%) as the media. 10 studies used a synchronous communication, four used an asynchronous communication, and one addressed both communications. Four studies (26.6%) developed a guideline-based telehealth tool. Of 15 included studies, seven (46.6%) addressed diagnosis, three (20%) prevention, three (20%) treatment, and three (20%) follow-up aspects of COVID-19. Totally, 10 group barriers were identified in literature.

**Conclusion:** This review reveals the usefulness of the telehealth-based services during the COVID-19 outbreak. The existing challenges identified through the literature pointed out the need for clear guidelines, scientific evidence, and innovative policies to implement successful telehealth projects.

## Keywords
Telehealth, Telemedicine, COVID-19, Coronavirus, Pandemic

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# ThyroCx: a Self-care and Telemedicine Cellphone Application in Thyroid Cancer Patients

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## ABSTRACT

**Background:** Thyroid cancer patients need to be followed up for life. However, the long course of the disease sometimes makes patients to not follow up regularly and face with complications and recurrence of the disease. Having a self-care mobile application with telemedicine services can play an important role in improving patient follow-up, increasing survival and patient satisfaction. Objectives: Our goal is to design a self-care cellphone application with the ability to consult a doctor, as well as artificial intelligence (AI) based patient's prognosis using the data collected in the application.

**Material and Methods:** The application was designed using Django web framework in python programming language. American Thyroid Association (ATA) guidelines were used for defining the algorithms. The Delphi method including ten nuclear medicine specialists was used to determine the application pitfalls. A pilot was performed to assess the limitations according to the patients' opinions. Patients are followed up by the application and data will be used for (AI) based patient's prognosis.

**Results:** The application was designed in two versions: patient version and physician version including AI assistant; Patients can ask pre/post treatment questions and upload the medical documents, while ATA algorithms, direct physician consult with AI prognosis and alarms in the follow up will help.

**Conclusion:** The ATA+ AI based application warns the patient to start/ stop the proposed treatments and necessary lab tests. Physicians can observe the patients' questions, medical records and estimate the prognosis of patients using AI.

## Keywords
Thyroid Cancer, self-care, ATA, Artificial intelligence

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# The effect of mHealth in improving oral and dental health

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## ABSTRACT

**Background:** Mobile health has provided an effective means to educate, empower, and provide access to health services for individuals and groups.

**Objective:** This study aimed to assess the effects of education through short message service on the knowledge and performance of mothers about children oral health.

**Material and Methods:** This RCT was conducted in kindergartens and preschool centers in Iran. There were 211 participants in this study. Dental health education was provided to mothers using short message service. The data were collected before and four weeks after the intervention.

**Results:** Results showed that oral health education for mothers through short message service has significantly increased mothers' knowledge and practice (p=value>0.05).

**Conclusion:** Educational text messages can be used as an effective, easy to use and simple strategy to improve mothers' knowledge and performance regarding children oral health.

## Keywords
Telemedicine, Oral health, Knowledge, Performance

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# Improving the skills of midwifery students by using the application of prescription in obstetrics and gynecology

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## ABSTRACT

**Background:** Prescribing is one of the main steps in using drugs. Mistakes in prescription can reduce the effectiveness of treatment or increase harm to the patient.

**Objective:** The aim of producing a prescription application in obstetrics and gynecology was to increase the skills of midwifery students in prescribing as well as convenient of using the drugs for users.

**Material and Methods:** This study was performed on 23 midwifery students in the 6th semester. Production and implementation of application was performed in 4 states that includes: 1: product design (Needs assessment and obtain the production license) 2: preparation and product (Conceptual model design, physical model design, implementation and assessment) 3: Product implementation 4: Product evaluation. Using the pre-test and post -test, satisfaction and medication error checklist, data collected. By SPSS software version 21 and t-test data were analyzed.

**Results:** The mean score of pre-tests in gynecological diseases before the intervention was 15.48 and the mean post-tests score after the intervention was 18.96. The mean score of pre-tests in pregnancy diseases before the intervention was 14.29 and the mean post-test score after the intervention was 18.10. All of professors were very satisfied from the application. 91% of the students gave a very high satisfaction score and 9% of them gave a high satisfaction score for the educational package.

**Conclusion:** This application can improve the quality of life of women as a new method in clinical education and prevent of medical errors in gynecological and obstetric fields as much as possible.

## Keywords
Midwifery, Students, Application

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# The association between the use of electronic devices and body mass index in healthy individuals

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## ABSTRACT

**Background:** These days, various types of electronic devices including computers, cellphones, televisions and lamps are used.

**Objective:** This study aimed to evaluate the association between the use of electronic devices and BMI in healthy people.

**Material and Methods:** This cross-sectional study was performed on 225 healthy people. Data were collected using a questionnaire on the duration and hours of use of cellphone, computer, watching TV and the type of lamp used at home. BMI was also assessed. Data were analyzed by SPSS software.

**Results:** The findings of this study showed that there was no association between BMI and duration and number of times of cellphone use per day and length of time having cellphone. In addition, there was no association between the duration of cellphone use and the duration of use for games and entertainment and BMI. Also, there was no association between using handsfree earphone and its duration and BMI. The results showed that there was an association between the duration of watching TV and BMI and people who had longer TV watching time had higher BMI (P = 0.001). On the other hand, there was no association between BMI and duration of using computer, computer usage purpose, type of computer and type of lamp used at home. The results of linear regression also showed that the distance of a person from television and the type of computer were factors that predicted BMI.

**Conclusion:** The results of this study showed that long-term watching television was associated with increased BMI and obesity. Therefore, we draw the attention of people in the society to the fact that watching TV for long times, which were associated with immobility, had many side effects that might be associated with obesity.

## Keywords
Obesity, Body mass index, Electromagnetic devices

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# Prevalence of Using Mobile and Internet by Elderlies and Its Association with Quality of Life and Self-Care: A Field-Based Cross-Sectional Study in Shiraz, Iran

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## ABSTRACT

**Background:**  In Iran, population of elderlies will reach to 25.1% in 2061 compared to 10% in 2010, while increasing use of mobile phones provides a great opportunity for improvement of quality of life (QOL) in them.

**Objective:** Determination of prevalence of using mobile phones and internet and their associations with QOL.

**Material and Methods:** As a cross-sectional study, elderlies which covered by the health centers of Shiraz, Iran were selected by a multi-stage cluster random sampling and interviewed individually. Mobile and internet using were queried. Core Component of Quality of life (CCQOL) and self-care component (SCC) were assessed by LIPAD questionnaire. Analysis of data was done in SPSS 25 using one-way ANOVA (LSD method).

**Results:** Mean age of 412 participants was $68.12 \pm 6.24$ years. Mean of CCQOL was $70.2 \pm 10.5$ (out of 93), while mean of SCC was $16.5 \pm 2.4$ (out of 18). Out of all, 122 (29.6%) did not use mobile phones daily, while 270 (65.5%) used mobiles without internet and 20 (4.9%) used mobiles with internet. CCQOL of these three groups were $67.7 \pm 11.5$, $71 \pm 10$ and $74.4 \pm 8.6$ (P=0.004) and SCC was $15.7 \pm 3.3$, $16.9 \pm 1.75$ and $17 \pm 2.5$, respectively (P<0.001). In these two scales, the difference was noted between non-mobile users and mobile users, while no statistical difference was found between users of mobile phones with or without internet.

**Conclusion:** Using of mobile phones has a significant association with increasing QOL in the elderlies, however such difference was not found between users of mobile phones with internet or without it.

## Keywords
Elderlies, Mobile phone, Internet, Quality of life

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# Telerehabilitation in Older Adults in Covid-19 Pandemic (Systematic Review)

Zhale Zandieh[1], Farzaneh Bahadori[2]*

## ABSTRACT

**Background:** The COVID-19 pandemic has impacted all aspects of health care delivery. To protect health care workers and patients from the risk of disease transmission, use of telecommunications technology is very necessary. Since the elderly population is at risk of this disease, they need the continuation of telerehabilitation services to maintain physical and mental function.

**Objective:** The purpose of this study Use of Gerontology to Assist Older Adults in Isolation during the Covid-19 Pandemic.

**Material and Methods:** Databases have been PubMed, Google Scholar, Scopus, SID, and Iran Doc. The main keywords were COVID-19 Pandemic, Older Adults, Telerehabilitation that were searched in the published papers during 2019-2021. About 3articles were found.

**Results:** The results showed that the use of telerehabilitation during the corona epidemic in maintain the performance of the elderly in activities of daily living(ADL) and instrumental activities of daily living(IADL).

**Conclusion:** Receiving such services is very useful in the elderly population during epidemics, but it faces many challenges that require efforts to address these challenges on the part of service providers and recipients.

## Keywords
Telerehabilitation, Oder Adults, COVID-19 Pandemic

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# The Effect of Virtual Reality on Cognitive Function in Older Adult with Cognitive Impairment in COVID-19 Pandemic (Systematic Review)

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## ABSTRACT

**Background:** With the global outbreak of coronavirus disease and the resulting concerns, caring for at-risk individuals, especially the elderly, has become a stressful issue for caregivers and families. Elderly people with cognitive impairments need more care than others because of the characteristics of the disease.

**Objective:** The purpose of this study Effect of virtual Reality on Cognitive Function in Older Adult in COVID-19 Pandemic.

**Material and Methods:** Databases have been PubMed, Google Scholar, Scopus, SID, and Iran Doc. The main keywords were virtual Reality, Cognitive Function, Cognitive Impairment, COVID-19 Pandemic and older adults that were searched in the published papers during 2019-2020. About 3 articles were found.

**Results:** The results showed that virtual reality can improve the physical and cognitive function of the elderly. The effects of virtual exercise training have been able to have a positive effect on the dimensions of cognitive domains in the elderly with cognitive impairment and the rate of falls in the elderly with cognitive impairment has decreased.

**Conclusion:** Since it is not possible to receive rehabilitation services in these conditions of corona disease epidemic, so it is recommended that all centers providing rehabilitation and care services to increase the quality of life and health of the elderly provide their services through virtual reality.

## Keywords
Virtual Reality, Cognitive Function, Cognitive Impairment, COVID-19 Pandemic

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# Medical image watermarking for mobile health applications

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## ABSTRACT

**Background:** In recent years, image watermarking has provided various usage and has received much attention. Image watermarking is embedding a message in a media that is not easily recognizable. Among all different usages of watermark, it is useful to use it for medical images such as medical application and mobile health. In this method, we make a hyperlink of all patient's information such as name, age, doctor's name, disease, cause, date and time of imaging and embed it invisibly in the medical image and then with an authorized mobile application and holding the mobile on the image containing the watermark, we can access the hyperlink. The transfer of medical images and patient's information is easier and more efficient in this case, and no one allows to manipulate the information.

**Material and Methods:** There are many ways to implement watermarking and access patient's information. In the proposed method, a hyperlink of patient's information is secretly embedded in each medical image which is robust to possible attacks. By holding a mobile toward the medical images and using a specific medical application, the hyperlink is extracted and the information will be obtained.

**Results:** In this paper, we achieved a good accuracy when the watermark is extracted with the mobile phone while it is exposed to various attacks such as image warping, noise, compression and geometric attacks. We can properly retrieve the patient's information embedded into the medical image and transfer it easily.

**Conclusion:** In this paper, we provide a hyperlink to the desired medical image and examine various factors to keep the watermark safe and robust to attacks. We will also show that this method has good stability and can replace all available methods to transfer patient's information using mobile phone.

## Keywords
Image watermarking, Medical application, Medical image, Mobile health, Robust to Attacks

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# COVID-19 Intelligent Assessment System Applicable for Large-scale Population

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## ABSTRACT

**Background:** Limitations in therapeutic infrastructure, health budget, and the number of RT-PCR Kits make it difficult for governments to screen the whole population regularly during COVID-19 outbreak. This study suggests a practical way to assess large populations and monitor infected individuals using a multistage assessment system while considering the limitations.

**Objective:** This research aims to develop an intelligent assessment system that helps use the health infrastructure most efficiently. This system predicts:
a. The probability of being infected
b. The worst disease stage (mild/moderate/critical)
c. The probability of ICU. hospitalizations and death

**Material and Methods:** In this study, training subjects divided into a case group and two different control groups. 1000 individuals participated in each group. An interactive form collected *demographic information, Clinical symptoms, Background diseases & risk factors* from all of the participants. *Chest CT-scan Laboratory data. Blood gas*, and *PCT-RT* test were other features that were studied in this research. Also, a questionnaire asked specialists clinical and diagnostic questions for different stages of COVID-19 (mild, moderate, severe, and critical) In this stage, all of the gathered information was studied using statistical and machine learning analytical algorithms, e.g., Markov models, regression models, and Bayesian networks. Recurrent Neural Network and tree-based algorithms were used to analyze the data and predict the patient's future stage. Moreover, a Convolutional Neural Network (CNN) segmented the lung nodules in CT-Scans and differentiated between COVID-19 disease and similar diseases.

**Results:** After implementation, the model was validated to prevent overfitting and check whether the parameters are tuned. Furthermore, the final product was tested using alpha and beta testing methods to see whether it is generalizable.

**Conclusion:** The proposed model is able to assess large populations in the most efficient way and help medical .

## Keywords
Coronavirus, Assessment System, AI, Mobile Health, Pandemic

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# Online Diagnosis of Coronavirus abnormality from CT-scan of the patient

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## ABSTRACT

**Background:** In today's medical world, the use of technology is a very important issue. With the development of artificial intelligence, the use of this knowledge in the field of medicine also increased day by day. Radiology imaging and CT scans of the lungs are one of the most interesting parts to use AI.

**Objective:** After the coronavirus epidemic, there was a great need for a rapid, very accurate and detailed diagnosis of this anomaly. For this reason, we have tried to address this need so that cases that the physician is not able to diagnose are identified by the system.

**Material and Methods:** In the first part, we used software approaches to read patients' information, and then we used this data to build a model based on deep learning to identify the coronavirus. Our model is based on VGG16 Network, which parameters have been customized and optimized.

**Results:** Different hospital systems with different characteristics have been used and the output accuracy has been obtained on average about 97% for lung CT scans.

**Conclusion:** The proposed system can detect coronavirus disease as well as the degree of lung involvement, Which helps to identify and accelerate the healing process.

## Keywords
Covid-19, coronavirus detection, deep learning, anomaly detection

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# Investigating the effective factors in increasing the quality of care for the elderly by mobile health

Hadis Seifolahzadeh[1]*, Fatemeh Khetabiruodi[2], Sadegh Sharafi[1], Ali Hajipour[3,4]

## ABSTRACT

**Background:** Currently, the tendency to use emerging technologies to increase the quality of care for the elderly is increasing internationally. The emergence of mobile health technology for the elderly in various aspects can be considered as a help and facilitator of health services.

**Objective:** The aim of this study was to investigate the effective factors in increasing the quality of care for the elderly by associated health technology.

**Material and Methods:** This study was conducted systematically by searching the Scopus, Science, PubMed and Google Scholar databases and using the PRISMA workflow diagram to select articles. English language input and time range 2018_2020 were used for the search. There were about 105 articles, of which 48 were included in the study. Then, the qualitative evaluation of the articles was performed based on the abstract list of CASP diagnostic tests with 12 questions and finally 13 articles related to the study were selected.

**Results:** From the search of the mentioned databases and by applying the search restriction, 7 valid articles whose titles and abstracts of related articles were reviewed were used in the present study. Findings showed that the effective factors in increasing the quality of care for the elderly by mobile health include: usefulness of mobile health (33.2%), ease of use (16.6%), ease of access (16.6%) and facilitating conditions (48.9%).

**Conclusion:** The use of mobile phones is effective in providing care for the elderly and reduces costs and easy access to care and its various aspects, as well as increases the impact of self-care in the elderly. Mobile health technology can reduce the number of re-hospitalizations of the elderly through self-care applications and training.

## Keywords
Mobile Health, Tele care, Elderly

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# Investigating the effectiveness of Mobile application in menstruation

Fateme hosseini[1]*, yasaman hosseini[2]

## ABSTRACT

**Background:** Hormonal imbalances affect both physical and mental conditions, daily life and productivity of women. Mobile health (m-health) applications that control menstruation have dramatically increased worldwide. These applications record a lot of personal and demographic information.

**Objective:** To provide an overview of studies that have evaluated the effectiveness of menstrual m-health applications.

**Material and Methods:** This was a systematic review of 832 articles in which certain keywords were searched in PubMed, Google scholar, Scopus, ACM databases between 2000 and 2021. Among these, 58 articles were related to m-health and menstruation, and 18 articles were analyzed by omitting repeated articles. The reviewed articles cover various disciplinary frameworks and methods. Three main issues were identified: menstruation, dysmenorrhea, and menstrual problems.

**Results and Conclusion:** The motivation for using a menstrual program varied, overlapped and changed over time. Women prefer accurate and evidence-based applications to be able to predict physical health, menstrual health, prevention or planning for pregnancy. M-health applications play a very important role in menstrual literacy, ovulation awareness, dysmenorrhea and depression. The common point of many articles have been the lack of adequate scientific and security monitoring of the data of these applications in which the confidential information of individuals is recorded.

## Keywords
Menstruation, Dysmenorrhea, Mobile application

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# Remote Surveillance of SSIs in Abdominal Surgeries with Mobile Health Application

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## ABSTRACT

**Background:** Early diagnosis of surgical site infection (SSI) and other surgical complications in the post-discharge period is important and can prevent many patients' readmissions. Telemedicine and mHealth-based services appear to be a valid option to follow up surgical wounds.

**Objective:** This study aims to develop a follow-up system for remote surveillance of SSIs in abdominal surgeries.

**Material and Methods:** In this applied study first, the necessary components and information infrastructure of the system were extracted through a systematic literature review and then was validated by clinical experts. In the second phase, the system was designed and tested. Finally, the system usability was evaluated as a pilot study by the participation of twenty patients and clinicians from Shahid-Mohammadi hospital in Bandar Abbas city.

**Results:** The main components of the web-based app included indicators and criteria for regular and emergency assessment of self-reported symptoms, visual analog scale (VAS), as well as a feature for regular uploading patient-generated wound images, reminders and notifications, education material, and teleconsultation services. The risk-based models are embedded in the database for early detection of wound complications and poor recovery via monitoring dashboards for healthcare providers. It including main rules set created from incidence, frequency, and severity of SSI-related symptoms. The result of a pilot evaluation showed high users' satisfaction and willingness to use the program.

**Conclusion:** Implementing this new system potentially is feasible. However, this method is not a substitute for conventional clinic follow-up but applying it as part of routine postoperative care management can provide positive effects and outcomes especially in the era of COVID-19 that more willingness to virtual care service is seen.

## Keywords
Surgery, Wound, Surgical site infection, Postoperative period, Follow-up, Telehealth

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# Design, implementation and evaluation of smartphone-based application for medical emergencies in dental office

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## ABSTRACT

**Background:** The occurrence of medical emergencies in dental offices are not common but can be life threatening. The level of theoretical and practical readiness of the dentist and office staff and equipment is one of the most important factors influencing on emergency situation. use mobile software is the easiest ways to update dentists' knowledge

**Objective:** The purpose of this study is to design, build and implement educational software in the field of medical emergencies in the dental office.

**Material and Methods:** This study is an applied-production study, which was conducted in three stages. The first stage is data collection and design of treatment algorithms, the second stage is software development and the third stage is evaluating the efficiency of the software in raising the level of dentists' knowledge. The sample size of this study was 30 dentists working in Shiraz who were selected by simple random sampling. Dentists were evaluated before and after using the software. Data were analyzed by descriptive statistics and analytical statistics by SPSS software.

**Results:** The analysis of tests showed a significant relationship in terms of increasing and updating knowledge. Also, in evaluating the level of user satisfaction, a high number was obtained for various aspects of the software.

**Conclusion:** This software can help the dentist by increasing and updating knowledge in three stages of prevention, diagnosis and treatment of an emergency situation and h him to make appropriate decisions.

## Keywords
smart phone application, medical emergencies, dental office

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# Effect of Education Based on Health Belief Model Using Social Networks on Promoting Pediculosis Preventive Behaviors among School Girls

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## ABSTRACT

**Background:** Pediculosis is one of the most common health problems in children and especially in girls.

**Objective:** This study aimed to investigate effect of education based on health belief model using social network on promoting pediculosis preventive behaviors among school girls.

**Material and Methods:** This quasi-experimental study was conducted in Bojnourd in 2018. 145 students were selected through cluster sampling from 12 schools and randomly divided into intervention and control groups. For the intervention group, the training program was implemented for two weeks and three days each week by uploading videos and educational materials about pediculosis in Social Networks. Data collection tools included a questionnaire based on the Health Belief Model and a demographic questionnaire that was completed by the students before, immediately and 3 months after the education. After the pre-test, educational intervention was done for the test group, data was analyzed by SPSS 20 and by using Chi-square, Exact Fisher tests, Mann-Whitney and ANOVA tests.

**Results:** Based on the results of the study on the mean scores of awareness, perceived sensitivity, perceived benefits, perceived barriers and self-efficacy in the intervention group, a significant statistical difference was observed immediately after the intervention compared to before the intervention ($p<0.001$). Also, mean score of the Perceived Severity ($p<0.001$) cues to action ($p<0.001$) and behavior ($p=0.002$) increased significantly immediately after the intervention in the intervention group compared to the control group.

**Conclusion:** The results of this study showed that education based on health belief model using Social Networks is effective in promoting preventive behaviors of pediculosis in girl students .

## Keywords

Education, Pediculosis, Health Belief Model, Virtual Social network, Girl students

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# Effect of a Self-care Training Program using a Smartphone on General Health, Nutrition Status, and Sleep Quality in the Elderly

Fatemeh Vizeshfar[1], Zakiye Ghelbash[2]*

## ABSTRACT

**Background:** Self-care programs can be considered in the form of primary or secondary level prevention. Since sleep disorders, problems related to eating patterns and general health become more apparent with age.

**Objective:** we aimed to investigate the effect of a self-care training program using a smart phones on general health, nutritional status, and sleep quality of the elderly.

**Material and Methods:** In this randomized quality improvement trial with pre-test and post-test design, 54 healthy and independent elderly were enrolled and randomly allocated to two intervention and control groups. The interventions included 21 sessions of self-care training that were presented virtually using a smart phone.

**Results:** The difference between the mean scores before and after the intervention in the intervention group was significant with respect to general health, nutrition index, and sleep quality.

**Conclusion:** Health-promoting self-care behaviors should be considered as the main strategy to maintain and promote health.

## Keywords
Elderly population, General health, Nutrition quality pattern, Self-care, Sleep quality, Smartphone

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# Mobile health technology effectiveness for weight loss in patients following bariatric surgery

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## ABSTRACT

**Background:** Bariatric surgery is the most effective treatment for morbid obesity, helping individuals losing weight especially over the first year. However, as an adjunct to surgery, behavior modification to achieve and sustain long-term weight loss is needed. Patients must increase physical activity, decrease sedentary behaviors, and adhere to dietary recommendations post-surgery. Compliance with dietary and exercise recommendations is low due to the cumbersome nature. Moreover, many patients show difficulty engaging in long-term follow-up and treatment due to time restrictions, geographic limitations, and financial burdens.

**Objective:** The aim of this review is to summarize the results of studies using Mobile Health (mHealth) technology to conduct assessments and implement interventions with patients after bariatric surgery.

**Material and Methods:** In this review study search engines such as: Scopus, Google Scholar, and PubMed have been searched for keywords such as: Bariatric Surgery, mHealth, Weight Loss, Applications and their combinations were used for the search.

**Results:** Digital health technologies (e.g., wearable activity trackers and mobile phone apps) provide opportunities to empower patients to play an active role in their long-term care, remote health monitoring, and facilitate connectivity with clinicians and peers. In the context of bariatric surgeries, mHealth technology offers the advantages of assisting with calorie counting and exercise tracking. Several studies have confirmed that mHealth technology can be an effective tool for weight loss. This technology has the potential to focus on behavioral modification in a way that's effective for weight loss. It is critical for bariatric surgery success to improve patient's adherence to recommended preoperative and postoperative guidance.

**Conclusion:** Because these patients need high information preoperatively and especially have a high reduction in follow-up rates postoperatively, thus mHealth technology may present a useful method of support.

## Keywords
Bariatric Surgery, mHealth, Weight Loss, Applications

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# Mobile health technology and nutrition support during the COVID-19 pandemic

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## ABSTRACT

**Background:** Optimal nutritional status might decrease the risk and morbidity associated with Coronavirus Disease 2019 (COVID-19), caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Public health recommendations and governmental measures for holding the diffusion of infection, during the COVID-19 pandemic have resulted in many restrictions on outdoor activities or even collective quarantine on the population.

**Objective:** The present review study summarizes the effects of quarantine on lifestyle, including nutrition and physical activity, and the impact of Mobile Health (mHealth) technology in dealing with this crisis.

**Material and Methods:** In this review study search engines such as: Scopus, Google Scholar, and PubMed have been searched for keywords such as: nutritional status, mHealth, obesity, applications and their combinations were used for the search.

**Results:** Quarantine is associated with stress and depression leading to an unhealthy diet and lessened physical activity. This unhealthy nutritional habit may contribute to excess energy intake and weight gain, increasing the risk of developing obesity. Obesity is associated with chronic inflammation, and it is a strong risk factor for heart disease, diabetes, and lung disease that has been confirmed to increase the risk for more serious complications of COVID-19. Educating people to have a healthy diet and physical activity is mandatory to return them to a good lifestyle routine. In the context of lifestyle education, using smart mobile devices, called mHealth, facilitates health services the advantages of assisting with behavioral modification in people following quarantine. mHealth can be used in epidemic and pandemic outbreaks because of its accessibility, ease of use, and attracting many users.

**Conclusion:** In the pandemic outbreak of COVID-19, mHealth is one of the best opportunities to use in the people-nutritionist relationship for nutritional status monitoring and detecting obesity based on obtained data from different locations.

## Keywords
Nutritional Status, mHealth, Obesity, Applications

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# Mobile health for the management of rheumatic diseases: a systematic review

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## ABSTRACT

**Background:** Rheumatoid Arthritis (RA) is the most common inflammatory rheumatic disease. Smartphones with unique features such as: overcoming the distance and time boundaries, online access to a huge amount of health and medical information, as well as ease of sharing these information on social networks by establishing fast and safe communication between patients and doctors, can be used in health care as mobile health (mHealth) tools.

**Objective:** The aim of this study was to investigate the use of smartphones in the self-management and treatment of RA.

**Material and Methods:** The present systematic review study has been analyzed by extensive search in search engines such as: Scopus, SID, Google Scholar, PubMed, Science direct, and ISC. English language and keywords such as: Rheumatoid Arthritis, Applications, Mobile health, Messages, Smartphone and their combinations were used for the search. authors assessed the results based on PRISMA guidelines and performed content analysis using a preestablished categorization of barriers. The time period from 2010 to 2021 was considered for the selection of articles. Initially 149 articles were found, of which about 45 articles were included in the study. Then, these articles were evaluated in terms of title, abstract and full text, and after removing duplicate and irrelevant items, about 25 articles related to the research were selected.

**Results:** The results of the present study showed that mHealth tools for RA patients include; smartphone applications, SMS and video conferencing. These tools have been used in different studies to monitor patient activity, gathering information, communicating with the treatment team, and providing drugs and medication information. Studies have shown that mHealth methods are more effective in promoting the patients' physical activity and self-management than conventional methods. Beside, to collect information, using mHealth is a valid and cost-effective method. mHealth methods are also suitable for communicating with the treatment team and providing medication information. Patients were more satisfied with the mHealth method than the usual methods.

**Conclusion:** Given the prevalence of RA worldwide and its burden on performance, quality of life and longevity of patients, the potential capabilities of new internet-based technologies, including smartphones, can be used to increase the access to knowledge, monitoring, self-management and patient treatment.

## Keywords
mobile health; applications; rheumatoid arthritis; smartphone

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# Mobile health in chronic disease management

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## ABSTRACT

**Background:** Nowadays, mobile technologies are more accessible to the public compare to other systems and have rapidly penetrated the public and private settings. One of the usages of mobile technology is its usage as health control tools.

**Objective:** The purpose of this article is to investigate the effectiveness of mobile health applications and their usage in the process of chronic disease management.

**Material and Methods:** In this review, articles published from 2018 to 2020 were searched using the keywords: Telemedicine, Health and Chronic disease in Electronic databases such as SID, IranMedex, Google Scholar, PubMed, and Scopus.

**Results:** Mobile education is one of the main elements of e-learning, which due to its easy access and up-to-datedness, becomes popular and can make the learning process easier. Mobile education is seen as a new opportunity to improve quality of life for individuals. This technology has been considered in various studies in the world for patients. Studies also focus on health-related software, self-care facilitation, health quality evaluation, mental health, infectious disease diagnosis, chronic disease management. Mobile Health has been used in conjunction with text messages and videoconferencing to diagnose and treat, screen, triage and manage people with chronic illnesses.

**Conclusion:** Mobile technology has provided new opportunities for countries' health care systems. Mobile health has the potential to be used as a low-cost, affordable way to complement chronic disease management services, especially in areas that are economically or geographically poor, and could be used as a bridge to fill the gap in access to specialist services.

## Keywords

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# Lessons Learnt from Developing and Implementing Covid19 Contact Tracing Apps

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## ABSTRACT

**Background:** COVID-19 pandemic requiring collective action at the systemic level; through the use of emerging technologies.

**Objective:** This study presents the lessons learned during the developing and implementing contact tracing apps during the covid19 pandemic.

**Material and Methods:** The key lessons were summarized literature collected from PubMed, Springer, Google Scholar, and JMIR publications looking for covid19 AND contact tracing app with no time constraint.

**Results:** According to the literature, digital contact tracing tools are efficient approaches for better controlling infection spreading. In general, there are distinct approaches in developing these apps regarding system architectures. These architectures (e,g. centralized, decentralized, and hybrid approaches) have their pros and cons. Selecting an appropriate architecture and technologies for developing the app depends on the existing contact tracing process and technology awareness in the community; and the operating cost. Considering factors that facilitate adopting these tools among the public is a critical key in its implementation success. In particular, preserving patient information privacy and respecting ethical issues in data management.

**Conclusion:** Being familiar with the power of digital technologies in response to a global crisis such as the covid19 pandemic is a golden opportunity to prepare for developing and expanding public health infrastructure and strategies to early response to the infectious outbreak.

## Keywords
Contact Tracing, Digital App, Covid19, Smartphone

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# The effects of self- care application on lifestyle and laboratory indices in Non-Alcoholic fatty liver

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## ABSTRACT

**Background:** Non-alcoholic fatty liver disease (NAFLD) is the most prevalent chronic liver disease that if not treated, it may lead to liver failure.

**Objective:** Determine the effect of self-care application on lifestyle and laboratory parameters of NAFLD patients.

**Material and Methods:** This study was randomized clinical trial. 68NAFLD Patients assigned two (Control and Test) groups. Self-care application was developed and implemented for(TG). Data gathered by lifestyle questionnaire that were completed before, one, two and three months after the intervention. Before and after the intervention alanine aminotransferase(ALT), aspartate aminotransferase(AST), triglyceride(TG), cholesterol(Chol), high-densitylipoprotein(HDL), low- densitylipoprotein(LDL), fasting blood sugar (FBS), albumin(Alb), alkaline phosphatase(ALK), blood cell count(CBC) and homeostatic model assessment(HOMA) tests were measured. Educational pamphlets were delivered and telephone follow-up was performed in the CG and TG. Data were analyzed using t-test, chi-square, Fisher's exact, McNemar and repeated measures analysis of variance in SPSS16 software.

**Results:** Mean lifestyle one(p=0.017), two(p=0.001), three(p=0.001) months and Chol(p=0.008), insulin(P<0.001) and HOMAindex(p=0.008) both groups had a significant difference after the intervention. Compared to the pre-intervention, there was significant difference in lifestyle score in both CG(p<0.001) and TG(p<0.001) after the intervention. In the TG, there was a statistically significant difference in terms of TG(p=0.008), Chol(p=0.001) HDL(p=0.001), LDL(p=0.004), insulin(p=0.008), AST(p=0.039) and ALT(p =0.002) and while in the CG in terms of FBS(p=0.013), ALT(p=0.016) after the intervention.

**Conclusion:** Employing self-care application could improve lifestyle and liver laboratory indicators and can be used as part of health promotion programs for NAFLD patients.

## Keywords

Application, Self-care, Lifestyle, Laboratory-indices, Non-alcoholic fatty liver disease

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# Design and evaluation of electronic logbook in the audiology departments of Ahvaz University of Medical Sciences

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## ABSTRACT

**Background:** The most important aspect in the process of educational activities is the assessment and evaluation of students. One of the evaluation methods to record students' activities in the learning environment is electronic logbook. electronic logbooks provides the possibility of accurate and evidence-based documentation for both groups of professors-students.

**Objective:** The aim of this study is Design and evaluation of electronic logbook in the audiology departments of Ahvaz University of Medical Sciences.

**Material and Methods:** In the present original study, the logbook has been designed and compiled by the faculty members of the Department of Audiology of Ahvaz Rehabilitation School based. Data collection tool was a researcher-made questionnaire. All undergraduate audiology students at Ahvaz Rehabilitation School (25 individual) and all clinical professors in the field of audiology (6 individual) were participated in this study.

**Results:** The findings of this study show that 89.3% of professors and 78.4% of students considered the use of electronic logbooks in practical units is necessary. 90.2% of professors and 70% of students believed that the minimum educational requirements for each course were included in the electronic logbook. 89.4% of the professors stated that electronic logbook greatly introduces the student to the learning tasks in each ward.

**Conclusion:** The use of electronic logbook makes it easier to communicate and receive professor answers and spend less time completing the logbook. It also make facilitate the investigation of the number and type of clients for each student and increase quality of the student's clinical evaluation.

## Keywords

electronic logbook, application, education, rehabilitation, audiology

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# Tele audiology and its role in promoting hearing health

Maryam Delphi¹*

## ABSTRACT

**Background:** Tele audiology means the use of electronic information and telecommunication technologies to support clinical hearing care, general and specialized education in audiology field, public health issues and health care providers. In tele audiology many opportunities is Introduced in the fields of education, screening, diagnosis and interventions of auditory. During the COVID_19 epidemic, the use and promotion of tele audiology is very important.

**Objective:** The aim of this study is investigation of the tele audiology role in promoting hearing health.

**Material and Methods:** In the present narrative reviews study, searches were conducted in Pubmed, Springer, magiran, and Embase databases with the keywords Mobile Applications, Hearing Health Care, tele audiology and tele fitting for the period 2010 to 2020.

**Results:** one of the opportunities that teleology provides to therapists are video otoscopy and hearing aid and cochlear implant programming remotely. In addition to saving time for both the patient and the audiologist, it can be used for patients who they have mobility or distance problems. Another notable technology in the tele audiology is ear scanning, which has created a great change in the process of hearing aids, molding, and ear protectors.

**Conclusion:** It should be noted that the use of tele audiology will never replace the audiologist specialty. On the other hand, if such services are used properly, it can lead to the development of audiological professional activity All of these positive tele audiological features make it a unique opportunity during the Covid-19 epidemic.

## Keywords
tele audiology, remote hearing aid fitting, hearing health

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# The role of m-health in elderly self-care during the Corona epidemic: A review study

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## ABSTRACT

**Background:** Aging leads to changes in the body that make the elderly susceptible to various diseases and affect their quality of life. Available information indicates that the elderly are at higher risk for COVID-19. Self-care is one of the main challenges in the effective management of diseases in this population. M-health has an important role in managing, providing care and preventing various diseases and also has the potential to have an impact on supportive care and self-care.

**Objective:** This study was conducted to investigate the role of mobile health technology in improving self-care in the elderly.

**Material and Methods:** To conduct this review study scientific databases such as PubMed, Scopus, Science Direct, Web of Science, Google Scholar, Magiran, Iran Medex and Sid were searched. To find related studies, the keywords "self-care", "older adult", "elder", "COVID-19", "mobile health" and their Persian equivalents were used. Among the articles found, studies on individuals Over 50 years and had the most thematic relevance to the present study was extracted and studied.

**Results:** M-Health technology has good potential for educating and empowering the target population. Improving self-care and health-related lifestyle after using this technology have been reported in some studies. Findings showed that paying attention to items such as technical features (such as background color, font size, user guide) and educational content in designing various mobile health programs can increase the desire of the elderly to use this tool and improve self-care skills. During the corona epidemic, the use of this technology can be effective in promoting self-care, reducing in-person visits and improving the quality of life.

**Conclusion:** Planned use of this technology seems to help increase the efficiency of the health care system and reduce health costs, and leads to symptom management, motivation, stress reduction, personal hygiene, and better communication with health care providers. The growing population of the elderly and the high risk of various diseases, including COVID-19, create an urgent need to identify effective interventions based on mobile health technology that can be designed and implemented to suit the characteristics of the elderly.

## Keywords
elderly, self-care, COVID-19, M-health

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# Follow Up of Coronavirus Infected Patients Using Telemedicine in a Referral Pulmonary Center

Lida Fadaizadeh[1]*

## ABSTRACT

**Background:** Telemedicine is considered an innovative approach for management and follow up of communicable diseases, when person to person contact has the risk of disease dissemination, such as the situation being experienced with corona virus infection.

**Objective:** The aim of this study was to evaluate the role of telemedicine in patient follow up and patient compliance to different communication methods.

**Material and Methods:** For this cross sectional study, all patients discharged from a referral pulmonary hospital dedicated to coronavirus infected patients were given instructions about follow up of symptoms. One group received messages via short message system regarding the severity of their symptoms. For the other group a mobile application was specially developed for tracking their well-being on a daily basis. Severity of symptoms and course of disease were monitored in each group for a two-month period. Statistical analysis was performed using SPSS software version 20.

**Results:** A total 1091 patients with mean age of 53.96± 17.95 years were enrolled in the study. In the first group 406 (60.14%) messages were successfully sent, from which 150 (36.94%) patients replied. Also, 243(35%) patients contacted us by making phone calls .Of the total patients in the second group, 153(64%) patients started using the mobile application. Chief complaint of patients was mainly cough, shortness of breath, fatigue, and myalgia. Deep vein thrombosis, hyperglycemia, post kidney transplant patient and bloody diarrhea were among the reported cases.

**Conclusion:** Patient follow up during epidemics, especially when the disease course is unknown, is an important step in both successful patient management and disease control. This study showed the role of telemedicine for patient follow up, mostly in detecting special situations. But, in order to be successful patient education and active follow up are important factors that must be considered.

## Keywords

Corona virus, telemedicine, monitoring, pandemic, Covid-19

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# Identification of factors affecting adoption of mobile health applications expressed by health care consumers in Shiraz using Interpretive Structural Modeling (ISM)

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## ABSTRACT

**Background:** Today, with the development of mobile technologies in the field of E-health called m-health, we are witnessing the increasing use of this technology. Smartphones, portable devices and their applications can help improving patients' health.

**Objective:** The main purpose of this study was to identify and analyze the factors affecting the acceptance of m-health applications by health care consumers to develop m-health technology using ISM method.

**Material and Methods:** It is a descriptive and cross-sectional study. the population were 100 health care consumers. Data were collected using a researcher-made questionnaire. factors with a higher mean were selected and transferred to ISM questionnaire and distributed among 10 experts. Then, using ISM, correlation and sequence of indices were obtained. Also, the research model was evaluated in terms of driving and dependence power using MICMAC analysis.

**Results:** First, 15 main variables were determined, including information security and privacy, service quality, ease of use, information quality, Trust, system quality, waiting time, design issue, facilitating conditions, Familiarity with technology, interoperability, Personal innovativeness, level of literacy, usefulness and cost. Then, using ISM technique, the variables were classified into 6-levels based on susceptibility and effectiveness.

**Conclusion:** Level-6 include "level of literacy" was determined as the most effective, and level-1 include "trust" and "personal innovativeness" was determined as the most susceptible level. According to MICMAC analysis, independent variables are information security and privacy, level of literacy, interoperability, and familiarity with technology (weak dependence power, strong driving power). trust and personal innovativeness are dependent type (strong dependence power, weak driving power). The rest of the variables are linkage type (strong dependence power, strong driving power), any small changes in these variables causes fundamental changes in the system.

## Keywords
mobile health application, m-health, technology acceptance model, interpretive structural modeling, Electronic-health

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# Identification of factors affecting adoption of mobile health applications expressed by health care providers in Shiraz using Interpretive Structural Modeling (ISM)

Aida Nasihatkon[1]*, Vahid Saffari[2]

## ABSTRACT

**Background:** Smartphones technology in combination with medical specialty has introduced a new possibility called m-health, which provides new opportunities to improve patients' health. Acceptance of m-health technology by health care providers is an important factor in establishing m-health services.

**Objective:** The main purpose of this study is to identify and analyze the factors affecting the acceptance of m-health applications by health care providers to develop m-health technology using ISM method.

**Material and Methods:** It is a descriptive and cross-sectional study. The population were 60 health care providers. Data were collected using a researcher-made questionnaire. factors with a higher mean were selected and transferred to ISM questionnaire and distributed among 10 experts. Data were analyzed using ISM technique, then the correlation and sequence of indices were found. Moreover, the research model was evaluated using MICMAC analysis in terms of driving and dependence power.

**Results:** First, 15 main variables were determined, including trust, information security and privacy, system quality, facilitating conditions, ease of use, waiting time, service quality, information quality, design issues, age, interoperability, usefulness, attitude, familiarity with technology and cost. Then, using ISM technique, the variables were classified into 7-levels based on susceptibility and effectiveness.

**Conclusion:** Level-7 include "age" was determined as the most effective and level-1 include "trust, facilitating conditions, usefulness, attitude and cost" were determined as the most susceptible level. According to MICMAC analysis, independent variables are information security and privacy, design issues, age, interoperability and familiarity with technology (weak dependence power, strong driving power). Dependent variable is trust (strong dependence power, weak driving power). The rest of the criteria are linkage type (strong dependence power, strong driving power), any small changes in these variables causes fundamental changes in the system.

## Keywords

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# Social networks can improve session follow-up of diet therapy

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## ABSTRACT

**Background:** One of the major challenges of weight loss diet therapy is following the counseling sessions until achieving the desired outcome. While online social networks are among the cost-effective tools that can provide social support.

**Objective:** The purpose of this study was to examine the effect of using online social networks as a supplementary tool for a weight loss program on follow-up rate.

**Material and Methods:** This was a parallel three-armed randomized controlled trial followed up for 2 months. 113 overweight and obese females, who attended a clinic to receive the usual care for weight loss, participated in this study. The participants were randomly assigned to one of three study groups: the control group, the interactive, and non-interactive group. The Control group received the usual care. Besides the usual care, participants in the interactive group joined a group on the WhatsApp platform, and participants in the non-interactive group received daily messages via the WhatsApp platform. Chi-square test was used to test the differences. The original protocol of this study is registered at the Iranian Registry of Clinical Trials (irct.ir, identifier IRCT20181017041368N1).

**Results:** The highest follow-up rate was observed in the interactive group. After the second month, again, the interactive group had the highest follow-up rate which was statistically significant compared to the control group (p = 0.037).

**Conclusion:** Providing an interactive online community through social networks, besides the routine diet therapy of obesity and overweight, may have a positive effect on session follow-up rate.

## Keywords
social networking, diet therapy, overweight and obesity, randomized controlled trial, office visits

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# A mobile-based game called Amoo could enhance dietary information of patients with type 2 diabetes

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## ABSTRACT

**Background:** Nowadays, digital games are not just an entertainment, but beside the routine treatments, they are being used in patient cares especially in patients with diabetes, one of the most prevalent diseases in the world. Application of digital games in patient education could improve self-management of diabetes.

**Objective:** The aim of the present study was to evaluate the effect of a mobile game (Amoo) implementation on enhancing the dietary information in patients with type 2 diabetes.

**Material and Methods:** This was an intervention study. A mobile game (called Amoo), which was developed by researchers of this study, was applied to assess the self-education of patients with diabetes. Sixty patients with type 2 diabetes were participated in the study. The participants took part in a pre-intervention test to determine their dietary information. The participants were randomly divided into one of two groups including intervention group: played the game for 15 minutes daily for 6 weeks, and control group: did not involve in the game. A post-intervention test was run to show a possible improvement in dietary information.

**Results:** The results indicated a statistically significant difference between the pre and post-test scores in the intervention group (p <0.0001). However, there was no significant difference in fasting blood sugar (p = 0.625).

**Conclusion:** The mobile game (Amoo) could enhance the knowledge of patients with type 2 diabetes about food calorie and glycemic index. This means that mobile games may serve as an educational aid to these patients.

## Keywords
diabetes mellitus, video games, education, telemedicine

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# The role of Mobile health(mHealth) during coronavirus disease (COVID-19): A qualitative study

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## ABSTRACT

**Background:** Nowadays, COVID-19 has affected all human areas and quarantine is the most effective tool for outbreak control. In such circumstances, use of mobile health technology (mHealth), can be very helpful.

**Objective:** The present qualitative study aimed to explore people's experinces of Mobile health during COVID-19.

**Material and Methods:** This research is a qualitative content analysis that was conducted in 2020 in Guilan province( North of Iran). The research samples consisted of 27 people(employed, housewife, students). Purposeful sampling was done to achieve data saturation. Semi-structured interviews used to data collection. Data analysis was performed according to the suggested steps of Lundman & Graneheim. Research strength and its scientific accuracy were evaluated as per the criteria proposed by Guba & Lincoln.

**Results:** The study yielded 3 main themes and 7 sub-themes: virtual style entertainment (mobile market, Sitting together in a cell phone), distance sciences (mobile online class, obtaining medical information, receiving miscellaneous education), unconditional freedom (receiving inappropriate information, Physical and mental complications).

**Conclusion:** The role of mHealth has become more prominent in the quarantine situation. In the field of entertainment, mHealth has provided a comfortable space for buying and selling which can reduce the pressure of loneliness. Due to the closure of scientific centers, students, can go to all kinds of online classes in their homes without worries about traveling long distances. But, not proper control from this tool can cause irreparable damage to physical health as well as emotional distress caused by bad news.

## Keywords
quarantine, coronavirus disease, mobile phone, qualitative research

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# Menopausal knowledge In Couples: Do Media And Gender Are Matter?

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## ABSTRACT

**Background:** The lack of knowledge about menopause is a social problem, damaging the quality of life and couples' relationships.

**Objective:** The purpose of this study was to investigate the menopausal knowledge of couples and the media used to acquire this knowledge.

**Material and Methods:** This study was conducted as part of the approved thesis entitled "Evaluation of the effectiveness of menopausal care training for couples on women's quality of life and marital satisfaction of couples in 2019." In this cross-sectional study, which was performed on 160 postmenopausal women and their husbands, couples were asked to mention the media used to gain their menopausal knowledge. Data were collected using the menopausal knowledge questionnaire and a researcher-made demographic information questionnaire. The data were analyzed using SPSS software version 25.

**Results:** Based on the findings, TV (30%), physicians and health professionals (27.5%), other women (27.5%), magazines and print media (12.5%), and text messages (2.5%) were mentioned as the source of information in women, respectively. Men also mentioned their wives (75%), TV (12.5%), physicians and health professionals (7.5%), magazines and print media (5%), and text messages (0%), respectively. Post hoc test showed that the highest menopausal knowledge score in women was related to the group that received their information from the doctor and health professionals, and in men was related to the group that named their spouse as the source of information.

**Conclusion:** Women are the superior media for providing knowledge about menopause in their husbands, and physicians and health professionals are more accurate media to acquired menopausal knowledge.

## Keywords
Knowledge, Women, Menopause, Social Media

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# The Most Popular Smartphone Training Applications for Bladder Cancer: Quality Assessment

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## ABSTRACT

**Background:** Bladder cancer appears to be on the list of the most prevalent cancers throughout the world, which its early diagnosis and treatment is of extreme importance as it is represented by a high mortality rate. The use of smartphone-based applications(apps) has increased as a tool for educating specialists and management of diseases.

**Objective:** The aim of this study was to find educational bladder cancer realted applications for urologists in online app stores and to rate their quality.

**Material and Methods:** : Current study was conducted as a non-systematic review in November 2020. Apps were selected from 3 mobile operating system stores (Google Play App Store, Bazar App Store and iTunes App Store).Free apps in Persian and English sources, a minimum of 1000 installs for the Google Play, a review of 1000 for the iTunes, and a minimum of 500 installs for the Bazar to be associated with bladder cancer and their target group was urologists, were included in the study. Apps were evaluated using MARS tool with 4 subscales. Items in this tool are rated using a 5-score Likert scale.

**Results:** Of 55 potentially relevant apps overviewed, 8 met the inclusion criteria, of which 4 apps required a username and password that could not be accessed through Iranian based ip adresses. Finally, 4 apps were evaluated. The average scores of these 4 apps for each domain in MARS is as follows. engagement(2/95), functionality(3/6), visual aesthetics(3/15), information(1/67), mental quality(2/37). The highest score in the apps was 1/3.

**Conclusion:** There is a limited number of Persian applications related to bladder cancer in app stores. It is necessary that developers, seek to create apps based on scientific guidelines. in order to achive this goal, more effective interaction between health professionals and organizations is recommended.

## Keywords
Bladder Cancer; Smartphone; Mobile Apps; Mobile Health

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# An Overview of the Use of Smartphone Applications to Educate Medical Students

Atefeh Khosrobeigi[1]**,** Elham Moosavinasab[2]**,** Fateme Rangrazjeddi[3]**,** Ehsan Nabovati[4]**\***

## ABSTRACT

**Background:**  Today health care providers need to receive training in a clinical setting based on credible guidelines to update and knowledge. Therefore, providing of clinical guidelines in the format of innovative educational technologies is essential. Smartphone applications (apps) provide a platform for access to valid clinical guidelines to enhance education and improve performance in medical students.

**Objective:** The purpose of this study is to review the perspectives of medical students in the field of learning using smartphone-based applications.

**Material and Methods:** The present study was a review-narration by searching the internet based databases of Pubmed, Scopus, Chocrane from 2008 to 2020 with key words related to clinical education, smartphone and mobile health were searched. Studies in Persian and English that used an smartphone based application either based on iOS, Android or other web platforms to educate medical students were included in this study.

**Results:** A total of 40 related articles were reviewed. The results of the studies show a wide range of benefits of a smartphone-based apps. Most medical students have a positive perception of medical apps and have expressed a positive impact on their learning, knowledge, clinical performance , and providing quick and timely access to clinical guidelines, drug information, clinical calculations, reminders, patient information, as well as the latest scientific evidence without any space or time constraints. Lack of awareness and lack of training on how to use medical apps, lack of accreditation and culture building are the most important barriers to the use of these apps among students.

**Conclusion:** smartphone-based apps through improved access to guidelines and educational information graphically prove to be benficial for medical students to follow valid guidelines in the clinical environment and helps improve the education and quality of health services.

## Keywords
Smartphone; Applications; Medical Students; Clinical Education; Clinical Guidelines

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# The relationship between Covid 19 and workload of Iranian healthcare workers: a cross-sectional study

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## ABSTRACT

**Background:** The aim of the present study was to investigate the relationship between Covid-19 and workload and mental health of Iranian medical service staff using the General Health Questionnaire (GHQ-12) and NASA -Task Load Index (NASA-TLX) Questionnaire, respectively.

**Material and Methods:** This cross-sectional study was done between March 5th to April 5th, 2020. We targeted all of health care worker that works in Iran ministry of health and medical education such as nurses, doctors, emergency medical service staffs, clinical, and public health technicians. The Independent samples t-test, One-way ANOVA test, and Linear regression analysis in 3 models were used for data analysis.

**Results:** We analyzed 495 of the 1,000 health workers who filled out the questionnaire, 505 questionnaires with incomplete data were excluded from the study. Task load and mental health scores were significantly higher in healthcare workers who encountered COVID- 19 patients ($p<0.001$). In terms of the subscale score of NASA-TLX, nurses had more scores in mental pressure, physical pressure, time pressure(temporal), and frustration compared to the rest of jobs ($p<0.05$). Moreover, nurses had significantly more workload compared to the rest of jobs. Task Load score, mental demand, temporal demand, and performance demand had a negative correlation with education level ($p<0.05$).

**Conclusion:** Type of job, the shift of work, education level, and facing COVID-19 affect the score of NASA-TLX. Generally, NASA-TLX scores in nursing were higher than other health staff groups. The results of this study indicated that the total workload and mental health of staff who contracted COVID-19 patients were significantly higher than those who didn't face COVID-19 patients.

## Keywords
COVID-19, health worker, mental health, work load

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# Effectiveness of the mHealth Technology in Improvement of Elderly Health Care

Zahra Arabkermani[1]*[iD], Roxana Sharifian[2]

## ABSTRACT

**Background:** Increasing number of aged population has brought more significant concerns about how proper care will be provided to the elderly people in the future. Innovative information and communication technology including mobile health can change the behavior and lifestyle of elderly individuals.

**Objective:** This study was conducted to search and review the effectiveness of the mHealth technology in improving healthcare services supplied to the elderly people.

**Material and Methods:** A systematic review was conducted according to PRISMA standards. Independently, two authors searching articles in scientific databases (Web of Science & Scopus & Pub Med) up until 10 November 2020 using keywords such as mHealth, care and Aged combined with the Boolean operator. Initially, 1,395 articles were found in all databases. Duplicate articles and irrelevant articles were removed through title and abstract screening.

**Results:** Upon initial evaluations, there remain 13 articles. Findings showed that mHealth can improve health care, self-management, behavior promotion and medication adherence. It has been proved that mHealth technology is effective for disease prevention, lifestyle changes and is a suitable tool for elderly people. With increasing disease burden from hypertension globally, mHealth offers a potentially effective method for self-management and control of BP but cognition and motivation barriers complicate effective and satisfactory use of mHealth by older adults.

**Conclusion:** Digital strategies such as mHealth provide the potential to deliver active aging in a cost-effective manner but further studies are required to gain a clear understanding of the effects of mHealth on healthcare change among the elderly population.

## Keywords
mHealth, elderly, healthcare, improvement

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# Bibliometric study of mHealth in Geriatrics

Parand Porghane[1], Leila Nemati-anaraki[2], Mina Darvish[3], Arezoo Ghamgosar[4]*

## ABSTRACT

**Background:** Aging is a growing public health concern for governments. mHealth is currently recommended in a range of health contexts.

**Objective:** The current study was undertaken to provide insights into the global research output on mHealth in geriatrics.

**Material and Methods:** A bibliometric study was implemented using WOS database for the period from 1900 to 2020. The search terms were used to identify the related documents for the study. Various tools and measures are used to explore trends and citations of results, active countries, prolific authors, research themes, most cited papers, and active journals. After gathering the data was used some bibliometrics software, including Bibexcel and VOSviewer, and Microsoft Excel 2013.

**Results:** The search strategy found 994 documents. The h-index of the retrieved literature was 55. 50% of the retrieved documents were published in the last 5 years. The active country was the USA followed by Australia and Canada. The leading author was Weinstock RS. Research themes focused on Gerontology, Computer Science Information Systems, Medical Informatics. The most cited paper was Health behavior models in the age of mobile interventions: are our theories up to the task? It was about mobile health behavior interventions. The active journals included Journal of the American Geriatrics Society, Gerontologist, JMIR Mhealth and Uhealth.

**Conclusion:** mHealth in geriatric is a growing process. The use of mhealth in geriatric be supported by in-come countries. Governments and Policy-makers need to take into consideration to gather interdisciplinary scientists from Gerontology, Information Systems, and Informatics for the best practice.

## Keywords
Aging, Geriatrics, Mobile Health Units, Telemedicine, Bibliometrics

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# Application of digital technology and social networks in reducing loneliness and social isolation of the elderly: A review article

Mahtab Naraghi Rad[1]*

## ABSTRACT

**Background:**  The elderly population (people over 65) is increasing dramatically in the world. Feelings of loneliness and social isolation are common in the elderly. Social isolation in the elderly is recognized as a risk factor for mental and physical health as well as higher mortality, depression and cognitive decline. Recent studies have shown that a variety of digital tools, such as social media systems, videoconferencing, online calling and video networks, and Internet-based activities are useful for coping with feelings of loneliness and reducing social isolation in the elderly.

**Objective:** The purpose of this study is to review the application of digital technology and social networks in reducing the feeling of loneliness and social isolation of the elderly.

**Material and Methods:** All English-language articles in peer-reviewed journals in the Google Scholar, ScienceDriect, pub med, Wileyonline Library, ResearchGate, and Cochranelibrary databases from 2010 to 2020 were reviewed. Finally, 20 articles were identified and reviewed in accordance with the purpose of the study. Research in which the full text was not available, as well as articles by method to the editor, articles related to other age groups and articles that did not address the issue of loneliness and social isolation but the impact of digital technology and social networks on others. The lives of the elderly were measured and excluded from the study. must be mentioned and specify any software used for data analysis. The used search systems should be clearly mentioned.

**Results:** Findings indicate the positive effect of this method of education on reducing social isolation and loneliness of the elderly, especially in the pact of Covid - 19. Therefore, it is suggested that such interventions in our country be considered for the elderly, taking into account the cultural conditions of the country.

## Keywords
Social isolation, elderly, loneliness, digital technology

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# Applying computer-based games for physical rehabilitation of patients post-stroke

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## ABSTRACT

**Background:** Many patients need vital rehabilitation after a stroke. Stroke rehabilitation can help them improve their quality of life and regain independence. Today, however, modern computer-based games can be used to empower these people. As a new treatment method in medical science, computer-motion games have attracted the attention of many experts. Physicians and specialists apply these games in rehabilitation, therapy, and physiotherapy, which are even widely utilized to rehabilitate the disabled and the elderly.

**Objective:** In this study, papers that were performed about the usage of computer-based games for the rehabilitation of patients after stroke are reviewed.

**Material and Methods:** In this study, after introducing the facilities provided by computer-motion games in the field of rehabilitation and based on reviewing non-systematic studies, the main features of these games such as game development tools, i.e., game engine, platform, technology, types of developed games and game genre were identified and reported.

**Results:** The genre of games developed in rehabilitation does not have a precise classification and has much overlap; the most common of these are educational types, serious games, and sport-based ones. Besides, the type of system on which the game runs is, in most cases, Nintendo Wi-Fi game consoles (Windows Wii), Windows, and Xbox 360. The type of technology used to build and present various games is Flash, HTML, JavaScript, and the Kinect sensor. The game engine can be briefly considered the heart of any computer game; it is the interface between the player, the action, and the reactions of the game. It is worth in motion games, Unreal and Unity 3D engines were utilized commonly. Virtual reality games with the Kinect sensor are the most popular games in the field of rehabilitation.

**Conclusion:** Computer-motion games have demonstrated their power as an interactive medium for communicating with a player, patient, or specialist. Computer games can be effective in improving balance disorders, inability to walk independently, muscle wasting due to stroke, and fear of falling. They can also be used as supportive criteria in traditional interventions, like stimulating and empowering a patient to adapt to specific behaviors. However, at present, digital games cannot be applied as the primary treatment in serious medical conditions.

## Keywords
Rehabilitation; stroke; Computer-motion games; Movement disorders

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# The Effect of Tele Rehabilitation on Depression in Patients with Beta Thalassemia Major

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## ABSTRACT

**Background:** Beta thalassemia major is an inherited- blood disorder that causes moderate or severe anemia due to decreased hemoglobin production. Studies show that most beta thalassemia major patients suffer from moderate to severe depression.

**Objective:** As the use of social media is increasing, the researcher came up with the idea to investigate the effect of tele rehabilitation on improving depression in patients with beta thalassemia major.

**Material and Methods:** The present study is a clinical trial study that was performed on 48 patients with beta thalassemia major in Jahrom in 1399. Firstly, paired subjects were selected among identical subjects ,and were randomly assigned to study and control groups.then, demographic questionnaires and DASS-21 were given to case group patients. before starting the intervention, the researcher made a group in the WhatsApp for experimental group to provide educational and supplementary information based on the needs of patients. In this intervention, patients received four messages per week. At the end of period (3 months), a questionnaire was completed by the patients. Independent t-test was used to compare the means of the two groups and paired t-test was used to compare before and after in each group through SPSS software version 19.

**Results:** The results of chi square test showed a significant difference in the depression score between the two groups after the intervention ($p = 0.0001$).

**Conclusion:** According to the research results, nurses are recommended to use this method as an affordable and low-cost method to improve and reduce depression in patients with beta thalassemia major.

## Keywords

Tele Rehabilitation, Depression, Beta Thalassemia Major

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# Comparison of the Effect of Group Based and Mobile Based Education on Self-Care Behaviors in Type II Diabetic Patients

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## ABSTRACT

**Background:** The lack of self-care is the most important in diabetic. Because it is important factor that lead to dead of diabetic patients.

**Objective:** The aim of this study was to Comparison of the Effect of Group Based and Mobile Based Education on Self-Care Behaviors in Type II Diabetic Patients.

**Material and Methods:** This randomized clinical trial was conducted on 90 patients' diabetic type 2 who referred to diabetic clinic of Ahvaz University of Medical Sciences. Initially, patients were divided into three groups of homogeneous mobile-based education, group training and control group based on individual characteristics. . In group training, eight sessions of training were conducted, mobile education was installed on the patient's phone and the control group through had given routine education. The data collection tool was self-care questionnaire, demographic, and demographic questionnaire for type II diabetic patients. Data were analyzed using $SPSS_{22}$ software and one-way and one-way ANOVA tests at a significant level was (0.05).

**Results:** Group training and mobile-based education had a significant effect on routine education (P = 0.001). Self-care education, except in the field of foot care that the effect of mobile-based education was more than group training. In comparison, self-care score in the three groups was statistically significant. Although there was no statistically significant difference between the two educational groups, the effectiveness of education in the mobile group was more effective.

**Conclusion:** However, the findings found the effectiveness of group-based and mobile-based education. However, the use of mobile-based training programs is recommended because of easy access, lack of time and space restrictions.

## Keywords
Type 2 diabetes, Group training, Mobile based education, Self-car

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# The usefulness of mobile Application education-based on self-efficacy and dietary fiber among patient with high blood pressure: a randomized controlled trial

Zahra Darabi[1], Marzieh Araban[2], Amir Abbas Azizi[3], Kambiz Ahmadi Angali[4], Fatemeh Borazjani[5]*

## ABSTRACT

**Background:** The emerging evidence showed the imperative role of self-efficacy in controlling of chronic disease. In addition, dietary fiber consumption decreased the risk of hypertension or blood pressure (BP).

**Objective:** We aimed to study the effect of mobile application to improve the self-efficacy and dietary fiber on blood pressure.

**Material and Methods:** The present RCT conducted on 88 patients with hypertension in the public health care centers for twelve weeks. Self-efficacy, SBP and DBP, body mass index, physical activity and dietary intakes were assessed. Self-efficacy with validated questionnaire and Android-based offline application which contain dietary knowledge and two video from experience of patient and also nutrition specialist were used. The ANCOVA was used to show the differences between the two groups and adjusting for baseline and covariates.

**Results:** Finding of self-efficacy showed that baseline values were not significantly different between two groups; however, all five components include of Negative Emotions, Social Pressure, Physical Discomfort and Positive Activities) improved significantly at the end of trial. Intake of dietary fiber in intervention group significantly increased at the end of trial. Dietary carbohydrate decreased at the end of trial. BMI difference significantly reduced (-0.15 kg/m$^2$) at the end of trial.

**Conclusion:** Here in present study we showed that using mobile apps for improving diet and self-efficacy lead to better control of BP among patients whilst their self-efficacy improved their BMI status simultaneously.

## Keywords
mobile application, blood pressure, dietary fiber, self-efficacy

# Using mobile phone education-based on DASH diet among patient with high blood pressure: a randomized controlled trial

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## ABSTRACT

**Background:** Hypertension (HTN) is a global public health problem. the imperative role of self-efficacy and dietary approach to stop hypertension (DASH) diet reported as, they are most appropriate dietary approaches for controlling HTN.

**Objective:** We aimed to determine the efficiency of mobile app for improving self-efficacy on adherence of DASH diet in HTN patients.

**Material and Methods:** The present randomized controlled trial conducted on 88 patients with hypertension who referring to public health care centers between Novomber2019 to March 2020. The subjects were randomly assigned to receive mobile app for DASH-related recommendation +usual care; or control group to follow their habitual diets and given usual health care in public health care centers for twelve weeks. Self-efficacy, SBP and DBP, body mass index, physical activity and dietary intakes were assessed at the baseline and the end of trial. The ANCOVA was used to show the differences between the two groups and adjusting for baseline and covariates.

**Results:** Results showed that whilst there were no significant differences in DBP and SBP at the baseline, however intervention lead to significant decrease in only SBP of intervention group (150.43±10.19; 144.65±10.36; P=0.0001) and DBP (94.15±7.69; 88.59±8.34; P=0.0001) respectively. Energy intake decreased between groups (p=0.0001) and reduced only in intervention group. Dietary DASH score at end of trial were interestingly significant within group in both arm of study.

**Conclusion:** Here we showed that using mobile apps for educating DASH diet and improving self-efficacy lead to better control of BP among patients whilst their self-efficacy improved simultaneously.

## Keywords
Hypertension, Mobile app, Trial, DASH diet

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# The use of mobile Apps to educate and improve student learning of Dietary Glycemic index

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## ABSTRACT

**Background:** The glycaemic index (GI) is a classification of carbohydrate foods based on their postprandial glycaemic responses. It has been implicated in the etiology of diabetes, coronary heart disease and cancer. In the clinical settings where complex health care is required, using mobile technology has been used as a supplementary tool for students to build up their clinical practice and experience without any temporal and spatial restraints.

**Objective:** To empower undergraduate students to control and prevent diseases.

**Material and Methods:** This cross-sectional study was performed with simple, convenient sampling between 410 undergraduate students and students majoring in medicine, pharmacy and dentistry. We applied the opinions of nutritionists and medical informatics, to improve the quality of the application. A questionnaire was designed to evaluate the user friendly, Knowledge enhancement and ease of implementation and applicability of application. it contained 14 questions with a Likert scale (I strongly agree, agree, have no opinion, disagree, strongly disagree) and 2 separate questions, and then its validity and reliability were examined in a pretest study.

**Results:** Finding showed that the expression of two areas of behavior change and the area of knowledge about the use of the application. In both areas of behavior change and knowledge, female students significantly announced more and better feedback. Student feedback among the different departments, the Faculty of Health and Paramedical Sciences and Nursing received the highest score in the field of behavior change and knowledge enhancement.

**Conclusion:** mobile technologies can enhance learning and change learning environments with informal settings can inform the development of nutritional knowledge to control and prevent of chronic disease.

## Keywords
dietary Glycemic index, student, learning, mobile application, educational technology

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# Designing a mobile-based self-care application as an educational and supportive resource for patients with Alzheimer disease and support to careHeroes

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## ABSTRACT

**Background:** Today, the emphasis of healthcare is on self-care. Caregivers encounter several challenges related to caring for people with Alzheimer, and they need support in managing care recipients' health needs. Due to the increasing use of mobile phones, mobile applications plays an important role in self-care.

**Objective:** To support Alzheimer's patients and their caregivers, we designed a mobile-based self-care application as an educational and supportive resource for them.

**Material and Methods:** This was an applied developmental study. The experimental version of software designed in two stages. Initially, a questionnaire was prepared to assess information requirements, determine data elements and necessary capacities of the application. Then, five neurologist and psychiatrist asked to fill out the questionnaire. The obtained data were analyzed and the application was developed accordingly. Finally, in order to evaluate its practical capability and patients' satisfaction rate, 10 caregivers used it.

**Results:** The majority of data elements in the questionnaire were found necessary by the neurologist and psychiatrist. The main menu of the designed application included "introduction to Alzheimer", "behavioral changes", "other diseases of the patient" (such as urinary tract infection, lung infection and bedsore) and "other care matters" (such as transfer, bathing and coping strategies with patient). In evaluation of practical capability of the application by patients, it was evaluated in a good level with the mean score of 7.8 (out of 9).

**Conclusion:** Mobile-based self-care applications can be used to help Caregivers to manage patients with Alzheimer and to obtain self-care skills.

## Keywords
Alzheimer, caregiver, mHealth, self-care

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# A Review and Content Analysis of Persian Apps for MS Management using Mobile Application Rating Scale (MARS)

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## ABSTRACT

**Background:** The use of mHealth for health-related activities, especially chronic diseases, is an evolving activity. Always researchers made to examine them from different angles such as performance, technology, benefits, risks etc.

**Objective:** The purpose of this study was to review and content analysis Persian apps for MS based on MARS.

**Material and Methods:** This study is a descriptive cross-sectional study that conducted on Persian apps related to MS in September 2020. To identify these applications, a combined search of keywords related to "Multiple sclerosis" and "mobile application" used in Google Play and marketplace software. Overall, related apps were identified based on the research title. Inclusion criteria included all free Persian apps, which were designed for MS. The MARS standard checklist used to check the quality of apps.

**Results:** 10 apps were included in this study. The results showed that the goals of the imported apps included prevention, diagnosis, initial treatment or control of the disease in order to increase awareness about MS. The common goal of all apps was to increase information about initial treatment. The agreement between the two reviewers was 0.83. In this review, none of the apps was suitable for helping patients with MS because their MARS scores were lower than 3, while the accepted score for this scale is more than 3.

**Conclusion:** The results of this review show a severe weakness in the development of Persian apps related to MS. Of course, the creators of these apps have paid some attention to their Functionality and aesthetic.

## Keywords
Multiple sclerosis, mHealth, mobile app, evaluation

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# Knowledge and attitude of nurses towards using telehealth: A Systematic Review

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## ABSTRACT

**Background:** As the closest members of the medical staff to patients, cannot play an effective role in the proper use of telehealth services, if there is insufficient knowledge and negative attitude.

**Objective:** The aim of the study was to assess the knowledge and attitude of nurses towards using telehealth.

**Material and Methods:** This systematic review was performed based on the PRISMA guideline. An extensive search was carried in PubMed, ISI, Scopus, Google Scholar, ProQuest databases with the keywords such as "Knowledge", "Attitude", "Telehealth", "mHealth", "Nurses", "Nursing", from the earliest records up to December 19, 2020. All English-language cross-sectional articles related to the purpose of the study were included. All stages of search and quality assessment of studies were carried by two researchers, independently.

**Results:** 6 out of 6,671 articles were included in this study with 742 nurses (76% of female) and a mean age of 37.21 years. 56% of nurses had desirable knowledge about using telehealth. Nurses' knowledge was undesirable, moderate, and desirable in two, one, and two studies, respectively. The attitude of nurses was at a positive level (n=3). There was a direct and significant relationship between nurses' knowledge and attitudes toward using telehealth in the two studies. There was a significant relationship between education level and work experience with the level of nurses' knowledge in the two studies.

**Conclusion:** Therefore, due to the many benefits of using telehealth services in patients care, we suggest that nursing students and nurses be trained to use telehealth in nursing care.

## Keywords
Knowledge, Attitude, Telehealth, mHealth, Nurses

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# The effect of telehealth on health-related outcomes in patients with chronic disease: A Systematic Review

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## ABSTRACT

**Background:** Telehealth technologies can improve health-related outcomes such as quality of life and self-care in patients with chronic diseases.

**Objective:** The aim of this study was to assess the role of telehealth on health-related outcomes in patients with chronic disease.

**Material and Methods:** The protocol of this systematic review followed the PRISMA guideline. An extensive search was carried in online databases including PubMed, ISI, Scopus, Google Scholar, ProQuest with the keywords such as "mHealth", "Mobile health", "Telehealth Strategies", "Telehealth", "Health Promotion", "Disease Management", "Chronic Condition", from the earliest records up to December 19, 2020. Also, all English-language intervention studies related to the purpose of the present study were included. All stages of search and quality evaluation of articles were conducted by two researchers, independently.

**Results:** 21 out of 862 studies were included in the study with 3,027 patients with chronic diseases, a mean age of 65 years, and 17 randomized controlled trial. The most used telehealth technologies were long-distance communication technology (n=12), home-health monitoring system (n=3), and web-based technology (n=3), respectively. The most evaluated diseases were chronic heart failure (n=8), type 2 diabetes (n=6), and hypertension (n=3), respectively. The most effective health-related outcomes of patients with chronic diseases were medication adherence, control of blood sugar and blood pressure (n=8), promotion of self-efficacy (n=5), and self-care (n=4).

**Conclusion:** Telehealth technologies have a significant impact on health-related outcomes such as medication adherence, self-efficacy, self-care, self-management, and quality of life of patients with chronic diseases.

## Keywords

Telehealth Strategies, Health Promotion, Disease Management Chronic Condition

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# Introducing Public Health Informatics to Prevention And Control of Public Health Emergencies: Integration Between Public Health Information System and mHealth

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## ABSTRACT

**Background:** Public health informatics (PHI) is defined as the systematic application of information, computer science and technology in areas of public health, including surveillance, prevention, preparedness, and health promotion.

**Objective:** The aim of this study is to introduce the effectiveness of PHI to prevention and control of public health emergencies .

**Material and Methods:** This is a review study which was done in 2020. Searching was performed in online databases and search engines including PubMed, Scopus, Science Direct and google scholar. Finally, 20 articles from 45 were selected which met our eligibility criteria and were included in this study.

**Results:** The results showed that PHI includes information systems; for instance, 1. Immunization Information System (IIS), 2. Electronic Laboratory Reporting (ELR) and 3.Syndromic Surveillance System. The main functions of IIS is to Consolidate immunization data from disparate sources; Provide patient-specific vaccine forecasting/decision support based on known immunization history and patient age; Support the creation of reminder and recall notices; Support proper vaccine inventory management; and Generate vaccination coverage assessments. Also ELR involves the transmission of laboratory data, following the confirmation of a reportable disease to a public health agency. Syndromic surveillance detects initial manifestations of disease before diagnoses (clinical or laboratory) are established. Results also showed that information and data generated by these systems can be collected, stored and exchanged by a Service-oriented architecture (SOA). Also in this architecture takes place integration between theses system and mhealth technology.

**Conclusion:** In general, PHI could be considered as one of the most useful systems in addressing disease surveillance epidemics, natural disasters and bioterrorism.

## Keywords
Public health informatics, public health emergencies, mhealth, information system

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# mHealth technology a good solution to improve adherence with medication regimens in organ transplant recipients: based on patient-centered services

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## ABSTRACT

**Background:** Solid organ transplantation is a life-saving treatment option for many end-stage diseases. However, it requires strict adherence to a medical regimen that includes, frequent clinic visits, lifelong immunosuppression and laboratory testing. Because poor adherence is associated with serious consequences, including graft rejection and mortality. mHealth technologies have the potential to address the different factors that influence non adherence.

**Objective:** The aim of this paper is to introduce mHealth technologies as a good solution to improve adherence with medication regimens in organ transplant recipients.

**Material and Methods:** This is a review study which was done in 2020. Searching was performed in online databases and search engines including PubMed, Scopus, Science Direct and google scholar. Finally, 28 studies were reviewed.

**Results:** Results showed that, mHealth interventions exhibited significant improvements in medication adherence and significant reductions in clinic-measured systolic blood pressures across the monthly evaluations in renal transplant recipients; Also the use of text messages or mobile applications to enhance adherence to medication do seem to have been beneficial, as 65% of the studies found had positive outcomes. In addition; mHealth technologies have provided a possible avenue to intervene using behavioral health in the home environment and influence behaviors for sustained engagement in healthy lifestyles, education about transplantation, and medical regimens.

**Conclusion:** Considering the fact that mobile apps are an attractive tool to support medication adherence; moreover, they have potential as a platform to improving medication adherence in organ transplant recipients; therefore, mHealth technology can be used as an innovative approach to self-management after organ transplantation to enhancing medication adherence.

## Keywords
mHealth technology, organ transplant recipients, adherence, medication regimens

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# Introducing ontology approach to knowledge management for cancer diseases: Utilization in mobile applications and information systems

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## ABSTRACT

**Background:** Ontology is a system of knowledge representation of a domain in the form of a structured set of concepts and relationships between these concepts. Moreover, ontology as a knowledge management approach has played an effective role to treat problems related to medical and biomedical domains such as diagnosis and disease treatment; also ontology-based systems can be used to support the prognosis, diagnosis and treatment of cancer diseases.

**Objective:** The purpose of this paper is to introduce the ontology approach to knowledge management for cancer diseases.

**Material and Methods:** This is a review study which was done in 2020. Searching was performed for articles published between 2010 to 2020 in online databases and search engines including PubMed, Scopus, Science Direct, Springer Link, Web of Science and google scholar. Finally, 32 articles from 140 were selected which met our eligibility criteria and were included in this study.

**Results:** The results showed that the most numbers of the articles in cancer domain which have used an ontology approach included the general field of cancer (11 articles), breast cancer (10 articles), gastrointestinal cancer (4 articles) and liver cancer (3 articles). Also HPV-causing cancers and cancers of cervix, lung and mouth each one contained only one article. In the studies reviewed, the ontology has had various applications; for instance, it was used in designing a decision support systems based on guidelines, data integration, and tumors classification, semantic queries in cancer registers, facilitating interoperability between information systems and Electronic Patient Record (EPR), knowledge sharing, improving data quality, solutions based ontology for the semantic heterogeneity, solving the terminology dilemma, integrating data from different sources, diagnostic information extraction, enhancing of knowledge sharing about mammography examination expertise, representing information from radiological reports in order to make them comprehensible and machine readable.

**Conclusion:** In general, the ontology approach could be considered as one of the most useful knowledge management approaches in cancer domain; in addition, it could be used in mobile applications and information systems with various operations.

## Keywords
ontology approach, knowledge management, cancer, information systems, mobile health applications

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# Exploring Students' Perspectives on the Health Challenges of Using Smartphones in Learning: A Qualitative Study

Fatemeh Jafarzadeh-Kenarsari[1]*, Parand Pourghane[2]

## ABSTRACT

**Background:** One of the well-known applications of mobile technology is in education and learning. Besides many benefits of the mobile phone technologies, different and important effects including health problems have been related to them.

**Objective:** This study aimed to explore students' perspectives on the health challenges of using smartphones in learning.

**Material and Methods:** In this qualitative content analysis, participants included 32 Nursing, Midwifery and Para medicine Faculty students of the East Guilan that were recruited using purposive sampling method with maximum variation. Data was collected through 11 semi-structured interviews and 3 focus group discussions (5-8 numbers). All interviews were continued up to data saturation. Data analysis was done based on a conventional content analysis approach. Data trustworthiness and ethical considerations were considered.

**Results:** In this study, 3 categories and 9 sub-categories were extracted. The main cetegories included: "The experience of physical challenges"; "The experience of psychosocial challenges"; "The experience of behavioral challenges".

**Conclusion:** Based on the students' opinions about the health challenges of using smartphones in learning, education policy makers and health system authorities should acknowledge such challenges and provide public education programs through mass media as well as emphasize pre-use education of any new technology.

## Keywords
Smart Phones, Students' Perspective, Qualitative Research

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# Practical review of Iranian mobile health programs in Covid-19 disease

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## ABSTRACT

**Background:** Covid-19 is currently one of the biggest global health concerns that requires adequate knowledge enhancement. With the increase of smartphones, a suitable opportunity has been created in order to increase public awareness, but the accuracy of information and the adequacy of their scientific content can be considered as a health challenge.

**Objective:** The purpose of this study is to examine the use of mobile applications related to Covid-19.

**Material and Methods:** A systematic review of Bazaar Cafe software was performed. Search keywords included: corona, covid-19, and their Persian alternative. Criteria for entering the applications were using Persian language, application health-orientation, and the capability to install the application on Android phones.

**Results:** 48 applications were identified of which 10 applications were excluded from the study due to lack of health-orientation. Based on the type of application, the remaining 38 programs divided into 26 apps for education, 9 for information and news, 7 for diagnosis, 3 for Danger announcement and 5 for locating covid-19 medical centers. Also 21(27.55%) applications were single-use and 17(73.44%) applications were multi-use.

**Conclusion:** Unlike applications with educational content, those with danger warning in high risk areas had the lowest number. Applications associated with covid-19 can be used to raise public awareness, early diagnosis and treatment through online testing, so it is recommended through mass media. Use of existing applications should be encouraged by the community and it is suggested to accelerate production of applications based on features that listed in this research.

## Keywords
Covid-19, coronavirus, mobile applications

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# Mobile applications in management of health in Covid-19 pandemic

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## ABSTRACT

**Background:** Covid-19 disease is one of the most important challenges of the world, so it is important to control this disease in various ways to reduce any possible events. In this regard, various activities such as using mobile phones were suggested to control this disease.

**Objective:** The purpose of this study is to investigate the applications of mobile phones in Health management.

**Material and Methods:** In this review study, articles related to keywords Covid_19, Corona, Management and Health were gathered from Google Scholar, PubMed, Iran-doc, Magiran and SID databases. Criteria for entering the research was relation to the subject and published articles, being from recent year and the exclusion criterion was lack of article's relevance to the research topic.

**Results:** Uses of mobile phones in covid-19 pandemic divided into three parts: mobile device uses, SMS service and using mobile application. Mobile applications can provide tracking movements of populations, health communication, communicating with others, long range caring via devices, patient tracking, notification and epidemiological study of the disease. SMS content can be educational or at least raise awareness level in patient. Covid-19 Mobile applications can also: diagnose, manage the data, train hospital staff, communicate between vulnerable people and volunteers to provide services, cover disable patient, and localize infected areas.

**Conclusion:** Mobile applications have many uses in controlling Covid-19 disease with appropriate management Health, so further studies related to covid-19 mobile applications are required to reduce the disease burden on public health and clinical systems.

## Keywords
Covid-19, Coronavirus, Mobile applications, Management, Health

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# The effect of mobile educational application on adherence to treatment and blood pressure in the elderly with hypertension

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## ABSTRACT

**Background:** Hypertension is one of the most important chronic diseases in elderly people. Smart phones can be used as a potential medium for education and awareness of treatment adherence elderly people with hypertension.

**Objective:** The aim of this study was to investigate the effect of mobile health application on adherence to treatment in the elderly with hypertension.

**Material and Methods:** This study was performed as a randomized clinical trial. Using Purposive sampling method, 54 retired techers with hypertension in 2020 were selected and using block randomization method were assigned to two equal groups of intervention and control. Data collection tools were demographic questionnaire, AMT cognitive impairment tool and Modanloo treatment adherence tool. Adherence tools were completed before and 5 weeks after the intervention. After collecting the data, they were entered into SPSS software version 22 and analyzed using Chi-square and independent t-test.

**Results:** Referring to the T-test results, this study revealed significant difference in the mean of treatment adherence participants after intervention was documented between case and control groups; P=0.023 and P=0.026 in treatment committed and hesitation for treatment respectively.

**Conclusion:** The results in this study revealed that medical education through smartphones had a positive impact on certain aspects of treatment adherence and systolic blood pressure control in the elderly population.

## Keywords
treatment adherence, hypertension, elderly, application, smartphone

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# The role of mHealth in nutrition health in COVID-19 pandemic , strategies and challenges

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## ABSTRACT

**Background:** The COVID-19 pandemic was affect the entire food system including compromising food security and in a matter of months, has brought about a change in behavior. Due to the impossibility of face-to-face training, using smartphones can be a way to prevent malnutrition.

**Objective:** Aim this study how avoid to preventing further spread of unhealthy nutrition Using smartphones.

**Material and Methods:** This review study examines the results of papers in year 2020 and papers published in this time. The studies conducted in the field of Smartphone, COVID-19, nutrition and challenge in valid databases of Iran medex, Google scholar, PubMed, Web of Science, and Scopus were investigated, and the results were extracted.

**Results:** In the coronavirus pandemic, nutritionists and dietitians can offer remote nutritional education and follow-up. This training method can be associated with some challenges, for example: If, Access to connectivity limited for some populations, Ensure appropriate online support. Also, maybe participants worried from how privacy. so,It is important to ensure that the privacy, confidentiality and consent of the respondents is maintained and Be clear on the limitations and representation of the data. The opportunity for nutrition education is to advocate for nutrition quality and access to healthy food for all, in the best and worst of times. In this time, proper planning with focusing on the remote recommendations of nutritionists Utilizing technologies such as mobl is needed to ensure that this pandemic does not threaten food security and health.

## Keywords
mHealth, COVID-19, Nutrition, strategy, Challenge

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# Applied experience of Pharmacists from Patient-based services based on mHealth in pharmacy in COVID-19 pandemic

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## ABSTRACT

**Background:** Clinical roles of pharmacists in optimizing medication therapy without compromising the efficacy and relevance have been proved in assuring patient safety. Pharmacy professionals are considered essential partners in response to the ongoing COVID-19 pandemic and enhance the scope of service globally.

**Objective:** This study aims to evaluate the effectiveness of structural and operational changes made in pharmacy services during the COVID-19 pandemic.

**Material and Methods:** This review study examines the results of papers in year 2020 and papers published in this time. The studies conducted in the field of Smartphone, COVID-19, Pharmacist, Patient-based services in valid databases of Iran medex, Google scholar, PubMed, Web of Science, and Scopus were investigated, and the results were extracted.

**Results:** As a result of the structural and operational changes made in pharmacy services during the COVID-19 pandemic, a 48% -55%prescriptions requests increased through online health portal application. A two to three-fold increase in the pharmacy call center utilization resulted in 37%-50% reduction physical visits to pharmacies. The access to ambulatory care pharmacy services during COVID-19 pandemic has been successfully maintained via consulting with smartphone from home, pharmacy call-center consultations and other measures and reduced the number of physical visits to pharmacy.

**Conclusion:** Pharmacists shall use various approaches to provide PC services in drug dispensing, Pharmacists professionals have been at the frontlines in responding to the COVID-19 pandemic consulting. Patient education and psychological support to promote the COVID-19 pandemic control and ensure safe medication use of community patients during the pandemic were Pharmacists functional results in COVID-19 pandemic.

## Keywords

Pharmacist, experience, Patient-based services, Smartphone, COVID-19 pandemic

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# Applied mHealth in caring of elderlies in COVID-19 pandemic

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## ABSTRACT

**Background:** The COVID-19 pandemic has caused untold fear and suffering for older adults across the world, so,The maintenance of well-being, healthcare, and social connection is crucial for older adults (OA) in(COVID-19) pandemic. OAs have been advised to isolate themselves because they are at higher risk for developing serious complications from severe acute respiratory syndrome coronavirus. Mobile technology such as applications (apps) could provide a valuable tool to help elderlies to resources that encourage physical and mental well-being.

**Objective:** This study aimed to evaluate the effectiveness of role of mHealth in caring of elderly during the COVID-19 pandemic.

**Material and Methods:** This review studied was examin the results of papers in year 2020 and papers published in this time. The studies conducted in the field of Smartphone, COVID-19, health and elderly in valid databases of Iran medex, Google scholar, PubMed, Web of Science, and Scopus were investigated, and the results were extracted. Two reviewers independently assessed search results and assessed the quality of the included studies.

**Results:** Widespread preventative measures have isolated elderlies, and limited access to physical and mental healthcare. While these measures may be necessary to minimize the spread of the virus, the negative physical, psychological, and social effects are evident. In response, application of technology has been adapted to try and mitigate these effects.

**Conclusion:** The use of telehealth improves the provision of health services in elderlies. Therefore, telehealth should be an important tool in caring services while keeping elderlies safe during COVID-19 outbreak.

## Keywords
Smartphone, COVID-19 pandemic, Health, Caring, elder

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# Effect of Telephone Counseling on Continuity and Duration of Breastfeeding among Primiparus Women

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## ABSTRACT

**Background:** Breast milk provides many healthy nutrients to infants. Support provided by health care provider has positive effects on duration of breastfeeding.

**Objective:** The purpose of this study was to determine the effects of telephone counseling on continuity and duration of breastfeeding among primiparus women.

**Material and Methods:** This clinical trial was conducted on 140 primiparus women referred to the selected health centers of Tehran University of Medical Sciences. The participants were randlomly allocated into two equal groups (each: 70 indviduals). The participants in the intervention group received telephone counseling by one of the researchers. The control group received routine care. Data were collected using a questionnaire including demographic characteristics and a breastfeeding check list. Exclusive breastfeeding rates were recorded one and three months after childbirth in both groups. Also, the continuity and duration of exclusive breastfeeding were recored three months after childbirth in both groups. Data were analyzed using the Chi-square test, Fisher's exact test, standard logistic regression and linear regression in the SPSS.

**Results:** The average duration of exclusive breastfeeding in the intervention group (8.05±3.99) was significantly more than the control group (6.23±4.03) (P=0.008). In the third month of delivery, continuity of exclusive breastfeeding in the intervention group was more than the control group (P=0.03). Results also showed that telephone counseling was effective in the duration of exclusive breastfeeding (P=0.02).

**Conclusion:** Telephone counseling was effective in continuity and duration of exclusive breastfeeding. Using this inexpensive and easy method can help to increase exclusive breastfeeding, especially in primiparus women.

## Keywords

Telephone counseling, breastfeeding, primiparus

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# The main requirements and capabilities for developing a mobile-based pre-visit application based on patient-centered care approach

Marjan Ghazisaeedi[1], Marsa Gholamzadeh[2]*

## ABSTRACT

**Background:** One of the main elements of the patient-centered care is respect for patients' value. Thus, pre-visit planning methods were emerged to enhance patients' value and patient-physician relationships.

**Objective:** Our main objective was to suggest the model of mobile-based applications for putting pre-visit planning into practice.

**Material and Methods:** In accordance with the PRISMA statement, a literature search was conducted in PubMed, Web of Science, IEEE and Scopus for English citations published from January 2010 to November 22, 2020 for studies including methods regarding pre-visit programs. The main characteristics of eligible studies were extracted, compared, and classified by authors for qualitative analysis. The ultimate model of application was defined based on analysis.

**Results:** Out of 385 citations were retrieved, 49 studies from ten countries were included. The main purpose of most articles was patient preparedness. Through this survey, most important functions of effective pre-visit program were extracted. Based on the audience of the program and its main functions, our app can be designed in three layers architecture. The thematic analysis of findings showed that the main sections of our mobile-based program include five main sections with more than 12 subsections. Based on this model, the patient can pursue the main goals of pre-visit planning such as disease management, adherence to treatment, receiving the necessary advice, get the necessary training, and preparing for each visit through our application.

**Conclusion:** Using a systematic method and proposing a framework leads to providing an overview of main requirements of a pre-visit care program.

## Keywords
mhealth, Pre-visit, Patient-centered care, Patient care planning

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# Designing a knowledge-enabled Chatbot for elderly support

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## ABSTRACT

**Background:** Chatbot developments is one of the most significant achievements in AI. On the other hand, aged people need to have conversations with others to address psychological problems and loneliness. These virtual assistants can be one of the best solutions to overcome the problems of the elderly.

**Objective:** Designing an AI-based chatbot to interact with elderly for immediate recommendation as clinical consultation is the main goal of our study.

**Material and Methods:** This study is descriptive and developmental study. A chatbot is an AI-based software designed to interact with humans in their natural languages with python language. In this work, a deep learning in combination with long short-term memory networks were applied to improve the virtual patient's conversational skills. Such a neural networks can learn specific word embeddings to drive sentence embeddings. Therefore, it has the ability to a given question from a knowledge-based.

**Results:** Its core functionalities include continuous monitoring of the patient's medication adherence and tracking of relevant health. Depending on user responses, the logic engine of system retrieves symptomatic keywords to assess the existing user's health and psychological conditions. This system can be very useful in checking daily symptoms for people. Ultimately, we aim to make sure the user feels like they are having a conversation with a health specialist.

**Conclusion:** Through this survey, we presented a functional architecture that we propose to build an intelligent chatbot for elderly assistance in mobile platform.

## Keywords
Chatbot, mhealth, Elderly

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# Designing mobile application for functional assessment of elderly

Reza Safdari[1], Marsa Gholamzadeh[2]*

## ABSTRACT

**Background:** Daily living activities and functional level assessment are important issues in elderly. Monitoring these scales in different times can aid physicians to manage aged persons easier.

**Objective:** Development of a new mobile application for manage functional level of elderly is a main objective of this survey.

**Material and Methods:** This study is descriptive and developmental study. Through a literature review, the functional and non-functional of application were determined. Comparative study of similar applications in Google play and App store were conducted in this survey. Ultimately, we achieved to the final model of applications with main sections. This application is developed based on user-centered methodology.

**Results:** According to literature review and comparative study of available applications, the datasets, main functions, and workflow of our application were determined. Thus, a standard scaled questionnaire known as the Comprehensive Older Persons' Evaluation (COPE) was selected as a main source of knowledge to evaluate daily functional and social status of elderly. The system provides appropriate suggestion and recommendation based on evaluation. All of these suggestion shows to user in combination of graphical image and simple text statement. Moreover, an educational section was considered to guide users.

**Conclusion:** Developing such application based on user-centered approach for aged persons could improve efficient provision of geriatric care.

## Keywords
User-centered, mhealth, Elderly, Functional Status

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# The role of mobile health in the quality of life of the elderly

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## ABSTRACT

**Background:** The elderly population is increasing in the world. Today, information technology has made good progress in the field of health. Using telecare and mobile health can reduce treatment costs and save time.

**Objective:** Using mobile health can be a solution to care elderly and this study is aimed to address the effect of mhealth on the elderly`s quality of life.

**Material and Methods:** This study is performed through a search in PubMed, Scopus, and the Web of Science databases from 2010 to 2020. The criteria for inclusion were included in any study illustrated about the elderly, English papers, original papers, and using Mobile health. Related articles were selected based on inclusion and exclusion criteria. The survey and meta-synthesis of included articles were conducted based on the predefined classification.

**Results:** Among 1683 studies, 14 articles met our inclusion criteria. about quality of life applied in reviewed articles have used 42.85% articles of the questionnaire to assess the quality of life of the elderly and 57.515% indirectly assess. The majority of studies (85.71%) showed the positive impact of mobile health in improving the quality of life of the aging population.

**Conclusion:** This systematic review could show a positive effect of using mhealth in the quality of life of aging people and it is good to pay attention to considering those factors which threaten the quality of life of the old population as there is still room to improve the level of life quality of old people.

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# Mobile-based education as a strategy to health promotion related to Covid-19

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## ABSTRACT

**Background:** How to promote health to prevent covid-19 in the community is one of the major public health challenges. Extensive and increasing access of different groups of society to mobile-based communication technologies has provided good opportunities for implementing educational interventions.

**Objective:** Therefore, the aim of this study was to investigate the types and forms of using mobile-based training in health promotion related to covid-19.

**Material and Methods:** This research was conducted in 2020 through a search in reputable databases such as PubMed, Google Scholar, Web of Science and Scopus with the keywords Covid-19, mobile health, health promotion. Finally, 10 articles from 2019 to 2020 were selected. After collecting related articles, the data extracted from the articles were summarized and analyzed by the researchers for analysis.

**Results:** The results of this study show that mobile health programs and the application of mobile-based education to promote the health of different population groups during the covid-19 disease epidemic have a very effective role and are very low cost and save time. One of the forms used in this field is the use of mobile technologies such as text messaging, voice services and mobile applications. In Asia, Singapore was one of the first countries to launch a mobile health app to promote covid-19-related health, followed by Indonesia, Korea and Malaysia. The use of covid-19-related mobile health applications in Malaysia has been reported 78.6%.

**Conclusion:** Based on scientific and empirical evidence, the development of mobile educational technologies can be considered as a strategy in health promotion, including in the field of prevention of adverse effects of covid-19.

## Keywords
Covid-19, Mobile Health, Health Promotion

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# The role of mobile health in reducing stress and anxiety and subsequently strengthening the immune system in COVID-19

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## ABSTRACT

**Background:** COVID-19 is currently the biggest health challenge associated with stress and anxiety. The use of mobile-based communication technologies in advertising and controlling and treating diseases is progressing.

**Objective:** The purpose of this review is to provide solutions to reduce stress and anxiety in COVID-19 patients based on mobile-based training.

**Material and Methods:** The present study is a review study, which results in a search of PubMed, Google Scholar and Web of Science databases in 2017-2020 with the keywords; Mobile, COVID-19 virus, anxiety, stress and immune system. Articles were evaluated in terms of title, abstract and full text, and after removing duplicate and irrelevant content, articles related to the purpose were selected.

**Results:** According to studies, stress and anxiety reduce the proliferation and function of immune cells and ultimately destroy them, causing inhibition and weakening of immune system function. Therefore, stress and anxiety play an important role in exacerbating of COVID-19 by weakening the immune system. Using mobile-based mobile health can provide useful information resources and solutions to reduce patients' stress and anxiety. Solutions include the use of applications, text messages and even establishing audio or video communication with a psychologist and psychiatrist. The efficiency of using mobile health-based applications in Malaysia has been about 78.3%.

**Conclusion:** Therefore, mobile-based mobile health may play an important role in reducing stress and anxiety and then strengthening the immune system, which in turn can accelerate the recovery process of COVID-19 patients and also reduce the mortality rate of these patients.

## Keywords
Mobile, COVID-19 virus, Anxiety, Stress, Immune system

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# Investigating the effect of accompanying health on Covid epidemic 19: with an approach to control and Inhibition

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## ABSTRACT

**Background:** Today, it has been proven that non-pharmacological interventions, including health, play an important role in controlling infectious diseases. Therefore, one of these diseases is Covid 19, which mobile health technology has played a key role in preventing this disease.

**Objective:** The aim of this study was to investigate the effect of comorbidity on the prevention of Covid 19 epidemic.

**Material and Methods:** This study was conducted systematically by searching the Scopus, Science, PubMed and Google Scholar databases and using the PRISMA workflow diagram to select articles. English language input and time range 2019_2020 were used for the search. There were about 114 articles, of which 42 were included in the study. Then, the qualitative evaluation of the articles was performed based on the abstract list of CASP diagnostic tests with 12 questions and finally 10 articles related to the study were selected.

**Results:** Studies have shown that health technology with the creation of a suitable hospital, such as: mobile-based online survey, artificial intelligence algorithm, video counseling for patients, as well as software related to the symptoms of Quid 19 has a significant impact on the treatment and prevention of this epidemic had; Also, studies have shown that this technology has an effective role in controlling Covid 19 by providing communication between the service provider and the patient.

**Conclusion:** The results showed that if there is a suitable substrate, mobile health technology can play an undeniable role in controlling and controlling the epidemic of Covid 19 by relying on this substrate.

## Keywords
Prevention, Control, Covid 19

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# COVID-19 and Contact Tracing: A systematic review of ethical Challenges for use of digital proximity tracking technologies during COVID-19 outbreak

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## ABSTRACT

**Background:** In response to the rapid spread of Coronavirus Disease (COVID-19) in the world, governments have applied widespread Smartphone-based contact tracing apps to curb COVID-19 transmission. Contact tracing is a successful response as part of a containment strategy, but this strategy has some ethical problems and challenges that need to be addressed.

**Objective:** The purpose of the present study was to systematically review the ethics problems and challenges related to the adoption of mobile contact tracing solutions for fighting COVID-19 outbreak.

**Material and Methods:** Electronic databases, including PubMed, ProQuest, Web of Science Scopus, and Google Scholar from December 01, 2019 to December 01, 2020 were systematically searched for find related published articles. In all electronic databases, these key words (in the title/abstract) were used: Contact tracing (and synonyms) or Smartphone (and synonyms), and COVID-19 (and synonyms), and ethic*(and synonyms). Eligibility criteria included interventional, observational, modelling, and case studies related to contact tracing in during COVID-19 outbreak that reported findings regarding at least one ethic challenges and published in English language at peer reviewed journals. The search results, data extraction and quality evaluation were accomplished by two reviewers independently and finally included studies were synthesized.

**Results:** Of 611 research articles generated from our initial search, 9 articles met inclusion criteria and were included in the review. Some of the primary ethical challenges of which are the spread of individual information paradox, unnecessary access to privacy information, causing panic among the societies and increase untruths to governments and healthcare systems.

**Conclusion:** Contact tracing is an important measure to attempt the curb transmission of COVID-19, but concerns over a breach in data privacy and another ethical problem have impact toward their adoption in societies. Also, improving the privacy policies by governments could be reassuring and addressed this challenges and ethical problems of these applications.

## Keywords
Contact tracing, Smartphone, Ethics, COVID-19, Outbreak

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# Application of mobile health technologies in nutrition during COVID-19

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## ABSTRACT

**Background:** The use of mobile health (mhealth), facilitates the delivery of health services and the complexities of direct services, speeds up work and reduces costs. New technologies are promising tools for nutrition management, their use has been highly encouraged during the COVID-19 pandemic.

**Objective:** The aim of this study is to identify the applications of mhealth in nutrition during the outbreak of COVID-19.

**Material and Methods:** This research is an applied study that was conducted by systematic review method in 2020. To find relevant studies, searches were conducted on PabMed, Scopus, Science Direct and Google Scholar from 2019 to 2020 (since the outbreak of Covid-19). Related articles were entered into the study using a PRISMA flowchart, their information was extracted and entered in a checklist, and finally the data were analyzed using descriptive statistics (frequency-mean) with SPSS25.

**Results:** Out of 546 studies, 12 studies were included. All studies have emphasized the positive effect of the use of mhealth in the nutrition of cancer (3 studies with an average of 96 samples), diabetic and obese patients (6 studies with an average of 189 samples) and the elderly (3 studies with an average of 101 samples) in the prevalence of COVID-19. The main mhealth programs in nutrition included aspects of general nutrition information in COVID-19 pandemic, nutrition programs for specific patients, and nutrition education programs.

**Conclusion:** MHealth is a resource through wireless mobile technologies that can improve access to health information and change health-related behaviors.

## Keywords
COVID-19, mhealth, mobile apps, nutrition, smartphone

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# The role of mhealth in elderly care in COVID-19: A systematic review

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## ABSTRACT

**Background:** Healthcare and social communication is very important for the elderly, especially during COVID-19. Mhealth can be a valuable tool to help families stay in touch and help older people stay active and connected.

**Objective:** The purpose is to categorize the effectiveness of apps that have been effective in caring for the elderly during COVID-19.

**Material and Methods:** The research was conducted by systematic review in 2020. PubMed, Scopus, Science Direct and Google Scholar were searched from 2019 to 2020 (since the COVID-19 outbreak). Related articles were chosen by PRISMA flowcharts, their information was entered in a checklist, and data were analyzed using descriptive statistics and SPSS25 software.

**Results:** 897 studies were found and 17 studies were selected after reviewing the inclusion and exclusion criteria. All studies emphasized the positive effect of the use of mhealth on the mental and physical health of the elderly (1400 people on average) in the prevalence of COVID-19. Major mhealth programs for the elderly included aspects of primary care in COVID-19 (3articles), food services (5articles), sports (3articles), and communication (6articles). The findings show that older people are increasingly using the apps: "K Health: Primary Care" for primary care, "Headspace: Meditation & Sleep" to soothe the elderly with exercise, "DoorDash-Food Delivery" for ordering food, and FaceTime and Skype for communication.

**Conclusion:** Mhealth can improve social welfare by improving social support and interaction in activities. It can provide a solution to isolation by increasing communication with people.

## Keywords
COVID-19, mhealth, mobile apps, Older Adults, smartphone

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# Opportunities of Information Technologies in COVID-19 Pandemic: Social Networks Approach

Azadeh Bashiri[1], Roxana Sharifian[2], Behrouz Alizadeh Savareh[3,4], Fatemeh Yazdanpanahi[5]*

## ABSTRACT

**Background:** COVID-19 is a respiratory disease caused by the coronavirus. It was officially declared as a pandemic by the World Health Organization on March 11th, 2020. This disease changed the routine of health care delivery and created the need to develop and use health technologies such as M-Health, social networks, artificial intelligence and etc. to manage, reduce, prevent and treat during outbreaks. Providing health information through social networks is more effective than other technologies, because information can be quickly exchanged and updated dynamically.

**Objective:** The aim of the present article is to explore social media opportunities during a COVID-19 pandemic.

**Material and Methods:** The current study is a review article which was done in 2020 by reviewing related articles through valid databases and E-journals (PubMed, Google scholar, ProQuest and Science Direct), and by using keywords including health information technologies, social media, M-health and COVID-19.

**Results:** The findings demonstrate the effectiveness of social networks during various infectious diseases including influenza, SARS and COVID-19. After epidemic of the coronavirus, social networks coming to the field in order to increase public awareness about prevention, early diagnosis, patient education and so, reduce direct complications and mortality rate of the disease.

**Conclusion:** Information technologies, especially social networks will definitely have a significant role in areas such as public health practice management during diseases pandemic. Therefore, it is one of the most appropriate technologies to deal with the outbreak of COVID-19 for people and health care providers.

## Keywords

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# Mobile Health Clinics; a Way to Control COVID-19 Pandemic in Iran

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## ABSTRACT

**Background:** Several years after Severe acute respiratory syndrome (SARS) outbreak, COVID-19 as a pandemic disease, has caused crises and affected various aspects of the health care systems. Therefore, there is a need to upgrade conventional medical technologies. Mobile health technologies have spread rapidly during coronavirus outbreak. Mobile Health Clinics (MHCs) attracted the attention of many countries which offer activities through mobile health technologies, such as teleconsultation and mobile health services.

**Objective:** This study aimed to introduce mobile health clinics to control the Covid-19 pandemic in Iran.

**Material and Methods:** This is a review article was done in 2020 through library studies and reviewing databases (Google Scholar, Science direct, ProQuest, and PubMed). Also, the keywords include mobile health, mobile health clinics, and Covid-19 were used.

**Results:** Many countries, including China, the U.S, and Canada, have long been associated with MHCs and use them to control chronic diseases. During this pandemic, they also managed to control the disease through this technology. In the U.S, 41% of primary care and 46% of disease prevention services were provided by them.In China, 146 MHCs were set up, which enabled them to control and reduce covid-19.

**Conclusion:** The strategic features of mobile health lead to the prevention, diagnosis and early management of infectious diseases, reduced the lack of access and inequality of health services in many countries. It seems that providing mobile health services in the field of mobile health clinics in Iran can be effective to control this pandemic.

## Keywords
Mobile Health Clinics, Mobile health, Covid-19

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# How can elderly population benefit from mobile health during pandemic?

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## ABSTRACT

**Background:** Thanks to the COVID-19 pandemic, demand for telehealth and virtual care technologies is upsurging, which is the adoption of telecommunication to deliver any health care activity. The use of remote health care services, telehealth, is a promising solution for providing health care to those unable to access care in person easily. stay-at-home orders created an optimal situation for the use of telehealth services. During the changes and restrictions digital tools and resources can mitigating the worst of the negative consequences such as social isolation having negative effects on well-being in individuals of all, but the effect has been shown to be magnified in older adults. Such circumstances are optimal for the use of telehealth services.

**Objective:** The purpose of this study is to determine the role of Digital Health particularly integrated telemedicine and virtual health for elderly people promising solution for providing health care to those unable to access care in person easily.

**Material and Methods:** To perform a systematic review of the literature and evaluate all the available studies, using valid sites and databases and online articles such as PubMed, Scopus, Web of Science, Science Direct, and Google Scholar searched until December 7th, 2020. The search strategy was based on a combination of following these concepts: mobile health (m-health), elderly population and the COVID-19 pandemic. A total of 20 full text studies were included in the final analysis.

**Results:** Overall, elderly patients were highly satisfied with their telehealth visits; with greater than 80% indicating that the provider addressed their concern and that they were willing to participate in telehealth visits in the future. High satisfaction was observed in all age groups, with the highest rates in patients older than age 75 and in the provision of urology, dermatology and urgent care.

**Conclusion:** The use of remote health care services, or telehealth, is a promising solution for providing health care to those unable to access care in person easily and thus helping to reduce health inequalities.

## Keywords
Public health, elderly population, coronavirus, mobile health

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# Evaluation and Satisfaction Survey on the User Interface and Usability of Smartphone Application Mask (Iranian government COVID-19 self-care app)

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## ABSTRACT

**Background:** Smartphone applications play an important role in management, providing care and preventing infectious diseases, as well as this tool has the potential to have an impact on supportive and self-care.

**Objective:** Evaluation and satisfaction survey on the user interface and usability of Iranian government COVID-19 self-care smartphone application (Mask app).

**Material and Methods:** This is a descriptive-analytical study that has been conducted in two main phases in 2020 using the expert review heuristic method. In the first phase, a literature review study was performed to identify the data elements and features of the User interface and usability mobile health apps in the area of coronavirus (COVID-19). In the second phase, using the information obtained from the review of similar articles, a questionnaire was designed to validate evaluation and satisfaction survey on the User interface and usability of Smartphone Application Mask. The statistical population of the present study consisted of 5 experts.

**Results:** The requirements and features of the user interface were identified in 4 areas (24 cases) and usability in 11 areas (54 cases). According to the experts, aesthetic and minimalist design in the area of the user interface, and user control and freedom in the area of usability scored the most mean.

**Conclusion:** Usability and user interface properties are key differentiation factors for mobile health smartphone applications. Applying the suggested strategies in the present study can improve user interface and usability, this principle will make users mobile health apps better accepted.

## Keywords
Smartphone, Application, Evaluation, User Interface, COVID-19

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# Evaluating the factors affecting the use of smartphone applications in patients with breast cancer: A qualitative study

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## ABSTRACT

**Background:** Breast cancer patients often face a variety of physical, functional, and psychosocial problems during treatment. Meeting the learning needs of breast cancer patients is an important part of a healthcare provider's duty, which improved patients' skills to self-management. The great relevance of Smartphone apps use in the healthcare setting creates new opportunities to educate patients and enhance their self-management skills.

**Objective:** This study aims to determine the factors affecting the use of m-health applications amongst breast cancer patients.

**Material and Methods:** This study is a qualitative research conducted at the Urmia University of Medical Sciences in 2020 using semi-structured interviews. The participants in our interviews consisted of 11 breast cancer patients who referred to Omid hospital in Urmia. Thematic analysis was used to analyze the qualitative data.

**Results:** From breast cancer patients' viewpoints, the most important factors affecting the use of m-health applications were approved by healthcare providers, the educational content of apps based on patient needs, facilitated doctor-patient relationship, easy to use, user-friendly interface, and protected the privacy of patient information.

**Conclusion:** Smartphone applications can play a useful role in the promotion of self-management of breast cancer patients. For increasing patients' motivation to adopt apps, healthcare providers should know suitable apps and advice to patients. It seems necessary that developers should design m-health apps user-friendly, easy to use, reliable, and secure.

## Keywords

Smartphone application, Self-management, Breast cancer

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# A Survey of the Students' knowledge about COVID-19 through Social Networks in Shiraz University of Medical Sciences

Azadeh Bashiri[1], Roxana Sharifian[2], Behrouz Alizadeh Savareh[3,4], Fatemeh Babaei[5]*

## ABSTRACT

**Background:** COVID-19 has spread all over the world since December 2019. There is no absolute treatment or vaccine in order to control and prevent coronavirus. So, awareness of people and training them relating to Covid-19, are necessary. Social networks as one of the important information media, can meet these needs.

**Objective:** In this study, an attempt has been made to examine students' awareness of COVID-19 through social networks.

**Material and Methods:** This descriptive cross-sectional study was performed on 384 students of Shiraz University of Medical Sciences by simple sampling method in 2020. After determining validity and reliability, the questionnaire was designed using PorsLine website and the link was sent to students by WhatsApp. The questionnaire included 25 questions (4 questions were demographic and other related to COVID-19). Finally, the results were analyzed by SPSS.

**Results:** 69.1% of students emphasized social media especially Instagram as the first source of receiving information about mortality, symptoms, mode of transmission and prevention of COVID-19. 37.2% of them were the member of social networks for 2-5 years and more than 90% of them enter social networks several times in a day. Also, the results showed that with prevalence of COVID-19, the number of hours of using social networks has increased.

**Conclusion:** The majority of students were members of social networks and use of these networks can cause their awareness of symptoms, methods of transmission and prevention of COVID-19.

## Keywords
Social Network, COVID-19, Medical Sciences Student

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# The role of telemedicine in COVID-19 pandemic

Somayyeh Zakerabasali[1], Fatemeh Babaei[2]*, Fatemeh Yazdanpanahi[3]

## ABSTRACT

**Background:** Telemedicine is providing remote medical services with technology. These services include diagnosis and management of chronic diseases, training and follow-up patients.

**Objective:** The aim of this article is role of telemedicine during COVID-19 pandemic.

**Material and Methods:** This article is systematic review that searched in PubMed and Scopus databases and Google Scholar search engine and published from January 2020 to November 2020 based on determined search strategy. 20 articles were found then by screening abstracts, 11 articles related with title were selected.

**Results:** After reviewing articles, results of articles included: Telemedicine utilizes during COVID-19 to manage diabetes by remote patient monitoring, virtual care, education, training and drug management. Roles of telemedicine in ENT include initial evaluation preoperative and diagnosis of vocal cords paralysis. It also uses in oncology to explain essential cares. In urology, this technology use to follow-up and patients care with non-metastatic prostate cancer after treatment, initial diagnosis and control hematuria, and diagnosis and follow-up patients with uncomplicated bladder stones. Telemedicine uses in orthopedics for postoperative follow-up patients with bone cancer, fracture and joint arthroplasty. Telemedicine manages inflammatory bowel disease through virtual visits, education of patients and provide appropriate care. Furthermore, Telemedicine is also useful for quarantined patients by online diagnosis of supraventricular arrhythmia. Telemedicine communicates between physicians and quarantine people at home with COVID to assess their condition, and physicians make treatment decisions.

**Conclusion:** As prevention and treatment of COVID-19 emphasizes on social distance, telemedicine can remotely collect patient information and aid physicians to provide diagnostic-therapeutic approaches.

## Keywords

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# Why the Elderly are on Social Media: a Study of the Geriatric Population in Shiraz, Iran

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## ABSTRACT

**Background:** The elderly population is growing at a rate faster than any other age group. If used correctly, social media use can benefit the geriatric population. These benefits include increased cognitive capacity, enhanced self-efficacy, and improved overall physical and mental health. Maintaining religious affiliations and interacting with loved ones via smartphones and computers are proposed ways of minimizing the impact of social distancing rules set forth due to conditions such as the Covid-19 pandemic.

**Objective:** The aim of this study was to gain insight into the purpose of the geriatric population's social media use.

**Material and Methods:** This cross-sectional study was conducted in Shiraz, Iran. One hundred forty participants who were literate and aged between 60 and 85 years old were included in the study. Data were analyzed in SPSS software Version 24.0 (Armonk, New York: IBM Corp) using descriptive statistics (frequency and percentage).

**Results:** Of the participants, 123 (88%) used social media for interpersonal communications, 96 (69%) for accessing health information, 88 (63%) for sharing their status, and 71 (51%) for entertainment. Health was one of the most important topics on social media for the elderly.

**Conclusion:** Most of the elderly in our study used social media for dyadic communications and obtaining knowledge. Since health was mentioned as one of the most important topics of knowledge, social media should be regarded as an effective way of improving health literacy in this population, and health policymakers should establish facilities to utilize and guide this potential.

## Keywords
Geriatrics, Social Media, Telemedicine, Social Networking

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# The Effectiveness of Self-Management of Hypertension in Elderly Using Mobile Health: A rapid systematic review

Seyyedeh Fatemeh Mousavi Baygi[1], Kosar Ghaddaripouri[2], Mohammad Reza Mazaheri Habibi[3]*

## ABSTRACT

**Background:** Hypertension is the fundamental cause of approximately 20% of deaths worldwide. Due to the exponential growth of mobile technologies, mobile Health becomes an efficient tool to improve the control of hypertension. Despite its effectiveness has been assessed in many studies, a systematic overview of the developed services would have assisted to better understand their opportunities and limitations.

**Objective:** The aim of the study was to identify and evaluate the effectiveness of mobile Health enabled self-management in the elderly with hypertension.

**Material and Methods:** A systematic search and retrieval of literature published between 2010 and 2020 was conducted in the electronic databases Scopus, Science Direct, and PubMed. A staged screening of titles, and later full-text, was conducted by two independent reviewers. Reviewers independently evaluated the quality of the articles considered relevant for inclusion. Finally, 7 main articles were selected based on inclusion, exclusion, and quality evaluation criteria.

**Results:** This study provides implications on the potentials of mobile Health in the elderly with hypertension. The interventions used in these studies were: messages to adhere to medications, including short and simple text messages (4, 57%), non-text messages (voices and photos) (5, 71%), personalized messages (3, 43%), group chats (1, 14%), video conferencing (1, 14%), and lifestyle training (6, 86%), and culture adaptation to the relationship with the effective factors of hypertension was inherent in the individual (2, 29%). Also in all studies, it was reported that whit intervention mobile Health, blood pressure was significantly reduced.

**Conclusion:** This review clearly demonstrated that a mobile Health empowered hypertension self-management intervention was effective in improving blood pressure control. The best health intervention is a combination of multifaceted interventions such as custom non-text messaging to adhere to medication and educational lifestyle intervention.

## Keywords

Hypertension, Telemedicine, Self-management, Elderly

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# A Systematic Review of Mobile Application for MCCs Patients: With Focus on Technical Aspects

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## ABSTRACT

**Background:** Multiple chronic conditions (MCCs) are two or more chronic conditions that affect a person at the same time. Nowadays, 1 in 3 adults lives with multiple chronic conditions and they often face complex and overwhelming conflicts in their personal health management. So, mobile-based applications can help MCCs patients in self-care and alleviate this challenge.

**Objective:** The purpose of this study was to review mobile application for MCCs patients and their characteristics for the first time.

**Material and Methods:** This review was reported in accordance with PRISMA guidelines. We identified keywords from our initial research, MeSH database and expert's opinion. Databases of PubMed, Sciences Direct, Scopus, Embase, and Google Scholar Until 20th December 2020, 106 articles were searched. After studying and evaluating articles based on inclusion and exclusion criteria 21 studies were included.

**Results:** Most applications were for measuring and controlling vital signs and issuing electronic alerts to patients. One case recommended exercise to patients with disabilities. A study was also conducted on the use of mobile cameras to report daily dietary intake by elderly patients with MCCs.

**Conclusion:** Mobile applications can be effective and useful in the management and self-care of patients with MCCs. If mobile applications can coordinate the provision of health services, it will be a great help in treating and alleviating the conditions of MCCs patients.

## Keywords
Multiple Chronic Conditions, Smartphone, Mobile Application, Telemedicine, mHealth

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# Telemedicine for MCCs Patients During COVID-19

Hediye Mousavi[1], Leila Marashi Hosseini[2]*

## ABSTRACT

**Background:** While the whole population is at risk from infection with the COVID-19 pandemic, caused by the severe acute respiratory syndrome coronavirus (SARS-CoV-2), people who have Multimorbidity or Multiple Chronic Conditions (MCCs) are at highest risk for severe and fatal disease.

**Objective:** The purpose of this study was to review the impact of telemedicine and mHealth on the health care of MCCs patients in the covid-19 pandemic.

**Material and Methods:** In this study, all articles in the PubMed database indexed in the field of COVID-19, Telemedicine and mHealth in patients with Multiple Chronic Conditions were reviewed.

**Results:** Video consulting is one of the technologies used to maintain physical distance. And the real-time continuous monitoring of vital parameters in patients is another novel technology. mHealth tools such as websites or mobile applications also play an important role in tracking location or COVID-19 symptoms and receiving recommendations or push notifications about COVID-19 for patients with chronic diseases.

**Conclusion:** Study demonstrates that telehealth services, remote monitoring capabilities, and new, targeted care innovation initiatives would help better care MCCs patients during this pandemic.

## Keywords

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# Developing a mobile-based application for supervising healthcare facilities

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## ABSTRACT

**Background:** Supervising healthcare facilities is a key step to make sure about the quality of the services provided to patients by these facilities. However inspecting healthcare facilities is performed in a paper-based process and it brings about lots of challenges like lack of on-time reprimanding or penalties for institutions that have not met the health standards.

**Objective:** To develop and evaluate usability of a mobile-based application for supervising dental facilities.

**Material and Methods:** To identify the requirements of the supervising mobile-based app literature search was performed, in addition to preparing a process analysis and a data-flow diagram. The requirement were summarized and presented to a focus group. A primary demo was programmed by the programmer. Experts discussed on the primary demo, and a series of iterative design steps targeting supervision needs were applied. SUS questionnaire was used to evaluate the app usability.

**Results:** The identified requirements were categorized based on management, inspectors, and dental centers. Management requirements included dashboard, reporting, referrals, reminders, link to associated systems like licensing system. Inspectors' requirements included electronic forms with agility to sign and calculate scores electronically, electronic supervision process, observing centers data bank, referrals, GIS. Dental centers requirements included centers profile, educations, Live sessions, chat room, reporting, requests like licensee renewal. The usability of the app was calculated as 4.27±0.15.

**Conclusion:** The usable supervision app considered a comprehensive need assessment and integrated the required features well. It can reduce cost, time, human resources, and increase efficiency, effectiveness and patients' safety as a result.

## Keywords
Mobile-based application, Healthcare centers, Supervision

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# The evaluate the dentists' attitude towards the application of mobile health technology in the field of oral diseases during the Covid-19 pandemic

Fatemeh dinari[1], Farzaneh Hoseini[2], Fatemeh Zarei[3], Kambiz Bahaadinbeigy[4]*

## ABSTRACT

**Background:** Covid-19 is a respiratory infection which through the spread of coronavirus particles by coughing or sneezing. A direct relationship has been observed between oral health and more severe symptoms of coronavirus. Nowadays, healthcare services can also be provided on smartphone phones. Assessing the dentists' attitude towards using this technology can help health planners provide health services.

**Objective:** The aim of this research was to evaluate the dentists' attitude towards the application of mobile health technology in the field of oral diseases (treatment and education and self-care) during the Covid-19 pandemic.

**Material and Methods:** This descriptive study was conducted on 32 dentists in Kerman and Zahedan in 2020. The data collection tool was a researcher-based questionnaire. The content validity of the questionnaire confirmed by three medical informatics specialists. The collected data was analyzed by SPSS software (version 22) using descriptive statistics (e.g. percentage, mean and standard deviation) and the paired t-test.

**Results:** Dentists agreement was higher in education and self-care than in treatment ($p < 0.05$, CI = 95%). According to dentists, making use of mobile technology in the field of treatment (with the highest average) ($3.41 \pm 0.87$) was related to "online follow-up of the visited patient" and the lowest average ($2.56 \pm 1.04$) was related to "asynchronous patient visit (save and send). Concerning education and self-care, the highest average ($3.97 \pm 0.64$) was related to "providing educational programs in the field of healthy nutrition for oral health" and the lowest average ($3.19 \pm 1.09$) was related to "sharing patient's health records by observing confidentiality".

**Conclusion:** Results revealed that dentists agreed with the provision of healthcare and self-care programs through mobile technology. By recognizing the infrastructures carefully, health planners can enjoy mobile capacity to manage and control oral diseases.

## Keywords
attitude, dentists, oral disease, mobile heath, covid-19

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# The examine the viewpoints of physically disabled people and physiotherapy experts in relation to the educational content required to create a rehabilitation mobile application

Fatemeh Dinari[1], Zahra Dinari[2], Samaneh Dinari[3], Kambiz Bahaadinbeigy[4]*

## ABSTRACT

**Background:** Physically disabled people are faced with a set of mobility challenges in their lives. This group of people need some training programs to facilitate their growth and to improve their functional independence in movement. Nowadays, making use of mobile features is a promising model to educate and improve the knowledge of different people in a society.

**Objective:** The aim of this research was to examine the viewpoints of physically disabled people and physiotherapy experts in relation to the educational content required to create a rehabilitation mobile application.

**Material and Methods:** This descriptive-analytical study was conducted in 2020 (in Fasa Town) on 19 physically disabled and 13 physiotherapists. The data collection tool was a research-based electronic questionnaire. The content validity and reliability of the questionnaire were confirmed by two medical informatics specialist. Data was entered into SPSS software (version 22) and was analyzed using descriptive statistics.

**Results:** According to the results of this study, Concerning the viewpoints of the physically disabled, the highest average ($3.79 \pm 1.31$) was related to the component "the Reason for Rehabilitation", while the highest average ($4.69 \pm 0.63$) for the experts was equally related to the components "Rehabilitation Benefits" and "Types of Diseases Covered in Rehabilitation Programs". Concerning both viewpoints, the lowest average was related to the educational content of the application ($3.26 \pm 1.36$ and $0.86 \pm 4.08$ respectively) and the "Rehabilitation Definition".

**Conclusion:** Given the high average obtained from 15 components related to the educational content of creating a rehabilitation application, all components should be used in designing and implementing the application.

## Keywords
Rehabilitation, Educational needs, the physically disabled, Physiotherapy expert, Mobile application

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# The evaluate the nutritional awareness of pregnant and lactating women using social networks during the Covid-19 pandemic

Fatemeh Dinari[1], Samaneh Dinari[2], Kambiz Bahaadinbeigy[3]*

## ABSTRACT

**Background:** Owing to their weak immune system, pregnant and lactating women are vulnerable groups during the outbreak of infectious diseases such as Covid-19, paying more attention to healthy nutrition for this group of people is of great importance. Given the importance of providing healthcare services through smart phones, this technology can be used for any purpose in the field of health.

**Objective:** The aim of this research was to evaluate the nutritional awareness of pregnant and lactating women using social networks during the Covid-19 pandemic.

**Material and Methods:** This descriptive study was conducted in 2020 on pregnant and lactating women in Fasa and Estahban. A researcher-made questionnaire was used to collect data. The content validity of the questionnaire confirmed by two medical informatics specialists. The collected data was analyzed by SPSS software (version 22) using descriptive statistics.

**Results:** According to the results of this study, 78.1% of women used WhatsApp social network. Concerning women's knowledge about nutritional information during Covid-19, the highest average ($4.53 \pm 0.56$) was related to "consumption of natural juices and liquids against covid-19" (with an average of 2.78% and average and more), while the lowest average ($2.78 \pm 1.2$) was related to "consumption of fatty food and canned food during covid-19".

**Conclusion:** Results showed that the awareness level of pregnant and lactating women about nutritional information during the Covid-19 pandemic was moderate to high. Healthcare providers can create groups on WhatsApp social network for these women.

## Keywords

Pregnant and lactating women, Nutrition, Social networks, Covid-19

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# Functional requirements for the implementation and control of mobile-based drug management systems

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## ABSTRACT

**Background:**  Drug errors are one of the most important factors threatening the safety of patients that will affect the health system of any country. Mobile-based drug management systems, as programmed systems that determine how patients use drugs, can greatly reduce these threats and increase adherence to drug treatments.

**Objective:** The purpose of this study is to identify and introduce the functional requirements related to the implementation and control of drug-based health management systems from the perspective of pharmacy students of Kerman University of Medical Sciences.

**Material and Methods:** The present study is a cross-sectional-analytical study that was conducted in 2020 on 43 pharmacy students of Kerman University of Medical Sciences. A researcher-made questionnaire was used to collect data. The content validity of the questionnaire confirmed by two medical informatics specialists. Data was entered into SPSS software (version 22). Data was analyzed using descriptive statistics (percentage, mean, standard deviation) and independent t-test and Pearson correlation.

**Results:** According to the results of this study, highest mean (4.64 ±0.53) was related to the component of "drug information such as side effects and uses". Also, the lowest average (4.21±0.81) was related to the "drug identification" component. There was no significant difference between age, sex and average score of each component requirements for implementation and control of drug management systems (p-value>0.05).

**Conclusion:** The present study showed that all the components studied are related to the functional requirements for the implementation and control of mobile-based drug management systems. Based on these components, mobile-based drug management systems can be designed and implemented for individuals.

## Keywords
Functional requirements, Drug management systems, Mobile

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# Why Young People Leave Groups of Health Education in Virtual Networks and How to Persuade Them to Stay in?

Fariba Khayyati[1], Mohiadin Amjadian[2]*

## ABSTRACT

**Background:** Using virtual social networks to prevent and control tobacco can be helpful.

**Objective:** Our study tried to answer the following questions: What were the main reasons for students' leaving the Telegram network group? And how could young people be encouraged to stay in such groups.

**Material and Methods:** This was a qualitative study based on Hsieh & Shanno content analysis. There were 24 participants (10 girls and 14 boys). Nvivo version 7 was used for data management. The reliability of the findings was provided by transcribing the data as soon as possible, accurate recording of the steps of the study and good method of data collection.

**Results:** The codes were placed into 10 sub-categories and 3 main categories including: the challenges of staying in the channel, smoking and not intending to quit, and motivational factors affecting the staying of individuals in the group.

**Conclusion:** Most of the participants explained low attractiveness of the channel, the cost of Internet, telegram filtering, and cultural reasons as significant challenges. To improve motivational factors affecting staying of individuals in the group, most of the participants recommended increasing the attractiveness of the channel. Using a photo instead of text, proposing questions to answer by the members of the group, putting story series in the channel, advertising on other channels for this channel, and photos or GIFs were described as motivations or staying on the channel. Authenticity of the materials such as messages and paying attention to the problems of young people were referred to be important reasons of staying on the channel.

## Keywords
Networks, Health Education, Students

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# Neonatal Prematurity syndrome: a systematic review on current databases and registries

Reza Safdari[1], Navid Danaee[2], Mohammadsaleh Safari[3], Shahrbanoo Pahlevanynejad[4,5]*

## ABSTRACT

**Background:** Registries are deliberated as wealthy sources of data for determination of neonates with prematurity and low birth weight (LBW), the improvement of provided care and research.

**Objective:** The aims of this study were: (1) to investigate the existing studies including premature infants' registries, (2) to identify and extract the required minimum data set.

**Material and Methods:** The following electronic databases were searched: PubMed, Scopus, Web of Science, ProQuest, Embase/Medline. In addition, a review of gray literature was undertaken to identify relevant studies in English without time limitation including registries and databases. Screening of titles, abstracts, and full-texts were conducted independently by two researchers based on PRISMA guidelines. The basic registry information, scope, registry type, data source, the purpose of registry, important variables were extracted and analyzed.

**Results:** Fifty-three articles were eligible and included in the review; they reported 47 registries and databases related to prematurity at the national and state levels in 29 countries from 1963 to 2017. We proposed a prematurity registry design framework based on well-known data-information knowledge (DIK) structure due to Ackoff's DIK hierarchy has a defined role as a central model of information systems, information management, and knowledge management.

**Conclusion:** To the best of our knowledge, this is the first study which has systematically reviewed prematurity-related registries. Since there are no international standards to develop new registries, the proposed framework in this article can be beneficial. This framework is essential not only to facilitate the prematurity registry design but also to help the collection of high-value clinical data necessary for the acquisition of better clinical knowledge.

## Keywords
Delphi, prematurity, maternal, minimum data set, neonatal and newborn, surveillance

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# A content evaluation of apps for dementia management using Mobile Application Rating Scale (MARS)

Reza Safdari[1], Fatemeh Aliabadian[2], Mohammadsaleh Safari[3], Shahrbanoo Pahlevanynejad[4,5]*

## ABSTRACT

**Background:** Dementia is a general term for loss of memory, language, problem-solving and other thinking abilities that are severe enough to interfere with daily life. mobile apps and other Mhealth tools could improve the patient's condition.

**Objective:** The objective of this study was to develop a reliable measure and rate the quality of dementia mobile health apps.

**Material and Methods:** App selection proceeded in several steps. At first, a systematic search for apps with dementia management content was conducted in 2020. The search utilized the Google Play Store and Apple App Store "app search" filter. Searches were conducted for the terms "dementia," "dementia tracker", "demance", were entered into the search field of the Apple App Store and Google Play Store in July 2020 to identify Dementia-related apps for iOS and Android devices. Our search with selected keywords in Google Play Store and Apple App Store to retrieve apps for Android and iOS platforms resulted in 27 dementia related apps, of which 8 apps met our criteria and included in this study.

**Results:** App quality was assessed independently using MARS by two reviewers. Search queries yielded a total of 27 potentially relevant apps, of which 8 met our final inclusion criteria. My Reef 3D app had the highest average MARS score (4.6/5), Flower Garden had the highest average in engagement item, and all of the apps had acceptable MARS scores (> 3.3).

**Conclusion:** Functionality and Esthetics scores highlight potential target areas for improvement. Many of the apps analyzed in this study were not necessarily high-quality apps, according to the MARS scores. But the important thing is to pay attention to the user-friendliness of these apps, which must be careful. These findings may also help designers better design and use the program to be significantly more user-friendly. In addition, personalization of these apps can be of great help to patients and their families in the application.

## Keywords
Dementia, Mhealth, Digital health, Evaluation, MARS

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# Mobile health, Strategy in Diagnosis and Treatment of Diabetic Foot Ulcer During COVID-19

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## ABSTRACT

**Background:** The concept of mobile health has revolutionized in providing health care to patients and physicians. Diabetic foot ulcer as a costly and painful complication has many capabilities in using health services.

**Objective:** This study was performed to survey the effect of m-health on the diagnosis and treatment of diabetic foot ulcers during covid-19.

**Material and Methods:** The study is descriptive-cross-sectional. The study tool was a checklist contained questions such as demographic information, use and non-use of mobile phone in sending wound image, type of virtual network in sending images (Telegram, Whatsapp), usefulness of using mobile phone. The study population was 200 patients referred to Yara Institute,ACECR in the period from May to November 2020. The sample size was 127 people according to Morgan table. The collected data were analyzed in SPSS software version 16.

**Results:** This study shown, 80% of patients referred to the Yara institute used mobile phones to receive counseling. 80 % were male and 47 female. 32% had used remote counseling before first visit with sending a picture of their own wound. 100% of patients used mobile phones as a means of sending images.100% used Whatsapp network.87% of patients considered mobile phones useful for receiving remote counseling.

**Conclusion:** This study indicate the role and significant impact of m-health in diagnosis and provision of remote counseling for this patients. Promoting awareness and use of types of mobile health services by these patients is emphasized during the corona virus.

## Keywords
m- Health, Diabetic Foot Ulcer, COVID-19, mobile phone

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# Urgent need for mobile health interventions to protect the health care workers during Covid-19 pandemics: a systematic literature review

Elham Monaghesh[1] , Nazila Azizi[2]*

## ABSTRACT

**Background:** The COVID-19 outbreak have affected safety of health care workers (HCW) and their families. To resolve the current challenge, mobile health (m-health) can play a significant role to protect HCW and their families.

**Objective:** This review aimed to identify m-health capabilities to protect of HCW and their families during COVID-19 outbreaks. It also highlights the challenges and experiences to the rapid implementation of m-health solutions to support HCW and their families during this situation.

**Material and Methods:** A comprehensive search of electronic databases, including PubMed, Scopus, ProQuest, Web of Science and Google Scholar by related keywords was conducted. Search terms included HCW (and synonyms), m-health (and synonyms), and COVID-19 (and synonyms). Inclusion criteria included articles that highlights an m-health intervention to support of HCW and their families during COVID-19 outbreaks, published in English language from December 31, 2019 to December 2020 and studies of any research design and methodology published in peer reviewed journals. Two reviewers independently assessed search results, extracted data, and assessed the quality of the included studies. Finally, narrative synthesis was conducted to report the findings.

**Results:** Of the 1021 articles initially identified as relating to the topic, 12 articles met the inclusion criteria. Our data analysis showed all m-health interventions has positive effect on health problems for HCW and their families. HCWs can be used the m-health tools during current outbreak for providing safety services for patients, keeping social distancing, decrease mental health problems and finally diminish the infection transmission among families.

**Conclusion:** The COVID-19 pandemic has accelerated the need for m-health to support HCW, but the challenges of designing m-health technology should be solved. Also, this review has the potential to make a significant impact on safety of HCW and their family's through presenting insights for importance of deploying m-health technology.

## Keywords

m-health, HCW, Coronavirus, COVID-19, Outbreak

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# Management of mobile health-based anemia _Systematic review study

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## ABSTRACT

**Background:** Anemia with low levels of circulating hemoglobin leads to a decrease in tissue oxygenation and can worsen the progression of many concomitant diseases and also reduce the quality of life of patients. Awareness, treatment and prevention of many human diseases, especanemia, are better for quality of life.

**Objective:** Managing anemia with the help of associated health through a systematic review study.

**Material and Methods:** This study is a systematic review study that was conducted in 1399. Using the keywords anemia, mobile health and hypoxia in valid databases including SID, Google schoolar, medline, scopus were performed without time limit. Article sources were reviewed to ensure that search results were complete. After removing duplicate titles from Endnote software and reviewing titles and abstracts, related articles were reviewed using JBi tools. After reviewing the quality of the articles, the findings were entered into the checklist.

**Results:** A total of 50 articles were reviewed and finally 10 articles were selected which were related to the purpose of the study. According to studies, anemia is caused by both genetic and nutritional factors, and affects more than one billion people worldwide, which is often not adequately assessed or controlled. Symptoms of anemia can include fatigue, weakness, lightheadedness, headache, paleness, tachycardia, palpitations, chest pain, and shortness of breath. Diagnosis and management of anemia is interprofessional because anemia is a symptom that must be identified as the underlying cause. The rapid development of health technology along with unprecedented opportunities to improve health services. Patients have a significant impact on the management of anemia.

**Conclusion:** Considering the relatively common disease of anemia among communities and its impact on quality of life, the use of mobile health in the management of this disease is very important and its use saves time, space and Money.

## Keywords
Anemia, mobile health, hypoxia

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# Evaluation and Ranking of Mobile Applications Drug Adherence Quality in Iran: A Systematized Review

Mahnaz Samadbeik[1], Atefeh Abtin[2], Ali Garavand[3]*, Nasim Aslani[4], Shahabeddin Abhari[5]

## ABSTRACT

**Background:** Mobile Applications (MA) are able to implement in portable tools, which can use in any time and any place easily. One of the important applications of MA is use as drug adherence. The quality of mobile applications drug adherence (MADA) is important in health care providing.

**Objective:** The aim of this study was evaluation and ranking of drug adherence mobile applications quality in Iran.

**Material and Methods:** This study is a systematized review which was done in 2018. For software finding it search the Cafebazar software as the most important Iranian android software market. After identification and downloading the software by criteria, evaluation and ranking of quality of software were done by using a valid and reliable questioner. Data analyzing was done by SPSS v 16 through descriptive and analytical statistical testing.

**Results:** From the 1336 cases which find at the first searching, finally 8 MADA selected. 62.5% of apps were up to date. 100% of apps have three main features include data security, multiuser support and adherence without internet access. The Pill reminder was the best MADA in the evaluation and quality ranking.

**Conclusion:** Should state the final result that the authors have reached. The results of other studies should not be stated in this section.

## Keywords
evaluation, quality, drug adherence

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# Providing healthcare services for patients with chronic diseases during the outbreak of COVID-19 by applying smart phones: A review of conducted studies

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## ABSTRACT

**Background:**  Reducing the number of patients with chronic diseases referrals to hospitals and other healthcare centers during the Covid-19 outbreak caused to increase their complications and cause irreparable problems for patients. The use of smart phone apps can facilitate the providing the healthcare services through reducing people's referrals. Diabetes, heart disease and neoplasms are among the most important chronic diseases that cause a significant percentage of deaths worldwide.

**Objective:** The aim of this study was to identifying the applications of smart phone apps for providing healthcare services in patients with chronic diseases during the outbreak of COVID-19.

**Material and Methods:** In the present study, the published articles related to the use of smart phone apps for patients with chronic diseases during the outbreak of Covid-19 were reviewed. We searched, Pabmad and Scapus scientific databases as well as Google Scholar in the period of 2020 with the appropriate combination of keywords. After applying the inclusion and exclusion criteria and selecting the studies, data gathering was performed using a data extraction form and the data were analyzed using the content analysis method based on the objectives of the study.

**Results:** Findings of the study showed that the use of smart phone apps for patients with chronic diseases in the COVID-19 period in eight categories include patient education (including education related to Covid-19 prevention and disease-related care), monitoring, Self-assessment, appointments, remote visits, online consultations, sharing of experiences, and medication reminders depend on the type of chronic disease.

**Conclusion:** The use of smart phone apps as a supportive tool can be considered to prevent unnecessary travel for patients with chronic diseases as a vulnerable group in the time of COVID-19 outbreak.

## Keywords
chronic disesses, COVID-19, smart phone

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# The Applications of Generated Data in Mobile Phones for encounter to COVID-19: A Rapid Review in Conducted Studies

Nasim Aslani[1], Ali Garavand[2]*

## ABSTRACT

**Background:** Due to expansion of the use of smartphones around the world, a lot of data is created from them, which can be used for effective confrontation in outbreak of new epidemics or pandemics in many dimensions.

**Objective:** The aim of this study was to discovering the applications of generated data in mobile phones for encounter to COVID-19.

**Material and Methods:** In this rapid review we searched PubMed database and Google search engine by combining the related keywords in 2020. After applying inclusion and exclusion creteria and selecting the related studies, data extraction was done by by a data extraction. Data anlyzing was done through content analyses method and the results summarized and reported based on the study objectives.

**Results:** The results of the study showed that monitoring the effectiveness of non-pharmaceutical interventions, tracing and tracking of patients and suspicious cases, geographic distribution model, spatiotemporal patterns of transmission, identifying the people information needs, and applying the social distancing programs were the most important applications of generated data in mobile phones for encounter to COVID-19. Also, one of the potential risks of mobile phones data in developing countries, is data confidentiality.

**Conclusion:** Applying generated data in mobile phones can be effective to control and manage the COVID-19, as the study results showed. Tracing and tracking the patients and suspicious cases by smart mobile phones is an effective strategy to control it.

## Keywords
COVID-19, mobile phone, data, tracing, tracking

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# The Effectiveness of Mobile Decision Support Systems in Covid-19 Pandemic: A systematic review

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## ABSTRACT

**Background:** Due to the spread of Coronavirus and increase in the number of Covid-19 patients, the necessity of attention to care in these patients can be felt. The recent advances in the mobile Health (m-Health) technologies have led to develop mobile based applications such as Mobile Decision Support Systems which are being used to offer easier access to health care.

**Objective:** This study investigates the role of Mobile Decision Support Systems in the care, diagnosis and treatment of Covid-19 patients.

**Material and Methods:** This systematic review was performed by searching articles since December 2019 to present in scientific databases and e-Journals (PubMed, Science direct, Google scholar and Scopus). Search keywords included "Clinical Decision Support Systems", "mobile health" and "Covid-19". By applying inclusion and exclusion criteria, finally 8 related articles were selected and analyzed.

**Results:** The findings show that Mobile Decision Support Systems could support the healthcare providers in clinical decisions making about Covid-19 patients for care, diagnosis and treatment. Furthermore, the Mobile Decision Support Systems help individuals who are affected by Covid-19 virus for self-diagnose based on existing symptoms.

**Conclusion:** Mobile Decision Support Systems have important impact in different disease especially viral disease such as Covid-19. Deployment such systems lead to improvements in patient outcomes and increase qualify of care.

## Keywords
Clinical Decision Support Systems, Mobile Health, Covid-19

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# WhatsApp in Healthcare: A Narrative Review

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## ABSTRACT

**Background:** Today mobile technology as a mean of communication for transmission and reception of information is increasing dramatically. Also, mobile-based interventions, such as social networks, are very popular. One of the most common social networks in the world is WhatsApp, which might be useful in healthcare.

**Objective:** This study aims to review the application of WhatsApp in the field of health.

**Material and Methods:** This review was conducted using two online databases and search engines (PubMed and Google Scholar). Studies from 2015 to 2020 were included. A combination of Medical Subject Headings (MeSH) terms such as "WhatsApp", "Health," and "Health Profession" were searched.

**Results:** The results showed that WhatsApp is the most social media that were used in the field of education. Studies have also highlighted the application of this popular media in areas such as disease management, infant nutrition, behavior, and habits changes (smoking, diet, and physical activity). WhatsApp has the capability to send radiological images for consultation. Also, WhatsApp was used to share viewpoints, health care, and distance learning during the COVID-19 crisis.

**Conclusion:** WhatsApp, simple and cheap means, could be useful tools for tracking and managing the disease and educating patients. Also, providing appropriate scientific content through social networks (WhatsApp) can educate and promote health literacy in the population.

## Keywords
Mobile Health, Social Network, WhatsApp

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# The Effect of Virtual Education and Counselling on Nurses' Psychological Health Who Caring for COVID-19 Patients

Mozhgan Rivaz[1], Nilofar Pasyar[2], Masoume Rambod[3]*

## ABSTRACT

**Background:** The COVID-19 pandemic is spreading quickly and imposing workload and psychological pressure on nursing staff.

**Objective:** This study aimed to determine the effect of virtual education and counselling on nurses' psychological health who caring for covid-19 patients.

**Material and Methods:** This quasi-experimental study conducted among 40 nurses with pre and post design. Virtual education, counselling and psycho-spiritual integrative intervention was conducted for 4 weeks through WhatsApp messenger on nurses who working in 3 teaching hospitals of COVID-19 centers, affiliated with Shiraz University of Medical Sciences, from 28 March to 15 June 2020. The data were collected using Depression, Anxiety stress scales, and adult Hope scale through an electronic method.

**Results:** The results showed a significant reduction in stress and fear of COVID-19 during the study period ($p<0.05$) and four weeks after the intervention, the nurses mean score of depression, anxiety and stress were in normal status. No significant difference was found in the nurses mean scores of hope throughout the study period ($p>0.05$).

**Conclusion:** After four weeks of the intervention, nurses showed normal heath status and a decrease in the level of fear of the COVID-19. As during COVID-19 pandemic, virtual education and psycho-spiritual, integrative intervention was effective in nurses' mental health. Supporting nurses psychologically is important to preserving their health in the short and long term. Therefore, psychological strategies for psychological well being of nurses at different levels, from organizational and team/ward are recommended.

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# Mobile Health Technology as an Effective Approach to Delivery of Tele health Services to Patients Suffering from Chronic Diseases in COVID-19 Crisis

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## ABSTRACT

**Background:** The novel coronavirus disease (COVID-19) pandemic and the need for social distancing have dramatically affected healthcare organizations across the globe and raised global public health concerns. During the COVID19 outbreak, the volume of elective or non-urgent outpatient cares has significantly been reduced in many centers to limit infection exposure to patients, communities and medical staffs, reserving face-to-face consultations to clinical relapses, emergencies or hospital therapies. It is even more challenging for patients suffering from chronic diseases because of either the disease itself or for disruptions in health care provision.

**Objective:** The aim of this study is to investigate mobile-health technologies as an appropriate approach to improve the delivery of outpatient care for patients with chronic diseases.

**Material and Methods:** In this review, we performed a comprehensive search from 2018 to 2020 in online databases and search engines including PubMed, Scopus, Science Direct and google scholar and 17 studies were included.

**Results:** The findings of these studies reveal that mHealth technologies have been widely proposed as one of the best alternatives for ambulatory clinical practice during quarantine. In pandemic era, mHealth technologies are now a rapidly emerging and safe approach to guarantee care continuity, especially for chronic disabling diseases requiring frequent medical consultations. These tools can provide full medical consultations, with the engagement of both patients and caregivers, and can support clinicians in defining whether patients need to access diagnostic and therapeutic procedures. The results highlighted that in the pandemic context, mHealth technologies are the means of ensuring continuity of care, and provides a high rate of patient satisfaction.

**Conclusion:** In response to the COVID-19 pandemic, the governments have implemented temporary policy changes that removed barriers and catalyzed the unprecedented adoption of mHealth technologies. These findings are very important when there is physical distance between patients and physicians, and when patients are not recommended to attend in-person consultations. Taken together, mHealth technologies will also carry a value in the future within conventional health care, to support clinicians in decision making, enabling more efficacious follow-up of patients with chronic diseases, reducing burden for caregivers.

## Keywords

mHealth technology, tele health, chronic diseases, COVID-19, health care delivery system

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# Survey the role of mobile health in improving the capacity and quality of health care services in confronting of the Covid-19

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## ABSTRACT

**Background:** One of the effective ways in reducing the prevalence Covid-19 is mobile health.

**Objective:** Mobile health provides the possibility of: elimination locative barriers,reducing costs,increasing the capacity & quality of health care services,diagnosis & monitoring & managing the disease for health care providers in order to provide high quality services.

**Material and Methods:** The present study is a systematic review with systematic search in Science database, PubMed, SID, ISMJ, DOI, NMC and meta-search engine Google scholar.Using keywords coronavirus,Mobile Health, Health,Health care,Quality Improvement & Capacity.Performed from 2015 to 2020. The obtained 251 articles were studied and refined step by step and finally 20 articles related to the purpose of the study were selected and presented.

**Results:** Mobile health plays a key role in improving the capacity and quality of health care services.Numerous uses of mobile health to confronting coronavirus include eCAALYX (provide a remote system for monitoring),Telehealth Toolkit(for screening/tracking/diagnosis/treatment/follow-up).Benefit of m-Health is the prevention of direct physical contact between doctors and nurses with patients.

**Conclusion:** Mobile health leading to increases opportunities for access, diagnosis and treatment of infectious diseases, improving the capacity and quality of clinical and health care. In mobile health related technologies, there are many opportunities for improvement people's health and well-being, the ability to monitor and report rapidly on health status changes, help create a healthy lifestyle, quickly diagnose health conditions, facilitate notices and promote health care.

## Keywords
Mobile health, capacity and quality, Coronavirus

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# Usability Evaluation of Web-based COVID-19 Dashboard: A Heuristic Evaluation

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## ABSTRACT

**Background:** Information dashboards are the main tool for understanding and extracting knowledge from large data sets. Dashboards should have capabilities such as usability to provide better quality health data.

**Objective:** The purpose of this research was to evaluate the usability of management dashboard of COVID-19 by Heuristic method.

**Material and Methods:** This research is a practical, descriptive, and cross-sectional study, which was conducted in Shiraz University of Medical Sciences in 2020. The evaluation was performed independently with the participation of three medical informatics specialists using the Xerox Heuristic Evaluation Checklist, whose validity and reliability were confirmed. Then the problems were identified, combined and a single list was prepared. Finally, the evaluators determined and reported the severity of the problems. Data analysis was performed with Excel software.

**Results:** The results of this study, a total of 80 usability problems were identified. The features of "Help and Documentation" with 12 items (15%) were the most and the features of "Aesthetic and Minimalist design" and "privacy" with two items (2.5%) were the least non-compliance with the principles of usability. The average severity of the problems ranged from 2.05 (Minor problem) to "Pleasurable and Respectful Interaction with the User" to 3.83 (Catastrophe problem) to "privacy".

**Conclusion:** The heuristic assessment method identifies the problems of the user interface of information systems and dashboards using predetermined standards. If these problems are not solved, they will waste users' time, increase errors, reduce information quality, dissatisfaction and confusion of users.

## Keywords

Dashboard, Usability, Heuristic Evaluation, COVID-19

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# Identification of Information Elements on mobile application for Self-management in Bipolar disorder

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## ABSTRACT

**Background:** Research conducted on mobile applications monitoring mental health has concluded that patients with mental disorders tend to use such applications to maintain mental health balance and applying technology may help manage and monitor issues like bipolar disorder.

**Objective:** This study has been done to identify the necessities of designing a mobile application for bipolar disorder affected patients.

**Material and Methods:** 1) Literature search, 2) analyzing existing mobile applications to examine their efficiency, 3) Interviewing patients with bipolar disorder to discover their needs, and 4) exploring the points of view of experts using a dynamic narrative survey.

**Results:** Literature search and mobile application analysis resulted in 45 characteristics, which was later reduced to 30 after the experts were surveyed about the project. The characteristics included the following: mood monitoring, sleep schedule, energy level evaluation, irritability, speech level, communication, sexual activity, self-confidence level, suicidal thoughts, guilt, concentration level, aggressiveness, anxiety, appetite, smoking or drug-abuse, blood pressure, the patient's weight and the side effects of medication, reminders, mood data scales, diagrams or charts of the collected data, referring the collected data to a psychologist, educational information, sending feedbacks to patients using the application and standard tests for mood assessment. Considering the first phase analysis along with expert and patient views, the most and least important matters among them are mood tracking and a list of psychiatrists respectively.

**Conclusion:** The present study has been conducted by identifying the necessities of applications intended for managing and monitoring bipolar patients to maximize efficiency and to subsequently minimize the relapse and side effects.

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# Importance and Need Assessment of Mobile-based Training in The Educational Hospitals Emergencies Nurses: A Content Analysis Qualitative study

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## ABSTRACT

**Background:** The emergency department is an unscheduled emergency care environment. Unscheduled care creates challenging conditions by increasing referrals to the emergency department and limited resources for emergency operations. Nurses are the first members of the treatment team to encounter patients in the hospital and need to make the right decision as soon as possible with sufficient knowledge and skills. With the growth of technology, the health care system has become increasingly dependent on technology. Mobile-based teaching allows learning to be created beyond the barriers of place and time. Teaching through mobile-based applications enhances skills, speed in doing things, and confidence.

**Objective:** Because the training of emergency nurses is important, this study was conducted to identify the importance and needs of mobile-based education based on the experiences of emergency nurses.

**Material and Methods:** This is a qualitative exploratory study. Data were analyzed using the conventional content analysis method. Emergency nurses of educational hospitals were selected from June 2019 to October 2020 using a purposeful sampling method (n = 15). In-depth and semi-structured interviews, and field notes were used for data collection.

**Results:** Data from interviews and filed notes were analyzed and classified into four themes, "Specialized nursing teaching", "general nursing teaching", "mobile health infrastructures", "efficient nursing applications".

**Conclusion:** Mobile-based education as a complementary and supportive method can lead to active learning in the field of nursing and has significant positive effects on nurses' knowledge, skills, attitudes toward education and their satisfaction with education. Nurses who use mobile health education applications, they feel more independent at work and take action as soon as possible in a stressful emergency environment.

## Keywords
Mobile applications, emergency service, nursing

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# Investigating the effect of mobile health on the self-care behaviors of the elderly

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## ABSTRACT

**Background:**  The increase in the world's elderly population is associated with an increase in the prevalence of chronic diseases. The elderly need to go to health centers a lot, often refusing to go to health centers due to physical limiting illnesses, high costs of treatment and care, and fear of contracting infectious diseases. Mobile health technology provides opportunities to address the challenges of aging and to support older people in the community. Because the elderly have high costs for the health care system, there is a clear need for education on healthy behavior, self-care and lifestyle changes.

**Objective:** Innovative information and communication technology can play an important role in education, this study was conducted to determine the role of accompanying health in the self-care behaviors of the elderly.

**Material and Methods:** The present study is a systematic review study. In order to collect data, Google Scholar, ProQuest, PubMed, Science Direct, Cochrane databases in the years 2009-2020 have been used. 149 sources were obtained using the keywords of mobile health, the elderly, self-care, and health applications. By screening, 65 sources were selected for full text review, and finally 25 sources were included in the systematic review. Using the Prisma checklist, the data were extracted by the two authors independently. Blinding was performed. Articles were analyzed according to the purpose of the research.

**Results:** Mobile phones can provide useful information. The use of mobile health can play an important role in changing the lifestyle of the elderly. Improving health behaviors such as diet modification, self-management, self-efficacy, mental health promotion, adherence to medication, management of chronic diseases are results of mobile health use by the elderly.

**Conclusion:** Appropriate training strategies improve the quality of training. Using mobile capabilities, an appropriate training program can significantly improve the quality of behaviors related to lifestyle, self-efficacy and independence. As a result, the use of mobile health can facilitate behavioral changes in the elderly.

## Keywords
Mobile health, elderly, self-care, application

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# Investigating the role of mobile Health in epilepsy-management: A systematic review

Atefeh Khoshkangin[1], Fariba Sadat Agha Seyyed Esmaeil Amiri[2], Kosar Ghaddaripouri[3], Mohammad Reza Mazaheri Habibi[4]*

## ABSTRACT

**Background:** Epilepsy is one of the most important and common neurological disorders in humans. The self-management behaviors include the activities that a person with the disease dose to manage their illness. Mobile Health (m-Health) is currently used as a promising tool to promote knowledge in chronic diseases such as epilepsy.

**Objective:** The aim of this study was to investigate the role of mobile Health in epilepsy-management.

**Material and Methods:** This study was conducted in the database of PubMed, Scopus, Google scholar from January 1990 to December 2020, by searching for keywords included, Epilepsy-management, Smartphone application, Mobile Health and Epilepsy in title and abstract. Inclusion criteria included all studies published in English that examined the effect of m-Health on epilepsy-management. Review studies were excluded from the study.

**Results:** From a total of 2438 studies, after evaluation, 10 eligible articles were selected. Among the articles found, 3 articles were about educating and improving users' knowledge in the field of epilepsy-management (30%). In line with the main purpose of this study, 6 articles reported improvement in seizure control (60%) and one article did not show significant progress in this regard (10%).

**Conclusion:** M-Health technology has been effective in improving epilepsy-management, creating a positive attitude and raising awareness about epilepsy, reducing social anxiety and increasing user's satisfaction. The use of smart apps seems to be a promising strategy for epilepsy-management.

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# Investigating the effect of mobile Health in improvement the health of the elderly: A systematic review

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## ABSTRACT

**Background:** With the increase in the number of elderly people in the community, we are need new health care strategies that can affect the behavior and lifestyle of older people. Mobile health (m-Health) as an important part of electronic health (e-Health) can play an important role in this.

**Objective:** The aim of this study was to investigate the effect of mobile Health on improvement the health of the elderly people.

**Material and Methods:** This study was conducted in the database of PubMed, Scopus, Google scholar from January 1990 to December 2020, by searching for keywords included, Mobile health, elderly, Smartphone application, and m-Health in title and abstract. Inclusion criteria included all studies published in English that examined the effect of m-Health on improvement the health of the elderly. Other studies were excluded due to non-aging and unrelated target groups.

**Results:** From a total of 4798 studies, 16 eligible articles were selected after evaluation. Findings showed that m-Health can improve self-management, cognitive capacity, behavioral promotion (diet, physical activity and mental health) and adherence to medication.

**Conclusion:** M-Health technology is a suitable tool for the elderly in diagnosing disease, changing lifestyle, managing dialysis and Alzheimer's diseases. It seems that m-Health can improve health. Also, age, physical and psychological changes have reduced m-Health acceptance and interaction with the elderly, which seems to be able to increase the level of m-Health acceptance and acceptance by educating these people.

## Keywords
Elderly, Telemedicine, Smartphone application, Aged

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# The Importance of Applying Telerehabilitation to Speech Therapy Services During the Covid-19 Pandemic

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## ABSTRACT

**Background:** Pandemic Covid-19 has limited social life and work activities in many countries around the world. Guidelines for social distance and staying at home are considered to be the most important barriers to the spread of the disease. However, such measures have led to the long-term closure of some businesses and restrictions on access to certain services, including rehabilitation. To counteract the effects of quarantine and social distancing remote services can be provided. Telerehabilitation as Telehealth is defined as the treatment by a speech-language pathologist, occupational therapist, and physiotherapist and is provided to access rehabilitation services and prevent the spread of disease. Various studies have examined the effectiveness of telerehabilitation and have shown that it is an effective treatment for patients who have limited access to medical centers.

**Objective:** The aim of this study was to evaluate the patients' outcomes and satisfaction with telerehabilitation of speech therapy services.

**Material and Methods:** A review of the literature concerning the telerehabilitation in the speech therapy services domain during the covid-19 pandemic was conducted using the databases MEDLINE (PubMed), Science Direct, Scopus, Web of Science, Web of Knowledge, and Cochrane. Relevant studies were identified by two reviewers based on screened titles/abstracts and full texts.

**Results:** Of the papers found based on keywords, papers that used telerehabilitation for patients in the field of speech therapy were selected. Based on the results, it was found that the use of telerehabilitation to treat voice disorders, speech and language disorders at different ages, has positive results and great satisfaction for both patients and speech and language pathologists, so that some studies has been shown that many patients prefer telerehabilitation even after the Covid-19 pandemic is over.

**Conclusion:** Telerehabilitation for reasons such as reducing indirect care costs, high patients' satisfaction, providing treatment in a familiar environment (especially for children), and eliminating the time required to reach clinics can be a good option for providing rehabilitation services during the Covid-19 pandemic. In order to better provide these services in health care, it is necessary for health policymakers, hospitals, and rehabilitation professionals to formulate and apply special strategies.

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## Keywords
Telerehabilitation, speech therapy, Covid-19

# Detecting respiratory problems using smartphone to screen covid-19 disease

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## ABSTRACT

**Background:** Nowadays, Coronavirus Disease 2019 (COVID-19) has become a serious global epidemic and resulted in tremendous loss to human society worldwide. To cope with this large-scale outbreak, early detection to isolate potential virus carriers is necessary. One of signs which is suggested by many clinical studies and could be used in screening potential COVID-19 patients is respiratory symptoms. Using smartphones in measuring and monitoring respiration, as a contact-free procedure, could reduce the risk of spreading virus.

**Objective:** The present study aimed to conduct the review of systems detecting respiratory problems using smartphones to screen COVID-19 disease.

**Material and Methods:** A review was conducted in relevant databases including PubMed, Science direct, Web of Science and Scopus to find appropriate sources.

**Results:** Evaluating the studies indicated that data acquisition in smartphone-based respiratory monitoring systems is through breathing sounds, thermal camera and etc. Also, the basis of data analysis in most of these systems is machine learning. These respiratory monitoring systems configured with smartphones, in addition to being attractive, can play an important role in the health and well-being of patients by saving many lives. These systems could be served as self-testing kits through continuously monitoring the respiratory function, which enable early diagnosis, preventative feedback and decision support.

**Conclusion:** If such smartphone-based monitoring and detection systems are implemented, users can easily test themselves at home with just a few clicks on the smartphone. Thus, spread of extremely contagious virus of COVID-19 could be suppressed.

## Keywords
respiration, smartphone, COVID-19

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# Tele-midwifery as a new approach to managing tocophobia: a clinical randomized controlled trial in nulliparous women during Covid-19 pandemic

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## ABSTRACT

**Background:** Fear of childbirth (FOC) has negative effects on maternal health. Due to the Covid-19 pandemic, women are experiencing FOC more and need new approaches without being endangered by presence in the medical centers.

**Objective:** The aim of this study was to investigate the effect of tele-midwifery on FOC, self-efficacy (SE), and delivery-mode in primiparous women during the Covid-19 pandemic.

**Material and Methods:** This randomized clinical trial was conducted on 70 pregnant women with FOC in two groups referring to Baharlu hospital. The intervention group received tele-midwifery intervention, an application based on multipurpose approaches, such as education, consultation, interaction, and continuity of care. Control group received routine prenatal care. Data collection tools included The Wijma A/B and the Self-Efficacy Questionnaires. Data were analyzed by SPSS 25 using Chi-square, Fisher's exact test, independent t-tests, and repeated-measures analysis of variance.

**Results:** : There was no significant difference between the two groups in terms of demographic characteristics (P <0.05). Mean score of FOC in intervention group decreased compared to the control group (P = 0.001). Mean score of SE in intervention group decreased compared to the control group (P = 0.001). NVD was at a higher rate in intervention group rather than control group (P = 0.03).

**Conclusion:** The results showed that tele-midwifery positively affects reducing the FOC, improving SE, and increasing the number of NVD. This study was performed during the Covid-19 pandemic and was welcomed by pregnant women. Therefore, health care providers are advised to consider tele-midwifery as an efficient approach.

## Keywords
Fear of childbirth, self-efficacy, Delivery mood, Tele-midwifery

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# Comprehensive database of mobile health information in field of psychology, today's country need

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## ABSTRACT

**Background:** Smart-phones and health related applications have grown exponentially in recent years. Meanwhile, people's interest in receiving mental health care with mobile phone has increased (due to low cost). Professionals can use mobile phones to interact with client and learn about clients' clinical decisions and self-care management. These programs also play an effective role in improving the mental health of patients by providing various trainings and evaluations.

**Objective:** Patients and health care providers may take important decisions based on the information provided by mobile health applications, so it is essential that these programs to be accurate, reliable, and scientifically valid.

**Material and Methods:** In this review study, articles and mobile applications related to the topic of mobile health in psychology were reviewed.

**Results:** One of the main criteria in evaluating the content of mobile health applications is using valid scientific content, Along with all the advantages, mobile health technologies face important challenges, including exposure of personal health information, and based on the studies of this research, the applications studied are not suitable in terms of the validity of the scientific resources used.

**Conclusion:** Due to the importance of this issue, it is necessary for Health regulatory agencies and psychology organization to control the quality of mobile health applications, The principles of referencing should be considered and it is important to design standards for evaluating mobile health applications and internet websites in the country also to create a comprehensive database of mobile psychological health information.

## Keywords
Mobile Health, Psychology, Database

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# Perception of hemodialysis patients about using smartphone applications in the face of the COVID-19 pandemic

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## ABSTRACT

**Background:** Because of focus health care systems around the diagnosis and treatment of COVID-19 patients in during the pandemic and reduce opportunities for routine visits, hemodialysis patients are at increased risk of COVID-19 and the consequences of care limitations. Samrtphone applications can as a potential tool to empower hemodialysis patients with self-management skills and to maintain adequate care without risking exposure to COVID-19.

**Objective:** This study objective to identify perception of hemodialysis patients about using smartphone applications in the face of the COVID-19 pandemic.

**Material and Methods:** This study conducted at the Urmia University of Medical Sciences in 2020 using semi-structured interviews. The participants in our interviews consisted of 9 hemodialysis patients (5 female and 4 male) who referred to hemodialysis center of Taleghani hospital of Urmia. Content analysis was used to analyze the qualitative data.

**Results:** The content analysis showed seven key themes in the perception of hemodialysis patients about using apps during the pandemic including: continue to care and monitor, channel for patient-clinician communication, avoid unnecessary clinic visits, reduce patients' stress, promote the patient safety, maintain adherence and self-care, access to accurate and up-to-date information.

**Conclusion:** The hemodialysis patients have strong desire and positive perception to use smartphone applications in the face of the COVID-19 pandemic. The apps can support hemodialysis patients through the information sharing and remote monitoring. We suggest that the needs and preferences of patients will be considered in develop of the apps to enhance adoption and usage.

## Keywords
Smartphone application, Hemodialysis patients, COVID-19 pandemic.

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# A Systematic Review on the Effectiveness of Online Delivery of Services for Speech and Language Disorders in Children

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## ABSTRACT

**Background:** With the development of communication technologies, services related to medical professions such as speech and language pathology can also be provided remotely.

**Objective:** The aim of the present systematic review was to investigate the effects of the online delivery of services for speech and language disorders in children.

**Material and Methods:** We used the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guideline for performing the present systematic review. The Scopus, PubMed, Web of Knowledge, Cochrane, and Google Scholar databases were searched until 2019. The methodological quality of the included studies was evaluated using the Physiotherapy Evidence Database (PEDro-P) scale. Since the included studies were heterogeneous, a narrative synthesis was applied for summarizing the studies.

**Results:** Ten studies met the inclusion criteria and were included in the present review. Based on the reviewed studies, both assessment and treatment of various speech and language problems in children including language disorders, stuttering, dyslexia, and articulation disorders can be delivered remotely with online services. The results showed that online delivery of the services for speech and language problems in children was increased in the recent years and has positive outcomes.

**Conclusion:** The results of the present review could provide primary evidence related to the effectiveness of online delivery services for assessment and treatment of speech and language problems in Children. To make better comment in this regard, further studies with rigorous methodological, high level of evidence quality, and long-term follow-ups are needed.

## Keywords
Speech disorders, Language disorders, Online systems, Treatment outcome

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# Using Online Treatments for Patients with Swallowing and Voice Disorders: A Systematic Review

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## ABSTRACT

**Background:** Recently, online delivery of treatment programs for treating deglutition disorders and voice problems in speech-language pathology profession have been considered by speech and language pathologists.

**Objective:** The present systematic review aimed to investigate an online treatment delivery for patients with swallowing and voice disorders.

**Material and Methods:** The following databases were searched until 2019: Scopus, PubMed, Ovid, Web of Knowledge, Cochrane, and Google Scholar. Reference lists of included articles were evaluated for additional data. The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guideline was used for conducting and reporting the systematic review. The Physiotherapy Evidence Database (PEDro-P) scale was used to evaluate the risk of bias of the included articles. A narrative synthesis of the evidence was used to summarize the studies, due to the heterogeneity of the included studies.

**Results:** Eleven studies were investigated in the present review. Included studies indicated that both assessment and treatment of deglutition (swallowing) disorders, voice disorders, and management of patients with lip and palate cleft can be done via online delivery. Online delivery of the services provided in the mentioned fields has positive treatment outcomes. The service delivery results from online methods were equivalent to conventional in person results.

**Conclusion:** The present review indicated that online delivery of speech therapy services to treat deglutition (swallowing) disorders and voice disorders can be effective. Conducting more studies with higher levels of evidence is recommended in this regard.

## Keywords
Deglutition disorders, Voice disorders, Online systems

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# The need to design and use pharmaceutical dashboards in public hospitals

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## ABSTRACT

**Background:** Hospital pharmacy by selecting, preparing and distributing drugs can play an important role in providing health care services in order to improve hospital pharmacy performance, improve patient safety, effectiveness and economic productivity, pharmacy managers to access effective and efficient reports They must use new tools. Hospital dashboards are useful and effective digital tools for monitoring financial, clinical and managerial processes. Using dashboards, managers can provide an overview of the performance of their departments and plan actions to improve performance.

**Objective:** Documentation of drug information, Decide on organizational issues.

**Material and Methods:** The present study was conducted using library studies and searching for valid scientific sources such as scopus, science direct, Google scholar, pubmed, Iran medex, magiran.

**Results:** So far, several studies have been conducted on the design and evaluation of dashboards in the field of health. However, most of the studies conducted in this field have been for the purpose of defining, reviewing and necessitating the use of information boards as well as designing and evaluating clinical dashboards. Unpaid.

**Conclusion:** Today, information is one of the most important pillars of management and a prerequisite for the development of organizations. To compensate for this weakness, managers and employees spend a lot of time and energy producing and analyzing reports. In addition to the dissatisfaction of the medical staff, decisions about organizational issues may be delayed due to such problems or unfavorable results. Due to the growing need to improve the performance of hospital pharmacies and also the problems in the pharmacy information system, including documentation of drug information, access to patient information, evaluation of staff work, etc., the importance of using drug dashboards in public hospitals It is obvious.

## Keywords
dashboard, information, drug dashboard

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# Developing a mobile based serious game app for prevention of COVID-19

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## ABSTRACT

**Background:** Since there is no particular vaccination or treatment for COVID-19, the best approach is to prevent infection and break the transmission chain. Awareness of preventive strategies is critical since people are willing to take precautionary actions. A serious game is novel approach for providing reliable information, awareness, and skills to people.

**Objective:** To develop a serious game for providing reliable information on the prevention of COVID-19 and personal care.

**Material and Methods:** The mobile-based game app was based on HTML5, the progressive web app development methodology. The educational materials were extracted based on the websites of the WHO, the Iranian Ministry of Health and Medical Education (MoHME), and some universities of medical sciences. The face validity of the contents were confirmed by experts, including one general physician, one infectious diseases specialist, one internist, two radiologists, one neurologist, one pediatrician, one environmental health specialist, three specialists in microbiology, immunology, and hematology, and one specialist in health information management.

**Results:** The game app was developed with the aim to provide awareness while asking questions and providing feedback. The usability features kept in our mind for developing the app included attractive and interactive user interface, connectivity, different display resolutions, consistency (e.g. Consistency in size, color, sounds, font, and arrangements), easy navigation, and presenting informative feedback to interact with the player in order to reinforce their correct answers or alert them about the need to learn more about the disease. The material included four dimensions: familiarity with the COVID-19 pathogen, virus transmission, prevention, and treatment.

**Conclusion:** By developing a serious game we tried to provide reliable information on topics related to the prevention of COVID-19. We hope that, when widely used, this game will combat misinformation about COVID-19 and expand the public's engagement in preventive measures against the disease.

## Keywords
Mobile-based application, serious game, COVID-19

# Developing a mobile-based dashboard for tracking covid-19 disease

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## ABSTRACT

**Background:** COVID-19 has imposed a substantial health burden on people in different countries. Proper managing for allocating resources during covid-19 disease is a challenge. Data dashboards are being used extensively in the pandemic in order to support policymakers in planning and refining interventions

**Objective:** To develop a mobile-based dashboard for tracking covid-19 disease.

**Material and Methods:** Literatures were reviewed to identify key indicators. The results of the review were summarized to present at the focus group discussion of a multidisciplinary expert panel. The experts were asked to discuss on and score each indicator based on completely necessary (5) to completely unnecessary (1). A primary design based on the confirmed key indicators was prepared using the spreadsheet Microsoft Excel and presented to a programmer. A primary demo was programmed by the programmer. Experts discussed the primary demo, and a series of iterative design steps targeting policymakers needs were applied to.

**Results:** The mobile-based dashboard can present real-time figures about affected cases and deaths in time series charts, identify the worst-affected areas and comparing it with other areas, and generate plots that depict temporal changes in testing capacity. The dashboard provides a variety of reports including affected cases according to patient's characteristics. Moreover it presents information on resource utilization statistics.

**Conclusion:** The developed dashboard can provide the policymakers with real-time updates of the outbreak in their area, and help them develop strategic plan and intervene based on real data.

## Keywords
dashboard, mobile based, covid-19

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# Role of Telemedicine in COVID-19 pandemic:a systematic review

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## ABSTRACT

**Background:**  The rapid progression of the coronavirus SARS-CoV-2 presents a real challenge for the whole world. As the usual capacity for citizen care is exceeded, health professionals and governments struggle. One of the most important strategies to reduce and mitigate the advance of the epidemic are social distance measures; this is where telemedicine can help, and provide support to the healthcare systems, especially in the areas of public health, prevention and clinical practices.

**Objective:** To determine the usage of telemedicine in the COVID-19 pandemic.

**Material and Methods:** We use a six-step process reflecting the systematicity and transparency which is implemented using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). A comprehensive survey was performed on Medline and Scopus in September 2020. Following studies were considered eligible: randomized and non-randomized clinical trial, and observational studies (cross-sectional, cohort study, case-control), and studies which evaluated at least one outcome. The articles were categorized based type of technology and outcomes. The risk of bias was evaluated by considering type of studies.

**Results:** In this review, 26 out of 2716 retrieved articles met the full-text inclusion criteria. Our study recognized twenty-six studies in the telemedicine domain. Twenty four of these studies applied synchronous methods, e.g. phone or video call consultation, while two of them used asynchronous approaches for the communication in their telemedicine services.  Moreover, eight (30%) studies designed online consultation. Forty two outcomes investigated by twenty six studies. All of outcomes in reviewed studies were process of care outcomes.It must be presented in the form of text, not tables or illustrations.

**Conclusion:** Telemedicine has been promoted and scaled up to reduce the risk of transmission, by increasing social distance and reducing contact. During the coronavirus epidemic, telemedicine has been the doctors' first choice to slow down the spread of the disease. The discovery of the important role of telemedicine in disease pandemic is necessary. Especially, video conferences are popular in telemedicine technology.

## Keywords
Telemedicine, COVID-19, systematic review

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# Can Medical Informatics Help to Control COVID-19 Pandemic:Protocol for Systematic Review

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## ABSTRACT

**Background:** SARS-CoV-2 has spread globally, and COVID-19 is labeled a public health emergency of global concern by the World Health Organization. Since 2019-nCoV has a long incubation period and strong infectivity, e-Health and its subset medical informatics has emerged as one viable solution to allow the continuity of the provision of health services. Also, new health care models are needed during the COVID-19 pandemic. The proposed systematic review will examine and summarize the evidence on the applications of medical informatics in covid-19 crisis as evidence-based approaches.

**Objective:** A research team that includes medical informatics and systematic review method experts guided this review according to the Cochrane Handbook and PRISMA reporting guidelines. We search PubMed and Scopus. Eligibility criteria for reviewed studies will be randomized and non-randomized control trails, English language. We will identify articles across 2019-2020 applying the medical informatics in COVID-19 pandemic. Two independent reviewers will assess article eligibility and extract data into a spreadsheet using a structured pilot-tested form. We will synthesize evidence by a thematic synthesis approach. We will evaluate risk of bias in all included studies by favor tools.

**Material and Methods:** The primary result showed a total of 1882 and 854 articles were retrieved from the PubMed and Scopus databases, respectively. After removing duplicates, 2716 articles remained for screening by title and abstract. We expect that our results serve as the basis for helping researchers, decision makers, MI specialist and politicians and other to develop, implement and evaluate IT-based tools and interventions to help medical staff in elimination COVID-19.

**Results:** The primary result showed a total of 1882 and 854 articles were retrieved from the PubMed and Scopus databases, respectively. After removing duplicates, 2716 articles remained for screening by title and abstract. We expect that our results serve as the basis for helping researchers, decision makers, MI specialist and politicians and other to develop, implement and evaluate IT-based tools and interventions to help medical staff in elimination COVID-19.

**Conclusion:** This systematic review aims to identify applications of medical informatics in COVID-19 pandemic. This review is the first attempt to develop an evidence-based methods using a systematic review approach, to the best of our knowledge. The proposed systematic review will inform further research and innovation in terms of benefits and shortcomings that MI may have in the health system.

## Keywords
Medical Informatics, COVID-19, Systematic Review, Quality Assessment

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# A review on the role of mobile health in the elderly with Alzheimer's disease

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## ABSTRACT

**Background:** Aging is a process of dementia and loss of manpower over time. Alzheimer's is an age-related disease that has a great impact on patients' quality and life expectancy. The great potential of smart devices has led researchers, physicians and health care professionals to develop and provide solutions for Alzheimer's patients.

**Objective:** The aim of this study was to investigate the role of mHealth in the elderly with Alzheimer's disease.

**Material and Methods:** This research was conducted by reviewing the period from 2009 to 2019 and searching the databases of Science Direct, Scopus, Google Scholar and PubMed. Abstracts of the obtained articles were reviewed and irrelevant articles were deleted and finally 11 related articles were found and reviewed.

**Results:** 11 articles extracted in the study were generally accompanied by: program review, reminder, mood assessment, behavioral support and management, track location and daily activities. According to the above articles, 55% of older people do not follow their prescription and 50% of all prescribed prescriptions are consumed incorrectly. Using mobile health can improve the lives of Alzheimer's patients and features such as: early diagnosis, mental education, symptom assessment, progress tracking, remote monitoring of patients as well as reminder of patient duties including: date and amount of medication, meal time Provide and facilitate food, visit dates and important events.

**Conclusion:** MHealth, along with helping people with Alzheimer's, slow down the disease by recalling memories, photos, and family information, and helps them remember tasks. Also, the support of this technology reduces workload of specialists.

## Keywords
Mobile health, M-health, Alzheimer, Dementia, elderly

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# Mobile applications in HIV self management: A systematic review of scientific literature

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## ABSTRACT

**Background:** Self-management by mHealth via mobile phone creates new opportunities for People Living with HIV (PLWH) for accurate management.

**Objective:** The aim of this study was to reviewing current evidence on HIV self-management mobile apps to identify and assess their objective, infrastructure, and target populations.

**Material and Methods:** A systematic search was conducted using the PubMed, Scopus, EMBASE, Sciencedirect, UpToDate, and Web of Science databases on studies that use apps to improve self-management among HIV patients. The search was limited to English-written articles and published in the last 10 years. A search of the Google Play for Android apps and App Store for iOS devices was performed to find the apps identified in the included articles.

**Results:** Of the 23 articles found through the search 17 HIV-apps were found to be mainly directed at PLWH. Also, the objectives of 17 identified HIV-apps were found to self-care, self-monitoring, and self-management (n=7), improve medication adherence (n=5), prevention, treatment and care (n=5), Adherence to antiretroviral therapy (n=4), Cognitive Behavioral Stress Management (n=1), and Support safer conception among HIV patients (n=1). The operating system of most of the HIV-apps was Android (n=15), seven apps were on both Android and iOS, and n=1 was only available for iOS. Furthermore, most apps were free (n=19).

**Conclusion:** Our results showed HIV mobile apps are new intervention tools to self-managements and control disease. Mobile apps have changed the way to receive and deliver health care services. HIV Mobile apps can provide a wide range of services and features.

## Keywords
HIV/AIDS, Self-management, Mobile applications, Smartphone, Mobile Health

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# Iranian COVID-19 Related Mobile Apps: A Study on Mobile Applications as an Active Area of M-health Research

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## ABSTRACT

**Background:** Digital technologies such as mobile apps are essential tools for improving the health and basic services provided to the population.

**Objective:** The purpose of this study was to identifying the key features of Iranian mobile apps developed in the COVID-19 pandemic.

**Material and Methods:** A systematic search with keywords consists of 'COVID', 'coronavirus', 'corona' individually was done to identify smartphone applications related to the COVID-19 available on Iranian major mobile apps platforms. For each app, the information extracted consisted of the name, category of the app, cost, size, version, need for Internet connection, subscriber count download, developers, and purpose.

**Results:** The search results included a total of 103 apps. Of these, 73.7% (n=76) were pertained to Android, and 26.3 % (n=27) to iOS. The most frequent categories were medical (41.7%), game (17.5%) and Educational (10.7%) apps. About 80% of apps (n=83) were free, whereas 15% (n =16) were in-app purchasing and 4% of apps (n=4) need payment. personal developers with 48% (n=49), private companies with 35% (n=34) and government with 9.7 % (n=10) were most frequent of developers. Approximately 82% (n=84) of apps need internet connection for usages.

**Conclusion:** Mobile apps have various beneficial functions in healthcare and more development of mobile health apps represent the change in the provision of health services towards online services in Iranian society. Mobile app patient tracking and outbreak monitoring can help manage the disease. Identifying the key features of mobile apps and the needs of Iranian users requires more detailed studies.

## Keywords
COVID-19, Android, mobile health, smartphone, mobile application

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# Examining the Role of Telehealth in the Crisis Management of COVID-19 through Nutritional Counseling: A Feasibility Study

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## ABSTRACT

**Background:** Due to the under-researched nature of COVID-19 and the lacking access to reliable information sources at a public scale, many ambiguities and questions arise. This has led to the prevalence of superstitions and haphazard decisions to consume various drugs and supplements in society.

**Objective:** This study aimed to develop and evaluate the feasibility of a nutritional teleconsultation system during the COVID-19 pandemic.

**Material and Methods:** The present cross-sectional research was conducted in April-May 2020 at Mashhad University of Medical Sciences, Mashhad, Iran. Following a needs assessment, the nutritional teleconsultation system was developed. The evaluation was done through system usability testing and functionality testing, and the system was modified accordingly. In the first phase, the system was availed to the clinical staff of Mashhad University of Medical Sciences for a week. After a survey and removing deficiencies, it was provided to the public.

**Results:** A total number of 1,006 logins were made to the system, and 641 users completed the questionnaires. Among 641 users, 344 used system facilities to receive a consultation. For both groups of users and the public who received consultation services, the most common age-group was 31-40 years, and the most common underlying disease was found to be hypertension. More than half of the system users (53%) were Mashhad residents. 49.1% of the questions were related to nutrition during the COVID-19 crisis; 32.0% were concerned with Coronavirus, and 7.5% only pertained to nutrition. Among the 169 questions related to Coronavirus and nutrition, the three most common relevant questions' topics were: diet (46.2%), body immunity (28.4%), and taking supplementation (20.7%).

**Conclusion:** The results of this research indicate the success and acceptance of telehealth and the teleconsultation approach in the field of nutrition during the Coronavirus pandemic in Iran. During the crisis, the most important nutritional information that people needed was about diet, immunity, and supplementation. It seems that continuous awareness-raising through various media is necessary to increase public awareness of the topic at hand.

## Keywords
Telehealth, Teleconsultation, Disaster management, Nutrition, COVID-19, Coronavirus, Pandemic

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# Enhancing nutrition behaviors in children Using Mobile health Applications: A Systematic Review

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## ABSTRACT

**Background:** Nutritional behaviors that developed during childhood continue with consequences such as controversy and inadequate dietary diversity, or high responsiveness to food cues, and an increased risk of obesity. Mobile app interventions are a promising way to change nutrition behaviors due to the high level of global penetration of smartphones.

**Objective:** This systematic review study aimed to determine the effectiveness of mobile health applications for improving nutrition behaviors in children.

**Material and Methods:** The review was conducted and reported according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses: the PRISMA statement. We systematically searched Medline (via PubMed) and Scopus for studies published between 2010 and 2020. We included English-language Randomized Controlled Trials (RCT) studies that evaluated the effects of mHealth apps for improving nutrition behaviors in children under 18 years of age. The characteristics of these studies and the effects of interventions were extracted. Authors individually screened the titles and abstracts, then full-text of articles to obtain papers that met inclusion criteria.

**Results:** Five of 1034 identified papers met all the inclusion criteria. Outcomes were categorized into three groups (dietary intake, physical activity, and weight management). Effects on dietary intake outcome were equivocal so that just in two studies statistically significantly improved. Most studies (75%) showed no statistically significant effect of app-based interventions on weight loss. There is limited evidence concerning the effects of these interventions on physical activity, so that in one study statistically significantly improved; and in another study, this outcome did not improve significantly.

**Conclusion:** Although mHealth apps have the potential to improve nutrition behaviors, their effects on children is mixed and consequently there is a need for further studies in this area.

## Keywords

Mobile application, mHealth, Nutrition, Dietary behavior, Children

# Mobile Applications Based Training on the use of IUD as Support in COVID-19 Crisis

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## ABSTRACT

**Background:** The COVID-19 global pandemic has created entirely unprecedented situations that have greatly affected people's lives with doubts remaining at present over how and when it will end. On the other hands The continuous educational programs and workshops on various aspects of IUD insertion are significantly important for midwives working in healthcare clinics.

**Objective:** While currently waiting for government policies on how to learn in the Time of COVID-19, it is an excellent time to learn through various means such as mobile applications.

**Material and Methods:** The research was performed on 54 midwives, who were responsible for IUD insertion, in healthcare centers of Shiraz, Iran in 2020. The participants were selected by simple sampling and divided into two groups of 27 applying the block randomization method. one intervention and one control groups. In the intervention groups, training was carried out using a mobile phone application. All two groups completed a pretest and a posttest questionnaire.

**Results:** In this study, changes observed in the knowledge score of the subjects in the application (P=0.035) while no significant change was detected in the control group (P=0.446).

**Conclusion:** According to the results of the study, education improved the personnel's knowledge of IUD insertion through mobile phone application methods. mobile phone application could make teaching and learning accessible anywhere, at any time, and while currently waiting for government policies on how to learn in the Time of COVID-19, it is an excellent method to learn.

## Keywords
IUD Insertion, Mobile Phone Application, Remote Learning

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# The Positive Effects of Social Media during the COVID-19 Pandemic

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## ABSTRACT

**Background:** During the Covid-19 pandemic, social media played a very important role in communication between people. Using social media can be have positive and negative effects on informing about this disease.

**Objective:** This study aimed to determine the positive effects of social media in the Covid-19 crisis from the viewpoints of users.

**Material and Methods:** This study was an analytical study conducted in 2020. According to Cochran's formula, 384 samples were predicted for this study. The data collection tool was a researcher-made online questionnaire. The questionnaire was distributed through groups, canals and pages of some applications. Data analysis was performed using SPSS 20 software.

**Results:** Paired-samples t-test showed the usage of social media increased significantly after the COVID-19 pandemic (P<0.001). The average raw score of social media advantages in informing disease was 1.65 and its adjusted score was 82.5 out of 100. From the users' point of view, the most important advantages of social media were information distribution about how the disease was transmitted. There was no significant difference between the mean score of social media advantages and any of the demographic variables (P>0.05).

**Conclusion:** From the users' viewpoints, the role of social media in informing about the disease is at an excellent level. The most important role of social media was to inform about the methods of transmitting the disease. It is suggested that the media affiliated with the Ministry of Health keep this informing at the desired level by controlling rumors and preventing the spread of false news.

## Keywords
Social media, COVID-19, Advantages, Information Dissemination

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# m-Health Role in Self-Management of Stroke: A Narrative Review

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## ABSTRACT

**Background:** Stroke is the second leading cause of death in the world. Only half of affected people have access to rehabilitation care. Self-care applications can be effective in improving chronic diseases like stroke and can be accessible in anywhere.

**Objective:** This study conducted for evaluate the effects of mobile-based self-care applications on patients with stroke.

**Material and Methods:** This study was a narrative review that performed in 2021. This study was performed by searching appropriate keywords (according to MeSH) in Pubmed and Google Scholar databases. After extracting and studying the related papers, a comparison performed, between the studies and their results was reported. A summary of the extracted results was discussed by the researchers.

**Results:** A review of related papers showed that most self-care apps for stroke are designed to teach upper and lower limbs rehabilitation and Activities of Daily Living (ADL). The duration of the intervention varies greatly, but most mobile-based interventions have reported positive effects on the self-care in patients with stroke. Quality of life, depression, medication adherence are other outcomes that are targeted by these applications.

**Conclusion:** Although the impact of the applications on stroke self-care depends on the quality of the software interface, the duration of the intervention and also the type of outcomes being measured, but in general it can be concluded that such applications have a positive effect on some components of stroke self-care.

## Keywords
Stroke, Self-Care, Mobile Applications, Telemedicine, Telerehabilitation

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# Tailored Mobile Health Intervention Modifies Adherence to Treatment in Minority Aging Group: Older Turkmen Rural  Females

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## ABSTRACT

**Background:**  Hypertension is one of the most prevalent risk factors in COVID-19 patients. Increased mortality rates associated with hypertension during the COVID-19 pandemic, especially for the elderly, necessitate the better design and use of distance learning tools such as mobile phones for this vulnerable group.

**Objective:** The aim of this study was to investigate the effectiveness of a tailored mobile-health intervention on medication adherence and blood pressure in the population of elderly women.

**Material and Methods:** This experimental study was performed on 116 elderly Turkmen rural women with hypertension in Gonbaekavoos city in Golestan province (Iran) at the beginning of the COVID-19 out-break (spring 2020). Eligible women were selected using two-stage cluster random sampling method and randomly were divided into intervention and control groups. Two mobile educational video clips which were developed tailored to the culture, language and educational needs of the audience in addition to four face-to-face brief educational intervention were carried out. The Turkmen version of the Hill-Bone Medication Adherence Scale was filled at the beginning of the intervention, one and two months after the intervention. The data were analyzed using IBM SPSS software version 25 and AMOS version 24.

**Results:** There was a significant improvement (p <0.001) in the medication adherence and blood pressure in intervention group after the intervention. blood pressure and medication adherence in the control group did not changed significantly. The numerical value of RMSEA index was less than 0.05, Cronbach's alpha coefficient and Kapayflyce coefficient were higher than 0.90 and 0.80, respectively.

**Conclusion:** The tailored mobile-health intervention, increases medication adherence among the elderly. Thus, it can be recommended in providing health services for elderly people.

## Keywords
Hypertension, medication adherence, Elderly, Iran

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# Evaluation of the effect of accompanying health on improving nutritional information of cancer patients

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## ABSTRACT

**Background:** In recent years, the use of mobile health has become very common, so significant advances in this field provide cost-effective solutions to improve the nutritional information of cancer patients at any time and place.

**Objective:** The aim of this study was to investigate the effect of accompanying health on improving the nutritional information of cancer patients.

**Material and Methods:** This study was conducted systematically by searching the Scopus, Science, PubMed and Google Scholar databases and using the PRISMA workflow diagram to select articles. English language input and time range 2018_2020 were used for the search. There were about 105 articles, of which 48 were included in the study. Then, the qualitative evaluation of the articles was performed based on the abstract list of CASP diagnostic tests with 12 questions and finally 13 articles related to the study were selected.

**Results:** Findings show that empowering the patient to overcome cancer requires developed strategies such as new technologies used in mobile phones. In this regard, studies show that the use of health along with it is important to pay attention to recent developments in technology and its key applications in creating diverse programs and achieving health through technology.

**Conclusion:** The obtained results show that considering the effect of diet and nutrition on the recovery process of cancer patients and different performance of mobile health in providing this information, mobile health has a significant effect on improving the nutritional information of cancer patients.

## Keywords
Mobile health, nutritional information, cancer patients

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# Prototype design of resilience application in women with breast cancer

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## ABSTRACT

**Background:** Diagnosis and treatment of cancer is known as a stressful experience that can lead to many psychological problems. On the other hand, the diagnosis of breast cancer in women makes them more vulnerable due to their role in the family and society, so the use of new technologies in developmental care and treatment programs can be an effective help.

**Objective:** This study was designed to develop a mobile-based application with psychotherapy strategies to promote resilience in women with breast cancer.

**Material and Methods:** In the first stage, in order to prepare a needs assessment document, resilience areas were determined by reviewing texts and library studies, then the opinions of stakeholders including psychiatrists, oncologists, educators and end users (women with breast cancer) about the necessity, usefulness and unnecessary the presence of components was questioned and prioritized. In the second stage, the prototype was prepared with the help of "Adobe XD" software.

**Results:** Findings were divided into three categories of personality factors including self-confidence and positive feelings and self-esteem, social factors including social and family support, and psychological factors including stress and anxiety.

**Conclusion:** Due to the important role of women in society and the family and the psychological burden of cancer for them, planning to diagnose the disease early and reduce mortality is an important step. Improving mental health, which is affected by promoting resilience during treatment, is also an important health program.

## Keywords
Mobile health, Resilience, Breast Cancer

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# The economic impact of COVID-19 and how technology can help

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## ABSTRACT

**Background:** Today, the entire world has been affected by a new disease, called coronavirus disease 2019 (COVID-19). As a result of this pandemic, financial activities have been significantly limited, and businesses of all sizes have been negatively affected.

**Objective:** In this study, we aimed to investigate how people's income was affected by the COVID-19 pandemic in Iran and how technology can help.

**Material and Methods:** We designed an online survey to study how people's income has been affected by COVID-19 in Iran. We used an online questionnaire in Persian language.

**Results:** Finally, a total of 1,498 participants were included in the survey. 57% of individuals reported that they were unemployed or had drop in their income. Only 1.9% of participants stated that the COVID-19 outbreak increased their revenue and had a positive impact on their job.

**Conclusion:** In this situation, it seems necessary to accelerate digitization of industries. In this way, governments and policymakers can help through developing policies and regulations to facilitate digital transformation of traditional industries to digital economy as well as to upgrade ICT infrastructure, and to provide fastest internet connection.

## Keywords
COVID-19, Economics, Income, Telemedicine

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# Did Iranians change their eating behavior following COVID-19 outbreak?

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## ABSTRACT

**Background:** Significant lifestyle changes have been reported after COVID-19 outbreak.

**Objective:** The present study aimed at investigating changes in dietary habits in response to the COVID-19 outbreak in an Iranian population sample.

**Material and Methods:** In this cross-sectional study, the dietary habits of Iranian adults was assessed before and during the COVID-19 outbreak. Consumption of different food groups such as meats, dairy, fruits, vegetables, seeds and nuts, etc. were assessed using a digital questionnaire which was shared on social media platforms. For the statistical analysis, the Wilcoxon signed-rank test was used.

**Results:** In this online survey, 1553 questionnaires were completed. The results showed that the reported consumption of protein-rich foods increased (P-value< 0.05), but fish and dairy consumption showed a significant reduction (P-value= 0.006, and <0.001, respectively). There was a significant reduction in reported fast food consumption (P-value< 0.001). Fruits and vegetables (P-value< 0.001), natural fruit juices (P-value< 0.001) and water (P-value< 0.001) were consumed more frequently. Individuals also consumed more vitamin and mineral supplements (P-value< 0.001) including those containing vitamin D.

**Conclusion:** During the COVID-19 pandemic, participants reported a significant change in their dietary habits and intake of supplements. Higher intakes of meats, and protein-rich foods, fruits, vegetables and nutritional supplements, and lower intakes of fish, dairy and fast foods were reported.

## Keywords
COVID-19, SARS-COV-2, Pandemic, eating behavior, dietary supplements

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# Telerehabilitation for Scoliosis Patients: A smartphone based solution

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## ABSTRACT

**Background:** This study aimed to develop a telecare application for scoliosis patients.

**Objective:** Home exercise programs are an integral part of treatments that have been proposed for scoliosis. Unfortunately, less attention has been paid to the evaluation of these exercises.

**Material and Methods:** The study was conducted in four phases: In the development process involved defining the features, contents, developing the application and system testing. In the evaluation phase, the application was provided to a group of 10 participants comprising of patients and experts for evaluating the usability of the application and user satisfaction with its features. n the intervention phase, the application was provided to 10 patients (case group).

**Results:** The outcome of this study is a remote-care application for scoliosis patients, which includes a total of 51 exercises. The Functional requirements included use case and activity diagram. The comparison of the obtained evaluation results with the evaluation results reported in other studies showed that in only 10% of the previous evaluations with UEQ, the systems had an excellent condition in terms of "perspicuity". The mean Cobb angle change amount in the case group indicates better improvement, which was the reason for this significant difference. There was a statistically significant difference between the results before and after the intervention. (CI=95% Pv=0.04).

**Conclusion:** The smartphone-based Home exercise¬ programs system as a telerehabilitation solution was developed and described in the current study. It presents a platform that connects the patients with the Physiotherapy experts. This technology offers an important opportunity to improve access to exercises for scoliosis disorder patients.

## Keywords
Mhealth, Scoliosis, Smartphone,Telerehabilitation, Telemedicine.

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# Mobile-Based Intervention in Parkinson's Disease: A Narrative Review

Mahsa Roozrokh Arshadi Montazer[1], Elahe Hosseini[2], Azadeh Bashiri[3], Roxana Sharifian[4]*

## ABSTRACT

**Background:** Parkinson's disease (PD) is the second common, chronic, and complicated disease of nervous system disorder that can progress with aging. Tremble, bradykinesia, loss of automatic movements and impaired posture and balance are common symptoms of PDs. Patients spend many years with PD that affects the quality of their life. Furthermore, m-Health is an emerging area of healthcare application intended to enhance access to health services. Studies have shown that new medical technologies, such as mobile phones and smartphones, can effectively manage and diagnose Parkinson's disease.

**Objective:** This study aims to identify mobile-based intervention in the diagnosis and management of Parkinson's disease.

**Material and Methods:** This review was conducted using three online databases and search engines (PubMed، Google Scholar, and Science Direct). Studies were included if they described any mobile-based intervention in PD from 2015 to 2020. A combination of Medical Subject Headings (MeSH) terms such as "mobile-based application", "smartphone", "mHealth", "Mobile Health," and "Parkinson Disease" were used.

**Results:** M-Health interventions which are integrated with other technologies such as wearable sensors can be used for early and low-cost PD diagnostic care, management, monitoring, and evaluation of PD's symptoms, especially motor symptoms such as hand tremors and balance and movement. Furthermore, the mobile-based applications can help to improve physical activities and drug management of Parkinson's patients.

**Conclusion:** Mobile phones and smartphone apps can successfully improve the management and diagnosis of PD symptoms and so, improve the quality of life and delivering care to patients.

## Keywords

Mobile phone, Smartphone, Application, mHealth, Parkinson's disease

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# Ergonomic Approaches in mobile health: A Narrative review

Mahsa Roozrokh Arshadi Montazer[1], Elahe Hosseini[2], Roxana Sharifian[3], Azadeh Bashiri[4]*

## ABSTRACT

**Background:** Mobile health (mhealth) is a quickly increasing area in the digital health sector. One of the most popular platforms for mhealth delivery is mobile phones, which ergonomic approaches should be considered in their use. Ergonomics affects many disciplines to optimize communication between the work environment and the users.

**Objective:** Due to the rapid development of mobile technologies and the insufficient attention to an ergonomic aspect of them, this study aims to reviews the most recent literatures about ergonomic issues in mobile health.

**Material and Methods:** : A narrative review of English-language articles through the PubMed، Google Scholar, and Science Direct databases was conducted using a set of keywords: ergonomic AND (mobile OR mhealth OR "mobile health" OR "mobile application" OR smartphone or app).

**Results:** According to studies, mobile usage may cause lower extremity disorders, Carpal Tunnel Syndrome (CTS), cervical lordosis, the biomedical risk for neck, wrist, and thumb, and computer vision syndrome for users. Besides, some surveys described the mobile device ergonomics features to make it more comfortable for users. Other studies have used mobile to continue the assessment of ergonomic risks in some occupations such as workers.

**Conclusion:** Despite all mobile's positive utilization in health, it can create many ergonomic problems for the users. Therefore, mobile device developers should consider the ergonomic aspect of mobile when designing a mobile device. The application developers should also embed an ergonomic recommendations section in the application for users to appropriately use the mobile to prevent physical problems.

## Keywords
Ergonomics, mHealth, Mobile, Application

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# The Consequences of Virtual Environment for Sustainable Healthy Nutrition

Salmeh Bahmanpour[1]*, Siavash Babajafari[2]

## ABSTRACT

**Background:** The world is facing all forms of malnutrition that are largely caused by unhealthy diets. Digital innovations (tools) and digital insights (technology) present a potentially important platform for nutritional- advice, education, literacy and agrifood industry

**Objective:** The consequences of social media platforms on the achievement of nutrition-related sustainable development goals were reviewed.

**Material and Methods:** A systematic search of grey literature sources, the WHO library database, Medline, EMBASE, CENTRAL, CINHAL, food marketing workgroup website and JSTOR were conducted between 2010 and 2020.

**Results:** One best part of social media platforms in the digital age is a useful educational tool for raising healthy nutritional awareness, reducing poverty, achieving zero hunger and improving sustainability of diet. Other best parts are distributing accessible healthy nutrition literacy to remote regions where people might never meet in real life; progression to encourage people to search for a healthier lifestyle; changing consumer's behavior from wasted food products and redirecting them to those who are food insecure. It is essential to bear in mind that digital technology may also hold the negative potentials to causes of malnutrition. Technology exposes young people to high fat, salt and sugar (HFSS) foods marketing. What's more are losing of the emotional interaction of nutritional counselling, nutrition transition & shaping surveillance capitalism.

**Conclusion:** Although the speed of changes in the digital landscape are high but necessarily does not mean access to better-quality nutrition content. Achievement of sustainable food system, promotion of healthy people and having healthy planet are big challenges.

## Keywords

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# The role of mobile health use in the rate of depression in the elderly

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## ABSTRACT

**Background:** Mobile health is a term used for applications in medical and public health supported by mobile communication devices. Old age is associated with potential threats such as loneliness and isolation, and depression is one of the most common mental disorders in the elderly

**Objective:** The aim of this study was to determine the role of mobile health and technology in the rate of depression in the elderly.

**Material and Methods:** The present study was conducted by reviewing and collecting authoritative articles and texts in pop fashion scientific databases and advanced search in Google, Google Scholar, with the keywords mobile health, aging, depression . A total of 6 articles were found in the period from 2009 to 2020, of which 3 articles were included in the study.

**Results:** Of all the articles in this study, almost all studies confirmed the positive role of technology and mobile health in reducing depression in the elderly. In a study of retirees in Yazd province, 74% of people who used smartphones did not experience depression, and in another study of American retirees who used the Internet, the risk was reduced. 20 to 28 percent confirmed depression, and another study of U.S. retirees reported a 33 percent reduction in depression.

**Conclusion:** The use of the Internet and virtual networks can reduce social isolation and loneliness of the elderly and consequently reduce their risk of depression. Therefore, based on these results, the programs needed by the elderly should be designed more through virtual networks.

## Keywords
Mobile Health, Aging, Depression

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# The effect of three methods of follow-up (short message service sms, telephone and regular) on the quality of life in heart failure patients

Sarvenaz Roshanisefat[1], Rostam Jalali[2]*

## ABSTRACT

**Background:** Modern methods and telemonitoring manage care and control of chronic diseases has improved, meanwhile, the hospital uses traditional methods to teach their patients.

**Objective:** The purpose of the study was to compare the effectiveness of three methods of follow-up (SMS, telephone and regular follow up) on the quality of life in heart failure patients.

**Material and Methods:** In the randomized clinical trial, patients with heart failure admitted to Emam Ali and Emam Reza hospitals were selected. The patients or dependent relatives of the patients had used mobile phones and text messages with a written consent participated in the study. With a convenience sampling thepatients selected and patients randomly assigned to three groups of SMS, telephone and regular follow-up, respectively. Each patient was assessed before and in the first, second and third months after discharge, respectively. To collect data, the Minnesota Living with Heart Failure Questionnaire was used. The data were analyzed with software SPSS VER19 by paired t test, repeated measure ANOVA and curves.

**Results:** Twenty five patients assigned to each group. There were not statistically significant differences between the quality of life of the telephone follow up before and the first, second and third months, as well as in the regular follow-up (36±12.6, 41.7±14.4, 36.5±13.5 and 36±13.2, respectively) and also there wasn't significant difference between before discharge and after 3 months in regular follow up (38±17 vs. 39.7±17.7) In the follow up via SMS, there was a significant difference between the quality of life before and in the first, second and third months (49.6±21.5, 43.9±16.6, 39.1±13.8 and 38.4±12.6 respectively).

**Conclusion:** Because the heart failure patients need different education and follow up, the result of this study showed that SMS follow up can promote the patients'quality of life, but telephone and usual follow up didn't change the quality of change in heart failure patients. Hence, follow up by SMS may be considered in these patients.

## Keywords

Heart failure, Short Message Service, Quality of Life, Telephone Follow-Up

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# Promoting the health of the elderly in a community based on mobile health and technology

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## ABSTRACT

**Background:** Aging is one of the critical period of life of each individual is faced with threats and psychological health .Today, due to the spread of technology have seen an increase in public health. One of these technologies is mobile health, which aims to improve the health and well-being of users.

**Objective:** The purpose of this study is to investigate the role and importance of mobile health and technology in promoting the health of the elderly.

**Material and Methods:** This study is a systematic review study that was conducted in1399. Using the keywords: mobile health, health care and technology were performed in reputable databases including Pubmed, Scopus, Cochrane and Embase without time limit.

**Results:** Studies show that the main challenges in using mobile health in the elderly are lack of e-literacy and resistance to the use of technology. This requires the provision of infrastructure, regulations and standards, and further research in this area. Mobile phone technology can play a key role in controlling the health of the elderly. The use of these technologies can be used as a complementary tool in modern medicine in the future.

**Conclusion:** Health technology empowers the elderly and Prevention of their chronic diseases. Mobile applications can lead to lower costs, improve the quality of health care and health behavior change by strengthening prevention and improving health in the long term. Using this tool can increase the satisfaction of the elderly and make them more motivated to continue treatment and life..

## Keywords
mobile health, health care, technology

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# Intensive Care Unit Telemedicine and the Necessity to Develop Minimum Dataset

Azadeh Bashiri[1], Farid Zand[2], Roxana Sharifian[3], Golnar Sabetian[4], Mansoor Masjedi[5], Saeed Jelvay[6], Hajar Mardani[7]*

## ABSTRACT

**Background:** Intensive care unit (ICU) is a vital and complex department which has multidisciplinary nature and requires health care professionals in all fields. Intensive care unit telemedicine (tele-ICU) technology which may also be referred as an Electronic Intensive Care Unit (eICU) provides critical care services for distance locations which has increasing complexity of patients and insufficient supplies and professionals.

**Objective:** Present study aims to propose the minimum dataset for Electronic Intensive Care Unit (eICU).

**Material and Methods:** This scoping review was performed based on relevant articles and guidelines in 2020 through scientific databases and e-Journals (PubMed, Science Direct, Scopus, Web of Science, and Google scholar). Search keywords included "Intensive care unit", "Telemedicine", "Minimum Dataset", "Tele-ICU" and "Electronic ICU".

**Results:** Various studies have shown that intensive care unit dataset is divided into demographic and clinical categories. Clinical minimum dataset in ICU classified in 11 sections including past medical history, vital signs, body systems data (neurologic system, respiratory system, cardiovascular system, gastrointestinal system, genitourinary system, integumentary system), hematology data, infections data and antimicrobial drugs.

**Conclusion:** Remote intensive care can provide timely services without location restrictions. Tele-ICU technology by providing tele-monitoring of vital signs and faster detection of unstable situations in patients, can improve safety and the quality of care delivered to ICU patients. Developing minimum data set is one of the most important requirements for Tele-ICU implementation.

## Keywords
Intensive Care Unit, Telemedicine, Minimum Data Set, Tele-ICU, Electronic

# Intensive Care Unit Telemedicine and the Necessity to Develop Data Requirement for Covid-19 patient

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## ABSTRACT

**Background:** Covid-19 now poses major health threats to public health. With the outbreak of the covid-19, intensive care has increased all around the word. Intensive care unit (ICU) provides special nursing and medical care service with continuous monitoring. Intensive care unit telemedicine (tele-ICU) technology solve the limitation of intensive care physicians, provides critical care services for distance locations and patients with covid-19 that have respiratory failure.

**Objective:** Present study aims to categorize data required by covid-19 patient in the intensive care units.

**Material and Methods:** This scoping review was performed based on relevant articles and guidelines in 2020 through scientific databases and e-Journals (PubMed, Science Direct, Scopus, Web of Science, and Google scholar). Search keywords included "Intensive care unit", "Telemedicine", "covid-19 data requirement", "Tele-ICU" and "Electronic ICU".

**Results:** Various studies have shown that intensive care unit data requirement for covid-19 is divided into demographic and clinical categories. Clinical data requirement for covid-19 in ICU classified in 6 sections including past medical history, clinical examination, medications, laboratory data specially PCR test, procedures, and imaging.

**Conclusion:** Remote intensive care for covid-19 patients provide timely services regardless location restrictions. Tele-ICU technology by providing tele-monitoring of vital signs and faster detection of unstable situations in patients, can improve safety and the quality of care delivered to ICU patients with covid-19. Integrating data requirements for covid-19 patients in the intensive care unit is one of the important requirements to implementation Tele-ICU for this patients.

## Keywords
Intensive Care Unit, Telemedicine, covid-19 Data Requirement, Tele-ICU

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# The Value of Telemedicine for the Follow-up of Type 1 diabetes Patients During COVID-19 Pandemic : A Report of ten Cases

Hanieh Abdi[1]*, Soheila Esmaeili[2]

## ABSTRACT

**Background:** The Covid-19 epidemic has forced health care teams to use more time than ever before to manage large numbers of diabetics. Our goal in this Covid-19 epidemic was to provide follow-up information to patients with type 1 diabetes (T1D) and to discuss the effectiveness and effectiveness of telemedicine in routine long-term clinical care.

**Objective:** Evaluation of the effectiveness and efficiency of telemedicine during the outbreak of Covid-19 on type 1 diabetic patients.

**Material and Methods:** In this study, changes in standard deviation (SD), change coefficient (CV) and amplitude time percentage (TIR) in 10 patients with T1D who were in the age range of 15-20 years with a two-month follow-up using the telemedicine system during The prevalence of COVID-19 was examined.

**Results:** The average follow-up time was 60 days. Four patients used low glucose suspension and 6 patients underwent daily multiple dose (MDI) injections. Target TIR values in 7 patients at the last TV viewing and according to the latest consensus recommendations, TBR <70 mg / dL (3.9 mmol / L) (level 1 hypoglycemia) less than 4% and a TBR <54 mg / dL Obtained. mmol / l) (blood glucose level 2) <1% was obtained in all patients. Eight patients received less than 36% of their CVs on their last TV visit.

**Conclusion:** Telemedicine as an alternative tracking tool in unusual situations such as epidemics, even in countries that are not commonly used, can be helpful in achieving optimal glycemic control in patients with new T1D.

## Keywords
COVID-19; Type1 diabetes; telemedicine

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# Mhealth, Ehealth & justice in Health: A Study of the Relationship between the Emergence of New Communication Technologies in Health with the Transformation of Social Justice in Health

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## ABSTRACT

**Background:** One of the problems of health systems is the lack of fair access to health services for different groups. Today, mhealth and e-health have made changes in the fields of prevention, diagnosis and treatment so the realization of justice in health have changed, too.

**Objective:** This study aims to study the effectiveness of new communication technologies in promoting justice in health.

**Material and Methods:** The method is case study which records a complete record of the details of the subject and therefore uses various technics. In this study, interviews, observations, content analysis of doctors' web pages and mhealth apps in Iran have been used.

**Results:** 1. Using health apps can help people to get health information without paying too much. These apps are available almost equally to all social classes. 2. The spread of e-health makes doctors to launch pages on Internet pages to introduce themselves. As a result, patients can get acquainted with doctors, while in the past, some people had information rents. 3. Doctors' use of mhealth and e-health services, helps patients in small towns and the disabled- who are unable to visit some doctors in the office- to be cared for by experienced doctors in big cities. 4. Doctors' use of mhealth and e-health services changes the doctor-patient hierarchical relationships. Patients are in a more equal and interactive relationship with the doctor.

**Conclusion:** Achieving social justice in health requires several requirements, mobile health and e-health services can be one of the helpful solutions.

## Keywords
Social Justice, Health, Medicine, eHealth, mHealth

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# Application of medical IoT to provide an electrocardiogram signal recognition model based on deep learning

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## ABSTRACT

**Background:** Today, data is extracted from patient-connected sensors to monitor the diagnosis and predict important clinical signs.

**Objective:** Data with ambient noise in these data prevent their use. Since deep learning algorithms are extracted without human intervention, in this study we assume that it has been used to screen for unacceptable heart signals that include noise. To test it, according to the interpretations of one expert, a comparison was made between a model based on learning unacceptable signals.

**Material and Methods:** To develop and apply the screening model, we used a bio signal database comprising 165,142,920 ECG II (10-second lead II electrocardiogram) data gathered between August 31, 2016 and September 30, 2018 from a trauma intensive-care unit. Then, 2,700 and 300 ECGs (ratio of 9:1) were reviewed by a medical expert and used for 9-fold cross-validation (training and validation) and test datasets. A convolutional neural network-based model for unacceptable ECG screening was developed based on the training and validation datasets. The model exhibiting the lowest cross-validation loss was subsequently selected as the final model. Its performance was evaluated through comparison with a test dataset.

**Results:** When the screening results of the proposed model were compared to the test dataset, the area under the receiver operating characteristic curve and the F1-score of the model were 0.93 and 0.80 (sensitivity = 0.88, specificity = 0.89, positive predictive value = 0.74, and negative predictive value = 0.96).

**Conclusion:** The deep learning-based model developed in this study is capable of detecting and screening unacceptable ECGs efficiently.

## Keywords

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# Characteristics of patient-centered m-health Applications for diabetes management

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## ABSTRACT

**Background:** The emergence of the mobile app improves the chance of self-management and access health information for diabetic patients. Despite the increase in the number of mobile health app in Iran, few studies evaluate the feature of these apps.

**Objective:** The objective of the study was to conduct a systematic search of mobile app for the patient with diabetes to evaluate all features and type of information.

**Material and Methods:** Data was gathered through multiple rounds of screening in the Persian Android and iOS App Store (Bazar, Myket, Google play, Iapps, Sibcheh). Features and heath information' type of app extracted according to the app's description in-app store. We used a 15- feature checklist to evaluate self-management diabetic patients. Heath information want (HIW) framework used for analyzing health information type.

**Results:** Totally 108 diabetes apps reviewed and in 82% of apps, only diabetes education was provided. The most common health information was about diagnosis, treatment, and diet management. Some other features were blood glucose tracking (12%), monitoring of medication (9%), and weight (11%), HA1C (5%), hypertension (5%), diet and exercise (5%), and disease-related alerts or reminders (7%).

**Conclusion:** In patient-centric care, the improvement of features of apps can increase the achievement of self-management goals for the patients. the development of additional features should be encouraged to facilitate disease management and patient and health provider engagement.

## Keywords
Mobile Health, Patient-center, Diabetes Mellitus

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# Evaluation of the Impact of an electronic intervention material on health care teachers' knowledge regarding to the emergency management of traumatic dental injuries

Zahra Momeni[1]*, Fateme sadat Hoseyni[2], Sanaz Afzalsoltani[3]

## ABSTRACT

**Background:** Dental injuries are one of the most important public health issues. Knowledge of health care teachers on management of these injuries plays a critical role in prevention and treatment of them.

**Objective:** This study aimed to investigate the role of smart phones to promote health care teachers' knowledge regarding to the emergency management of traumatic dental injuries after an educational intervention in the social network.

**Material and Methods:** We conducted an interventional study of health care teachers using census sampling method in Karaj, Iran in 2019. The intervention included an educational materials about emergency management of traumatic dental injuries using social network. We used a questionnaire to assess the effect of the intervention at baseline, immediately after the intervention and after a three-month follow-up. A total of 182 participants responded at baseline and immediately after the intervention, and 134 were answered at the three-month follow-up assessment (response rate: 57.3%). We assessed each participant's knowledge score, calculated as a sum of correct answers, and the change in their score following the virtual intervention. T-test and paired T-test were used for statistical analysis.

**Results:** The mean score for knowledge improvement from baseline to immediate post-intervention evaluation was higher among those who received educational material (2.45) than among those who did not (0.10); the corresponding figures from immediate evaluation to three-month follow-up were -1.15 and 0.03, respectively.

**Conclusion:** Intervention using social network promoting knowledge among teachers had a positive short-term impact. Despite the decrease in knowledge score after three-month follow-up; it was more than the baseline.

## Keywords

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# Developing a dermatology application to deduct non-essential face-to-face referrals during Covid-19 Pandemic

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## ABSTRACT

**Background:** Telemedicine system plays a vital role as a bridge between patients and medical environments. During covid-19 pandemic, one the high risk situation is to be in a populated area such as waiting saloon to visit a doctor for non-essential face-to-face diagnosis.

**Objective:** To develop an application in order to drop considerable amount of in-person referrals during covid-19.

**Material and Methods:** This application includes several phases. First of all, patients should fill out the questionnaire such as last day's foodstuffs, taken medicine, being exposed of any chemical substance, makeup material, radiation and so on. The secondary phase, patients should attach some photos from skin appendages, like eczema, acne, skin mole and etc. And third phase, contains uploading data with patient profile which consist of patients name, age, disease background and extra note for additional items if they are not listed already. At the end of the day, final phase includes related dermatologist's prescription and diagnosis. If any question remained, we provided a message box for both patient and doctor. The usability testing of this application evaluated by Nielsen model.

**Results:** The results from the usability tests showed the application has met 8 out of the 13 heuristics rules set by Nielsen.

**Conclusion:** It helps to the health center to prevent congestion which is useful for both treatment staff of health centers and patients for being immune from infectious of Covid-19.

## Keywords
Telemedicine, Covid-19, Skin appendage

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# Developing a blood pressure monitoring application during pregnancy

Hossein Jamalirad[1]*

## ABSTRACT

**Background:** Nowadays, many pregnant are suffering from blood pressure which impacts on the mother and embryo's health. So they should be under control constantly. Mobile technologies can be a facilitator for disease self-management. m-Health applications can empower patients to take charge of their own disease management.

**Objective:** To develop an application in order to track daily blood pressure of pregnant women at their home whom should be controlled.

**Material and Methods:** The application consists of related information that guides mothers how to register their blood pressure (with simple digital home pressure device), instructions and offline consultant. Required information such as BMI, description for under taking any specific medicine, and demographic information should be filled. Also, we have set a daily reminder for mothers to input their blood pressure values. Consequently, visualize daily diagrams of mother's blood pressure values constantly. If any abnormal values set, the warning notification would be sent by a/an SMS-application notification to both mother and related-doctor/midwife to be in contact with each other as soon as possible. A number of techniques and tools were used to help implement a design solution by Kotlin. Some sort of tests such as white box and usability testing were carried out to evaluate if the user requirements have been met. A number of informal interviews were conducted to ensure that the application met the user's demands.

**Results:** This app was developed by java Kotlin. The results from the usability tests showed the application has met 11 out of the 13 heuristics rules set by Nielsen.

**Conclusion:** This app has the ability to constant daily tracking of blood pressure factor to prevent any consequences of abnormal blood pressure for both mother and embryo.

## Keywords
m-Health, Blood pressure, pregnancy

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# Use of Gerontology to Assist Older Adults in Isolation during the Covid-19 Pandemic (Systematic Review)

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## ABSTRACT

**Background:** Over the past several weeks, the total number of patients with 2019 novel coronavirus disease (COVID-19) and the number of associated deaths has been increasing. One of the problems of long-term quarantine in the elderly is the assessment of physical and mental health of this population.

**Objective:** The purpose of this study use Telerehabilitation in Oder Adults in Covid-19 Pandemic.

**Material and Methods:** Databases have been PubMed, Google Scholar, Scopus, SID, and Iran Doc. The main keywords were COVID-19 Pandemic, gerontology and older adults, assist, isolation that were searched in the published papers during 2019-2021. About 2 articles were found.

**Results:** The results showed that the use of gerontology is very useful for assessing the physical and mental health of the elderly, such technologies are essential in pandemics for early diagnosis and treatment.

**Conclusion:** Since the prevalence of corona disease is increasing day by day and definitive treatment and prevention is not yet available, it is recommended to evaluate the health status of the elderly using such technologies to prevent the disease.

## Keywords
Gerontology, Assist, Isolation, Older Adult, COVID-19 Pandemic

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# The role of smart phones in improving the quality of life for elderly people

Ghazaleh Namvar[1], Hadi Kazemi Arpanahi[2]*, Najmeh Shams[3], Sadegh Sharafi[4], Hadis Seifolahzadeh[5]

## ABSTRACT

**Background:** Nowadays, advances in quality of health care services and enhanced the living and working conveniences have led to an increase in the life expectancy index. As trends in life expectancy escalation, the quality of life (QoL) is likewise expected to increase. So far, several studies have been reviewed the adoption of mobile-based solutions in health care delivery to elderly population in Iran; but there is still little information about the impact of these tools on elderly QoL.

**Objective:** To investigate the impact of smartphones on improving the QoL of the elderly.

**Material and Methods:** In this review study, the scientific databases including web of science, PubMed, Google scholar, Scientific Information Database (SID) and Magiran were reviewed using the keywords elderly, mobile health device, quality of life, m-health, aged, Smart phone, and their Persian equivalents in timespan from 2010 to 2021.

**Results:** The results showed that the use of mobile phones in delivering care for elderly leadings to reduce costs, easy and timely access to care and its various aspects, better patient-caregiver relationships, and increase the impact of self-care management in chronic diseases, which are more common in the elderly. The main challenges are lack of e-literacy and resistance to technology adoption.

**Conclusion:** Smart phones can be considered promising tools to improve the Qol for elderly people by providing training programs and self-care interventions. Creating e-literacy, overcoming resistance to the use of technology can revolutionize the health of the elderly, which requires more infrastructure and research in this area.

## Keywords
Aged, Mobile applications, Quality of life, smartphone

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# Quality Assessment of the road traffic health and safety Apps Using the Mobile App Rating Scale (MARS)

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## ABSTRACT

**Background:** Expansion of road traffic apps may develop several issues about their as a tool. Quality assessment of these apps appears inevitable since their possible low quality may cause irreversible injury or fatal consequences.

**Objective:** This study aimed to evaluate the quality of the apps in the three subcategories of road traffic safety apps (including Accident record and report (ARR), Distraction management (DM), and Vehicle operating, fixing, and maintenance (VOFM)) using the MARS.

**Material and Methods:** The researchers retrieved road traffic health and safety mobile apps from Google play. Two researchers independently reviewed the apps and conducted the qualitative content analysis to categorize them into ARR, DM, and VOFM classes. Finally, the quality of the apps was assessed using the MARS rating scale (max=5). The mean scores for the subjective quality, objective quality, and the app-specific sections were calculated separately for each mobile app. The score $\geq 3.0$ was considered acceptable.

**Results:** A total number of 42 apps met the criteria for the assessment. The average scores of objective quality were computed 2.6, 2.2, and 3.0 for the ARR, DM, and VOFM apps respectively. Therefore the quality of the apps in the ARR and DM subgroup was not acceptable. Moreover, the quality of the apps in the VOFM subcategory was considered moderate. Furthermore, the subjective quality and app-specific sections of apps in the ARR and DM categories was less than moderate.

**Conclusion:** Findings of this study revealed the existing gaps of three subcategories of road traffic safety apps. Considering these gaps, developers of the apps may achieve better products in road traffic safety. However, these results need to be examined in a real-world experience.

## Keywords
Telemedicine, mobile applications, accidents, traffic, safety

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# The use of telemedicine and mhealth in the care of patients with Covid-19: A systematic review

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## ABSTRACT

**Background:** During recent years, mobile-based technologies (health apps) and telemedicine is expanding rapidly and also the global impact of COVID-19 pandemic has led to a rapid use of this Digital technologies. The benefits of these technologies in the COVID-19 pandemic include communication between patient and providers, fast access to health information, improve patient care and self-management, and prevention of infection transmission.

**Objective:** The aim of this study was to evaluate the effect of electronics tools and mobile health application in Covid-19 Control and Self-Care.

**Material and Methods:** In this article, the search was conducted through systematic review in four online databases and search engines namely PubMed, Science Direct, Scopus and Google Scholar during the years 2020 to 2021. The following search terms were used to identify relevant articles: "Telemedicine," "mobile health", "mhealth", "telehealth" with "covid-19" and "coronavirus". Finally, 23 articles were selected. After collecting related articles, the data extracted from the articles were summarized by the researchers for analysis.

**Results:** The findings of the present study showed that electronics health (e-health) and mobile health apps (mhealth) are ideal for the management of Covid-19 diseases. One of the most important factors in slowing this disease transmission is providing accurate health information to people and observe social distance with patients with COVID-19. During infectious disease outbreaks, digital technologies can enable easily access to routine care without the risk of exposure in a congested hospital. Also, telemedicine assist with disease diagnosis via video consultations with health professionals. One effective strategy to reduce the spread of infection, is to trace contacts of confirmed COVID-19 cases. Previous study shows that contact tracing technology with mobile position data is important for epidemic control.

**Conclusion:** Many covid-19 patients have poor access to healthcare services due to residence location, disability, travel costs and lack of related services. So the use of available mhealth applications and electronic and digital services health have introduced as a common solution for remote communication and self-management in this population which can improve patients' care and enhance the quality of their life.

## Keywords

mhealth, Telemedicine, Telehealth, ehealth, Covid-19, Coronavirus

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# Design and evaluation of digital medical image archiving and distribution system to improve the care of patients with COVID-19 disease in the intensive care unit

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## ABSTRACT

**Background:** Those patients with COVID-19 disease that admitted in intensive care unit not only require being constantly monitored, both they also need long lengths of stay in the ICU. One of the factors that play an essential role in monitoring the condition of these patients and their diagnosis is digital medical images; but the proper distribution of these images and how care providers have access to them, especially during the COVID-19 pandemic, is one of the major problems ahead.

**Objective:** The purpose of this study is to design a system for archiving and distributing digital medical images electronically, which can be used to provide image data of patients, especially patients admitted to the intensive care unit to care providers in a way that in addition to improving access, they can use this data in a completely safe, fast and hygienic environment to improve patient care as a decision-making system.

**Material and Methods:** A checklist was devised in order to determine the required fields and the data relevant to the picture archiving and communication system (PACS); next, the visual design of the PACS and a model was carried out based on the corresponding standards. In the next step, the evaluation of the PACS system was performed in a semi-experimental study before - after. Finally, a study was conducted for usability analysis.

**Results:** A Delphi study was conducted and after two rounds, 25 data elements were classified in 5 categories. The second part of the results, i.e. the design of the PACS, provided 10 key performance indicators in 3 categories. The quality of the PACS was approved by the care-providers. Based on the average time of access to images and the length of the patient's stay in the intervention ward and after the establishment of the PACS system showed a reduction of 24.5 minutes and 7.6 days, respectively (p-value<0.0001 , p-value=0.028)..

**Conclusion:** The designed PACS achieved its goals regarding the determined indicators of reduction in mortality, reduction in the average time of access to images, and reduction in the average length of stay and the satisfaction of the ICU care-providers about the quality of the PACS.

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# The role of blockchain technology in development of mobile health

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## ABSTRACT

**Background:** The blockchain technology has reached a great explosion in the health sector, due to its importance to overcome interoperability and security issues in eHealth. Several blockchain initiatives have appeared recently. One of the most promising in the health care section is mobile health.

**Objective:** This study aimed at determining the role of blockchain technology in development of mobile health.

**Material and Methods:** The present study performed by review and library, using search of articles with the MeSH Terms such as: blockchain, Telemedicine and through Boolean operands in databases including: IEEE Xplore, ISI-web of science, Pub Med, Scopus, Science Direct and Google Scholar from 2010 to the present. The obtained articles revised in accordance with the study goal.

**Results:** Results showed that generally, the most common approach used to develop mHealth through blockchain technology is the appearance of blockchain start-ups based on mobile health platforms. Digital tools such as conversational interfaces and chatbots are the other blockchain initiatives in mobile health.

**Conclusion:** The new blockchain technology applied in mobile health, identifies new reliable ways to exchange the decentralized health data and promotes the development of novel mobile health applications.

## Keywords
blockchain, telemedicine, mobile health

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# The utilization of Artificial Intelligence in development of mobile health

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## ABSTRACT

**Background:** Nowadays, artificial intelligence with its dramatic expansion can make a significant evolution in the development of mHealth applications. artificial intelligence conforms human thinking and the ability to learn from past interactions and experiences.

**Objective:** In this study, we determine how artificial intelligence results in development of mobile health.

**Material and Methods:** The present study performed by review and library, using search of articles with the MeSH Terms such as: artificial intelligence, Telemedicine and through Boolean operands in databases including: IEEE Xplore, ISI-web of science, Pub Med, Scopus, Science Direct and Google Scholar from 2010 to the present. The obtained articles revised in accordance with the study goal.

**Results:** The results showed that artificial intelligence through: 1) the impact on accuracy of the results; artificial intelligence has proven its efficiency in data management in a completely accurate way in a variety of situations, 2) advanced real-time estimates, 3) clinicians/patients satisfaction, and 4) real-time data transfer; artificial intelligence and the Internet of Things together have made possible many probabilities that once seemed impossible; even, real-time prediction is possible without the Internet, results in development of mobile health.

**Conclusion:** The adaptive nature of artificial intelligence (AI) technology has prepared an innovative opportunity for creative developers of mHealth applications to interact applications intelligently with humans.

## Keywords
artificial intelligence, telemedicine, mobile health

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# Smart-phone Apps Assisting Children and Adolescents with Cancer and their Families: A scoping review

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## ABSTRACT

**Background:** Considering the importance of empowering patients and their families by providing appropriate information and education, it seems smartphone apps provide a good opportunity for this group.

**Objective:** The aim of this study was to identify apps which are designed to help children, adolescents with cancer and their family.

**Material and Methods:** Arksey and O'Malley's framework was employed in this scoping review. To examine the evidence on the design and use of smartphone apps for the target group, PubMed, Embase, Scopus, and Web of Science databases were searched from 2007 to December 2020.

**Results:** Twenty-three articles met the inclusion criteria, with 39% being conducted in the USA and 28% in Canada. Moreover, 87% of apps were specifically designed for children and adolescents, with only 13% for parents and 6% for both. The main modules in these apps included symptom assessment (90%), provision of information and education (78%), communication with caregivers (62%), social support (37%), and calendar and reminder (33%).

**Conclusion:** Due to the easy access to smartphones without a costly infrastructure compared to landline phones, the use of m-Health has become a suitable method of providing healthcare services, especially for cancer. Use of smartphone apps, increases patient and families' access to reliable and suitable education and information regarding the disease. Thus, healthcare policy-makers in developing or underdeveloped countries can exploit the health-related potentials of m-Health following the experience of developed countries.

## Keywords

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# Effect of text message based intervention for weight control and health promoting lifestyle behaviors of overweight and obese children

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## ABSTRACT

**Background:** Little information is available on the use of text messages through mobile phones to address overweight/obesity in children.

**Objective:** This study aims to evaluate the impact of a text message based intervention for weight control and health promoting lifestyle behaviors of overweight/obese children.

**Material and Methods:** This quasi experimental study was conducted among overweight/obese school students. Data on socio-demographic, dietary intake, sleep, sedentary behavior, physical activity (PA), and anthropometry were collected before and after the intervention. Weight and height were examined according to the standard protocols. The intervention was consisted of tailored messages for weight control and healthy lifestyle, including diet, PA, sedentary behavior, and sleep. Child attitude and his practice were asked before and after the intervention. The paired t test was performed to compare means of continuous variables before and after the intervention for normal distribution data. The Wilcoxon test was also used for non-normal data.

**Results:** A total of 71 boy students were included in the study (62% obese). The mean age was 10.07 years. The means of attitude score for PA, nutrition, and sleep after intervention were greater than before it, but it was significant only for PA. The mean of nighttime sleep duration of students after the intervention was significantly less. Furthermore, unhealthy score decreases after the intervention.

**Conclusion:** Three month lifestyle intervention as text messages had positive effects on the nutritional intake of obese children and their attitudes toward PA, but no effect on child body mass index.

## Keywords
Child, healthy lifestyle, intervention, weight, obesity

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# The effects of exposure to Heat subsequent Wifi radiation (2.4GHZ) on the cardiovascular system

Seyede Fateme Hosseini[1]*

## ABSTRACT

**Background:** Nowadays wireless technology are very popular, causing concern about the harmful biological effect on people's health by changing free radicals, increase lipid peroxidation and changes antioxidant activity.

**Objective:** The aim of this study was to investigate the effects of 2.45 GHz electromagnetic field on histopathological changes of cardiovascular system in rats.

**Material and Methods:** 32 adult male Sprague-Dawley rats were randomly divided into four groups. Group 1: exposed to 2.45GHz for 2 h/day, 52 consecutive days, group 2: in a water bath at 43°C for10 minutes/day, 52 consecutive days, group 3: exposed to 2.45GHz for 2 h/day+ in a water bath at 43°C for10 minutes/day, group 4: control, was not exposed to Heat and Wifi waves. On the 52nd day, the heart was removed and its total volume and weight were determined using isotropic Cavalieri method. The total volume of the myocardium and total number of cardiomyocytes nuclei were determined as well. At the end of the experiment blood sample was collected for measurement of total antioxidant capacity (TAC), reduced glutathione (GSH) content and malondialdehyde level (MDA).

**Results:** Based on the main findings, heart weight and volume density of myocardium increased in the Wifi-irradiated group in comparison to the control group ($p<0.05$). Also, the results indicated that exposure to wifi in test group decreased TAC and GSH compared with the control group ($p<0.05$).

**Conclusion:** It can be concluded that wifi might cause structural changes and decrease antioxidant activity in heart.

## Keywords
Wireless Technology, Cardiovascular System, Biology, Radiation

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# Hepatitis C Virus Infection Awareness-raising Through HepC Mobile Application and Hepatobot

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## ABSTRACT

**Background:** Hepatitis C virus (HCV) infection is among the main public health concerns with around 200 thousand infected cases in Iran. The World Health Organization (WHO) aims towards eliminating HCV by 2030. Conducting face-to-face awareness-raising campaigns is one of the most important measures taken to reach that aim, but doing so takes a lot of time and energy and the effectiveness is in question.

**Objective:** Our objective was to design, develop, and evaluate an informing mobile application and also a social media bot to raise awareness about HCV infection.

**Material and Methods:** We designed a mobile application (HepC) and a social media bot (Hepatobot) which provide the users with information on HCV infection social stigma, transmission, prevention, diagnosis, cure, statistics, and the closest health centers' contact details. A pre-test is designed inside the application which evaluates the users' knowledge before using the app and gives them a background on the most important points they're going to learn. We also designed an optional post-test on the homepage to help us inspect the application's effectiveness and also for the users to assess what they learned.

**Results:** The application and bot were both designed and developed under the supervision of an expert in the HCV infection field. The application and bot both received positive reviews after the initial release.

**Conclusion:** Considering the increasing usage of smartphones, alternating face-to-face awareness-raising campaigns with informing applications and bots can accelerate the process, save resources, and increase the efficacy.

## Keywords
Hepatitis C, awareness, mobile applications, telemedicine

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# Telepractice in Speech-Language Pathology

Masume Hosseini[1], Sara Abedini[2]*

## ABSTRACT

**Background:** Today, due to the corona pandemic conditions and with the advancement in technology, telepractice has established as a kind of assessment and treatment service for people with speech and language disorders. Telepractice is the application of telecommunication technologies in health and rehabilitation services. It facilitates cost-effective, quality, and flexible health and social services even when the service provider and the recipients are at a distance to each other. Telepractice can bring services to rural areas,enabling professionals to see clients and increase the impact of services in these communities.

**Objective:** The objective is to investigate the efficacy of telepractice for clients with speech and language disorders.

**Material and Methods:** This article is a review of researches published between 2005 to 2020 in PubMed, Scopus, and Web of Science databases and a search of library resources.

**Results:** Of the papers found, related articles were selected. Researchers have found that telepractice is an effective means of increasing access to high-quality services for everybody everywhere.The results showed that Participation in a speech-language pathology telepractice program improved the speech and language skills of clients.

**Conclusion:** COVID-19 pandemic has brought dramatic changes to many aspects of our lives. Service delivery in speech language pathology was impacted significantly as well. Overall, results of the review continue to support the use of telepractice as an appropriate service delivery model in speech-language pathology. Telepractice is an emerging area of service delivery in speech-language pathology that is likely to become an integral part of mainstream practice in the future.

## Keywords

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# Covid-19 related mobile apps in Iran: a review of characteristics   and use-case analysis study

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## ABSTRACT

**Background:**  A significant number of mobile health apps have been created around the world to help the consequence reduction of this emerging pandemic.

**Objective:** This study aimed to review the characteristics of Persian Android and iOS apps related to COVID-19 and categorize them by the use-case model.

**Material and Methods:** This was a cross-sectional descriptive study. We searched related COVID-19 Iranian mobile apps' for Android and iOS in January 2021. Then, the apps were analyzed and categorized according to their characteristics and use-case model.

**Results:** We found 123 apps based on our inclusion and described them based on the following variables: platform, size, and cost, date of update, use case, rating score, developer, expert consultation, privacy, reference, and contact ability. The results showed that 87% of them were free and 8.94% of them had in-app payment. Only 2.43 of the selected apps were developed in iOS and most of them developed for Android smartphone apps (97.56). 41% of the apps did not mention compliance with privacy rules.  Only 5.7% of the apps declared that clinical experts were involved in the development process. 20% of the apps that were educational or informative had no reference. 77.23% of the apps were categorized as educational tools. 20.32% categorized as fulfilling a contextual need. Only 1 android app developed in communicating use-case. 30.90% of the apps were dedicated to entertainment and games only.

**Conclusion:** Lack of standardization for Persian app development may cause some drawbacks which require regulation set and evaluation process.

## Keywords
Mobile-Health, mHealth, Covid-19, coronavirus, classification

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# Mobile health in the management of diabetes: asystematic review and meta-analysis

Hamidreza Dehghan [1]*, maryam morshedian[2], Arezoo Dehghani Mahmoodabadi[3]

## ABSTRACT

**Background:** Mobile Health is the use of mobile technology in the development of healthcare, to remind and motivate patients to adopt a healthy lifestyle.

**Objective:** The objective of this study was to conduct a systematic review and meta-analyses to summarize evidence of mobile health interventions on control HbA1c in patients with Type1 and 2 diabetes mellitus.

**Material and Methods:** We performed a systematic literature review of all studies in the ISI web of science, EMBASE, PubMed, Scopus, and Google Scholar, Cochrane,HTA ,EED ,DARE ,CRD databases that used mHealth (including mobile phones) in diabetes care and reported glycated hemoglobin (HbA1c) values as a measure of glycemic control. The fixed effects model is used for this meta-analysis.

**Results:** The study analyzed three studies involving a total of 309 participants. In the meta-analysis, the fixed effects model showed a statistically significant decrease in the mean HbA1c in the intervention group - 0.41 (95% confidence interval: - 0.63, - 0.18; P = 0.000, I2 = 0%). Subgroup analyses indicated that the duration of the intervention influenced HbA1c.

**Conclusion:** Mobile health interventions may be effective among patients with diabetes. A significant reduction in HbA1c levels was associated with the duration of the intervention.

## Keywords
diabetes mellitus, telemedicine, telecare, Systematic review

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# A review of Iranian diet and calorie counting applications

Sara Pourrokni Salehan[1], Arezoo Dehghani Mahmoodabadi[2]*

## ABSTRACT

**Background:** Since the importance of a healthy diet is not hidden from anyone and it is possible to prevent many diseases by using a healthy diet and also to achieve an ideal body, requires a comprehensive healthy lifestyle plan that has different parts. Including diet, exercise programs, and training information.

**Objective:** We reviewed Iranian apps on diet and calorie counting with high download rates in the perspective of functionalities of different parts.

**Material and Methods:** To select Iranian nutrition applications from the Bazaar and Google Play applications. we selected applications that included various aspects of a healthy lifestyle, then selected different parts of each application. We examined from 12 perspectives, including determining the caloric content of each meal, reminders to eat meals, users' social network, the possibility of editing diet promises, a diet based on personal characteristics, online counseling, exercise program, diet recipes, medical advice and Nutrition, calculation of various weight and body characteristics, consideration of underlying diseases, reminders motivational messages.

**Results:** After reviewing 20 applications from different perspectives, it was found that Iranian applications have serious weaknesses in the field of online consulting and lack of expert support. These applications often only calculate the number of calories in food and do not specify the exact amount of nutritional value. Most sports programs have a training and recommendation mode, and a program is not designed according to each person's physical condition. The controllers of these applications are weak and often do not encourage the user to continue.

**Conclusion:** Iranian applications in the field of nutrition, despite the progress, still have opportunities for improvement and need serious attention in this area.

## Keywords
Nutrition applications, diet therapy, mobile app

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# Comparison of the effect of virtual reality and conventional proprioceptive training in the neck region on pain, functional variables and balance in patients with cervical radiculopathy. A randomized controlled trial

Sara Shabakhti[1]**\***, Mohsen Razeghi[2,4], Iman Rezaei[3,4], Niloofar Jenabi[1]

## ABSTRACT

**Background:** Cervical radiculopathy (CR) is one of the most common problems, demonstrated as the neck and shoulder pain. Previous studies have shown that patients with CR suffer from proprioception alteration.

**Objective:** To evaluate and compare the effect of virtual reality training (VRT) and conventional proprioceptive training (CPT) in the neck region on pain, disability, proprioception, kinesiophobia and balance in patients with CR.

**Material and Methods:** Forty-five patients (40-60 years old) with CR were randomly assigned to three groups of VRT, CPT, and control (CON) in this Randomized controlled trial. All patients were instructed to do a home exercises program. The patients in CON group just performed home exercises. The patients in VRT group played a newly method of cervical proprioceptive training in virtual environment. This is a developed videogame called Cervigame® (Patent number: 99109, Islamic Republic of Iran[1]). The patients in CPT group underwent a set of conventional proprioceptive. Patients in VRT and CPT groups performed ten intervention sessions, 3 times a week, lasting 20 minutes each session. Primary outcome measures included Visual Analogue Scale (VAS), Neck Disability Index (NDI) and Joint Position Sense Error (JPSE), and secondary outcome measures were modified Star Excursion Balance Test (mSEBT) and Tampa Scale of Kinesiophobia (TSK). A repeated measure ANOVA test was used to evaluate the statistical significance. For all analyses, SPSS (version 23; IBM, Armonk, NY) software was used.

**Results:** The result showed a significant group-by-time interaction in VAS and TSK. No significant group-by-time interaction were seen in NDI and all directions of JPSE and mSEBT. Further analyses showed significant improvement in all variables post-intervention and during follow-up period in all three groups. Moreover, improvement in VAS, TSK were significantly more than CON group.

**Conclusion:** The addition of proprioceptive training in the form of virtual reality to routine exercises could enhance the efficacy of treatment on reducing pain and kinesiophobia in patients with CR.

## Keywords

cervical radiculopathy, virtual reality, proprioceptive training

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# The use of mobile applications in the management of patients in the intensive care unit: a review study

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## ABSTRACT

**Background:** The production and development of mobile applications are growing rapidly in the field of health and patient monitoring, especially patients admitted to the intensive care unit (ICU).

**Objective:** In this study, we will introduce the applications that were used for the management of patients admitted to the ICU, which can be referred to as "ICU management applications". These applications are designed to provide support tools and training, diagnostic and treatment guides to help the medical staff make quick decisions.

**Material and Methods:** This review was done in January 2021 by searching databases such as Scopus, Web of Science, Google Scholar, and PubMed with the keywords, ICU Management, Mobile application, Mobile app, and Mobile health. Finally, based on the PICO, 7 articles were selected from 2017 to 2020. After collecting articles, the data extracted from the articles were summarized and analyzed by the researchers for analysis.

**Results:** The results showed that monitoring and management applications using in ICU had significant upward growth nowadays. User-friendliness and ease of access to patient data in any place are some of the reasons for the success of this technology.

**Conclusion:** The highest frequency was among the programs that were used to teach medical and nursing students, so the educational aspect of using this software in the field of E-learning is significant. Because the intensivist can continuously monitor the patient's condition, more appropriate decisions are made. Sharing patient data, with other specialists saves time and saves patients' lives.

## Keywords
Management, Intensive Care Unit, Mobile Apps

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# The effect of using mHealth on the self-care of patients with type 2 diabetes: A systematic review

Samaneh jalali[1], Azam Sabahi[2,3]*, Fatemeh Ameri[4]

## ABSTRACT

**Background:** Diabetes is the fifth main cause of death worldwide. Today, type 2 diabetes is the most prevalent type of diabetes, constituting 90% of the cases of diabetes and inflicting >400 million people. It requires continuous patient management and support. Patients' self-care and involvement also contribute to the control and prevention of this disease. The popularity of smartphones has presented an opportunity for the management and self-care of these patients.

**Objective:** Examining the effect of using mHealth on the self-care of patients with type 2 diabetes.

**Material and Methods:** This systematic review was conducted for the 2012-2020 period. The searches were performed in Persian (SID, Irandoc, Magiran) and English (Scopus, PubMed) databases via a combination of keywords, e.g., diabetes, mHealth, and mobile health. Two researchers independently examined the titles, abstracts, and full text of the articles. Finally, the data were collected from the relevant articles.

**Results:** Twenty articles investigating self-care in 11 domains were included. Twelve studies deemed mHealth effective in increasing hemoglobin control. The other studies regarded mHealth effective in increasing adherence to exercise (n=9), adherence to medication (n=7), adherence to diet (n=7), foot care against diabetic ulcers (n=7), self-efficacy and empowerment (n=5), cholesterol control (n=4), awareness and attitude (n=3), insulin dose control (n=2), adherence to education (n=1), and blood urea control (n=1).

**Conclusion:** The use of mHealth contributes to the management and control of the disease and promotion of self-care in patients with type 2 diabetes.

## Keywords
Type 2 diabetes, M-health, Mobile health

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# A review of Android-based rescue Mobile applications in Iran

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## ABSTRACT

**Background:** Providing immediate assistance to people in medical emergencies and natural disasters are one of the biggest rescue challenges. The widespread use of smartphones and their capabilities has created the opportunity to use their capabilities to assist in the rescue. Many countries have developed apps to help rescue.

**Objective:** This study aimed to identify Android-based rescue Mobile applications in Iran, also study their structure and content.

**Material and Methods:** This was a cross-sectional study. The population of the study consisted of all Android apps related to the rescue in Iran. First, by searching Google, Google Play (Google App Store) , Bazaar (Persian app store) and others Persian apps stores all related rescue applications were identified and the applications downloaded, installed and evaluated. The application evaluation tool was a researcher-made checklist. The collected data were analyzed using descriptive statistics in Microsoft Excel 2019 software.

**Results:** In total, 65 Iranian rescue apps for Android were identified. The apps fell into three general categories, including first aid training apps, disaster response training such as earthquakes, and emergency rescue requests. The automatic location detection of the person and the possibility of asking for help in emergencies was available in only three apps. The use of most rescue apps was completely free (84%). Very few of these apps were developed by rescue organizations such as the Red Crescent or the fire department (17%). Also, a review of app stores showed that most apps had less than 500 active downloads (86%).

**Conclusion:** The ability to detect the geographical location of the injured person, automatic calls to emergency centers or family, notification of the latest news in natural disasters, etc. are the most important features of a rescue app that did not exist in most rescue Mobile applications in Iran. Therefore, it is recommended that the Iranian Crisis Management Organization, in cooperation with other organizations involved in rescue, design a national rescue app.

## Keywords
Rescue, Android, Mobile applications, Iran, Smartphone

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# Investigating the effect of using new technologies on the quality of life in elderly

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## ABSTRACT

**Background:** The population of Iran and the world is aging. The elderly are one of the most vulnerable groups in society, which reduces their quality of life. New technologies can help the elderly to do their daily activities and have a good recreation and free time.

**Objective:** The purpose of this study is to investigate the effect of using new technologies on quality of life in elderly.

**Material and Methods:** This descriptive cross-sectional study was performed on 226 elderly people in Esfarayen using cluster sampling. The study questionnaire was consisted of demographic information, use of new technologies and Quality of life SF-36. Data were analyzed using independent t-test and analysis of variance using SPSS24 software.

**Results:** The mean age of the subjects was $63.94 \pm 7.44$ and 60% of the participants are women. 48% of the subjects used new technology. Which respectively include use of new home technologies (52%), entertainment (24%), communication (20%) and entertainment (4%). The score of mental health and Physical health dimension of quality of life in people who used new technology was higher than people who did not use ($p<0.05$). Also, the type of new technology has affected this on Physical health dimension ($p<0.05$).

**Conclusion:** It is recommended to inform and teach the use of new technologies to improve the quality of life in elderly.

## Keywords
new technologies, quality of life, elderly

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# Mobile sensing for characterizing behavioral features and contextual factors of depression

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## ABSTRACT

**Background:** Smartphones with a set of embedded sensors provide a practical data collection opportunity to explore new modalities of monitoring, and research of psychiatric and mental health conditions. Through utilizing mobile sensing, different features and patterns can be monitored to get more insight into different behavioral and contextual aspects of depression.

**Objective:** This study aimed to investigate any use of mobile sensing for monitoring different parameters and features in depression.

**Material and Methods:** A comprehensive literature review was conducted in different data bases including Scopus, PubMed, ProQuest, IEEE, EMBASE, web of science, and Cochrane. Inclusion criteria were defined for the studies. To be included in our review, studies must have been report usage of mobile sensing among patients with depression. Peer-reviewed journal papers and conference proceedings papers were included; extended abstracts were excluded.

**Results:** A total number of 44 studies met the criteria. The most frequently used mobile sensing were GPS(n=41), phone usage(n=33), and accelerometer(n=23) followed by Wi-Fi(n=10), Microphone(n=9), Light(n=8), Bluetooth(n=5), proximity(n=2), gyroscope(n=1), and temperature(n=1) sensors. The main categories of features monitored by mobile sensing included: geographical position, activity/moving duration/time, sleep state and pattern, social interaction, Number and pattern of photos taken by mobile camera, phone usage pattern, home stay or being out of home and environmental state/context. Association between depression status and some features monitored through mobile sensing had been reported in 15 studies.

**Conclusion:** Mobile sensing has been used in different studies for monitoring different behavioral and contextual features and patterns among patients with depression. However it appears that more randomized clinical trial studies are needed to conclude about the association between features monitored through mobile sensing and depression status.

## Keywords
Mobile sensing, Depression, Monitoring

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